RED LANL 6/19/00

Los Alamos National Laboratory

Hazardous and Solid Waste (ESH-19)
P.O. Box 1663, Mail Stop K490
Los Alamos, New Mexico 87545
(505) 667-9524 FAX (505) 667-5224

Date: June 19, 2000
Refer to: ESH-19-00-053

Mr. John E. Kieling, Program Manager
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044-A Galisteo Street
P.O. Box 26110
Santa Fe, New Mexico 87502-6110

Dear Mr. Kieling:

SUBJECT: Permit Working Group (PWG), Draft Permit Documents, Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit Renewal

The purpose of this letter is to provide the attached draft permit renewal documents as originally requested by your office on January 28, 2000. The documents will be used to assist with the PWG document preparation activities for the renewal of the LANL Hazardous Waste Facility Permit, U.S. Environmental Protection Agency Number, NM 0890010515-1.

The enclosed documents consist of draft permit chapters addressing the material contained in the *Los Alamos National Laboratory General Part B Permit Application, Revision 1.0*, October, 1998, and the *Los Alamos National Laboratory Technical Area 16, Part B Permit Renewal Document, Revision 3.0*, January 2000. The format and arrangement of the proposed permit chapters is consistent with the permit strategy originally suggested for the permit renewal (Letter, "Proposed Permit Strategy," to Dr. John Browne, LANL, and David Gurulé, U.S. Department of Energy, from Robert S. Dinwiddie, Hazardous and Radioactive Materials Bureau [HRMB], February 5, 1998) and subsequently modified in on-going discussions with the HRMB.

A revised outline incorporating the original permit format strategy and containing adjustments to attachments and modules as needed to maintain internal consistency is also included with this letter (Attachment 1). This can be used to ease review of the enclosed Chapters 1 and 5 of the draft permit text. Chapter 1 incorporates proposed LANL general facility conditions and is drawn from the above referenced General Part B. Chapter 5 has been developed from the TA-16 permit application.

15851

Some proposed sections incorporate changes that have been recently discussed with the HRMB. The Chapter 1, Appendix C, "Training Plan" incorporates revisions originally submitted as a permit modification request (*Los Alamos National Laboratory General Part B Plans, Permit Modification Request*, November, 1999). The revision deletes "Hazardous Waste Operations and Emergency Response" (HAZWOPER) training requirements because the course is required for hazardous waste workers by the Occupational Safety and Health Act (OSHA) rather than the Resource Conservation and Recovery Act (RCRA) The listed LANL courses provide comparable training, and the workers will continue to be provided with this training under OSHA. In addition, the general closure plan section has been deleted and the conditions listed there have been moved to technical area specific closure plans in response to discussions in the PWG on May 11, 2000, that indicated HRMB's concern for stand-alone closure documents.

Other LANL general plans such as the Appendix B, "Waste Analysis Plan" are currently being modified in response to the Request for Supplemental Information comments received by LANL on March 29, 2000. The changes anticipated for those sections have not been included with this submittal, pending PWG discussion and approval.

If you should have any questions or concerns regarding this submittal, please feel free to contact me at 665-0677 or Gian Bacigalupa at 667-1579.

Sincerely,

James L. White
Group Leader

JW/GB/vh

Attach./Enc.

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G. Bacigalupa, LANL, ESH-19, K490 w/enc.
ESH-19 (00053GB) LANL, K490
CIC-10, A150

ATTACHMENT 1

PERMIT STRATEGY FORMAT – Revised May 4, 2000

Chapter 1 – EPA ID# General Permit: Covers common operations for entire facility

Module I – Standard Conditions
Module II – General Facility Conditions
Appendix A – Waste Analysis Plan
Appendix B – Inspection Plan
Appendix C – Personnel Training Plan
Appendix D – Contingency Plan
Appendix E – Closure Plan

Chapter 2 – EPA ID# HSWA Permit

Chapter 3 – EPA ID # 03, TA-3 Specific Part B: Container Storage

Module I – Technical Area 3 Conditions
Module II – Container Storage
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Container Management
Attachment G – Authorized Waste

Chapter 4 – EPA ID# 14, TA-14 Specific Part B: Open Burning/Open Detonation

Module I – Technical Area 14 Conditions
Module II – Open Burning/Open Detonation
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Open Burning/Open Detonation Unit Management
Attachment G – Authorized Waste

Chapter 5 – EPA ID# 16, TA-16 Specific Part B: Container Storage, Open Burn Unit

Module I – Technical Area 16 Conditions
Module II – Container Storage
Module III – Subpart X Open Burning Unit
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E.1 – Closure Plan for Container Storage
Attachment E.2 – Closure Plan for Burn Ground Unit
Attachment F.1 – Container Management
Attachment F.2 –Burn Ground Unit Management
Attachment G.1 – Authorized Waste for Container Storage
Attachment G.2 – Authorized Waste for Burn Ground Unit

ATTACHMENT 1

PERMIT STRATEGY FORMAT – Revised May 4, 2000

Chapter 6 – EPA ID# 36, TA-36 Specific Part B: Open Detonation

Module I – Technical Area 36 Conditions
Module II – Subpart X Open Detonation Unit
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Open Detonation Unit Management
Attachment G – Authorized Waste

Chapter 7 – EPA ID# 39, TA-39 Specific Part B: Open Detonation

Module I – Technical Area 39 Conditions
Module II – Subpart X Open Detonation Unit
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Open Detonation Unit Management
Attachment G – Authorized Waste

Chapter 8 – EPA ID# 50, TA-50 Specific Part B: Container Storage, Treatment Tanks

Module I – Technical Area 50 Conditions
Module II – Container Storage
Module III – Treatment Tanks
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E.1 – Closure Plan for Container Storage
Attachment E.2 – Closure Plan for Treatment Tanks
Attachment F.1 – Container Management
Attachment F.2 – Treatment Tanks Management
Attachment G.1 – Authorized Waste for Container Storage
Attachment G.2 – Authorized Waste for Treatment Tanks

Chapter 9 – EPA ID # 54G, TA-54 Area G Specific Part B: Container Storage

Module I – Technical Area 54 Area G Conditions
Module II – Container Storage
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
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Attachment G – Authorized Waste

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PERMIT STRATEGY FORMAT – Revised May 4, 2000

Chapter 10 – EPA ID # 54L, TA-54 Area L Specific Part B: Container Storage

Module I – Technical Area 54 Area L Conditions
Module II – Container Storage
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Container Management
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Chapter 11 – EPA ID # 54 West, TA-54 West Specific Part B: Container Storage

Module I – Technical Area 54 West Conditions
Module II – Container Storage
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
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Chapter 12 – EPA ID # 54G, TA-54 Area G Specific Part B: Landfill

Module I – Technical Area 54 Area G Landfill Conditions
Module II – Landfill
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Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Landfill Management
Attachment G – Authorized Waste

Chapter 13 – EPA ID # 54H, TA-54 Area H Specific Part B: Landfill

Module I – Technical Area 54 Area H Landfill Conditions
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Attachment B – Inspection Plan
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Attachment F – Landfill Management
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ATTACHMENT 1

PERMIT STRATEGY FORMAT – Revised May 4, 2000

Chapter 14 – EPA ID # 54J, TA-54 Area J Specific Part B: Landfill

Module I – Technical Area 54 Area J Landfill Conditions
Module II – Landfill
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
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Chapter 15 – EPA ID # 54L, TA-54 Area L Specific Part B: Landfill

Module I – Technical Area 54 Area L Landfill Conditions
Module II – Landfill
Attachment A – Waste Analysis Plan
Attachment B – Inspection Plan
Attachment C – Personnel Training Plan
Attachment D – Contingency Plan
Attachment E – Closure Plan
Attachment F – Landfill Management
Attachment G – Authorized Waste

Chapter 16 – EPA ID # 55, TA-55 Specific Part B: Container Storage, Tank Storage, Subpart X Cementation Unit, Subpart X Vitrification Unit

Module I – Technical Area 55 Conditions
Module II – Container Storage
Module III – Tank Storage
Module IV – Subpart X Cementation Unit
Module V – Subpart X Vitrification Unit
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Attachment B – Inspection Plan
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Attachment D – Contingency Plan
Attachment E.1 – Closure Plan for Container Storage
Attachment E.2 – Closure Plan for the Storage Tank System
Attachment E.3 – Closure Plan for the Cementation Unit
Attachment E.4 – Closure Plan for the Vitrification Unit
Attachment F.1 – Container Management
Attachment F.2 – Storage Tank System Management
Attachment F.3 – Cementation Unit Management
Attachment F.4 – Vitrification Unit Management
Attachment G.1 – Authorized Waste for Container Storage
Attachment G.2 – Authorized Waste for Tank Storage
Attachment G.3 – Authorized Waste for Cementation Unit
Attachment G.4 – Authorized Waste for Vitrification Unit

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June 2000
Draft

Los Alamos National Laboratory Hazardous Waste Facility Permit

Chapter 1

General Conditions

Los Alamos National Laboratory Hazardous Waste Facility Permit

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Chapter 1

General Conditions

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MODULE I—STANDARD CONDITIONS

I.A. EFFECT OF PERMIT

The Secretary of the New Mexico Environment Department (NMED) issues this permit to the United States Department of Energy, the owner and co-operator, and the University of California, the co-operator, of Los Alamos National Laboratory. The Permittee is allowed to treat and store on site hazardous waste in accordance with the conditions of this permit. Any treatment or storage of hazardous waste not authorized in this permit, as defined by the Resource Conservation and Recovery Act (RCRA), is prohibited. Compliance with this permit constitutes compliance, for purposes of enforcement, with the New Mexico Hazardous Waste Act (Section 74-4-1 *et seq.* NMSA 1978) and the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subparts V and IX, revised June 14, 2000 [6-14-00], only for those management practices specifically authorized by this permit. The Permittee is also required to comply with 20 NMAC 4.1, Subparts I, II, III, and IV [6-14-00], to the extent the requirements of those subparts are applicable. The Permittee must also comply with all applicable self-implementing provisions imposed by RCRA statute and/or 20 NMAC 4.1, Subpart VIII [6-14-00]. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; or any other law providing for protection of public health or the environment.

I.B. PERMIT ACTIONS

1. Permit Modification, Revocation and Reissuance, and Termination. This permit may be modified, revoked and reissued, or terminated for cause as specified in 20 NMAC 4.1, Subpart IX, Subpart D [6-14-00]. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any permit condition.
2. Permit Renewal. This permit may be renewed, as specified in 20 NMAC 4.1, Subpart IX, 270.30(b) [6-14-00], and permit condition I.E.2 below. Review of any

application for a permit renewal shall consider improvements in the state of control and measurement technology as well as changes in applicable regulations.

I.C. SEVERABILITY

The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

I.D. DEFINITIONS

For purposes of this permit, terms used herein shall have the same meaning as those in 20 NMAC 4.1, Subparts I, V, VII, VIII, and IX [6-14-00], unless this permit specifically provides otherwise. Where terms are not defined in the regulations or the permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

"Secretary" means the Secretary of New Mexico Environment Department (NMED), or his/her designee or authorized representative.

I.E. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply, in accordance with 20 NMAC 4.1, Subpart IX, 270.30(a) [6-14-00], with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with 20 NMAC 4.1, Subpart IX, 270.61 [6-14-00]. Any permit noncompliance by any Permittee employee or contractor, other than noncompliance authorized by an emergency permit, constitutes a violation of the New Mexico Hazardous Waste Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

2. Duty to Reapply. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(b) [6-14-00], if the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee shall submit an

administratively complete application for a new permit at least 180 calendar days before this permit expires. (20 NMAC 4.1, Subpart V, 270.10(h) [6-14-00])

3. Permit Expiration. Pursuant to 20 NMAC 4.1, Subpart IX, 270.50 [6-14-00], this permit shall be effective for the fixed term of ten years. As long as the New Mexico Environment Department (NMED) is the permit-issuing authority, this permit and all conditions herein will remain in effect beyond the permit's expiration date, if the Permittee has submitted a timely, complete application (see 20 NMAC 4.1, Subpart IX, 270.10 and 270.13 through 270.29 [6-14-00]) and, through no fault of the Permittee, the Secretary has not issued a new permit, as set forth in 20 NMAC 4.1, Subpart IX, 270.51 [6-14-00].

4. Need to Halt or Reduce Activity Not a Defense. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(c) [6-14-00], it shall not be a defense for the Permittee, in an enforcement action, that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. Duty to Mitigate. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(d) [6-14-00], the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures, as are reasonable, to prevent significant adverse impacts on human health or the environment resulting from noncompliance with this permit.

6. Proper Operation and Maintenance. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(e) [6-14-00], the Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

7. Duty to Provide Information. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(h) [6-14-00], the Permittee shall furnish to the Secretary, within a reasonable time, any relevant information which the Secretary may request to

determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Secretary, upon request, copies of records required to be kept by this permit. (20 NMAC 4.1, Subpart V, 264.74(a) [6-14-00])

8. Inspection and Entry. In accordance with 20 NMAC 4.1, Subpart IX, 270.30(i) [6-14-00], the Permittee shall allow the Secretary or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to:

   a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

   b. Have access to and copy, at reasonable times, any unclassified records that must be kept under the conditions of this permit;

   c. Inspect, at reasonable times, any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

   d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the New Mexico Hazardous Waste Act, any substances or parameters at any location.

   e. The Secretary recognizes that the Permittee operates in some cases under security restrictions imposed by the Atomic Energy Act (42 USC 2011 *et seq.*) and the regulations promulgated thereunder, and by other Federal laws and regulations. Should conflict arise under this permit section, the Secretary and the Permittee shall cooperate in working with the appropriate Federal agency to obtain access approval. Nothing in this permit section shall be construed to deny access authorized by RCRA.

9. Monitoring and Records.

   a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of 20 NMAC 4.1, Subpart II, Part 261 [6-14-00], or an equivalent method approved by the Secretary.

Laboratory methods must be those specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*, (EPA, 1986 and all approved updates); "Standard Methods for the Examination of Water and Wastewater," (most current edition); or an equivalent method, as specified in the Waste Analysis Plan in Appendix A of Chapter 1 of this permit and Attachment A of TA-specific permit chapters.

b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, the certification required by 20 NMAC 4.1, Subpart V, 264.73(b)(9) [6-14-00], and records of all data used to complete the application for this permit for a period of at least 3 years from the date of sample, measurement, report, record, certification, or application. These periods may be extended by request of the Secretary at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. The Permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations for the active life of the facility. (20 NMAC 4.1, Subpart V, 264.74(b), and 20 NMAC 4.1, Subpart IX, 270.30(j)(2) [6-14-00])

c. Pursuant to 20 NMAC 4.1, Subpart IX, 270.30(j)(3) [6-14-00], records of monitoring information shall specify:

i. The dates, exact place, and times of sampling or measurements;

ii. The individuals who performed the sampling or measurements;

iii. The dates analyses were performed;

iv. The individuals or off-site laboratory who performed the analyses;

v. The analytical techniques or methods used; and

vi. The results of such analyses.

10. Reporting Planned Changes. The Permittee shall give notice to the Secretary, as soon as possible, of any planned physical alterations or additions to the permitted facility, per 20 NMAC 4.1, Subpart IX, 270.30(l)(1) [6-14-00].

11. Certification of Construction or Modification. The Permittee may not commence treatment or storage of waste at the modified unit until:

a. The Permittee has submitted to the Secretary, by certified mail or hand delivery, a letter signed by the Permittee and a registered professional engineer, stating that the unit has been constructed or modified in compliance with the permit; and

b. i. The Secretary or his designee has inspected the modified or newly-constructed unit and finds it is in compliance with the conditions of the permit; or

ii. The Secretary or his designee has either waived the inspection or has not, within 15 calendar days, notified the Permittee of his intent to inspect.

12. Reporting Anticipated Noncompliance. The Permittee shall give advance notice to the Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

13. Transfer of Permit. This permit may be transferred to a new owner or operator, pursuant to 20 NMAC 4.1, Subpart IX, 270.40 [6-14-00]. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 20 NMAC 4.1, Subparts V and IX [6-14-00], and this permit.

14. Twenty-Four Hour Reporting.

a. The Permittee shall report to the Secretary any noncompliance which may endanger human health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. The report shall include the following:

i. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

ii. Any information of a release or discharge of hazardous waste or of a fire or explosion from the hazardous waste management facility, which could threaten the environment or human health outside the facility.

b. The description of the occurrence and its cause shall include:

i. Name, address, and telephone number of the owner or operator;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Name and quantity of material(s) involved;

v. The extent of injuries, if any;

vi. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

vii. Estimated quantity and disposition of recovered material that resulted from the incident.

The 24-hour report shall be made by calling (505) 827-2929 during normal duty hours or (505) 827-9329, the 24-hour emergency telephone number.

c. A written submission shall also be provided within five days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected; and, if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Secretary may waive the five-day written notice requirement in favor of a written report within 15 days (20 NMAC 4.1, Subpart IX, 270.30(l)(6) [6-14-00].

15. Other Noncompliance. The Permittee shall report all other instances of noncompliance not otherwise required to be reported above in permit conditions I.E.10 through I.E.15, at the time monitoring reports are submitted. The reports shall contain the information listed in permit condition I.E.14 (20 NMAC 4.1, Subpart IX, 270.30(l)(10) [6-14-00].

16. Other Information. Whenever the Permittee becomes aware that he failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Secretary, the Permittee shall verbally notify the Secretary of such fact on the next work day and submit, within thirty calendar days, written correction of such facts or information.

I.F. SIGNATORY REQUIREMENTS

All permit applications, permit modification requests, permit renewal documents, reports, or other information requested by the Secretary, his designee, or an authorized

representative, shall be signed and certified as required by 20 NMAC 4.1, Subpart IX, 270.11 and 270.30(k) [6-14-00].

I.G. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE SECRETARY

All reports, notifications, or other submissions required by this permit to be sent or given to the Secretary should be sent by certified mail or given to:

RCRA Permit Program Manager
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
525 Camino de los Marquez
P.O. Box 26110
Santa Fe, NM 87502

(505) 827-4308
(505) 827-4389 (Fax)

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I.H. CONFIDENTIAL INFORMATION

The Permittee may claim confidential, in accordance with 20 NMAC 4.1, Subpart IX, 270.12 [6-14-00], any information required to be submitted by this permit.

I.I. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittee shall maintain at the facility, until closure is completed and certified by an independent registered professional engineer, the following documents and all amendments, revisions, and modifications to these documents:

1. All chapters of this permit, its appendices, and its attachments;
2. The Waste Analysis Plan in Appendix A of this permit chapter and Attachment A of TA-specific permit chapters, as required by 20 NMAC 4.1, Subpart V, 264.13(b) [6-14-00], and this permit;
3. The Inspection Plan in Appendix B of this permit chapter and Attachment B of TA-specific permit chapters, as required by 20 NMAC 4.1, Subpart V, 264.15 [6-14-00], and this permit.

4. The Personnel Training Plan in Appendix C of this permit chapter and Attachment C of TA-specific permit chapters, and training records, as required by 20 NMAC 4.1, Subpart V, 264.16(a) [6-14-00], and this permit;
5. The Contingency Plan in Appendix D of this permit chapter and Attachment D of TA-specific permit chapters, as required by 20 NMAC 4.1, Subpart V, 264.53(a) [6-14-00], and this permit;
6. The Closure Plan in Appendix F of this permit chapter and Attachment F of TA-specific permit chapters, as required by 20 NMAC 4.1, Subpart V, 254.112(a) [6-14-00], and this permit;
7. The Operating Record, as required by 20 NMAC 4.1, Subpart V, 264.15 [6-14-00], and this permit.
8. Post-Closure Plan, as required by 20 NMAC 4.1, Subpart V, 264.118(a) [6-14-00], and this permit.

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MODULE II—GENERAL FACILITY CONDITIONS

II.A MAINTENANCE AND OPERATION OF THE FACILITY

The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned, sudden or nonsudden release of hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, as required by the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, 264.31, revised June 14, 2000 [6-14-00].

II.B. REQUIRED NOTICES

1. Foreign Wastes. This permit does not allow the Permittee to accept wastes from a foreign source. If the Permittee is to receive hazardous waste from a foreign source, he shall apply for and receive a permit modification, in accordance with 20 NMAC 4.1, Subpart IX, 270.41 or 270.42 [6-14-00], prior to accepting such waste.

2. Off-Site Source. "Off-site source" refers to wastes generated by sources other than the Permittee or its contractor(s) operating on site. When the Permittee is to receive such hazardous waste from an off-site source, he must inform the generator in writing that he has the appropriate permit and will accept the waste the generator is shipping, as required by 20 NMAC 4.1, Subpart V, 264.12(b) [6-14-00]. The Permittee must keep a copy of this written notice as part of the operating record, in accordance with 20 NMAC 4.1, Subpart V, 264.12(b) [6-14-00].

II.C. WASTE ANALYSIS

1. Waste Analysis Plan. The Permittee shall follow the procedures described in Appendix A of this permit chapter and/or Attachment A of Technical Area (TA)-specific permit chapters, when appropriate, as required by 20 NMAC 4.1, Subpart V, 264.13 [6-14-00].

2. Quality Assurance. The Permittee shall verify its waste analysis as part of a written quality assurance program. The quality assurance program shall be in accordance with current accepted practices, such as specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" *(EPA-SW-846*, 1986

and all approved updates), or equivalent methods approved by the Secretary. At a minimum, the quality assurance program shall ensure that the Permittee maintains proper functional instruments, uses approved sampling and analytical methods, verifies the validity of sampling and analytical procedures, and performs correct calculations. The Permittee shall inform any contract laboratory in writing of the requirements of this permit.

3. Annual Verification. The Permittee shall verify the accuracy and currency of each waste stream annually.

II.D. SECURITY

The Permittee shall comply with the security provisions described in Attachment I.D of TA-specific permit chapters, in accordance with 20 NMAC 4.1, Subpart V, 264.14 [6-14-00].

II.E. INSPECTION REQUIREMENTS

The Permittee shall follow the inspection requirements in Appendix B of this permit chapter and/or Attachment B of TA-specific permit chapters. Inspection records shall be kept for at least three years from the date of inspection, as required by 20 NMAC 4.1, Subpart V, 264.15(d) [6-14-00]. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by 20 NMAC 4.1, Subpart V, 264.15(e) [6-14-00]. Records of inspections leading to corrective action shall be retained for three years after the corrective action taken as a result of the inspection.

II.F PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by 20 NMAC 4.1, Subpart V, 264.16 [6-14-00]. This training program shall follow Appendix C of this permit chapter and/or Attachment C of TA-specific permit chapters, when appropriate. The Permittee shall maintain training documents and records on all current employees and for three years from the date the employee last worked at the facility, as required by 20 NMAC 4.1, Subpart V, 264.16(d) and (e) [6-14-00].

II.G SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the procedures for handling ignitable, reactive, and incompatible wastes described in TA-specific permit chapters, in accordance with 20 NMAC 4.1, Subpart V, 264.17 [6-14-00].

II.H PREPAREDNESS AND PREVENTION

1. Required Equipment. At a minimum, the Permittee shall maintain at the facility the equipment set forth in Appendix D of this permit chapter and Attachment D of TA-specific permit chapters, in accordance with 20 NMAC 4.1, Subpart V, 264.32 [6-14-00].
2. Testing and Maintenance of Equipment. The Permittee shall test and maintain the equipment specified in permit paragraph II.H.1 above, as necessary, to assure its proper operation in time of emergency, as required by 20 NMAC 4.1, Subpart V, 264.33 [6-14-00].
3. Access to Communications or Alarm System. The Permittee shall maintain access to the necessary communications or alarm system(s), as required by 20 NMAC 4.1, Subpart V, 264.34 [6-14-00].
4. Required Aisle Space. The Permittee shall maintain aisle space as described in TA-specific permit chapters, in accordance with 20 NMAC 4.1, Subpart V, 264.35 [6-14-00].
5. Arrangements with Local Authorities. The Permittee shall maintain arrangements with state and local authorities, as required by 20 NMAC 4.1, Subpart V, 264.37 [6-14-00]. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

II.I CONTINGENCY PLAN

1. Implementation of Plan. The Permittee shall immediately carry out the provisions of Appendix D of this permit chapter and Attachment D of TA-specific permit chapters whenever there is an unplanned fire, explosion, or unpermitted release of hazardous waste or hazardous constituents which could threaten human health or the environment.

2. Amendment of the Plan. The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by 20 NMAC 4.1, Subpart V, 264.54 [6-14-00].
3. Copies of the Plan. The Permittee shall comply with the requirements of 20 NMAC 4.1, Subpart V, 264.53 [6-14-00]. A copy of the Contingency Plan and all revisions to the plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.
4. Emergency Coordinator. The Permittee shall comply with the requirements of 20 NMAC 4.1, Subpart V, 264.55 [6-14-00], concerning the emergency coordinator. A trained emergency coordinator shall be available at all times in case of an emergency.

II.J MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of 20 NMAC 4.1, Subpart V, 264.71, 264.72, and 264.76 [6-14-00], for any hazardous wastes received from or shipped off site by the Permittee for treatment, storage, or disposal.

II.K RECORDKEEPING AND REPORTING

In addition to the recordkeeping and reporting requirements specified elsewhere in this permit, the Permittee shall do the following:

1. Operating Record. The Permittee shall maintain a written Operating Record at the facility, as required by 20 NMAC 4.1, Subpart V, 264.73(a) [6-14-00].
2. Biennial Reports. The Permittee shall comply with the biennial reporting requirements of 20 NMAC 4.1, Subpart V, 264.75 [6-14-00].

II.L CLOSURE

The provisions of this permit section apply to individual waste management units (or related structures/locations) for partial closure of the facility, as well as total closure of the entire facility. Closure of one unit (or related structures/locations) may or may not affect the remaining units. The impact of such sequential or partial closure may depend on the sequence and circumstances in existence at the time of closure. The Secretary

may direct or the Permittee may request appropriate revisions to the closure plan at that time.

1. Performance Standard. The Permittee shall close the facility, as required by 20 NMAC 4.1, Subpart V, 264.111 [6-14-00], and in accordance with each closure plan in Attachment E of TA-specific permit chapters.
2. Amendment of Closure Plans. The Permittee shall amend each closure plan, whenever necessary, in accordance with 20 NMAC 4.1, Subpart V, 264.112(c) [6-14-00].
3. Notification of Closure. The Permittee shall notify the Secretary, in writing, at least 60 days prior to the date on which he expects to begin closure of any landfill or final closure of the facility, as required by 20 NMAC 4.1, Subpart V, 264.112(d) [6-14-00]. Similarly, the Permittee shall notify the Secretary in writing at least 45 days prior to the date on which he expects to begin closure of any tank units or container storage units or final closure of the facility.
4. Time Allowed for Closure. After receiving the final volume of hazardous waste, the Permittee shall treat or remove, from the site undergoing closure, all hazardous waste and shall complete closure activities in accordance with the schedule specified in the applicable closure plan, as required by 20 NMAC 4.1, Subpart V, 264.113 [6-14-00].
5. Disposal, Decontamination, or Decommissioning of Equipment. The Permittee shall properly dispose of, decontaminate, or decommission all contaminated equipment, structures, and soils, as specified in the TA-specific permit chapter closure plan, as required by 20 NMAC 4.1, Subpart V, 264.114 [6-14-00].
6. Certification of Closure. The Permittee shall certify that the facility has been closed in accordance with the specifications in the closure plan, as required by 20 NMAC 4.1, Subpart V, 264.115 [6-14-00].
7. Survey Plat. For hazardous waste disposal units, the Permittee shall submit a survey plat no later than the submission of certification of closure, as required by 20 NMAC 4.1, Subpart V, 264.116 [6-14-00].

II.M. POST-CLOSURE FOR LANDFILLS

1. Post-Closure Care Period. The Permittee shall begin post-closure care for each landfill after completion of closure of the unit and continue for 30 years after that date. Post-closure care shall be in accordance with 20 NMAC 4.1, Subpart V, 264.117 [6-14-00], and with Post-Closure Plans in the applicable TA-specific permit chapters.
2. Post-Closure Security. The Permittee shall maintain security at the facility during the post-closure care period, in accordance with 20 NMAC 4.1, Subpart V, 264.117(b) [6-14-00], and with Post-Closure Plans in the applicable TA-specific permit chapters.
3. Amendment to Post-Closure Plan. The Permittee shall amend the Post-Closure Plan, whenever necessary, in accordance with 20 NMAC 4.1, Subpart V, 264.118(d) [6-14-00].
4. Post-Closure Notices.
   a. No later than 60 days after certification of closure of each hazardous waste disposal unit, the Permittee shall submit records of the type, location, and quantity of hazardous waste disposed within each cell or disposal unit, in accordance with 20 NMAC 4.1, Subpart V, 264.119(a) [6-14-00].
   b. Within 60 days of certification of closure of the first hazardous waste disposal unit, the Permittee shall do the following:
      i. Record a notation on the deed to the facility property, in accordance with 20 NMAC 4.1, Subpart V, 264.119(b)(1) [6-14-00].
      ii. Submit a certification that a notation has been recorded, in accordance with 20 NMAC 4.1, Subpart V, 264.119(b)(2) [6-14-00].
   c. The Permittee shall request and obtain a permit modification prior to post-closure removal of hazardous wastes, hazardous waste residues, liners, or contaminated soils, in accordance with 20 NMAC 4.1, Subpart V, 264.119(c) [6-14-00].

5. Certification of Completion of Post-Closure Care. The Permittee shall certify that the post-closure care period was performed in accordance with the specifications in the Post-Closure Plan, as required by 20 NMAC 4.1, Subpart V, 264.120 [6-14-00].

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APPENDIX A

WASTE ANALYSIS PLAN

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LIST OF ATTACHMENTS

ATTACHMENT	TITLE
A-1	Waste Management Units at Los Alamos National Laboratory

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LIST OF ABBREVIATIONS/ACRONYMS

20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ASTM	American Society for Testing and Materials
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	environmental remediation/restoration
HE	high explosives
INEEL	Idaho National Engineering and Environmental Laboratory
LANL	Los Alamos National Laboratory
LDR	land disposal restrictions
NMED	New Mexico Environment Department
OB	open burning
OD	open detonation
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Program Plan
QC	quality control
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RTL	regulatory threshold limit
RTR	real-time radiography
SVOC	semivolatile organic compound

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LIST OF ABBREVIATIONS/ACRONYMS
(Continued)

SW-846	EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"
TA	technical area
TC	toxicity characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TRU	transuranic
TRUCON	TRUPACT-II Content
TRUPACT-II	Transuranic Package Transporter-II
TSDF	treatment, storage, and disposal facility
TWCP	TRU Waste Certification Plan
VOC	volatile organic compound
WAC	waste acceptance criteria
WAP	waste analysis plan
WIPP	Waste Isolation Pilot Plant

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APPENDIX A
WASTE ANALYSIS PLAN

This waste analysis plan (WAP) presents information on the chemical and physical nature of hazardous, mixed low-level, mixed transuranic (TRU), and high explosives (HE) and HE-contaminated wastes stored and treated at Los Alamos National Laboratory (LANL). It has been prepared to meet the requirements set forth in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, 264.13, revised June 14, 2000 [6-14-00]. The waste analysis information contained in this WAP is specific to storage in containers and tanks, and treatment by open burning (OB), open detonation (OD), and stabilization (cementation). Waste analysis plan requirements specific to other types of storage or treatment are addressed in Attachment A in technical area (TA)-specific permit chapters. Additional waste analysis requirements are specified in 20 NMAC 4.1, Subpart IX, 270.14(b) [6-14-00]; and 20 NMAC 4.1, Subpart VIII, 268.7 [6-14-00], "Waste Analysis and Record Keeping." The content of this WAP follows the guidance provided in "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual" (U.S. Environmental Protection Agency [EPA], 1994). It is organized as follows:

Section A.1 Facility Description: Includes a general description of LANL; general descriptions of the waste streams stored and treated and the activities that generate waste; and a list of the waste management units at LANL.

Section A.2 Waste Analysis Parameters: Includes a discussion of the proposed analytical parameters and methods used by LANL and the criteria/rationale for the parameter selection.

Section A.3 Characterization Procedures: Includes the characterization approach (e.g., acceptable knowledge, sampling and analysis) for each waste classification stored and treated at LANL.

Section A.4 Off-Site Waste: Includes a discussion of procedures in place for acceptance of waste from off-site facilities.

Section A.5 Special Procedural Requirements: Includes a discussion of the procedures in place for ignitable, reactive, and incompatible wastes; procedures to ensure compliance with land disposal restrictions (LDR); and procedures to ensure compliance with Subpart CC requirements.

Section A.6 References.

A.1 FACILITY DESCRIPTION [20 NMAC 4.1, Subpart V, 270.14(b)(1)]

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 and the associated residential and commercial areas of Los Alamos County are situated on the Pajarito Plateau.

LANL's central mission 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 safeguards and stockpile stewardship; 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; biomedicine, health, and biotechnology; and industrial partnerships. LANL is owned by the U.S. Department of Energy (DOE) and is operated jointly by DOE and the University of California.

A.1.1 Facility Waste-Generating Processes and Activities

Wastes are generated at LANL primarily from research and development (R&D) activities, processing and recovery operations, decontamination and decommissioning (D&D) projects, and environmental remediation/restoration (ER) activities. Wastes generated from these types of processes and activities may also be received from off-site facilities, as described in permit paragraph II.B of Chapter 1 of this permit. Tables A-1 through A-6 provide information on potential hazardous, mixed low-level, mixed TRU, HE, and HE-contaminated wastes generated at LANL. Wastes generated at off-site facilities that may be received at LANL are described in Table A-7. These tables include brief waste descriptions, waste-generating process or activity, the characterization basis for waste designation, potential EPA Hazardous Waste Number(s), potential hazardous constituents in and/or characteristics of the waste, and regulatory limits.

A.1.2 Stored Waste

Hazardous, mixed low-level, and mixed TRU wastes are stored at various container storage areas throughout LANL. The following sections contain general descriptions of these wastes and the processes which generate them.

A.1.2.1 Hazardous Waste

The criteria for establishing a waste as a hazardous waste are provided in 20 NMAC 4.1, Subpart II [6-14-00]. A waste is considered hazardous if it meets the definition of a solid waste described in 20 NMAC 4.1, Subpart II, 261.2 [6-14-00]; is not exempted from regulation as a hazardous waste under 20 NMAC 4.1, Subpart II, 261.4 [6-14-00]; and exhibits any of the characteristics of hazardous

waste identified in 20 NMAC 4.1, Subpart II, Part 261, Subpart C [6-14-00], or is listed in 20 NMAC 4.1, Subpart II, Part 261, Subpart D [6-14-00].

Hazardous wastes are generated at LANL primarily from R&D activities, general facility operations, D&D projects, and ER activities. These waste streams include spent solvents, contaminated solid wastes, paint and related wastes, photographic and photocopier wastes, corrosive liquids, solid metals and metallic compounds, noncorrosive aqueous and nonaqueous solutions and slurries, aqueous solutions and sludges, mercury wastes, used batteries and battery fluids, unused off-specification commercial chemical products, ER soils and sludges, ER aqueous liquids, and ER debris. Hazardous waste streams may be of uniform composition (i.e., homogeneous) or of dissimilar/diverse composition (i.e., heterogeneous). Descriptions of these routinely handled hazardous waste streams and their waste-generating processes are provided below and summarized in Table A-1.

Spent Solvents

This homogeneous waste stream consists of liquid spent solvents and spent solvent mixtures that may contain organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include R&D, laser research, organic and inorganic chemical research, cleaning, and degreasing.

Contaminated Solid Wastes

Contaminated solid wastes (i.e., wastes of a solid physical form) are typically heterogeneous mixtures of rags, spill cleanup materials, Kimwipes™, gloves, filters, plastic and paper products, and personal protective equipment. This waste stream may also consist of disposable equipment contaminated with organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include machining operations, chemical research, D&D projects, metal finishing operations, and general maintenance operations.

Paint and Related Wastes

Paint and paint-related wastes generally consist of excess paint, paint strippers/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. These waste matrices may be homogeneous or heterogeneous, depending on the specific waste-generating process.

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. This waste stream is typically homogeneous and is generated primarily from photographic film processing and photocopier operations.

Corrosive Liquid Wastes

These homogeneous 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

This waste stream consists of homogeneous wastes including metal chips and turnings from machining and cutting operations. It also consists 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 Noncorrosive Aqueous and Nonaqueous Solutions and Sludges

This waste stream consists of noncorrosive aqueous and nonaqueous solutions and sludges that are contaminated with hazardous constituents. These wastes are typically homogeneous. 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. This waste stream may be homogeneous or heterogeneous, depending on the specific waste-generating activity.

Used Batteries and Battery Fluids

This waste stream consists of used batteries and battery fluids that may contain heavy metals such as cadmium, lead, mercury, and silver. Waste-generating activities include routine equipment

maintenance. This waste stream may be homogeneous or heterogeneous, depending on the specific waste-generating activity.

Unused/Off-specification Commercial Chemical Products

This waste stream consists of discarded solid and liquid chemical reagents that are off-specification, unused, or outdated. This waste stream may also include spill residues and containers containing original product residues that are unused.

Gas Cylinder Waste

This waste stream consists of pressurized gas cylinders, including aerosol cans, that may contain regulated hazardous metals, organic compounds, or exhibit hazardous characteristics of ignitability, corrosivity, and reactivity.

ER Soils and Sludges

This homogeneous waste stream consists of environmental media and sludges generated through ER 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.

ER Aqueous Liquids

This homogeneous waste stream consists of liquids generated during ER activities, including decontamination of remedial equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated stormwater runoff.

ER Debris

This heterogeneous waste stream consists of debris (such as concrete, vitrified clay pipe, steel baffles, and building materials) generated through ER 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.

A.1.2.2 Mixed Low-Level Waste

Low-level waste is defined in DOE Order 5820.2A, "Radioactive Waste Management" (DOE, 1988), as "waste that contains radioactivity and is not classified as high-level waste, transuranic waste, spent nuclear fuel, or 11(e)(2) by-product material as defined by the Order. Test specimens of fissionable material irradiated for research and development only, and not for the production of

power or plutonium, may be classified as low-level, provided that the concentration of transuranics is less than 100 nanocuries per gram of waste." By-product material, as defined in Section 11(e)(2) of the Atomic Energy Act of 1954, as amended, consists of uranium and thorium mill tailings. Section 11(e)(2) by-product material is not generated at LANL. Mixed low-level waste is any waste that has both a hazardous waste component and a low-level waste component, as defined above. For mixed low-level waste, this WAP addresses only the hazardous component.

Mixed low-level waste is generated at LANL primarily from R&D activities, processing and recovery operations, D&D projects, and ER activities. Descriptions of the mixed low-level wastes and their waste-generating processes are provided below and summarized in Table A-2. These descriptions are extracted primarily from LANL's "Report for the Characterization Review of Low-Level Mixed Waste" (LANL, 1995a) and "Federal Facilities Compliance Order Site Treatment Plan Background Volume" (LANL, 1995b).

A.1.2.2.1 Mixed Low-Level Solid Homogeneous Waste

Homogeneous mixed low-level solid waste is of uniform composition. Waste streams of this type are generally described below.

Soils with Heavy Metals

Soil waste contaminated with heavy metals is generated during D&D and ER activities at various locations throughout LANL. Typically, this waste consists of soils contaminated with varying concentrations of lead or other heavy metals resulting from contact with small shapes, typically in the form of small pieces, shot, or pellets.

Environmental Restoration Soils

This waste consists of soils contaminated with heavy metals and organic compounds. They are typically generated by ER activities, such as the remediation of release sites and D&D activities.

Inorganic Solid Oxidizers

Many different types of discarded reagent powders and crystalline materials comprise this waste stream. 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 R&D and D&D of research laboratories.

A.1.2.2.2 Mixed Low-Level Solid Heterogeneous Waste

Heterogeneous mixed low-level solid waste streams contain components that are dissimilar or have a diverse composition. Waste streams of this type are generally described below.

Lead for Surface Decontamination

Lead for surface decontamination consists of contaminated lead shielding used as radiation shielding. 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, and special shapes. The radioactive material on the surface of the lead may be removable by decontamination and the lead can then be recycled or reused.

Other Lead Wastes

Other lead waste consists of activated or inseparable lead, lead blankets, and lead requiring sorting. This lead may also have been used as shielding for radiation, but is not amenable to surface decontamination because the waste is either activated or has a physical form that prevents decontamination. It is generated primarily from radioisotope experiments and other reactor, accelerator, laser, and x-ray activities. The waste may be in the form of sheets, pigs, bricks, special shapes, shot, shavings, slag, and dross.

Noncombustible Debris

Noncombustible debris typically consists of discarded hazardous and contaminated scrap metals that are generated by maintenance, D&D of research laboratories or equipment, R&D, and ER activities. Additionally, discarded bricks and glass are generated through dismantling of LANL 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. The waste may be contaminated with residues such as cadmium, cyanide, lead, and mercury.

Combustible Debris

Maintenance, D&D, R&D, and ER activities may generate rags and combustible debris with heavy metals and/or organics, some of which may contain residual liquids. Examples include solvents and lubricants that are used in metal-cutting operations. Much of this waste is generated during the processing (e.g., metal-cutting operations) of lead and barium, resulting in heavy metal contamination.

Organic-Contaminated Noncombustible Solids

This waste stream typically includes absorbed oils, laboratory trash, and discarded equipment. Absorbed oil waste is typically comprised of drums containing vermiculite or corncob fractions used to absorb many different types of oil from spills and routine maintenance operations. The oil generally originates from vacuum pumps and may be contaminated by mercury, lead, or cadmium. Mercury is a common constituent in the waste stream because of its use at various LANL locations as a vacuum-pumping fluid for early vacuum systems. Cadmium contamination may be the result of soldering and brazing-fume-hood operations. Lead contamination is the result of lead turnings contained in cooling oil. Absorbent is routinely added to these waste oils as required by standard operating procedures.

Laboratory trash typically consists of noncombustible solid materials with residual solvent contamination. The laboratory debris includes reagent bottles, broken glassware, and discarded disposable materials (e.g., syringes and drying dishes). Large quantities of chemicals were not placed in this trash; however, residual liquids or powders may have remained on some of the disposed material.

Discarded equipment with heavy metals and solvents primarily includes equipment and broken glassware that may have contained residual solvents.

Organic-Contaminated Combustible Solids

This waste stream typically consists of waste similar to the combustible debris, along with rags, cardboard, protective clothing, and paint-stripper trash. This waste stream is potentially contaminated with methyl ethyl ketone and other solvents. Waste-generating activities include maintenance, D&D, and ER activities.

Water-Reactive Wastes

Water-reactive wastes consist of reactive metal debris generated through the cleanup of HE firing-site debris and from machining and disassembly of test components. This waste stream includes calcium, lithium hydride, lithium metal, and magnesium.

Mercury Wastes

The mercury-contaminated instruments and equipment waste stream consists of discarded or broken equipment containing liquid mercury. The instruments and equipment include broken thermometers, vacuum tubes from electronics applications, vacuum pumps with residual mercury, activated or

nondecontaminatable fluorescent light bulbs, and mercury absorbed into a paper or solid matrix. Most of this waste is generated by cleanup operations and could not effectively be recycled or separated from its containing vessel.

Unused Solid Reagent Chemicals

Many different types of discardable off-specification unused solid reagent chemicals are generated at LANL by the R&D programs it supports. Most of these items are in their original containers.

A.1.2.2.3 Mixed Low-Level Liquid Waste

Mixed low-level liquid waste streams stored at LANL are described generally in the following paragraphs.

Spent Solvents and Contaminated Solvent Mixtures

This waste stream is comprised of spent solvents and spent solvent mixtures that may 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

This waste stream consists of acidic or alkaline solutions that may contain organics, inorganics, metals, oils, or other contaminants. Waste-generating activities include radiochemistry research, plutonium processing, and analytical chemistry.

Aqueous Liquids Contaminated with Heavy Metals

This waste stream consists of aqueous solutions that may contain heavy metals. Waste-generating activities include metal-polishing operations, radiochemistry research, and ER activities.

Oil Wastes

Oil wastes at LANL are generated primarily during equipment maintenance operations. Possible contaminants in this waste stream include heavy metals and solvents.

Unused Liquid Reagent Chemicals

Many different types of discarded off-specification unused liquid reagent chemicals are generated at LANL by the R&D programs it supports. Most of these items are in their original containers.

A.1.2.2.4 Mixed Low-Level Gas Cylinder Waste

This waste stream consists of pressurized gas cylinders, including aerosol cans, that may contain regulated hazardous metals, organic compounds, or exhibit hazardous characteristics of ignitability, corrosivity, and reactivity.

A.1.2.3 Mixed TRU Waste

TRU waste is defined in DOE Order 5820.2A, "Radioactive Waste Management" (DOE, 1988), as follows: "Without regard to source or form, waste that is contaminated with alpha emitting transuranic radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay and has atomic numbers greater than 92. Heads of Field Elements can determine that other alpha contaminated waste, peculiar to a specific site, must be managed as TRU waste." Mixed TRU waste contains both a hazardous waste component and a TRU waste component. For mixed TRU waste, this WAP addresses only the hazardous component.

Mixed TRU waste is generated at LANL primarily from R&D activities, processing and recovery operations, and D&D projects. Limited quantities of mixed TRU waste from off-site facilities will be accepted at LANL for additional characterization and management. Mixed TRU waste streams at LANL are divided into four broad categories and described by a matrix parameter code. Matrix parameter codes 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 matrix parameter codes are available in "DOE Waste Treatability Groups Guidance" (DOE, 1995). The matrix parameter codes that are applicable to the mixed TRU wastes stored at LANL are listed below.

- *Matrix Parameter Code S3000, Homogeneous Solids*: defined as solid waste materials, excluding soil/gravel, that do not meet the EPA LDR criteria for classification as debris.
- *Matrix Parameter Code S4000, Soil/Gravel*: defined as solid waste materials that are at least 50 percent by volume soil/gravel.
- *Matrix Parameter Code S5000, Debris*: defined as a heterogeneous waste stream that is at least 50 percent by volume solid materials exceeding a 2.36-inch particle size that is intended for disposal and is a manufactured object, plant or animal matter, or neutral geologic material.

- *Matrix Parameter Code 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).

Matrix parameter codes are applied to mixed TRU waste streams as a general categorization scheme to distinguish between waste types. More specific waste identification systems are used for supplementary purposes as part of waste management operations at LANL. To better identify wastes containing hazardous constituents, mixed TRU wastes are assigned to a numbered waste stream. These numbered waste streams are based on the following prioritized criteria: waste generation process (including location of the process); bulk material content of the waste (e.g., combustible debris, noncombustible debris, cemented sludge, or organics absorbed on vermiculite); and/or hazardous constituents in the waste. These numbered waste streams also correspond to other identification systems used by LANL in the past. Table A-3 lists the mixed TRU waste streams stored at LANL by their matrix parameter code and provides a cross-reference between past and present waste stream identification systems. This includes identification of the waste streams by Transuranic Package Transporter-II (TRUPACT-II) Content (TRUCON) codes, described below.

TRUCON codes were developed by DOE to provide consistent waste content descriptions for TRU and mixed TRU waste generated throughout all of DOE's facilities (DOE, 1996a). The TRUCON codes describe the bulk material and chemical characteristics of TRU and mixed TRU waste to be certified for transportation in the TRUPACT-II. LANL TRUCON codes consists of a three digit number preceded by the letters "LA" and followed by a letter that further defines the waste packaging. The following paragraphs provide consolidated waste descriptions for the mixed TRU wastes stored at LANL. Mixed TRU waste information is summarized in Table A-4.

TRUCON Code LA 111/211

This waste consists of solidified inorganic process solids and liquids. It is generated as a result of plutonium processing operations and D&D activities. It generally includes hydroxide filtrate cakes, plutonium-contaminated soils, and aqueous waste (dewatered treatment sludges). These wastes are typically solidified with cement to form a noncorrosive solid matrix.

TRUCON Code 112/212

This waste consists primarily of absorbed organics on vermiculite.

TRUCON Code LA 114/214

This waste consists of solidified inorganic process solids and is generated as a result of plutonium-processing operations. Solidified process solids include process residue from evaporator bottoms and other discardable solutions, process leached solids, ash, filter cakes, salts, metal oxides, and fines. These process solids are immobilized in cement to form a noncorrosive solid matrix.

TRUCON Code LA 115/215

Graphite waste generated from plutonium-processing activities is packaged as TRUCON Code LA 115/215 waste. The waste consists of discarded graphite mold and furnace equipment from plutonium casting operations. A small fraction of combustible waste, such as plastic (mainly packaging), may also comprise this waste type.

TRUCON Code LA 116/216

This waste is comprised of combustible waste generated from R&D, process and recovery, and D&D operations at LANL. The combustible solids consist primarily of paper, rags, plastic, and rubber. A small fraction of noncombustible solids, such as scrap metal, may also be contained in this waste form.

TRUCON Code LA 117/217

This waste is comprised of noncombustible (primarily metal) waste generated by R&D, process and recovery, and D&D operations at LANL. It may consist of motors, pumps, tools, and process equipment and may contain some small fraction of combustible waste, such as plastics (mainly packaging). This waste may also contain glass in the form of discarded laboratory glassware, windows, and bottles with a small fraction of combustibles.

TRUCON Code LA 118/218

This waste consists of mixed TRU glass waste generated from plutonium processing. This glass waste consists of discarded laboratory glassware, windows, and bottles. It may also contain small fractions of combustible waste, such as plastic (mainly packaging).

TRUCON Code LA 119/219

This waste consists of discarded high-efficiency particulate air filters.

TRUCON Code 120/220

This waste consists of isotopic source waste. It includes isotopic source waste generated as a result of R&D activities.

TRUCON Code 122/222

This waste consists of inorganic solid waste. It includes noncombustible building debris, glovebox debris, and other solid waste debris. Waste-generating activities include R&D, process and recovery, and D&D operations.

TRUCON Code LA 123

This waste consists of leaded rubber and metal waste generated from plutonium-processing activities. This waste type consists of lead-lined glovebox gloves discarded along with metal waste, such as discarded metals, motors, and tools.

TRUCON Code 124/224

This waste consists primarily of used chloride salts from pyrochemical processes (i.e., electrorefining, molten salts extraction, salt stripping, fluoride reduction, and direct oxide reduction) and a small fraction of combustible waste (i.e., plastic).

TRUCON Code LA 125/225

This waste consists of metal equipment, either whole or sectioned, along with its combustible components. This waste also contains a small volume of combustibles generated during decommissioning, sectioning, and packaging.

TRUCON Code LA 126

This waste consists of solidified organic process solids. The waste is generated as a result of plutonium-processing operations. Solidified process solids include process residue from evaporator bottoms and other discardable solutions, process-leached solids, ash, filter cakes, salts, metal oxides, and fines. These process solids are immobilized in cement to form a noncorrosive solid matrix.

Sandia National Laboratories/New Mexico - Generated Waste

Mixed TRU waste managed at Sandia National Laboratories/New Mexico will be received and stored at LANL for waste certification purposes prior to subsequent reshipment for final disposition. The

waste stream consists of combustible and noncombustible debris and may include metals, cellulosics, rubber, plastics, organic matrices, and inorganic materials (see Table A-7).

A.1.3 Treated Wastes

Mixed TRU waste, HE waste, and HE-contaminated waste are treated at various waste management units throughout LANL. The mixed TRU waste is treated by cementation to stabilize the waste for storage and to meet waste acceptance criteria (WAC) for disposal at the Waste Isolation Pilot Plant (WIPP). The HE waste and HE-contaminated waste are treated by open burning or open detonation to remove its reactive characteristic.

A.1.3.1 Treated Mixed TRU Wastes

Mixed TRU wastes that require treatment are generated primarily from R&D and processing and recovery operations. Matrix parameter codes are applied to mixed TRU wastes as a general categorization scheme. The TRUCON codes which are used to more specifically describe mixed TRU wastes are cross-referenced to matrix parameter codes in Table A-3. The TRUCON-coded mixed TRU wastes treated at LANL are LA 111/211, LA 114/214, and LA 126. These TRUCON codes are fully described in Section A.1.2.3. The EPA Hazardous Waste Numbers that potentially apply to these wastes are provided in Table A-4. The matrix parameter codes that are applicable to the mixed TRU wastes treated at LANL are listed below.

- *Matrix Parameter Code S3000, Homogeneous Solids*: defined as solid waste materials, excluding soil/gravel, that do not meet the EPA LDR criteria for classification as debris.
- *Matrix Parameter Code 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).

Complete descriptions of the matrix parameter codes are available in "DOE Waste Treatability Groups Guidance" (DOE, 1995).

Treatment of mixed TRU wastes at LANL may consist of immobilization/solidification in cement to form a noncorrosive solid matrix. Additional specific information on various treatment processes is provided in the appropriate TA-specific permit chapters.

A.1.3.2 HE Waste and HE-Contaminated Waste Treated by Open Burning

HE waste and HE-contaminated waste are treated by OB at LANL to remove the hazardous characteristic of reactivity. HE waste generally consists of discrete pieces of HE, whereas HE-contaminated waste consists of solid or liquid wastes that have been contaminated with HE material. An explosive material is defined as any compound or mechanical mixture which detonates or deflagrates when subjected to heat, impact, friction, shock, or other suitable initiation stimulus. Therefore, HE waste and HE-contaminated waste meet the definition of reactive provided in 20 NMAC 4.1, Subpart II, 261.23 [6-14-00], because they are capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.

HE waste and HE-contaminated waste are generated at LANL primarily from R&D activities, D&D, and ER activities. Table A-5 provides a summary of available information on HE waste and HE-contaminated waste treated by OB. This table includes brief waste descriptions, waste-generating activities, the characterization basis for hazardous waste designation (i.e., process knowledge and/or analysis), potential EPA Hazardous Waste Number(s), potential hazardous constituents in and/or characteristics of the waste, and regulatory limits. These waste streams include homogeneous and heterogeneous wastes and are described in the following paragraphs.

HE-Contaminated Water with Trace Solvents and/or Metals

This waste stream consists of HE-contaminated water that may contain trace solvents and/or regulated hazardous metals. It is generated primarily by laboratory analysis, HE processing, and maintenance activities.

HE-Contaminated Spent Solvent Waste

This waste stream consists of HE-contaminated solvents. It is generated primarily by laboratory analysis and the dissolving of HE and polymers.

HE-Contaminated Water

This waste stream consists of HE-contaminated water generated primarily from pressure washing walls, equipment, and floors. It is also generated by water-cooled HE-machining operations.

HE-Contaminated Used Oil

This waste stream consists of HE-contaminated used oil, which is generated primarily from hydraulic presses and lubrication systems associated with HE-machining operations.

Solid and Scrap HE

This waste stream consists of off-specification or obsolete HE. It is generated primarily from machining and forming processes and consists primarily of discrete pieces of explosives left over from R&D activities and testing operations.

HE-Contaminated ER Soil and/or Debris

This waste stream consists of ER soils, debris, and investigation-derived waste (e.g., personal protective equipment, samples, and sampling equipment). These wastes are generated during remediation and D&D activities.

HE-Contaminated Commercial Chemical Products

HE-contaminated commercial chemical products may be generated at various TAs throughout LANL that manage HE. This waste generally consists of spilled or off-specification unused commercial chemical products potentially contaminated with HE.

Wastewater Treatment Residues

This waste stream consists of sludges, spent activated carbon, and filter solids that result primarily from the filtration of HE wastewater.

HE-Contaminated Solid Waste

This waste stream may include solvent-contaminated paper, glassware, tools, and other waste. It is generated primarily from HE-processing activities, plastic forming, and general office and laboratory use.

HE-Contaminated Equipment

This waste stream consists of HE-contaminated equipment, which includes discarded, noncombustible equipment and material from HE-processing areas, D&D, and ER activities.

HE-Contaminated Waste Rags, Wipes, and Other Combustibles

This waste stream includes solvent-soaked rags and wipes used at HE-processing areas. It is generated primarily from hydraulic press operations and laboratory analysis.

HE-Contaminated Liquid Acids, Bases, and/or Inorganic Salt Solutions

This waste stream consists of liquid acids, bases, and/or inorganic salts. It may include materials used as titrants, solvents, cleaning fluids, and/or materials from hydrolysis research.

Liquid Process Explosive Waste

This waste stream consists of off-specification or obsolete liquid HE waste. It is generated from R&D activities and testing operations.

Treatment Residues

Ash and/or debris generated during the thermal treatment of HE-contaminated waste by OB is characterized for the toxicity characteristic prior to disposal. Ash/debris generated from any waste stream which contains listed hazardous waste is considered "derived from" waste subject to 20 NMAC 4.1, Subpart II, 261.3(c)(2)(i) [6-14-00], and is sent to a permitted treatment, storage, and disposal facility (TSDF) for proper disposal.

A.1.3.3 HE Waste and HE-Contaminated Waste Treated by Open Detonation

The HE waste and HE-contaminated waste treated by OD typically consist of off-specification explosive wastes, scrap explosive waste, and other HE-contaminated solid wastes (e.g., rags, glass, wood). These wastes are characteristic for reactivity, as defined in Section A.1.3.2. OD treatment of these wastes involves an explosion that chemically transforms the HE component of the waste faster than the speed of sound.

Table A-6 provides a summary of available information on HE waste and HE-contaminated waste that is treated by OD. This table includes a brief waste description, waste-generating activities, the characterization basis for hazardous waste designation, potential hazardous constituents in and/or characteristics of the waste, and regulatory limits. These waste streams include homogeneous and heterogeneous wastes and are described briefly below.

Solid/Scrap Process Explosive Waste

This waste stream consists of scrap or off-specification HE waste. It is generated from HE machining, forming, and preparation processes and consists primarily of discrete pieces of explosives left over from R&D activities and testing operations.

Liquid Process Explosive Waste

This waste stream consists of off-specification or obsolete liquid HE waste. It is generated from R&D activities and testing operations.

A.1.4 Description of Waste Management Units

The waste management units used for storage and treatment of wastes addressed in this WAP are located within numerous TAs at LANL. These units are listed in Attachment A-1. Detailed information on the waste management units is provided in the TA-specific permit chapters.

A.2 WASTE ANALYSIS PARAMETERS [20 NMAC 4.1, Subpart V, 264.13(a)(1)]

A detailed chemical and physical characterization will be performed on all hazardous, mixed low-level, mixed TRU, HE, and HE-contaminated wastes for management purposes, as required by 20 NMAC 4.1, Subpart V, 264.13 [6-14-00]. Waste analysis parameters will be selected to ensure that the characterization documentation will contain all information necessary to properly treat, store, or dispose of waste in accordance with Resource Conservation and Recovery Act (RCRA) general facility standards and LDR requirements. These waste parameters will be selected to ensure that the characterization will provide all of the necessary information to properly treat the waste in accordance with RCRA general facility standards and LDR requirements.

A.2.1 Proposed Analytical Parameters and Methods [20 NMAC 4.1, Subpart V, 264.13(b)(1), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

Analytical parameters and characterization methods that may be used for hazardous, mixed low-level, mixed TRU, and HE and HE-contaminated wastes generated at LANL are summarized in Tables A-8 through A-11. Some or all of the parameters listed below will be used to determine the RCRA regulatory status of the wastes.

- Acceptable knowledge
- Sampling and analysis to determine the presence and concentrations of:
  - RCRA-regulated metals
  - RCRA-regulated volatile organic compounds (VOC)
  - RCRA-regulated semivolatile organic compounds (SVOC)
- Headspace gas sampling to determine the presence of VOCs in container headspace
- Flash point characterization
- pH characterization
- Physical waste form characterization through real-time radiography (RTR) and visual examination to verify the absence of free liquids.

A.2.2 Criteria and Rationale for Parameter Selection [20 NMAC 4.1, Subpart V, 264.13(b)(1)]
Waste analysis parameters are selected to characterize hazardous and mixed low-level wastes in conformance with 20 NMAC 4.1. Mixed TRU waste characterization incorporates characterization procedures from the WIPP "TRU Waste Characterization Quality Assurance Program Plan" (QAPP) (DOE, 1994) requirements, which are based on knowledge of raw materials and physical/chemical processes of waste-generating activities and may be supported by analytical results. Additional characterization procedures will be implemented as needed to meet the requirements of the final WIPP WAP permit conditions. The analytical parameters selected to confirm knowledge-based waste characterization for hazardous, mixed low-level, and mixed TRU waste, and the rationale for the selected parameters, are identified in Tables A-8, A-9, and A-10, respectively. Parameters for HE waste and HE-contaminated waste are selected to characterize the hazardous and explosive components of the waste and are based on knowledge of raw materials and physical/chemical processes of waste-generating activities. The rationale for HE waste and HE-contaminated waste parameter selection are identified in Table A-11.

A.3 CHARACTERIZATION PROCEDURES [20 NMAC 4.1, Subpart V, 264.13(a)(1) and 264.13(b)(2), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]
The characterization of hazardous, mixed low-level, mixed TRU, HE, and HE-contaminated waste is conducted by the waste generator before the waste is treated or stored. The approach to the characterization of hazardous, mixed low-level, mixed TRU, HE, and HE-contaminated wastes is based on the chemical, physical, and radiological nature of the waste stream. Characterization procedures require that each waste generator provide documented information on the waste stream. This is accomplished by using acceptable knowledge and/or sampling and analysis, which are described in the following sections. The completion of characterization documentation allows for the assignment of EPA Hazardous Waste Numbers and the proper management of the waste. All waste generators must certify, based on their knowledge of the waste, that the information included in the characterization documentation is complete and accurate.

The following sections describe the characterization procedures that apply specifically to each waste type.

A.3.1 Hazardous and Mixed Low-Level Waste Characterization
Characterization procedures for hazardous and mixed low-level wastes are selected based on the physical nature of the waste stream (e.g., homogeneous or heterogeneous waste). Homogeneous solid waste may be characterized for the presence of hazardous constituents (i.e., VOCs, SVOCs,

and metals) on the basis of acceptable knowledge and/or sampling and analysis. Heterogeneous solid waste will be characterized largely on the basis of acceptable knowledge because of the difficulty in obtaining representative samples, the lack of appropriate sampling methodology, and for mixed low-level wastes, safety concerns associated with unnecessary exposure to the radioactive component of the waste.

Occasionally, chemicals of an unknown nature require disposal. These wastes are handled on a case-by-case basis. The individual waste may be tentatively characterized by knowledge of the operations and activities that were performed in the specific area in which the waste was generated. This information is used to restrict the choices of initial waste analysis to a small population of chemicals.

For purposes of managing unknown wastes, a small volume is defined at LANL as less than one liquid gallon (or approximately four liters). The rationale for the small volume designation is that this is the minimum quantity of sample which is needed to test if the waste is hazardous. At and below this limit, the sample is actually consumed in the analytical procedure. Small volumes of unknown wastes are typically analyzed for pH, flash point, and reactivity. This allows the material to be categorized for further handling.

Volumes greater than one gallon or four liters of a single unknown waste allow a more detailed analytical scheme. These wastes are tested for ignitability, corrosivity, reactivity, toxicity characteristics, and/or any other parameters indicated by the initial data gathered on the material. Sufficient detail must be reported to allow the assignment of the proper EPA Hazardous Waste Number to the waste. Characterization methods that may be used are provided in Tables A-8 and A-9.

A.3.1.1 Acceptable Knowledge [20 NMAC 4.1, Subpart V, 264.13(a)(2), and 264.13(b)(5), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

The physical, chemical, and radiological nature of some waste forms makes the collection of representative samples for characterization difficult. This difficulty arises from several factors, some of which include: waste streams that contain disparate elements; disparate elements may need to be segregated into similar forms; large objects which cannot fit within standard size sample containers; and laboratories which do not have the capability to sample large objects (EPA, 1992). Other difficulties arise from health and safety risks to personnel due to potential exposure to radioactive or explosive material. Acceptable knowledge is a method used to characterize the waste

forms utilizing process knowledge and supplemental forms of waste analysis data. Acceptable knowledge can be used to meet all or part of the waste analysis requirements.

According to EPA guidance, *acceptable knowledge* is broadly defined to include process knowledge, supplemental waste analysis data, and/or facility records of analysis (EPA, 1994). *Process knowledge* is described in 20 NMAC 4.1, Subpart V, Section 264.13(a)(2) [6-14-00], as data developed under Part 261 (i.e., 20 NMAC 4.1, Subpart II) and existing published or documented data on a specific hazardous waste or hazardous waste generated from similar processes. Supplemental *waste analysis data* include concentration(s) of RCRA-regulated constituents and/or results of tests for hazardous characteristics. These data are used to determine if wastes are RCRA-regulated and to determine LDR status. *Facility records of analysis* consist of waste analysis and/or physical characterization performed prior to the effective date of RCRA regulations. These analytical results must be accurate and applicable to the specified waste and should be supplemented with other existing information (e.g., published data).

Examples presented in the EPA guidance as to when application of acceptable knowledge may be appropriate include:

- Wastes containing hazardous constituents from specific processes that are well documented, such as F-listed and/or K-listed waste code descriptions.
- Wastes consisting of discarded unused commercial chemical products, reagents, or chemicals containing known physical and chemical constituents.
- Waste (e.g., radioactive mixed waste) containing levels of radioactivity such that health and safety risks to personnel do not justify sampling and analysis due to quantified and documented radiological concerns.
- Wastes containing heterogeneous materials, where the physical nature of the waste does not lend itself to taking a representative sample (e.g., laboratory trash and construction debris with surface contamination) (EPA, 1994).

A.3.1.1.1 Process Knowledge

Process knowledge consists of one or more of the following:

- Detailed information on a waste stream obtained from existing published or documented waste analysis data;
- Studies conducted on hazardous wastes generated by processes similar to that which generated the waste; and

- Knowledge of the materials and operations that generated the waste and that demonstrates the potential for hazardous constituents in the waste. For example, metals present in debris waste are often associated with specific materials (e.g., lead in leaded rubber or lead shielding).

Waste generators will obtain, assemble, and prepare the process knowledge documentation for each waste stream in a separate auditable file or maintain a waste stream reference file that identifies the documents and their locations. The documentation must be explicitly relevant and traceable to a given waste stream and cannot merely be a list of information sources for a particular operation and waste. There are many sources of applicable documentation at LANL that may be used to substantiate process knowledge for a specific waste stream. Examples of documentation that may be used include the following:

- Process design documents (e.g., Title II Design).
- Preliminary and final safety analysis reports, unreviewed safety question determinations, and technical safety requirements.
- Standard operating procedures and detailed operating procedures, which can include a list of the raw materials or reagents, a description of the process/experiment that uses the materials, and a description of the wastes generated and how the wastes are handled.
- Waste packaging logs.
- Test plans or research project reports that describe the reagents and other raw materials used in an experiment.
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).
- Information from site personnel (e.g., documented interviews).
- Standard industry practice documents (e.g., vendor information).
- Industry reports on a similar process when there is a clear connection between the LANL process/experiment and the industry's similar process/experiment.
- Previous analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, or routine waste verification sampling.
- Analytical data from studies of common industry processes that are similar to LANL processes. These data can be used to identify the constituents in a specific "similar" process waste stream and to determine the regulatory status of the waste.
- Material Safety Data Sheets, product labels, and other product package information.
- Sampling and analysis data from comparable waste streams.

- Documented visual inspections to confirm or identify the physical characteristics and packaging of a waste.
- Laboratory notebooks that detail the research processes and raw materials used in an experiment.
- ER site characterization data, waste characterization data, waste characterization strategy documentation, and RCRA Facility Investigation documentation.

A.3.1.1.2 Supplemental Waste Analysis Data

Supplemental waste analysis data used for acceptable knowledge includes information provided by the generator of the waste stream on the concentrations of hazardous constituents in the waste and/or the results of tests for hazardous characteristics. This information can be the result of a recent analysis of the waste, a well documented historical analysis of the waste, and/or the analysis of a surrogate waste stream. For example, data from the analysis of nonradioactive leaded-rubber glove waste may be used to evaluate the characteristics of similar radioactive leaded-rubber glove waste. Sampling nonradioactive inputs or outputs from processes may also provide data that are useful for characterizing a similar mixed waste stream.

A.3.1.2 Sampling and Analysis [20 NMAC 4.1, Subpart V, 264.13(a)(3), 264.13(b)(2), (3), and (4), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

This section discusses proposed sampling and analytical procedures and frequency of sampling applicable to hazardous and mixed low-level wastes. The approach described for characterizing these waste types is based on the radiological, physical, chemical, and hazardous properties of the waste. Solid and liquid waste sampling techniques are typically used to obtain the chemical data necessary for waste characterization.

Sampling and analysis is generally performed when a waste lacks sufficient process information to adequately characterize the waste based on acceptable knowledge. A representative sample of the waste is collected and handled by means that preserve its original physical form and composition and prevent contamination or changes in concentration of the constituents to be analyzed. Analytical methods for the determination of RCRA-regulated metals, VOCs, and SVOCs are conducted to meet with certain technical performance criteria and to be consistent with regulatory guidelines. Personnel involved in sampling and analysis comply with LANL-specific protocol consistent with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (*SW-846*) or other approved methods (EPA, 1986).

A.3.1.2.1 Solid Waste Sampling [20 NMAC 4.1, Subpart V, 264.13(b)(3)]

Solid wastes that may be sampled are typically homogeneous waste streams. These solids may be sampled and analyzed for total metal content, VOCs, and SVOCs. The sampling protocol for solid hazardous and low-level mixed wastes at LANL is based on sampling methods approved by EPA for solid waste and soil sampling in *SW-846*, as well as methods approved by the American Society for Testing and Materials (ASTM). These methods are designed to ensure that representative waste samples are consistently collected and transferred to the responsible laboratory in a manner that maintains sample integrity.

Homogeneous waste streams may be sampled and analyzed for the toxicity characteristic (TC) contaminants listed in 20 NMAC 4.1, Subpart II, 261.24 [6-14-00]. Analysis for total concentration of TC contaminants may be performed on samples in a screening step, as described in Section 1.2 of Method 1311, Toxicity Characteristic Leaching Procedure (TCLP). If total concentrations are used in the waste characterization process, analytical data will be compared 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. RTL values are obtained 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 RTL value, the waste does not exhibit the toxicity characteristic and the TCLP does not need to be completed for the screened TC contaminants.

A.3.1.2.2 Liquid Waste Sampling

The liquid wastes generated at LANL typically consist of aqueous solutions, slurries, and organic liquids. These wastes may be sampled and analyzed for total metal content, VOCs, and SVOCs. In accordance with 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, may be characterized by filtering the waste, measuring total constituent concentrations in the resulting filtrate, and comparing these concentrations to the TC regulatory levels in 20 NMAC 4.1, Subpart II, 261.24 [6-14-00].

To ensure the collection of a representative sample of the liquid, the sample is collected and handled in a manner that preserves its original physical form and composition and prevents contamination or changes in concentration of the parameters to be analyzed. The samples are typically collected using a glass tube or composite liquid waste sampler, in accordance with *SW-846* or other approved methods.

Wastes that contain both a liquid and a solid phase may be characterized using total analytical data for the solid phase to determine toxicity characteristics. This is accomplished by comparison with the TC regulatory levels for each phase in a manner consistent with the discussion in Section A.3.1.2.1 and using the multiple phase formula from Method 1311.

A.3.1.2.3 Sample Handling, Preservation, and Storage

Table A-12 presents requirements specified in *SW-846* regarding sample containers, preservation techniques, and holding times associated with sample collection. Adherence to these requirements will ensure that sampling and analysis meet quality objectives for data.

A.3.1.2.4 Analytical Laboratory Selection and Analytical Methods [20 NMAC 4.1, Subpart V, 264.13(b)(2)]

Analytical laboratories at LANL and/or approved subcontractor laboratories will perform the detailed qualitative and quantitative chemical analyses specified in Tables A-13 and A-14 of this WAP. These laboratories must have:

- A documented comprehensive quality assurance (QA)/quality control (QC) program
- Technical analytical expertise
- A document control/records management plan
- The capability to perform data reduction, validation, and reporting.

The selection and development of analytical testing methods for LANL waste streams were based on the following considerations:

- The physical form of the waste
- Constituents of interest
- Required detection limits (e.g., regulatory thresholds)
- Information requirements (e.g., verify compliance with LDR treatment standards, waste classification).

Collectively, these factors contributed to the selection of the analytical methods specified in Tables A-13 and A-14. Qualified analytical laboratories at LANL and/or approved subcontractor laboratories that meet the above criteria will analyze waste samples for RCRA-regulated hazardous

constituents (VOCs, SVOCs, and metals) and characteristics, according to *SW-846* or documented equivalent methods.

A.3.1.3 Verification and Reevaluation Frequencies [20 NMAC 4.1, Subpart V, 264.13(a)(3) and 264.13(b)(4)]

Reevaluation of initial characterization information may be performed to verify the accuracy of the initial waste characterization; to verify that applicable treatment standards have been met; when there is a change in a waste-generating process; when the generator requests a review; or when analytical results indicate a change in a waste stream.

Hazardous waste received at the waste management unit for storage will be randomly selected for verification by acceptable knowledge or sampling and analysis at a rate of 1 percent of received waste streams characterized by acceptable knowledge per year. Verification analyses, if needed, will be conducted at LANL's or an approved subcontractor's laboratory facilities, in conformance with appropriate methods. Other methods of verification may include RTR and visual examination. Factory sealed containers and original containers redistributed for use within the facility will not be included in this analysis. Lab packed chemicals in original containers will not be verified.

All routinely generated waste streams will be reevaluated annually to verify that they have not changed. This annual reevaluation will be accomplished through review and recertification of applicable waste characterization documentation. Any information that indicates a change in the process that generates the waste and may affect the waste shall cause the waste to be recharacterized no later than the next time the waste is generated.

A.3.2 Mixed TRU Waste Characterization

Characterization of mixed TRU waste stored at LANL is performed in accordance with the procedures described in the "Los Alamos National Laboratory TRU Mixed Waste Analysis Plan NOD Response" (LANL, 1996). Initial characterization of both homogeneous and heterogeneous mixed TRU waste is primarily based on process knowledge, which is suitable for safe storage of these waste streams. Additional characterization to meet WIPP certification procedures will be implemented at appropriate LANL facilities to meet requirements of the final WIPP WAP permit conditions. Pursuant to WIPP certification and WIPP WAP requirements, further characterization of homogeneous waste may be accomplished through statistically based sampling and analysis, headspace gas sampling, RTR, and visual examination. Further characterization of heterogeneous

waste will be implemented at appropriate LANL facilities using process knowledge, headspace gas sampling, RTR, and visual examination.

The mixed TRU waste streams described in Section A.1.2.3 are categorized by matrix parameter codes based on the physical and chemical form of the waste. Homogeneous waste streams in the solid process residue (Matrix Parameter Code S3000), soil/gravel (Matrix Parameter Code S4000), or aqueous liquids/slurries (Matrix Parameter Code L1000) categories may contain RCRA-regulated VOCs, SVOCs, and metals (see Table A-4) and may be characterized using acceptable knowledge and/or sampling and analysis. Debris waste streams (Matrix Parameter Code S5000) consist of heterogeneous materials and as such, it is difficult to obtain representative samples of these wastes. Therefore, debris waste will be characterized for the presence of hazardous constituents (i.e., VOCs, SVOCs, and metals) using acceptable knowledge based on examination of the original materials from which the waste was generated.

The documents referenced above address mixed TRU waste characterization procedures to be utilized after the waste is stored at LANL. These procedures were developed primarily to meet off-site WAC. LANL's use of these procedures is designed to allow appropriate waste characterization information obtained for storage to serve as a basis for or to supplement future characterization needs without a duplication of effort. These documents are referenced for informational purposes only, as they constitute requirements established for another facility's operating permit conditions. Because these references are subject to change as new information is provided, developed, or approved, and because LANL is not subject to their requirements in LANL's operating permit for storage, but rather utilizes them as waste management guidelines, this WAP will not be modified as ongoing changes to the referenced documents occur.

A.3.2.1 Mixed TRU Waste Certification Plan

The "Los Alamos TRU Waste Certification Plan" (TWCP) (LANL, 1991) incorporates the certification requirements of the "Waste Acceptance Criteria for the Waste Isolation Pilot Plant" (WIPP WAC) (DOE, 1996b) for mixed TRU waste that will be sent to that site. The TWCP establishes the programmatic framework and requirements within which waste generators must operate to ensure that their wastes can be certified as meeting the sampling, characterization, and packaging requirements of the WIPP WAC. These include LANL site-specific documents and procedures by which the waste stream analytical data and other acceptable knowledge information are evaluated. Once this documentation has been prepared, it is subject to review and approval by certification program personnel. Waste generators must also participate in external audits, as required by the

TWCP, to verify the certification process. If the requirements of the WIPP WAC are met, the waste will be certified and transported to WIPP.

A.3.2.2 Acceptable Knowledge

The TWCP described above includes an acceptable knowledge certification program in accordance with the WIPP WAC and with the WIPP Quality Assurance Program Plan (QAPP) (DOE, 1994). LANL-specific protocol consistent with the WIPP WAP will be used to implement acceptable knowledge as part of the LANL TRU waste certification program for WIPP. The acceptable knowledge certification program will include the following elements:

- A description of the waste certification program.
- Written procedures outlining the specific methodology used to assemble acceptable knowledge records, including document origins, guidelines for use of documents or information, auditable record guidelines, and potential limitations associated with the information.
- Procedures to evaluate acceptable knowledge information and to resolve discrepancies in documentation.
- Guidelines for the identification of RCRA hazardous constituents and assignment of appropriate EPA Hazardous Waste Numbers to each waste stream.
- Procedures to ensure that unacceptable wastes are identified, documented, and segregated.
- Procedures to verify or confirm acceptable knowledge.
- A cross reference to the applicable waste summary category group (i.e., matrix parameter codes) to verify the required confirmation data have been evaluated and the proper EPA Hazardous Waste Numbers have been assigned.
- Administrative control procedures that identify organization responsibility for compliance, oversight procedures, on-the-job procedure training, stop-work procedures, and nonconformance process and corrective action procedures.

A.3.2.2.1 Real-Time Radiography [20 NMAC 4.1, Subpart V, 264.13(b)(2), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

RTR is a nondestructive, qualitative, and semiquantitative assay technique that involves x-ray scanning of waste containers to identify and verify, using appropriate equipment and qualified operators, the physical form(s) of waste container contents. RTR will be used to verify the absence of free liquids and that the physical form requirements of the WIPP WAC are met. At the same time, RTR will verify the waste classification (i.e., matrix parameter code) and waste form determined using acceptable knowledge. All mixed TRU waste containers will be analyzed by RTR, and the

results for each waste container will be documented. The audio/visual tapes produced during the waste container scan will be maintained for a minimum of three years. In addition, an RTR data form will be used to document the types and quantities of material types observed in each drum.

A radiography system routinely consists of an x-ray producing device, an imaging system, an enclosure for radiation protection, a waste container-handling system, an audio/video recording system, and an operator control and data acquisition station. Operating parameters such as the intensity of the x-ray can be varied for optimum viewing of the interior of the waste container. The imaging system typically utilizes an image intensifier, television camera, and remotely located television screen. Instrument configurations will vary depending on manufacturer and site usage.

During operation of the system, the waste container is scanned while the operator views and permanently records the image from the television screen on audio/videotape. The radiography data form is also used to document the materials present and other information about the containerized waste, as required by the WIPP QAPP.

The radiography image produced is examined for evidence of liquid materials by jogging the container or repetitively moving the container-handling system and searching for evidence of wave motion in addition to observing the container contents for suspect waste items. The container contents are also observed for items that confirm the waste classification of the container. Conditions that may limit or interfere with this determination are noted.

Operator training and experience are important considerations for assuring the quality of the radiography data. Only properly trained personnel are allowed to operate radiography equipment. Standardized training requirements for radiography operators are based upon existing industry standard training requirements. Radiography operators receive formal and on-the-job training in project requirements, system operations and standards, safe operating practices, application techniques, specific waste-generating practices, packaging configurations, parameter estimation, and identification of prohibited items. Operators must be trained and tested before they are qualified for RTR operation, and must requalify at least every two years. LANL operating and training requirements for RTR analysis of mixed TRU waste are based on Procedure 310.1, Physical Waste Form Characterization Using Radiography, "TRU Waste Characterization Sampling and Analysis Methods Manual" (DOE, 1996c).

A.3.2.2.2 Visual Examination [20 NMAC 4.1, Subpart V, 264.13(b)(2), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

The contents of select mixed TRU waste containers will be visually examined to confirm RTR results. Visual examination will also verify aspects of acceptable knowledge amenable to visual confirmation. For example, the visual examination will verify the physical characteristics of a waste and the associated matrix parameter code (i.e., Matrix Parameter Code S3000, S4000, or S5000). In addition, visual examination will verify the presence of certain hazardous constituents, such as lead in lead bricks or lead-lined gloves. These types of visual confirmations will either verify or refute the overall acceptable knowledge used to characterize the waste stream.

The contents of each container undergoing visual examination will be recorded on audio/videotape and a description of the observed items must be provided on a visual examination data form. Visual examination procedure operators receive formal and on-the-job training in project requirements, safe operating practices, specific waste-generating practices, packaging configurations, waste parameter estimation, and identification of prohibited items. Operators must be trained and qualify for visual examination procedures and must requalify at least every two years. LANL operating and training requirements for visual examination of mixed TRU waste are based on Procedure 310.2, Physical Waste Form Characterization Using Visual Examination, "TRU Waste Characterization Sampling and Analysis Methods Manual," (DOE, 1996c).

The hypergeometric distribution is a statistical means of estimating the probability of determining the true number of miscertified containers in the overall population of waste drums by selecting a number of drums for visual examination using a previously determined or observed miscertification rate and a set confidence factor. The basis for the determination of the number of appropriate containers to be visually examined and a description of the hypergeometric distribution used is available in the WIPP QAPP. The following table is an example of how the number of mixed TRU waste containers to be randomly selected for visual examination will be determined. The selection process will be updated as necessary to maintain consistency with revisions of the WIPP QAPP.

Number of Waste Containers Requiring Visual Examination:

Annual Number of Waste Containers Undergoing Characterization	Number of Waste Containers Requiring Visual Examination					
50	NA	22	NA	22	NA	29
100	15	24	24	33	33	41
200	15	26	26	35	44	52
300	15	26	26	35	44	53
400	15	26	26	36	45	54
500	15	26	26	36	45	63
Percent of Waste Containers Miscertified to WIPP WAC by Radiography in Previous Year	1 percent	2 percent	3 percent	4 percent	5 percent	6 percent

NA = not applicable

(*Source: DOE, 1994*)

For the first year of container examination, LANL will use the 2 percent miscertification rate observed at the Idaho National Engineering and Environmental Laboratory (INEEL). In subsequent years, LANL will use the miscertification rate observed at LANL in the previous year(s) to determine the appropriate number of containers for visual examination.

A.3.2.2.3 Headspace Gas Sampling [20 NMAC 4.1, Subpart V, 264.13(b)(2) and (3), and 20 NMAC 4.1, Subpart IX, 270.14(b)(2)]

Headspace gas sampling and analysis is a qualitative screening technique used to confirm the presence of regulated hazardous constituents. This method of characterization includes sampling and analysis of headspace gas from the drum headspace (i.e., directly under the drum lid).

The drum headspace of all previously unvented drums is sampled for hydrogen when filters are inserted. A statistically selected subset of waste drums are sampled for flammable gases and selected VOCs in order to assure that health and safety criteria for safe storage of these drums are met. The statistical basis for selection of drums to be sampled is described in Section A.3.2.2.5. In order to meet the proposed characterization requirements in the WIPP QAPP, the headspace of all remaining drums in retrievable storage will be sampled and analyzed as the drums are characterized for shipment to WIPP. Headspace gas sampling and analysis also serves to confirm the presence of regulated hazardous constituents. Headspace gas sampling will not be relied upon to prove the absence of a hazardous constituent in a waste.

The precision, accuracy, and representativeness of headspace gas samples will be evaluated for adherence to the TWCP QA objectives through analysis of field QC samples and adherence to QC practices. Analytical methods for the determination of VOCs in the headspace of mixed TRU waste containers must meet technical performance criteria, be consistent with regulatory guidance, and be compatible with the operational constraints associated with the analysis of actinide-contaminated materials. Methods for the collection of headspace gases are based on *SW-846*, on the "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air" (EPA, 1988), and in accordance with the requirements of the WIPP QAPP. DOE has modified the EPA methods to accommodate the characteristics of mixed TRU waste headspace gas samples. These samples include SA 010 and SA 011 (DOE, 1994).

A.3.2.2.4 Solid Waste Sampling and Analysis

The following describes the methods for collecting samples of mixed TRU waste classified as homogeneous solids or soils. Sampling protocol is based on sampling methods similar to those approved by EPA for solid waste and soil sampling in *SW-846*; in "Standard Practice for Thin-Walled Tube Sampling of Soils" (American Society for Testing Materials [ASTM], 1983); and in "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds" (ASTM, 1991). These methods are designed to ensure that representative waste samples are consistently collected and transferred to the responsible laboratory in a manner that maintains sample integrity. The statistical basis for sampling is described in Section A.3.2.2.5.

The mixed TRU waste classified as homogeneous solids or soils is packaged in either 55-gallon drums or in smaller containers within 55-gallon drums. Drums may contain mixed TRU waste within a 55-gallon polyethylene bag or may consist of up to 20 or more small containers within a 55-gallon polyethylene bag. For drums selected for sampling that contain multiple small containers, one of the small containers will be randomly selected for sampling. Waste parameters for which homogeneous solids or soils may be analyzed are listed in Table A-15.

To accomplish sampling of these wastes, the techniques described below have been developed for sample and subsample collection. The sampling techniques are designed to obtain a representative sample from the container (e.g., 55-gallon drum, 1-gallon polyethylene bottle); the subsampling techniques are designed to obtain a representative subsample from the sample. Subsampling is conducted to provide laboratories the minimum amount of required sample, thus minimizing the quantity of investigation-derived waste.

The methods used to collect samples of mixed TRU waste classified as homogeneous solids or soils from 55-gallon drums and smaller containers must be such that the samples are representative of the waste from which they are taken. For 55-gallon drums containing homogeneous solids or soils, a sample must be collected as a core that is representative of the waste along the entire depth of the waste in the drum.

Sample Core Collection

Coring tools must be used to collect cores of homogeneous solids or soils from 55-gallon drums and smaller containers in a manner that minimizes disturbance to the core. A rotational coring tool (i.e., a tool that is rotated longitudinally), similar to a drill bit, must be used to cut, lift the waste cuttings, and collect a core sample from containers of waste. For homogeneous solids or soils that are relatively soft, nonrotational coring tools may be used in lieu of a rotational coring tool.

Rotational coring tools (i.e., lightweight augers) and nonrotational coring tools (i.e., thin-walled samplers) have each been tested for their ability to collect a vertical core of simulated solidified waste contained in 55-gallon drums and 1-gallon polyethylene bottles, as described in "Idaho National Engineering Laboratory Simulated Solidified Transuranic Waste Sampling Program" (EG&G, 1994). The rotational coring tool used at the INEEL has demonstrated core recoveries greater than 75 percent for soft simulated wastes and greater than 94 percent for hard simulated waste. The sampling tool has been designed to minimize the transfer of frictional heat to the core, thereby minimizing potential loss of VOCs. The nonrotational coring tool has demonstrated core recoveries greater than 88 percent for soft simulated wastes. LANL will use coring tools similar to those developed at the INEEL.

Subsample Collection

To obtain representative subsamples, subsampling of the sample core is required. Subsampling must be conducted as soon as possible after sample core collection to minimize the loss of VOCs. If a substantial delay (e.g., several minutes) is expected between sample core collection and subsampling, the sample core must remain in the sleeve and the sleeve must be capped at each end. Subsamples for VOCs must be collected prior to extruding the sample core from the sleeve. The sampling location must be randomly selected along the long axis of the sleeve and access to the waste must be gained by making a perpendicular cut through the sleeve and the waste it contains.

A.3.2.2.5 Statistical Approach for Headspace Gas and Solid Waste Sampling

A statistical approach will be used to select heterogeneous waste containers for headspace gas sampling. The same approach will be used for solid waste sampling and analysis of solid process residue and soil waste streams. This approach relies on the premise that the waste containers have been separated into waste streams on the basis of process knowledge and, thus, represent populations that contain similar waste. Drums are first segregated into waste streams based on existing characterization information. The methods used to segregate drums into waste streams and lots for sampling within waste streams are detailed in the LANL TRU Waste Characterization Sampling Plan (LANL, 1995c), a site-specific document required by the WIPP QAPP. An initial number of drums is selected from each waste stream for sampling and analysis using the method described in the WIPP QAPP. A minimum of five containers per waste stream are sampled. For waste streams with less than three drums, a total of three samples is taken. The analytical results from the initial round of sampling are used to calculate upper 90 percent one-sided confidence limits for the mean concentrations of RCRA-regulated constituents. Those limits are compared to the RTLs for the constituents. If a hazardous waste determination cannot be made based on the results from the initial round of sampling, an additional number of drums is selected. The number of additional drums for the second round of sampling depends on the variance of the analytical results from the first round. The specific method for calculating the number of drums for additional sampling is found in the WIPP QAPP.

The objective is to classify specific waste streams as hazardous or nonhazardous by determining the average, or mean, and associated variance of the concentration of regulated hazardous constituents in the waste stream. Waste containers within each waste stream and sample locations within each container will be randomly selected to ensure that the analytical results provide an unbiased estimate of the true mean contaminant concentration for each waste stream.

A.3.2.3 Characterization Procedures for Mixed TRU Wastes to be Treated

Chemical and physical characterization is performed prior to treatment of mixed TRU waste, in accordance with 20 NMAC 4.1, Subpart V, 264.13 [6-14-00]. Characterization of mixed TRU waste is accomplished by applying process knowledge or by obtaining chemical analytical data from representative samples of mixed TRU liquid waste (e.g., evaporator bottoms solutions) to be treated by solidification. Preliminary mixed TRU waste characterization is developed using process knowledge and through the use of a radioactive and mixed waste certification program. Documented and auditable acceptable knowledge, as described in Section A.3.2.2, is used to determine whether the waste stream is regulated as a hazardous waste. If a homogeneous mixed TRU waste cannot

be adequately characterized because of insufficient process information, sampling and analysis are performed.

Homogeneous solids and liquids are the only mixed TRU waste types treated. Waste streams in the homogeneous solids (Matrix Parameter Code S3000) category may contain RCRA-regulated metals. These homogeneous waste streams are periodically sampled and analyzed for the TC metal contaminants listed in 20 NMAC 4.1, Subpart II, 261.24 [6-14-00]. For liquids (Matrix Parameter Code L1000), the total values are directly correlated to the maximum concentration of contaminants listed in 20 NMAC 4.1, Subpart II, 261.24 [6-14-00].

Initial predictions of hazardous constituents present in each treated waste stream will be based on process knowledge, with waste sampling and analysis performed as necessary to obtain qualitative and quantitative data for hazardous constituents (i.e., metals). Table A-10 summarizes characterization methods by matrix parameter code. Parameters and analytical methods for specific hazardous constituents are presented in Table A-15.

Sampling of treated mixed TRU waste may be performed at other appropriate LANL facilities. For this additional sampling effort, LANL will use statistically-based sampling and analysis, along with RTR, visual examination, and headspace gas analysis, as described in Section A.3.2.

Mixed TRU liquid waste is periodically sampled and analyzed for total metal content, VOCs, and SVOCs. Alternatively, core samples of post-treatment cemented waste may be analyzed. To ensure that proper procedures and considerations for sample collection and preservation, QA/QC, and occupational safety and health are followed, personnel involved in sampling and analysis of mixed TRU waste comply with LANL-specific protocol consistent with *SW-846*. For purposes of collecting a representative sample of mixed TRU waste, the sample will be collected and handled in a manner that preserves its original physical form and composition and prevents contamination or changes in concentration of the parameters to be analyzed. Sampling of mixed TRU waste to be treated is conducted according to the procedures described in Attachment A of the applicable TA-specific permit chapter. Specific information relative to sampling, parameters, and analytical methods is outlined in Tables A-10 and A-15.

A.3.2.4 Sample Handling, Preservation, and Storage

Table A-11 presents *SW-846* requirements regarding sample containers, preservation techniques, and holding times associated with sample collection. Sampling personnel adhere to these requirements to ensure that sampling and analysis meet quality objectives for data.

A.3.2.5 Analytical Laboratory Selection and Analytical Methods

Analytical laboratories at LANL and/or approved subcontractor laboratories will perform the detailed qualitative and quantitative chemical analyses specified in Table A-15 of this WAP. These laboratories must have:

- The capability of handling TRU waste
- A documented comprehensive QA/QC program that meets the WIPP QAPP requirements
- Technical analytical expertise
- A document control/records management plan
- The capability to perform data reduction, validation, and reporting.

The selection and development of analytical testing methods for LANL mixed TRU waste streams were based on the following considerations:

- The physical form of the waste
- Analytes of interest
- Information requirements (e.g., verify compliance with LDR treatment standards, waste classification)
- Meet requirements of the WIPP QAPP.

Collectively, these factors contributed to the selection of the analytical methods specified in Table A-15. Qualified analytical laboratories at LANL and/or approved subcontractor laboratories that meet the above criteria will analyze mixed TRU waste samples for RCRA-regulated hazardous constituents (VOCs, SVOCs, and metals) and characteristics, according to *SW-846* or documented and approved equivalent methods.

A.3.3 HE Waste and HE-Contaminated Waste Characterization

HE waste and HE-contaminated waste at LANL are treated by OB or OD to remove the characteristic of reactivity. Regulations do not specify a particular test method for reactivity of HE waste and HE-contaminated waste, so the determination of whether a waste is HE-contaminated is made based

on the properties of the chemicals known or suspected to be in the waste. Wastes that may contain concentrated HE are characterized by process knowledge, as described in Section A.3.1.1.1. They are considered, by definition, to be reactive because they meet the RCRA requirement of being "capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement." Wastes that may contain HE in lower concentrations are characterized by both process knowledge and/or the following techniques to determine whether HE in lower concentrations is detonable/explosive:

- If it is unknown whether HE is present, a screening method, such as the DX-2 Spot Test or DeTech, is used.
- If the waste contains visible HE, it is considered reactive.
- If the waste came into direct contact with HE and all of the surfaces cannot be tested (e.g., debris or equipment), it is assumed that there is a reactive amount of HE associated with it.
- HE concentrations may be directly measured in homogeneous materials (e.g., soil or water). This is usually done by High Performance Liquid Chromatography, *SW-846* Method 8330. Parameters such as the concentration of HE, 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 HE and HE-contaminated wastes are summarized in Table A-16.

OB and OD completely remove the reactive characteristic from HE-contaminated wastes. These wastes, however, may also exhibit RCRA toxicity characteristics or contain listed wastes. In some cases, OB and OD are effective in removing these other characteristics (e.g., 2,4-dinitrotoluene and solvents). This is not the case when it comes to HE contaminated with RCRA metals. Untreated HE-contaminated wastes do not usually contain metals in high enough concentrations to be considered hazardous. Once the waste has been treated by OB, however, the metals are concentrated in the residue ash/debris. The treatment process may also oxidize parent metals, making them more soluble, which can cause the residue to fail a TCLP test. This creates the need for further characterization of the residue ash/debris after a burn. Sampling and analysis for ash generated by OB is summarized in Table A-17. The residue ash/debris from metal containing wastes is analyzed using TCLP and recharacterized according to the results. The residues from the treating of wastes with F002, F004, and F005 materials continue to carry these EPA Hazardous Waste Numbers and are disposed of accordingly.

A.4 OFF-SITE WASTE ACCEPTANCE PROCEDURES [20 NMAC 4.1, Subpart V, 264.13(a)(3)(ii) and (a)(4); 264.13(b)(5); and 264.13(c)]

This section discusses general waste acceptance procedures that will be used when hazardous or mixed waste is accepted from off-site waste-generating facilities. These procedures will be used to meet the requirements of 20 NMAC 4.1, Subpart V, 264.13(a)(3)(ii), 264.13(a)(4), 264.13(b)(5), and 264.13(c) [6-14-00]. The basis for characterization of waste streams to be accepted by LANL is generator documentation of the waste. For off-site waste, all of LANL's routine waste characterization documentation will, at a minimum, be collected from the generator and reviewed for completeness and accuracy by LANL in accordance with standard procedures. Off-site preshipment inspection of the waste may be used to examine the waste and its documentation if the information provided by the generator is insufficient to meet LANL waste acceptance criteria.

Uniform Hazardous Waste Manifests and LDR Notification Forms, as applicable, will be prepared for each shipment of off-site hazardous or mixed waste to LANL and verified by LANL waste management personnel. Upon receipt at the treatment, storage, and disposal facility (TSDF), waste shipments will be physically examined for correct documentation, presence and correctness/completeness of waste container identification and labeling, and conformance with LANL container types and waste compatibility for storage and segregation, as appropriate. If discrepancies are found, nonconformance procedures will be followed to resolve the discrepancy. Acceptable options for resolution will include shipment of the waste back to the off-site generation facility, or temporary storage pending further analysis or characterization.

Additional waste characterization activities in support of WIPP certification will generally be the purpose of mixed TRU waste shipments to LANL from off site, and discrepancies may become apparent as part of characterization, as described in Section A.3.2. Resolution of such discrepancies will be performed in accordance with the procedures contained in each analytical method in conformance with the WIPP QAPP.

A.5 SPECIAL PROCEDURAL REQUIREMENTS [20 NMAC 4.1, Subpart V, 264.13(b)(6)]

Waste management requirements specific to ignitable, reactive, and incompatible waste, as well as for compliance with LDR and Subpart CC regulations, are described below.

A.5.1 Procedures for Ignitable, Reactive, and Incompatible Wastes to be Stored

Pursuant to 20 NMAC 4.1, Subpart V, 264.17 [6-14-00], specific waste management procedures for ignitable, reactive, and incompatible wastes to be stored are described as follows. These waste

management methods vary depending on the physical form and type of waste managed. To ensure that these wastes are managed safely and properly, their characteristics are identified and documented, they are labeled appropriately, and the waste types are physically segregated within each container storage area. The wastes are segregated specifically by their physical characteristics (i.e., liquids or solids) and according to the following compatibility groups: (1) flammables/ignitables; (2) oxidizers; (3) corrosive acids; (4) reactive with water; (5) corrosive bases; (6) other reactives; and (7) other wastes.

A.5.2 Procedures for Ignitable, Reactive, and Incompatible Wastes to be Treated

Waste management procedures for ignitable, reactive, and incompatible wastes to be treated will be followed pursuant to 20 NMAC 4.1, Subpart V, 264.17 [6-14-00]. LANL personnel will take the necessary precautions to prevent accidental ignition or reaction of wastes to be treated by OB and OD. LANL relies on standard operating procedures for specific safety and handling associated with the treatment of HE waste and HE-contaminated waste. This includes, but is not limited to, the segregation of these wastes according to compatibility groups and by the physical nature of the waste (i.e., liquids and solids).

The treatment of these wastes by OB and OD is an appropriate treatment method under RCRA. It is necessary to mitigate the ignitable and/or reactive hazards associated with HE waste and HE-contaminated waste and is the preferred waste management practice for health and safety concerns.

A.5.3 Procedures to Ensure Compliance with LDR Requirements [20 NMAC 4.1, Subpart VIII, 268.7(a) and 268.7(b)(3), (4), and (5)]

In accordance with LDR requirements, waste to be shipped off site may need to be analyzed to determine whether it meets the applicable LDR treatment standards in 20 NMAC 4.1, Subpart VIII, Part 268, Subpart D [6-14-00]. Treatment standards are expressed in two ways: (1) as constituent concentrations in the waste (from either an extract of the waste, as determined by the TCLP, or from the total volume of the waste, referred to as total waste analysis) or (2) as specified treatment technologies. Waste that must meet concentration-based treatment standards prior to shipment off site for disposal will be evaluated to determine if applicable constituent concentration levels have been attained. This will be accomplished by testing the waste or by using acceptable knowledge. Testing will be conducted only to certify that a waste meets LDR treatment standards. If a waste meets applicable LDR treatment standards based on acceptable knowledge, then testing to certify LDR compliance is not necessary. All analytical results completed in support of LDR requirements will be retained within the facility operating record.

For wastes received from off site, LANL will require an LDR notification that addresses all LDR requirements applicable to the specific waste type. If off-site wastes are treated at LANL, LANL will comply with the requirements of 20 NMAC 4.1, Subpart VIII, 268.7(b) [6-14-00].

Wastes that exceed applicable LDR treatment standards will be sent to a permitted TSDF if treatment options are available. For off-site shipment of these wastes, LDR notifications, with information required under 20 NMAC 4.1, Subpart VIII, 268.7 [6-14-00], will be supplied. In addition to the LDR notification, additional data for the waste stream (e.g., generator's characterization documentation and analytical data) may be provided to the designated TSDF.

Any wastes that are determined through analysis to meet treatment standards as specified in 20 NMAC 4.1, Subpart VIII, Part 268, Subpart D [6-14-00], will be land disposed in a permitted TSDF without further treatment, with the exception of wastes that have been specifically exempted from LDR requirements, or disposed of or treated in other than a land disposal waste management unit. For example, mixed TRU wastes destined for WIPP will not be subject to LDR. An LDR notification, including applicable analytical records to support the notification, will be prepared and will accompany the shipment of waste to the receiving TSDF.

A.5.4 Procedures to Ensure Compliance with Subpart CC Requirements [20 NMAC 4.1, Subpart V, Part 264, Subpart CC]

LANL waste streams described in this document may be subject to 20 NMAC 4.1, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on applicability criteria specified in 20 NMAC 4.1, Subpart V, 264.1080 [6-14-00]. For wastes that are not eligible for exemption under 20 NMAC 4.1, Subpart V, 264.1082 [6-14-00], LANL will address the applicable Subpart CC requirements for control of air pollutant emissions from each hazardous waste management unit subject to the regulations. LANL requires that Subpart CC requirements be met by the generator as part of the waste characterization process. The generator determines whether the concentration of VOCs in a waste stream at the point of generation is less than 500 parts per million (ppm) by weight, or equal to or greater than 500 ppm by weight. The generator documents this determination for that waste stream. Acceptable knowledge or process knowledge may be used to make this determination; however, if sampling and analysis is needed, it will be performed in accordance with the approved methods listed in Tables A-13, A-14, A-15, and A-16.

A.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.

ASTM, 1983, "Standard Practice for Thin-Walled Tube Sampling of Soils," ASTM D1587-83, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

DOE, 1996a, "TRUPACT-II Content Codes (TRUCON)," *89-004*, Rev. 10 and subsequent revisions, U.S. Department of Energy.

DOE, 1996b, "Waste Acceptance Criteria for the Waste Isolation Pilot Plant," *DOE/WIPP-069*, Rev. 5, U.S. Department of Energy, Carlsbad Area Office, Carlsbad, New Mexico.

DOE, 1996c, "TRU Waste Characterization Sampling and Analysis Methods Manual," *DOE/WIPP-91-043*, April 1996.

DOE, 1995, "DOE Waste Treatability Groups Guidance," Revision 0.0, U.S. Department of Energy, Idaho Operations Office.

DOE, 1994 and all approved updates, "TRU Waste Characterization Quality Assurance Program Plan," *CAO-94-1010*, U.S. Department of Energy, Carlsbad Area Office, Carlsbad, New Mexico.

DOE, 1988, "Radioactive Waste Management," *DOE Order 5820.2A*, U.S. Department of Energy, Washington, D.C.

EG&G, 1994, "Idaho National Engineering Laboratory Simulated Solidified Transuranic Waste Sampling Program," *EGG-WM-11222*, Idaho Falls, Idaho, M.J. Connolly, EG&G-Idaho Inc., Idaho National Engineering Laboratory.

EPA, 1994, "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, 1992, "Characterizing Heterogeneous Wastes: Methods and Recommendations," U.S. Environmental Protection Agency, Environmental Systems Monitoring Laboratory, Office of Research and Development, Las Vegas, Nevada.

EPA, 1988, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air," *EPA/600/4-89/017*, Atmospheric Research and Exposure Assessment Lab, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

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.

LANL, 1996, "Los Alamos National Laboratory TRU Mixed Waste Analysis Plan NOD Response," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1995a, "Report for the Characterization Review of Low-Level Mixed Waste," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1995b, "LANL's Federal Facilities Compliance Order Site Treatment Plan Background Volume," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1995c, "Los Alamos National Laboratory Transuranic Waste Characterization Sampling Plan," DRAFT-CSTDO-PLAN-003, Environmental Systems and Waste Characterization, Los Alamos, Los Alamos, New Mexico.

LANL, 1991, "Los Alamos TRU Waste Certification Plan," Los Alamos National Laboratory, Los Alamos, New Mexico.

NMED, 1995, "Federal Facility Compliance Order (Los Alamos National Laboratory)" New Mexico Environment Department, Santa Fe, New Mexico.

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Table A-1

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
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[d] Sampling and Analysis	D001	Ignitability	NA[e]
			D002	Corrosivity	NA[e]
			D003	Reactivity	NA[e]
			D004	Arsenic	5.0
			D005	Barium	100.0
			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
			D028	1,2-Dichloroethane	0.5
			D030	2,4-Dinitrotoluene	0.13
			D032	Hexachlorobenzene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			D040	Trichloroethylene	0.5
			D043	Vinyl chloride	0.2
			F001	Tetrachloroethylene, Trichloroethylene, Methylene chloride, 1,1,1- Trichloroethane, Carbon tetrachloride, Chlorofluorocarbons	NA[e]
			F002	Tetrachloroethylene, Trichloroethylene, 1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane	NA[e]
			F003	Xylene, Acetone, Ethyl acetate, Ethyl ether, Methanol Methyl isobutyl ketone, n-Butyl alcohol	NA[e]
			F005	Toluene, Methyl ethyl ketone,	

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Spent Solvents (continued)				Carbon disulfide, Isobutanol, Pyridine, Benzene	NA[e]
Contaminated Solid Wastes	Machining operations, chemical research, decontamination and decommissioning projects, metal finishing operations, and general maintenance operations.	Acceptable Knowledge[d]	D001	Ignitability	NA[e]
			D003	Reactivity	NA[e]
			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
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13[f]
			D032	Hexachlorobenzene	0.13[f]
			D033	Hexachlorobutadiene	0.5
			D034	Hexachloroethane	3.0
			D036	Nitrobenzene	2.0
			D039	Tetrachloroethylene	0.7
			D040	Trichloroethylene	0.5
			D042	2,4,6-Trichlorophenol	2.0
			F001	1,1,1-Trichloroethane, Carbon tetrachloride	NA[e]
			F002	1,1,1-Trichloroethane	NA[e]
			F003	Acetone, Methanol	NA[e]
			F005	Toluene, Benzene	NA[e]
Paint and Related Wastes	Painting and finishing operations, and general facility maintenance.	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			F003	Xylene	NA[e]
			F005	Toluene	NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Photographic and Photocopier Wastes	Photographic film processing and photocopying operations.	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D007 D008 D011	Ignitability Corrosivity Chromium Lead Silver	NA[e] NA[e] 5.0 5.0 5.0
Corrosive Liquid Wastes	Analytical Chemistry, electroetching, and electropolishing.	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D004 D005 D006 D007 D008 D009 D010 D011 D038 F002 F003 F005	Ignitability Corrosivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Pyridine Tetrachloroethylene, Methylene chloride, Trichloroethylene, 1,1,1-Trichloroethane, Chlorobenzene, 1,1,2-Trichloro-1,2,2-trifluoroethane, Ortho-dichlorobenzene, Trichlorofluoromethane, 1,1,2-Trichloroethane Methanol Toluene, Methyl ethyl ketone, Carbon disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, 2-Nitropropane	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 5.0 NA[e] NA[e] NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Solid Metals and Metallic Compounds	Machining and cutting operations; synthesis reactions; solder from electronic manufacturing, repair, and brazing operations; and grinding operations.	Acceptable Knowledge[d] Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0
Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges	Vacuum pump maintenance, spectrometric operations, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal polishing operations, and chemical research.	Acceptable Knowledge[d] Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D038 D040 F002 F003	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Pyridine Trichloroethylene Tetrachloroethylene, Methylene chloride, Trichloroethylene, 1,1,1-Trichloroethane, Chlorobenzene, 1,1,2-Trichloro-1,2,2-trifluoroethane, Ortho-dichlorobenzene, Trichlorofluoromethane, 1,1,2-Trichloroethane Xylene, Acetone, Ethyl acetate, Ethyl benzene, Ethyl ether, Methyl isobutyl ketone, n-Butyl Alcohol, Cyclohexanone, Methanol	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 5.0[g] 0.5 NA[e] NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges (continued)			F005	Toluene, Methyl ethyl ketone, Carbon disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, 2-Nitropropane	NA[e]
Mercury Wastes	Lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance.	Acceptable Knowledge[d] Sampling and Analysis	D009 U151	Mercury Mercury	0.2 NA[e]
Used Batteries and Battery Fluids	Equipment Maintenance.	Acceptable Knowledge[d]	D002 D006 D007 D008 D009 D011	Corrosivity Cadmium Chromium Lead Mercury Silver	NA[e] 1.0 5.0 5.0 0.2 5.0
Unused/off-specification Commercial Chemical Products	Laboratory research and spill residues.	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 through D043 All P- and U-listed waste codes	Ignitability Corrosivity Reactivity Toxicity characteristic leaching procedure wastes Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] -[c] NA[e]
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge[d]	D001 D002 D003 Potential D-coded EPA Hazardous Waste Numbers Potential P-and U-listed EPA Hazardous Waste Numbers[g]	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] -[c] NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Environmental Restoration 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 closure.	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]
			D003	Reactivity	NA[e]
			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
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13[f]
			D032	Hexachlorobenzene	0.13[f]
			D033	Hexachlorobutadiene	0.5
			D034	Hexachloroethane	3.0
			D036	Nitrobenzene	2.0
			D039	Tetrachloroethylene	0.7
			D040	Trichloroethylene	0.5
			D042	2,4,6-Trichlorophenol	2.0
			F001	1,1,1-Trichloroethane, Carbon tetrachloride	NA[e]
			F002	1,1,1-Trichloroethane	NA[e]
			F003	Acetone, Methanol	NA[e]
			F005	Toluene, Benzene	NA[e]
Environmental Restoration Aqueous Liquids	Decontamination of remedial equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated stormwater runoff	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]
			D002	Corrosivity	NA[e]
			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
			D038	Pyridine	5.0
			F002	Tetrachloroethylene,	NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Environmental Restoration Aqueous Liquids (continued)				Methylene chloride, Trichloroethylene, 1,1,1-Trichloroethane, Chlorobenzene, 1,1,2-Trichloro-1,2,2-trifluoroethane, Ortho-dichlorobenzene, Trichlorofluoromethane, 1,1,2-Trichloroethane	
			F003	Methanol	NA[e]
			F005	Toluene, Methyl ethyl ketone, Carbon disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, 2-Nitropropane	NA[e]
Environmental Restoration Debris	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closure.	Acceptable Knowledge	D001	Ignitability	NA[e]
			D003	Reactivity	NA[e]
			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
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13[f]
			D032	Hexachlorobenzene	0.13[f]
			D033	Hexachlorobutadiene	0.5
			D034	Hexachloroethane	3.0
			D036	Nitrobenzene	2.0
			D039	Tetrachloroethylene	0.7
			D040	Trichloroethylene	0.5
			D042	2,4,6-Trichlorophenol	2.0
			F001	1,1,1-Trichloroethane, Carbon tetrachloride	NA[e]
			F002	1,1,1-Trichloroethane	NA[e]

Refer to footnotes at end of table.

Table A-1 (continued)

Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process Description[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Environmental Restoration Debris (continued)			F003 F005	Acetone, Methanol Toluene, Benzene	NA[e] NA[e]

a Denotes information from the Los Alamos National Laboratory Waste Profile Form database.
b U.S. Environmental Protection Agency.
c A solid waste exhibits the characteristics 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 NMAC 4.1), Subpart II, Part 261, Subpart C [6-14-00].
d Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994. "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
e No applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.
f The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level (20 NMAC 4.1, Subpart II, 261.24, Table 1 [6-14-00]).
g Refers to the P- and U-listed wastes found in the Los Alamos National Laboratory, 1998, "Los Alamos Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Refer to footnotes at end of table.

Table A-2

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Solid Homogeneous Wastes					
Soils with Heavy Metals	Decontamination and decommissioning (D&D) and environmental restoration (ER) activities	Acceptable Knowledge[d] and Preliminary Analysis[e]	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
Environmental Restoration Soils	Remediation of release sites and D&D activities	Acceptable Knowledge[d] Sampling and Analysis	D028	1,2-Dichloroethane	0.5
			D029	1,1-Dichloroethylene	0.7
			F001	1,1,1-Trichloroethane	NA[f]
			F002	1,1,1-Trichloroethane	NA[f]
Inorganic Solid Oxidizers	Research and development (R&D) and D&D of research laboratories	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D003	Reactivity	NA[f]
			D005	Barium	100.0
Solid Heterogeneous Wastes					
Lead for Surface Decontamination	Radioisotope experiments and other reactor, accelerator, laser, and x-ray applications	Acceptable Knowledge[d]	D008	Lead	5.0
Other Lead Wastes	Radioisotope experiments and other reactor, accelerator, laser, and x-ray applications (where the lead is not amenable to decontamination)	Acceptable Knowledge[d]	D003	Reactivity	NA[f]
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
Noncombustible Debris	Maintenance, D&D of research laboratories or equipment, R&D, and ER activities	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D003	Reactivity	NA[f]
			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
Combustible Debris	Maintenance, R&D, D&D, and ER activities	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D003	Reactivity	NA[f]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			F001	1,1,1-Trichloroethane	NA[f]
			F002	1,1,1-Trichloroethane	NA[f]
			F003	Spent nonhalogenated solvents	NA[f]
			F005	Spent nonhalogenated solvents	NA[f]

Table A-2 (continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
		Solid Heterogeneous Wastes (Continued)			
Organic-Contaminated Noncombustible Solids	Vacuum pump maintenance, R&D, D&D, and ER activities	Acceptable Knowledge[d]	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
			D027	1,4-Dichlorobenzene	7.5
			D030	2,4-Dinitrotoluene	0.13[g]
			D032	Hexachlorobenzene	0.13[g]
			D033	Hexachlorobutadiene	0.5
			D034	Hexachloroethane	3.0
			D042	2,4,6-Trichlorophenol	2.0
			F001	1,1,1-Trichloroethane, Trichloroethylene	NA[f]
			F002	Chlorobenzene[h], Methylene chloride, Tetrachloroethylene[h], Trichloroethylene	NA[f]
			F004	Cresol[h], Nitrobenzene[h]	NA[f]
			F005	Toluene, Methyl ethyl ketone[h], Benzene[h]	NA[f]
Organic-Contaminated Combustible Solids	Maintenance, D&D, and ER activities	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D003	Reactivity	NA[f]
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D030	2,4-Dinitrotoluene	0.13[g]
			D035	Methyl ethyl ketone[h]	
			F001	1,1,1-Trichloroethane, Carbon tetrachloride	NA[f]
			F002	1,1,1-Trichloroethane, Tetrachloroethylene[h], Trichlorethylene	NA[f]
			F003	Acetone, Ethyl Acetate, Methanol, Methyl isobutyl ketone, Xylene	NA[f]
			F005	Toluene,	NA[f]

Refer to footnotes at end of table.

Table A-2 (continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Solid Heterogeneous Wastes (Continued)					
Organic-Contaminated Combustible Solids (continued)				Methyl ethyl ketone[h], Carbon Disulfide, Isobutanol	
Water-Reactive Wastes	Preparative machining and debris cleanup	Acceptable Knowledge[d]	D001 D003 D005 F002	Ignitability Reactivity Barium 1,1,1-Trichloroethane	NA[f] NA[f] 100.0 NA[f]
Mercury Wastes	Cleanup operations	Acceptable Knowledge[d]	D007 D008 D009 F001	Chromium Lead Mercury 1,1,1-Trichloroethane	5.0 5.0 0.2 NA[f]
Unused Solid Reagent Chemicals	R&D activities	Acceptable Knowledge[d]	D001 D002 All P- and U-listed EPA Hazardous Waste Numbers[i]	Ignitability Corrosivity Discarded commercial chemical products and off-specification species	NA[f] NA[f] NA[f]
Liquid Wastes					
Spent Solvents and Contaminated Solvent Mixtures	Extraction operations, bench-scale experimental inorganic chemistry, environmental analysis, radiochemistry; maintenance, cleaning, and degreasing activities	Acceptable Knowledge[d]	D001 D002 D004 D005 D007 D008 D009 D010 D011 D018 D019 D021 D022 D027 D028 D030 D032 D033 D034 D036	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	NA[f] NA[f] 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[g] 0.13[g] 0.5 3.0 2.0

Refer to footnotes at end of table.

Table A-2 (continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
		Liquid Wastes (Contined)			
Spent Solvents and Contaminated Solvent Mixtures (continued)			D042	2,4,6-Trichlorophenol	2.0
			D043	Vinyl chloride	0.2
			F001	Tetrachloroethylene[h], Trichloroethylene[h], Methylene chloride, 1,1,1-Trichloroethane, Carbon tetrachloride, Chlorinated fluorocarbons	NA[f]
			F002	Tetrachloroethylene[h], Trichloroethylene[h], 1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane	NA[f]
			F003	Xylene, Acetone, Ethyl acetate, Ethyl ether, Methyl isobutyl ketone, n-Butyl alcohol, Methanol	NA[f]
			F005	Toluene, Methyl ethyl ketone[h], Carbon disulfide, Isobutanol, Pyridine[h], Benzene	NA[f]
Corrosive Liquid Wastes	Radiochemistry research, plutonium-processing operations, and analytical chemistry	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D002	Corrosivity	NA[f]
			D007	Chromium	5.0
			D009	Mercury	0.2
			D010	Selenium	1.0
			D011	Silver	5.0
			D036	Nitrobenzene	2.0
Aqueous Liquids Contaminated with Heavy Metals	ER activities, metal polishing operations, and radiochemistry research	Acceptable Knowledge[d] Sampling and Analysis[i]	D001	Ignitability	NA[f]
			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

Refer to footnotes at end of table.

Table A-2 (continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
		Liquid Wastes (Contined)			
Oil Wastes	Equipment maintenance operations	Acceptable Knowledge[d]	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
			D028	1,2-Dichloroethane	0.5
			F001	Tetrachloroethylene[h], Trichloroethylene[h], Methylene chloride, 1,1,1-Trichloroethane, Carbon tetrachloride[h], Chlorinated fluorocarbons	NA[f]
			F002	Tetrachloroethylene[h], Trichloroethylene[h], 1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane	NA[f]
			F003	Xylene, Acetone, Ethyl acetate, Ethyl ether, Methyl isobutyl ketone, n-Butyl alcohol, Methanol	NA[f]
			F005	Toluene, Methyl ethyl ketone[h], Carbon disulfide, Isobutanol, Pyridine[h], Benzene[h]	NA[f]
Unused Liquid Reagent Chemicals	R&D activities	Acceptable Knowledge[d]	D001	Ignitability	NA[f]
			D002	Corrosivity	NA[f]
			All P- and U-listed EPA Hazardous Waste Numbers[i]	Discarded commercial chemical products and off-specification species	NA[f]

Refer to footnotes at end of table.

Table A-2 (continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[c] (milligrams per liter)
Gas Cylinder Waste					
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge[d]	D001 D002 D003 Potential D-coded EPA Hazardous Waste Numbers	Ignitability Corrosivity Reactivity Toxicity characteristic wastes	NA[e] NA[e] NA[e] -[c]
			Potential P- and U-listed EPA Hazardous Waste Numbers[i]	Discarded commercial chemical products and off-specification species	NA[e]

a Denotes information from the "Report for the Characterization Review of Low-Level Mixed Waste," 1995, Los Alamos National Laboratory, Los Alamos, New Mexico.
b U.S. Environmental Protection Agency.
c 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 NMAC 4.1), Subpart II, Part 261, Subpart C [6-14-00].
d Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
e Limited and/or preliminary analysis: In reference to the basis for hazardous waste classification, indicates that sampling and analysis has been performed but that the data may not be completely documented or that data may exist but may not be verifiable.
f Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.
g The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level (20 NMAC 4.1, Subpart II, 261.24, Table 1 [6-14-00]).
h Process knowledge provided information that these constituents may have been used as solvents. Toxicity characteristic regulatory levels may also apply and will be evaluated.
i Refers to the P- and U-listed wastes found in the Los Alamos National Laboratory, 1998, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table A-3

Cross Reference of Matrix Parameter Codes with TRUCON[a], IDC[b], and RSWD[c] Codes

Matrix Parameter Code[d]	TRUCON Code(s)	IDC Code(s)	RSWD Code(s)	Waste Description
S3000 (Homogeneous Solids)	LA 111/211	002 003	A75 A76 A25 A26 A29	Stabilized Inorganic Process Solids and Aqueous Waste
	LA 114/214	006	A24 A25 A26	Solidified Inorganic Process Solids
	LA 124/224	005P2S	A27 A28 A29	Uncemented Inorganics
	LA 126	006	A24 A25 A26 A29 A46	Solidified Organic Process Solids
	LA 112/212	none	A20 A21 A70	Absorbed Organics on Vermiculite
S4000 (Soils/ Gravel)	none	none	A90	Contaminated Soils
S5000 (Debris Waste)	LA 115/215	005P2G	A10 A46	Graphite Waste
	LA 116/216	004	A14 A15 A16 A17 A18 A19 A35 A40 A60	Combustible Waste
	LA 117/217	005LM	A30 A31 A41 A50 A51 A52 A61 A80 A85	Metal Waste
	LA 118/218	005LG	A47 A95	Glass Waste/Noncombustible Waste
	LA 119/219	005	A55 A56	High-Efficiency Particulate Air Filters
	LA 120/220	none	A80	Isotopic Source Waste
	LA 122/222	none	A36	Inorganic Solid Waste
	LA 123	005P1	A61	Lead-Lined Gloves and Metal Waste

Refer to footnotes at end of table.

Table A-3 (continued)

Cross Reference of Matrix Parameter Codes with TRUCON[a], IDC[b], and RSWD[c] Codes

Matrix Parameter Code[d]	TRUCON Code(s)	IDC Code(s)	RSWD Code(s)	Waste Description
	LA 125/225	001	A14	Combustible/Noncombustible Waste
			A19	
			A30	
			A31	
			A36	
			A40	
			A41	
			A47	
			A52	
			A55	
			A56	
			A61	
			A72	
			A74	
			A77	

a TRUCON = Transuranic Package Transporter-II (TRUPACT-II) Content
b IDC = Item Description Code
c RSWD = Radioactive Solid Waste Disposal
d Information in this column was extracted from the "TRU Waste Characterization Quality Assurance Program Plan," U.S. Department of Energy, 1994 and all approved updates, *CAO-94-1010*, U.S. Department of Energy, Carlsbad Area Office, Carlsbad, New Mexico.

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Table A-4

Descriptions of Mixed TRU Waste Stored at LANL[a]

TRUCON Codes	Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents in the Waste	Regulatory Limits[c] (milligrams per liter)
LA 111/211	Stabilized Inorganic Process Solids and Aqueous Waste	Plutonium (Pu)-processing operations and D&D activities	Acceptable Knowledge[d]	D004 D005 D006 D007 D008 D009 None	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Beryllium hydroxide	5.0 100.0 1.0 5.0 5.0 0.2 None
LA 112/212	Absorbed Organics on Vermiculite	Organics absorbed on vermiculite as a result of Pu-processing	Acceptable Knowledge[d]	TBD[e]	TBD[e]	TBD[e]
LA 114/214	Solidified 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 Pu-processing	Acceptable Knowledge[d]	D002 D004 D006 D007 D008 D009	Hydrofluoric acid Arsenic Cadmium Chromium Lead Mercury	NA[f] 5.0 1.0 5.0 5.0 0.2
LA 115/215	Graphite Waste	Discarded graphite molds, furnace equipment, and a small fraction of combustible waste generated from Pu-processing and casting operations	Acceptable Knowledge[d]	D004 D006 D008 None None	Arsenic Cadmium Lead Beryllium Nickel	5.0 1.0 5.0 None None
LA 116/216	Combustible Waste	Combustible solids (e.g., paper, rags, plastic, rubber) and a small fraction of noncombustible (e.g., metal scrap) generated from research and development (R&D), process and recovery, and D&D operations	Acceptable Knowledge[d] Sampling and Analysis	D002 D004 D005 D006 D008 D009 D019 D022 D028 D040 F002 F003 F005 None None None None None	Hydrofluoric acid Arsenic Barium Cadmium Lead Mercury Carbon tetrachloride Chloroform Dichloroethane Trichloroethylene 1,1,1-Trichloroethane Acetone Toluene Beryllium Beryllium hydroxide Bromobenzene Nickel Tributyl phosphate	NA[f] 5.0 100.0 1.0 5.0 0.2 0.5 6.0 0.5 0.5 NA[f] NA[f] NA[f] None None None None None

Refer to footnotes at end of table.

Table A-4 (continued)

Descriptions of Mixed TRU Waste Stored at LANL[a]

TRUCON Codes	Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents in the Waste	Regulatory Limits[c] (milligrams per liter)
LA 117/217	Metal Waste	Metal waste (e.g., motors, pumps, tools, process equipment) with a small fraction of combustible waste (e.g., plastics) generated by R&D, process and recovery, and D&D operations	Acceptable Knowledge[d] Sampling and Analysis	D002 D005 D008 D019 None	Hydrofluoric acid Barium Lead Carbon tetrachloride Beryllium	NA[f] 100.0 5.0 0.5 None
LA 118/218	Glass Waste/Noncombustible Waste	Glass waste (e.g., discarded labware, windows, bottles) with a small fraction of combustibles (e.g., plastics) generated from Pu-processing	Acceptable Knowledge[d] Sampling and Analysis	D002 D005 D008 D009 D019	Hydrofluoric acid Barium Lead Mercury Carbon tetrachloride	NA[f] 100.0 5.0 0.2 0.5
LA 119/219	High-Efficiency Particulate Air (HEPA) Filters	HEPA filters from exhaust air systems associated with Pu-processing	Acceptable Knowledge[d]	TBD[e]	TBD[e]	TBD[e]
LA 120/220	Isotopic Source Waste	R&D activities	Acceptable Knowledge[d]	TBD[e]	TBD[e]	TBD[e]
LA 122/222	Inorganic Solid Waste	Noncombustible building debris, glovebox debris, and other solid waste debris generated by R&D, process and recovery, and D&D operations	Acceptable Knowledge[d]	TBD[e]	TBD[e]	TBD[e]
LA 123	Lead-Lined Gloves and Metal Waste	Lead-lined glovebox gloves and metal waste (e.g., motors, tools, discarded metals) generated from Pu-processing	Acceptable Knowledge[d] Sampling and Analysis	D002 D004 D006 D008 D009 D019 None None None	Hydrofluoric acid Arsenic Cadmium Lead Mercury Carbon tetrachloride Beryllium hydroxide Bromobenzene Nickel	NA[f] 5.0 1.0 5.0 0.2 0.5 None None None
LA 124/224	Uncemented Inorganics	Used chloride salts from pyrochemical processes (e.g., electrorefining, molten salt extraction, salt stripping, fluoride reduction, direct oxide reduction) and a small fraction of combustible waste (e.g., plastic) generated from Pu-processing	Acceptable Knowledge[d] Sampling and Analysis	D004 D006 D008 D009 None None	Arsenic Cadmium Lead Mercury Beryllium hydroxide Nickel	5.0 1.0 5.0 0.2 None None
LA 125/225	Combustible/Noncombustible Waste	Metal equipment from decommissioning (e.g., gloveboxes, process equipment, ductwork); small volumes of combustibles from decommissioning, sectioning, and packaging	Acceptable Knowledge[d]	D006 D008	Cadmium Lead	1.0 5.0

Refer to footnotes at end of table.

Table A-4 (continued)

Descriptions of Mixed TRU Waste Stored at LANL[a]

TRUCON Codes	Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Constituents in the Waste	Regulatory Limits[c] (milligrams per liter)
LA 126	Solidified Organic Process Solids	Solidified process residues (e.g., evaporator bottoms and other discardable solutions; processed leached solids, ash, filter cakes, salts, metal oxides, fines that are immobilized in cement) generated from Pu-processing operations	Acceptable Knowledge[d]	D002	Hydrofluoric acid	NA[f]
				D004	Arsenic	5.0
				D006	Cadmium	1.0
				D007	Chromium	5.0
				D008	Lead	5.0
				D009	Mercury	0.2
				D019	Carbon tetrachloride	0.5
				D021	Chlorobenzene	100.0
				D022	Chloroform	6.0
				D028	Dichloroethane	0.5
				D040	Trichloroethylene	0.5
				F002	1,1,1-Trichloroethane	NA[f]
				None	Acetone	None
				None	Beryllium	None
				None	Bromobenzene	None
				None	Ethanol	None
				None	Methanol	None
				None	Methylene chloride	None
				None	n-Butyl alcohol	None
				None	Toluene	None
				None	Xylene	None

[a] This table is based on preliminary information from the Los Alamos National Laboratory, 1994, "Draft Transuranic Waste Stream Hazardous Material Characterization Study," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.
[b] U.S. Environmental Protection Agency.
[c] 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, Part 261, Subpart C [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
[e] To be determined.
[f] Not Applicable.

Table A-5

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Burning at LANL

Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
High Explosives (HE)-Contaminated Water with Trace Solvents and/or Metals	Laboratory analysis, HE processing, maintenance activities	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
HE-Contaminated Spent Solvent Waste	Laboratory analysis, dissolving HE and polymers	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D002	Corrosivity	NA[d]
			D003	Reactivity	NA[d]
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D028	1,2-Dichloroethane	0.5
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
HE-Contaminated Water	Pressure-washing walls, equipment, and floors; water-cooled HE-machining operations	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D030	2,4-Dinitrotoluene	0.13

Refer to footnotes at end of table.

Table A-5 (continued)

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Burning at LANL

Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
HE-Contaminated Used Oil	HE-machining operations	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D030	2,4-Dinitrotoluene	0.13
Solid and Scrap HE	Off-specification or obsolete HE from machining and forming processes; discrete pieces of HE from research and development (R&D) and testing operations	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D003	Reactivity	NA[d]
			D005	Barium	100.0
			D030	2,4-Dinitrotoluene	0.13
HE-Contaminated Environmental Restoration (ER) Soil and/or Debris	Waste generated during ER and decontamination and decommissioning (D&D) activities; investigation-derived waste (personal protective equipment, samples, and sampling equipment)	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D038	Pyridine	2.0
			D036	Nitrobenzene	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]

Refer to footnotes at end of table.

Table A-5 (continued)

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Burning at LANL

Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
HE-Contaminated Commercial Chemical Products	Spilled or off-specification products that become contaminated with HE	Acceptable Knowledge[c]	U022	Acetone	NA[d]
			U019	Benzene	NA[d]
			U044	Chloroform	NA[d]
			U112	Ethyl acetate	NA[d]
			U154	Methanol	NA[d]
			U159	Methyl ethyl ketone	NA[d]
			U196	Pyridine	NA[d]
			U169	Nitrobenzene	NA[d]
			U220	Toluene	NA[d]
			U239	Xylene	NA[d]
Wastewater Treatment Residues	Sludges, spent activated carbon, and filter solids resulting from HE wastewater filtration	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D028	1,2-Dichloroethane	0.5
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
			K044	Wastewater sludges	NA[d]
			K045	Spent carbon	NA[d]

Refer to footnotes at end of table.

Table A-5 (continued)

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Burning at LANL

Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
HE-Contaminated Solid Waste	HE processing activities and general office and laboratory use	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
HE-Contaminated Equipment	HE processing, D&D, and ER activities	Acceptable Knowledge[c]	D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D009	Mercury	0.2
			D011	Silver	5.0
			D030	2,4-Dinitrotoluene	0.13
HE-Contaminated Waste Rags, Wipes, and Other Combustibles	HE processing, (e.g., hydraulic press operations, laboratory analysis)	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D002	Corrosive	NA[d]
			D003	Reactivity	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]

Refer to footnotes at end of table.

Table A-5 (continued)

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Burning at LANL

Waste Description	Waste Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
HE-Contaminated Liquid Acids, Bases, and/or Inorganic Salt Solutions	Materials used as titrants, solvents, and cleaning fluids and material from hydrolysis research	Acceptable Knowledge[c]	D002	Corrosivity	NA[d]
			D003	Reactivity	NA[d]
			D018	Benzene	0.5
			D022	Chloroform	6.0
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
Liquid Process Explosive Waste	Off-specification or obsolete HE from explosives preparation, R&D, and testing operations	Acceptable Knowledge[c]	D003	Reactivity	NA[d]

a U.S. Environmental Protection Agency. Note that these constituents will likely be present only in trace amounts.

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 ~~11, Part~~ 261, Subpart C [6-14-00]. These constituents are included if they are likely to be present; however, they are not expected to exceed the toxicity characteristic limits on a routine basis.

c Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

d Not applicable: refers to the absence of regulatory limits for ignitable, corrosive, reactive wastes, and F-, K-, and U-listed wastes. The amount of F-listed waste is expected to be trace in all waste streams, with the exception of the HE-contaminated spent solvent waste, which is expected to be 30 percent or more (by volume) solvent.

Table A-6

Descriptions of High Explosives (HE) Waste and HE-Contaminated Waste Treated by Open Detonation at LANL

Waste Description	Waste Generating Activity	~~Basis for Hazardous Waste Designation~~	Potential EPA[a] Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste	Regulatory Limits[b] (milligrams per liter)
Solid/Scrap Process Explosive Waste	Off-specification or obsolete from machining, forming, and preparation of HE; discrete pieces of HE from research and development (R&D) and testing operations	Acceptable Knowledge[c]	D003 D003 D005 D006 D007 D008 D009 D010 D011 D030	Reactivity Lithium Hydride Barium Cadmium Chromium Lead Mercury Selenium Silver 2,4-Dinitrotoluene	NA[d] NA[d] 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.13
Liquid Process Explosive Waste	Off-specification or obsolete HE from explosives preparation, R&D, and testing operations	Acceptable Knowledge[c]	D003	Reactivity	NA[d]

a U.S. Environmental Protection Agency. Note that these constituents will likely be present only in trace amounts.

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, Part 261, Subpart C [6-14-00]. These constituents are included if they are likely to be present; however, they are not expected to exceed the toxicity characteristic limits on a routine basis.

c Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

d Not applicable: refers to the absence of regulatory limits for ignitable, corrosive, reactive wastes, and F-, K-, and U-listed wastes.

Table A-7

Descriptions of Off-Site Waste Received at LANL

Off-Site Waste Generating Facility	Waste Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste
Sandia National Laboratories/New Mexico, Albuquerque, NM	Potential mixed transuranic waste: Combustible and noncombustible debris including metals, cellulosics, rubber, plastics, organic matrices, and inorganic materials.	To be determined	To be determined	To be determined	To be determined

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Table A-8

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)	- Acceptable Knowledge[d] - Sampling and Analysis	- Determine characteristic for ignitability, corrosivity, reactivity, and toxicity - Determine concentration of F-listed solvents
Contaminated Solid Wastes	- RCRA[c]-regulated metals - VOCs - SVOCs	- Acceptable Knowledge[d]	- 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[d] - 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[d] - 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[d] - Sampling and Analysis	- Determine characteristic for ignitability, corrosivity, and toxicity - Determine concentration of F-listed solvents
[illegible]id Metals and Metallic Compounds	- RCRA[c]-regulated metals	- Acceptable Knowledge[d] - 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[d] - Sampling and Analysis	- Determine characteristic for ignitability, reactivity, and toxicity - Determine concentration of F-listed solvents
Mercury Wastes	- RCRA[c]-regulated metal	- Acceptable Knowledge[d] - Sampling and Analysis	- Determine characterisitc 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[d]	- 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[d] - 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[d]	- Determine characterisitc for ignitability, corrosivity, and reactivity - Determine presence of D-coded and U- and P-listed wastes
Environmental Restoration Soils and Sludges	- RCRA[c]-regulated metals - VOCs - SVOCs	- Acceptable Knowledge[d]	- Determine characteristic for ignitability, reactivity, and toxicity - Determine concentration of F-listed solvents

[illegible]r to footnotes at end of table.

Table A-8 (continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Hazardous Waste

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Environmental Restoration Aqueous Liquids	- pH - RCRA[c]-regulated metals - VOCs - SVOCs	- Acceptable Knowledge[d]	- Determine characteristic for ignitability, corrosivity, reactivity, and toxicity - Determine concentration of F-listed solvents
Environmental Restoration Debris	- RCRA[c]-regulated metals - VOCs - SVOCs	- Acceptable Knowledge[d]	- 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 Profile Form 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, 261.24 [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-9

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Low-Level Waste

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Homogeneous Wastes			
Soils with Heavy Metals	– RCRA-regulated metals[c]	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic
Environmental Restoration Soils	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d] – 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[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity
Solid Heterogeneous Wastes			
Lead for Surface Decontamination	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine toxicity characteristic
Other Lead Wastes	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine characteristic for reactivity – Determine toxicity characteristic
Noncombustible Debris	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity
Combustible Debris	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– 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[d]	– Determine toxicity characteristic – Determine presence of F-listed solvents
Organic-Contaminated Combustible Solids	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability and reactivity – Determine toxicity characteristic – Determine presence of F-listed solvents
Water-Reactive Wastes	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity – Determine presence of F-listed solvents

See to footnotes at end of table.

Table A-9 (continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Low-Level Waste

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Heterogeneous Wastes (Continued)			
Mercury Wastes	- RCRA-regulated metals[c] - VOCs	- Acceptable Knowledge[d]	- Determine toxicity characteristic - Determine presence of F-listed solvents
Unused Solid Reagent Chemicals	- RCRA-regulated metals[c]	- Acceptable Knowledge[d]	- 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 - SVOCs	- Acceptable Knowledge[d] - 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[d] - Sampling and Analysis	- Determine characteristic for ignitability, corrosivity, and toxicity - Determine concentration of F-listed solvents
Aqueous Liquids Contaminated with Heavy Metals	- Flash point - RCRA-regulated metals[c]	- Acceptable Knowledge[d] - Sampling and Analysis	- Determine characteristic for ignitability and toxicity
Oil Wastes	- RCRA-regulated metals[c] - VOCs - SVOCs	- Acceptable Knowledge[d] - Sampling and analysis	- Determine characteristic for toxicity - Determine concentration of F-listed solvents
Unused Liquid Reagent Chemicals	- Flash point - pH	- Acceptable Knowledge[d]	- Determine characteristic for ignitability and corrosivity - Determine the presence of P- and U-listed unused commercial chemical product
Gas Wastes			
Gas Cylinder Waste	- RCRA[c]-regulated metals - VOCs - SVOCs	- Acceptable Knowledge[d]	- 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, 261.24 [6-14-00].

[d] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table A-10

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed TRU Waste

Matrix Parameter[a] Code/Description	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[b]	- 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	- Determine toxicity characteristic - Determine concentration of metals
	- Homogeneous inorganic solids - Glass/noncombustible waste - Uncemented inorganics - Absorbed organics on vermiculite	- Volatile organic compounds (VOC) in container headspace gas	- Gas chromatography/ mass spectrometry - Fourier transform infrared spectrometry - Gas chromatography/Flame ionization detector	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[b]	- Verify physical waste form - No free liquids allowed
		- RCRA-regulated metals	- Sample and analyze statistically selected number of drums in waste stream	- Determine toxicity characteristic - Determine concentration of metals
		- VOC in container headspace gas	- Gas chromatography/ mass spectrometry - 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[b] - Acceptable Knowledge[b]	- 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[b]	- Qualitative screening to confirm the presence of VOC - Determine compliance with LDR treatment standards, if applicable

efer to footnotes at end of table.

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Table A-10 (continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed TRU Waste

Matrix Parameter[a] Code/Description	Waste Description	Parameters	Characterization Methods	Rationale
		Treatment		
L1000—Aqueous Liquids/Slurries	- Inorganic process solids and liquids - Organic process solids and liquids	- Physical form of the waste	- Visual examination - Acceptable Knowledge[b]	- Verify physical waste form
S3000—Homogeneous Solids		- RCRA-regulated metals	- Sampling and Analysis	- Determine toxicity characteristic - Determine concentration of metals

[a] Information in this column was extracted from the U.S. Department of Energy, 1994, "TRU Waste Characterization Quality Assurance Program Plan," *CAO-94-1010*, U.S. Department of Energy, Carlsbad Area Office, Carlsbad, New Mexico.

[b] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis," U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-11

Parameters, Characterization Methods, and Rationale for Parameter Selection for High Explosives (HE) Waste and HE-Contaminated Waste

Waste Description	Parameter[a]	Characterization Method	Rationale
HE-Contaminated Water, with Trace Solvents and/or Metals	– Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (metals and organics) – Determine the presence of F-listed solvents
HE-Contaminated Spent Solvent Waste	– Corrosivity – Ignitability – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for ignitability, corrosivity, and reactivity – Determine toxicity characteristic (organics) – Determine the presence of F-listed solvents
HE-Contaminated Water	– Reactivity – Toxicity	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (dinitrotoluene)
HE-Contaminated Used Oil	– Reactivity – Toxicity	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (metals and dinitrotoluene)
Solid and Scrap HE	– Reactivity – Toxicity	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (barium and dinitrotoluene)
HE-Contaminated Environmental Restoration Soil and/or Debris	– Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (organics and metals) – Determine the presence of F-listed solvents

Refer to footnotes at end of table.

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Table A-11 (continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for High Explosives (HE) Waste and HE-Contaminated Waste

Waste Description	Parameter[a]	Characterization Method	Rationale
HE-Contaminated Commercial Chemical Products	– Reactivity – Spill residues from commercial products	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine the presence of U-listed wastes
Wastewater Treatment Residues	– Reactivity – Toxicity – Solvents from non-specific sources – Specific source wastes (K wastes)	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (organics and metals) – Determine the presence of F- and K- listed solvents
HE-Contaminated Solid Waste	– Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (organics and metals) – Determine the presence of F-listed solvents
HE-Contaminated Equipment	– Reactivity – Toxicity	– Acceptable[b] Knowledge	– Determine characteristic for reactivity – Determine toxicity characteristic (dinitrotoluene and metals)
HE-Contaminated Rags, Wipes, and Other Combustibles	– Reactivity – Toxicity – Corrosivity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for ignitability, corrosivity, and reactivity – Determine the presence of F-listed solvents
HE-Contaminated Liquid Acids, Bases, and/or Inorganic Salt Solutions	– Corrosivity – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable[b] Knowledge	– Determine characteristic for corrosivity and reactivity – Determine toxicity characteristic (organics) – Determine the presence of F-listed solvents
Liquid Process Explosive Waste	– Ignitability – Corrosivity – Reactivity – Toxicity	– Acceptable[b] Knowledge	– Determine characteristics for ignitability, corrosivity, and reactivity – Determine toxicity characteristic

[a] Parameter selection is based on process knowledge for each waste stream. Additional parameters may be selected for each waste stream as necessary.

[b] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table A-12

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 4° degrees Celsius (°C)[e]	14 days
Aqueous Samples:			
No Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-mL vials with Teflon-lined septum caps.	Cool to 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: 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 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: 2 x 40-mL vials with Teflon-lined septum caps.	Adjust ~~to pH~~ of 4-5. Cool to 4°C	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

Refer to footnotes at end of table.

Table A-12 (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 4°C	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 4°C	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 4°C.	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 4°C	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 4°C	180 days
Hexavalent chromium	500-mL WM[c]-P[h] or G[d]	Cool to 4°C	Not established - analyze as soon as possible.
Mercury	500-mL WM[c]-P[h] or G[d]	Cool to 4°C	28 days

Refer to footnotes at end of table.

Table A-12 (continued)

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

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 WM = Wide-mouth

d G - 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 AG = Amber glass

h P = Polyethylene

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Table A-13

Summary of Characterization Methods for Hazardous Waste

Parameter[a]	Method Numbers	Test Methods	Rationale
Volatile organic compounds (VOC) 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, 8275A)[c] or equivalent methods[d]	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) SVOC analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[i]	Determine total and/or TCLP and SVOC/VOC concentration in samples of solids or liquids
Semivolatile organic compounds (SVOC) in waste:	SW-846 (1311 and 8270C)[c,e] or equivalent methods[d]	Total or TCLP SVOC analysis by GC/MS Acceptable Knowledge[i]	Determine total and/or TCLP and SVOC concentration in samples of solids or liquids
Metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A[f], 7061A)[c] (1311, 6010B, 7080A[g], 7081[f])[c] (1311, 6010B, 7130[g], 7131A[f])[c] (1311, 6010B, 7190[g], 7191[f])[c] (1311, 6010B, 7420[g], 7421[f])[c] (1311, 7470B, 7471A, 7472[f])[c] (1311, 6010B, 7740[f], 7741A, 7742[f])[c] (1311, 6010B, 7760A[f], 7761[f])[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[i]	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[h] 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	SW-846 (1010, 1020, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitability of solids	Determine ignitablity
pH	SW-846 (9040B, 9041A, 9045C)[c] or equivalent methods[d]	pH electrometric measurement pH paper Soil and waste pH	Determine corrosivity

Refer to footnotes at end of table.

Table A-13 (continued)

Summary of Characterization Methods for Hazardous Waste

[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, 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] Method being revised per the January 1998 *SW-846* Draft Update IVA.
[f] Method being integrated into Method 7000B, per the January 1998 *SW-846* Draft Update IVA.
[g] Method being integrated into Method 7010, per the January 1998 *SW-846* Draft Update IVA.
[h] SW-846, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic.
[i] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-14

Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Method	Rationale
Solid Wastes			
Volatile organic compounds (VOC) 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, 8275A)[c] or equivalent methods[d]	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) SVOC analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[h]	Determine total and/or TCLP and VOC concentration in samples of solid process residues and soils
Semivolatile organic compounds (SVOC) in waste:	SW-846 (1311 and 8270C)[c,e] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[h]	Determine total and/or TCLP and SVOC concentration in samples of solid process residues and soils
Metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A[f], 7061A)[c] (1311, 6010B, 7080A[g], 7081[f])[c] (1311, 6010B, 7130[g], 7131A[f])[c] (1311, 6010B, 7190[g], 7191[f])[c] (1311, 6010B, 7420[g], 7421[f])[c] (1311, 7470B, 7471A, 7472[e])[c] (1311, 6010B, 7740[f], 7741A, 7742)[c] (1311, 6010B, 7760A[g], 7761[f])[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge[h]	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)[c] or equivalent methods[d]	Total and/or TCLP VOC analysis by GC/MS	Determine total and/or TCLP and VOC concentration in samples of liquid
SVOCs in waste:	SW-846 (1311 and 8270B)[c,e] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS	Determine total and/or TCLP and SVOC concentration in samples of liquid
Metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium	SW-846 (1311, 6010B, 7060A[f], 7061A)[c] (1311, 6010B, 7080A[g], 7081[f])[c] (1311, 6010B, 7130[g], 7131A[f])[c] (1311, 6010B, 7190[g], 7191[f])[c] (1311, 6010B, 7420[g], 7421[f])[c] (1311, 7470B, 7471A, 7472[e])[c] (1311, 6010B, 7740[f], 7741A, 7742)[c] (1311, 6010B, 7760A[g], 7761[f])[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	Determine total and/or TCLP concentration in samples of liquid

Refer footnotes at end of table.

Table A-14 (continued)

Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Method	Rationale
Liquid Wastes (Continued)			
Ignitability	SW-846 (1010 and 1020A)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup	Determine ignitability

[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, 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.
[e] Method being revised per the January 1998 *SW-846* Draft Update IVA.
[f] Method being integrated into Method 7000B, per the January 1998 *SW-846* Draft Update IVA.
[g] Method being integrated into Method 7010, per the January 1998 *SW-846* Draft Update IVA.
[h] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-15

Summary of Characterization Methods for Mixed TRU Waste

Parameter	Method Numbers	Test Methods	Rationale
Storage			
Physical Waste Form		Waste inspection procedures Visual examination Acceptable Knowledge[h]	Verify waste container contents
Volatile organic compounds (VOC) 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, 8275A)[c] or equivalent methods[d]	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) SVOC analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[h]	Determine the presence or absence of VOC in samples
Semivolatile organic compounds (SVOC) in waste	SW-846 (1311 and 8270C)[c,e] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[h]	Determine the presence or absence of SVOC in samples
Metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A[f], 7061A)[c] (1311, 6010B, 7080A[g], 7081[f])[c] (1311, 6010B, 7130[g], 7131A[f])[c] (1311, 6010B, 7190[g], 7191[f])[c] (1311, 6010B, 7420[g], 7421[f])[c] (1311, 7470B, 7471A, 7472[e])[c] (1311, 6010B, 7740[f], 7741A, 7742)[c] (1311, 6010B, 7760A[g], 7761[f]) 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[h]	Determine total and/or TCLP concentration in samples
Ignitability	SW-846 (1010, 1020A, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitabililty of Solids	Determine ignitability
pH	SW-846 (9040B, 9041A, 9045C)[c] or equivalent methods[d]	pH electrometric measurement pH paper Soil and waste pH	Determine corrosivity
Treatment			
Physical Waste Form		Waste inspection procedures Visual examination Acceptable Knowledge[h]	Verify waste container contents

Refer to footnotes at end of table.

Table A-15 (continued)

Summary of Characterization Methods for Mixed TRU Waste

Parameter	Method Numbers	Test Methods	Rationale
Metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A[f], 7061A)[c] (1311, 6010B, 7080A[g], 7081[f])[c] (1311, 6010B, 7130[g], 7131A[f])[c] (1311, 6010B, 7190[g], 7191[f])[c] (1311, 6010B, 7420[g], 7421[f])[c] (1311, 7470B, 7471A, 7472[e])[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A[g], 7761[f])[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[h]	Determine total and/or TCLP metals concentration in samples
pH	SW-846 (9040B, 9041A, 9045C)[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, 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] Method being revised per the January 1998 *SW-846* Draft Update IVA.
[f] Method being integrated into Method 7000B, per the January 1998 *SW-846* Draft Update IVA.
[g] Method being integrated into Method 7010, per the January 1998 *SW-846* Draft Update IVA.
[h] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-0*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-16

Summary of Characterization Methods for High Explosives (HE) Waste and HE-Contaminated Waste

Parameters	Method Numbers	Test Method	Rationale
HE in the Waste	SW-846 (8330)[a]	High Performance Liquid Chromotography	Determine HE concentrations directly in homogeneous materials.
		DX-2 Spot Test, DeTech	Determine if HE is present in the waste stream.
		Acceptable Knowledge[b]	If all surfaces cannot be directly tested and the waste object was potentially contaminated with HE during its use.

[a] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

[b] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Table A-17

Summary of Characterization Methods for Ash Generated by Open Burning[a]

Parameters	Method Numbers	Test Method	Rationale
Metals in waste:	SW-846	Total and/or toxicity characteristic leaching procedure (TCLP)	Determine total and/or TCLP metals concentrations in samples of solid process residues
Arsenic	(3051, 1311, 6010B, 7060A[d], 7061A)[b]		
Barium	(3051, 1311, 6010B, 7080A[e], 7081A[d])[b]		
Cadmium	(3051, 1311, 6010B, 7030[e], 7031A[d])[b]	Inductively-coupled plasma atomic emission spectroscopy	
Chromium	(3051, 1311, 6010B, 7090[e], 7091[d])[b]		
Lead	(3051, 1311, 6010B, 7420[e], 7421[d])[b]		
Mercury	(1311, 7470A, 7471A)[b]	Atomic absorption	
Selenium	(3051, 1311, 6010A, 7740[d], 7741A, 7742)[b]		
Silver	(3051, 1311, 6010A, 7760A[e], 7761[d])[b]	Manual cold vapor atomic absorption	
	or equivalent methods[c]	Acceptable Knowledge[f]	

[a] Ash generated by open burning is characterized for all TCLP metals.
[b] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-84*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C..
[c] Equivalent methods, subject to EPA approval, may be substituted.
[d] Method being integrated into Method 7000B, per the January 1998 *SW-846* Draft Update IVA.
[e] Method being integrated into Method 7010, per the January 1998 *SW-846* Draft Update IVA.
[f] Acceptable knowledge is broadly defined as process knowledge, supplemental waste analysis data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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Attachment A-1

Waste Management Units at Los Alamos National Laboratory

Attachment A-1

Waste Management Units at Los Alamos National Laboratory[a]

Unit Location	Unit Type	Waste Types Managed[b]
TA-3-29, Rooms 9010, 9020, 9030	Storage - container	Hazardous Waste (HW), Mixed Low-Level Waste (MLLW), Mixed Transuranic Waste (MTRUW)
TA-14, Burn Cage	Treatment - Open Burning (OB)	High Explosives (HE)-Contaminated waste
TA-14, Detonation area	Treatment - Open Detonation (OD)	HE and HE-Contaminated waste
TA-16-88	Storage - container	HW, MLLW
TA-16-387	Treatment - OB	HE and HE-Contaminated waste
TA-16-388	Treatment - OB	HE and HE-Contaminated waste
TA-16-394	Treatment - OB	HE and HE-Contaminated waste
TA-16-399	Treatment - OB	HE and HE-Contaminated waste
TA-16-401	Treatment - OB	HE and HE-Contaminated waste
TA-16-406	Treatment - OB	HE and HE-Contaminated waste
TA-36-8	Treatment - OD	HE and HE-Contaminated waste
TA-39-6	Treatment - OD	HE and HE-Contaminated waste
TA-50-1, Decon Ops	Storage - container	HW, MLLW, MTRUW
TA-50-1, 59	Storage - container	MTRUW
TA-50-1, 60A	Treatment - cementation	HW, MLLW, MTRUW
TA-50-37	Storage - container	HW, MLLW, MTRUW
TA-50-69, Indoor Area	Storage - container	HW, MLLW, MTRUW
TA-50-69, Outdoor Area	Storage - container	HW, MLLW, MTRUW
TA-50-114	Storage - container	HW, MLLW, MTRUW
TA-50-37, 117	Treatment – electrochemical	HW, MLLW
TA-54, L	Storage - container	HW, MLLW
TA-54, G	Storage - container	HW, MLLW, MTRUW
TA-54, West	Storage - container	HW, MLLW, MTRUW
TA-55-4, Basement	Storage - container	HW, MLLW, MTRUW
TA-55-185	Storage - container	HW, MLLW, MTRUW
TA-55, Storage Pad	Storage - container	HW, MLLW, MTRUW
TA-55-4, 401 and 434A	Storage - tanks	MTRUW
TA-55-4, 401	Treatment - cementation	MTRUW
TA-55-4, 434A	Treatment – vitrification	MTRUW

[a] Waste management units active or proposed as of May 2000.
[b] Waste types managed or planned to be managed as of May 2000.

APPENDIX B

INSPECTION PLAN

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LIST OF FIGURES

FIGURE NO.	TITLE
B-1	Hazardous and Mixed Waste Facility Inspection Record Form

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LIST OF ABBREVIATIONS/ACRONYMS

20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AR	Action Required
IRF	Inspection Record Form
LANL	Los Alamos National Laboratory
TA	technical area

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APPENDIX B
INSPECTION PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, 264.15, "General Inspection Requirements," revised June 14, 2000 [6-14-00], this appendix presents inspection requirements and schedules applicable to most hazardous or mixed waste management units at Los Alamos National Laboratory (LANL). Requirements applicable to some units at LANL are presented in Attachment B of Technical Area (TA)-specific permit chapters. Pursuant to 20 NMAC 4.1, Subpart V, 264.15(a) [6-14-00], inspection schedules for the units have been developed to identify equipment malfunctions and deterioration, operator errors, and discharges that might cause or lead to a release of hazardous or mixed waste and pose a threat to human health and the environment. Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

B.1 GENERAL INSPECTION SCHEDULES AND REQUIREMENTS [20 NMAC 4.1, Subpart IX, 270.14(b)(5) and 20 NMAC 4.1, Subpart V, 264.15(b) and (c)]

In accordance with the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(5) [6-14-00], and 20 NMAC 4.1, Subpart V, 264.15(b)(1) [6-14-00], a written inspection schedule has been developed at LANL. This schedule will be followed for the inspection of monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are important to preventing, detecting, and responding to environmental or human health hazards. Inspections may be conducted at any time during the applicable day or week, as specified in the inspection schedule.

Inspection schedules outlining the items to be addressed on LANL's Hazardous and Mixed Waste Facility Inspection Record Form (IRF) and inspection frequencies for the unit types at LANL are provided in Sections B.2 through B.9 of this appendix and in Attachment B of TA-specific permit chapters. The IRF and instructions for its completion are provided for informational purposes only as Figure B-1; the form is subject to change. Pursuant to 20 NMAC 4.1, Subpart V, 264.15(b)(3) [6-14-00], the IRF lists the types of problems to be looked for during an inspection. The activities discussed below are addressed according to the specified regulatory requirements as well as to existing LANL inspection requirements for hazardous and mixed waste units.

B.1.1 Inspection Records [20 NMAC 4.1, Subpart V, 264.15(d)]

Inspection training is provided through LANL's Environment, Safety, and Health Training Group. After training, personnel assigned from the division or operating group that is responsible for or manages the unit will conduct inspections and record the information on IRFs or equivalent forms. The division or operating group responsible for or managing the unit will retain the original inspection records for a minimum of three years from the date of inspection. The inspection records will be available for review in the event that the New Mexico Environment Department or the U.S. Environmental Protection Agency inspects the facility for compliance with inspection requirements.

If necessary, LANL may modify the IRF or develop a form equivalent to it. Because the IRF is a comprehensive form, not all sections of the form apply to all units. The IRF encompasses 20 NMAC 4.1, Subpart V, Part 264 [6-14-00], requirements for permitted hazardous and mixed waste units; and additional requirements directed by LANL policy. Instructions included with the IRF provide specific guidance for each inspection item listed.

The IRF or equivalent form will be completed according to the daily and/or weekly schedules provided in Sections B.2 through B.9 of this appendix and in Attachment B of TA-specific permit chapters. Inspections will be conducted and recorded in Parts I and II of the IRF for each working day or week that waste is opened, moved, received, stored, treated, or removed, as appropriate. For each working day that waste is not opened, moved, received, treated, or removed, a check mark will be placed in the "No Use" block in Part I. Alternatively, other records, such as a memo to file, may be used to document a condition of no use.

For every item requiring inspection, a response indicating the condition of each item must be entered in the column under the appropriate day of the week. Responses may include "OK", "NA" (Not Applicable), or "AR" (Action Required). If the response is AR, the action required must be noted in Part II of the IRF. If more than one AR is listed, ARs should be numbered. All ARs must be identified and noted, even if corrected immediately by the inspector. If inspection results indicate that corrective measures are warranted, any and all actions taken (along with time, date, and other pertinent information) will be recorded in Part II of the IRF and the AR noted on all subsequent IRFs until corrective measures are completed. Only after corrective measures have been completed and recorded on an IRF can an OK be entered in the "Condition" column on the IRF.

B.1.2 Inspection Frequency [20 NMAC 4.1, Subpart V, 264.15(b)(4)]

Inspection frequencies relevant to the unit types at LANL are presented in Sections B.2 through B.9 of this appendix and in Attachment B of TA-specific permit chapters. Inspection frequencies may be increased at LANL's discretion, or if unexpected malfunctions occur or an accelerated deterioration rate of containers, secondary containment systems, and/or equipment is detected.

B.1.3 Actions Resulting From Inspections [20 NMAC 4.1, Subpart V, 264.15(c)]

If any defects, deterioration, damage, or potential hazards are discovered during an inspection, appropriate corrective measures (e.g., transfer of waste from a defective container to an appropriate container in good condition, repair or replacement of nonfunctioning equipment and/or systems, or removal of any accumulated liquids) will be completed on a schedule which ensures that the problem does not lead to an environmental or human health hazard. Any action taken in response to an inspection will be noted on the IRF.

If a hazardous condition is imminent or has already occurred, an assessment of the condition will be made immediately, followed by appropriate remedial action. The condition will be assessed by the division or operating group that is responsible for or manages the unit. If this assessment indicates that human health or the environment may be adversely affected, the contingency plan (Appendix D of this permit chapter and Attachment D of TA-specific permit chapters) may be implemented. The contingency plan discusses the appropriate responses to emergency situations. Evacuation determinations will be made as outlined in Table D-4 of Appendix D. In the event the contingency plan is implemented, any sampling, decontamination, and verification will be conducted as specified in that plan. If the condition is such that the contingency plan is not implemented, remedial action will be defined and documented by the division or operating group that is responsible for or manages the unit.

B.2 INSPECTION SCHEDULE AND REQUIREMENTS FOR CONTAINER STORAGE AREAS [20 NMAC 4.1, Subpart V, 264.15(b) and 264.174]

Container storage areas are inspected according to the schedule provided below. Inspection frequencies are adequate based on the deterioration rates of equipment/systems and the probability of harm to human health or the environment if failure of the equipment/systems occurs, or any operator error goes undetected between inspections.

B.2.1 On Day(s) of Waste Handling

Inspections will be conducted every day that waste handling occurs, with special attention placed on areas subject to spills, such as loading and unloading areas. Waste handling includes when waste is received at, moved or opened within, treated at, or removed from a container storage area. For inspections of container storage areas, the following items will be addressed, as appropriate:

- General information
- Secondary containment structures
- Run-on/off control
- Covers/lids of containers
- Labels
- Accumulation start date
- Compatibility
- Structural integrity of containers
- (Un)loading area
- Presence and condition of shaft cover

B.2.2 Weekly

Weekly inspections of container storage areas will be conducted every week that waste remains in storage. These weekly inspections will address the following items, as appropriate:

- General information
- Communications equipment
- Warning signs
- Security
- Work surfaces/floors
- Spill/fire equipment
- Eyewashes/safety showers
- Wind sock
- Secondary containment structures
- Run-on/off control
- Covers/lids of containers
- Labels
- Accumulation start date
- Compatibility
- Structural integrity of containers
- Un(loading) area
- Aisle space/stacking
- Pallets/raised containers
- Presence and condition of shaft cover

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B.3 INSPECTION SCHEDULE AND REQUIREMENTS FOR TANK SYSTEMS [20 NMAC 4.1, Subpart V, 264.15(b), 264.193(i), and 264.195]

Resource Conservation and Recovery Act-regulated tank systems are inspected according to the schedule provided below. The inspection frequency is adequate based on the deterioration rate of equipment/systems and the probability of adverse impact to human health or the environment if failure of the equipment/systems or any operator error goes undetected between inspections.

B.3.1 Daily (During Operation)

Tank systems (including ancillary equipment) will be inspected at least once each operating day. An operating day includes when waste is added to or emptied from a tank, or when tank treatment is conducted. Tank systems will be inspected for the items listed below, as appropriate:

- General information
- Secondary containment structures
- Labels
- Structural integrity of tanks and ancillary equipment
- (Un)loading areas
- Aboveground portions of tank systems to detect corrosion or releases of waste and to detect any possible malfunctions to overfill/spill control equipment, tank monitoring and leak detection systems, and data from these systems
- Proper operating condition of treatment tank (if applicable)

B.3.2 Weekly

Weekly inspection requirements for tank systems include the following items, as appropriate:

- General information
- Communications equipment
- Warning signs
- Security
- Work surfaces/floors
- Spill/fire equipment
- Eyewashes/safety showers
- Wind sock, if applicable
- Secondary containment structures
- Run-on/off controls, if applicable
- Labels
- Accumulation start date, if appropriate
- Structural integrity of tanks and ancillary equipment
- (Un)loading areas
- Aboveground portions of tank systems to detect corrosion or releases of waste and to detect any possible malfunction to overfill/spill control equipment, tank monitoring and leak detection systems, and data from these systems
- Proper operating condition of treatment tank (if applicable)

B.3.3 Annually

In accordance with 20 NMAC 4.1, Subpart V, 264.193(i) [6-14-00], an annual assessment of the overall condition of a tank system that does not have secondary containment will be performed by an independent, qualified registered professional engineer. The assessment procedure must be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. Stored waste must be removed from the tank, if necessary, to allow the condition of all internal tank surfaces to be assessed. The frequency of these assessments must be based on the material of construction of the tank and its ancillary equipment, the age of the system, the type of corrosion or erosion protection used, the rate of corrosion or erosion observed during the previous inspection, and the characteristics of the waste being stored or treated.

B.4 INSPECTION SCHEDULE AND REQUIREMENTS FOR OPEN BURNING/OPEN DETONATION UNITS [20 NMAC 4.1, Subpart V, 264.15(b) and 264.602]

Open burning/open detonation units are inspected according to the schedule provided below. Inspection frequencies are adequate based on the deterioration rates of equipment/systems and the probability of harm to human health or the environment if failure of the equipment/systems occurs, or any operator error goes undetected between inspections.

B.4.1 On Day of Treatment

Inspections will be conducted every day of operation (i.e., every day that open burning/open detonation occurs). For inspections conducted on the day of treatment at open burning/open detonation units, the following items will be addressed, as appropriate:

- General information
- Secondary containment structures (if applicable)
- Run-on/off control
- (Un)loading area
- Overall condition

Monitoring controls, emergency shutdown controls, and alarms or warning systems associated with the open burning/open detonation units will be inspected and/or tested for proper operating condition prior to the initiation of treatment at the units.

B.4.2 Weekly

Weekly inspections of open burning/open detonation units will be conducted if no treatment will occur during that week or when waste is present on the treatment unit and awaiting treatment. Weekly inspections will address the following items, as appropriate:

- General information
- Communications equipment
- Warning signs
- Security
- Work surfaces
- Spill/fire equipment
- Eyewashes/safety showers
- Wind sock (if applicable)
- Secondary containment structures (if applicable)
- Run-on/off control
- (Un)loading area
- Overall condition

B.5 INSPECTION SCHEDULE AND REQUIREMENTS FOR CEMENTATION UNITS [20 NMAC 4.1, Subpart V, 264.15(b) and 264.602]

Cementation units will be inspected according to the schedule provided below. The inspection frequency is adequate based on the deterioration rate of equipment/systems and the probability of harm to human health or the environment if failure of the equipment/systems or any operator error goes undetected between inspections.

B.5.1 Daily (During Operation)

Cementation units for treatment by solidification will be inspected each operating day (i.e., when waste is treated in the unit). For the daily inspection of a cementation unit, the following items will be addressed, as appropriate.

- General information
- Warning signs
- Work surfaces/floors
- Secondary containment structures
- Covers/lids of containers
- Labels
- (Un)loading area
- Structural integrity of cementation unit

B.5.2 Weekly

Weekly inspections of cementation units will be conducted if no treatment will occur during that week. Weekly inspections will address the following items, as appropriate:

- General information
- Communications equipment
- Warning signs

- Security
- Work surfaces/floors
- Spill/fire equipment
- Eyewashes/safety showers
- Secondary containment structures
- Covers/lids of containers
- Labels
- (Un)loading area
- Structural integrity of cementation unit

B.6 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART AA REQUIREMENTS [20 NMAC 4.1, Subpart V, Part 264, Subpart AA]

Inspection and monitoring requirements for units subject to 20 NMAC 4.1, Subpart V, Part 264, Subpart AA [6-14-00], are addressed in Attachment B of the TA-specific permit chapters, as appropriate.

B.7 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART BB REQUIREMENTS [20 NMAC 4.1, Subpart V, Part 264, Subpart BB]

Inspection and monitoring requirements for units subject to 20 NMAC 4.1, Subpart V, Part 264, Subpart BB [6-14-00], are addressed in Attachment B of the TA-specific permit chapters, as appropriate.

B.8 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20 NMAC 4.1, Subpart V, Part 264, Subpart CC]

Inspection and monitoring requirements for units subject to 20 NMAC 4.1, Subpart V, Part 264, Subpart CC [6-14-00], are addressed in Attachment B of the TA-specific permit chapters, as appropriate.

B.9 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART DD REQUIREMENTS [20 NMAC 4.1, Subpart V, Part 264, Subpart DD]

Inspection and monitoring requirements for units subject to 20 NMAC 4.1, Subpart V, Part 264, Subpart DD [6-14-00], are addressed in Attachment B of the TA-specific permit chapters, as appropriate.

HAZARDOUS AND MIXED WASTE FACILITY INSPECTION RECORD FORM

[1] FACILITY: [2] Site ID #:	[3] ❑ <90-DAY ACCUMULATION AREA ❑ TREATMENT, STORAGE, OR DISPOSAL UNIT	[4] START DATE:	[5] END DATE:

[6] ❑ Containers ❑ Landfill ❑ Thermal Treatment
❑ Physical Treatment ❑ Biological Treatment ❑ Chemical Treatment
❑ Tank ❑ UST ❑ Miscellaneous Unit (OB/OD, Cementation)

PART I- Enter condition of the item inspected (**OK**, **NA** [Not Applicable], or **AR** [Action Required]) in column for day inspected.

ITEM	INSPECTED FOR:	MON	TUE	WED	THU	FRI	SAT	SUN
[7] NO USE	No waste opened, moved, received, treated, or removed; or no waste stored							
[8] COMMUNICATIONS EQUIPMENT	Availability and proper operating condition							
[9] WARNING SIGNS	Posted, legible, and bilingual							
[10] SECURITY	Condition of fences, gates, locks, and other access control equipment							
[11] WORK SURFACES/ FLOORS	Any conditions that could lead to an accident or spill							
[12] SPILL/FIRE EQUIPMENT	Present, appropriate, and in proper operating condition							
[13] EYEWASHES/ SAFETY SHOWERS	Proper operating condition							
[14] WIND SOCK	Proper operating condition and checked for damage							
[15] SECONDARY CONTAINMENT	Standing water/waste, integrity, surrounding vegetation, and erosion							
[16] RUN-ON/OFF CONTROL	Ponding, integrity, erosion, and damage							
[17] COVERS/LIDS OF CONTAINERS	Closed and secured properly							
[18] LABELS	Proper labels on all tanks and containers							
[19] ACCUMULATION START DATE	Present and legible							
[20] COMPATIBILITY	Separated according to compatibility							
[21] INTEGRITY (Containers, tanks, and ancillary equipment)	Integrity, leakage, deterioration, corrosion, and damage							
[22] (UN)LOADING AREA	Spills and deterioration							
[23] AISLE SPACE/STACKING	Appropriateness and adequacy							
[24] PALLETS AND RAISED CONTAINERS	Any condition that could result in failure							
[25] TANK SYSTEMS (Aboveground portions)	Discharge controls, leakage, fill level, and corrosion							
[26] TREATMENT TANKS	Proper operating condition and leakage							
[27] SHAFTS	Presence and condition of cover							
[28] FILTER VESSELS (for open burning)	Deterioration and sand condition							
[29] OPEN BURNING UNITS	Deterioration, vegetation, sand condition, erosion, and leakage							
[30] OPEN DETONATION UNITS	Condition, vegetation, and erosion							
[31] CEMENTATION UNITS	Structural integrity and condition of equipment and systems							

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Figure B-1

Hazardous and Mixed Waste Facility Inspection Record Form

HAZARDOUS AND MIXED WASTE FACILITY INSPECTION RECORD FORM

	MON	TUE	WED	THU	FRI	SAT	SUN
[32] DATE							
[33] TIME							
[34] SIGNATURE OF INSPECTOR(S)							

FACILITY:	Site ID #:	START DATE:	END DATE:

Part II- For any AR (Action Required) in PART I, describe below: action required, action taken, date, and time of action. Attach additional sheets if necessary. If more than one action is required, number each AR.

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Figure B-1 (Continued)

Hazardous and Mixed Waste Facility Inspection Record Form

Instruction for Use of the Hazardous and Mixed Waste Facility Inspection Record Form

Part I

TO BE CONDUCTED FOR ALL INSPECTIONS:

(Not all items in this section will apply to all facilities. An "NA" [not applicable] is required if the item does not apply.)

1. FACILITY: Location information, including TA, building, and room (if applicable). Other location descriptors may be necessary (e.g., TA-59-3-114 or TA-59-1S, Dock).

2. Site ID Number: An identification number is assigned to every facility. This allows for ease in identification of a certain TSD unit <90-day accumulation area.

3. <90-DAY ACCUMULATION AREA: Should be checked if this location is intended for operation in accordance with generator requirements for storage of hazardous or mixed waste for less than 90 days.

   TREATMENT, STORAGE, OR DISPOSAL (TSD) UNIT: Should be checked if this location is listed in LANL's Hazardous Waste Facility Permit or General Part A Permit Application as a TSD operation.

4. START DATE: The date of the actual first working day of the week.

5. END DATE: The date of the actual last working day of the week.

6. Check the appropriate box for the type of operation. Several boxes may be checked, if necessary, for those locations where inspections are combined on a single sheet. You must have prior approval from ESH-19 to combine inspections for more than one unit.

7. NO USE: May be checked if waste was not received at, moved, or opened (to add or remove waste) within, treated at, or removed from a unit for the day in question. For some inspections that are performed weekly, "NO USE" may be checked if no waste was stored. In the situation that this box is checked, the individual responsible for the inspection must only complete this box and the signature section for that day/week. If any hazardous or mixed waste is subsequently placed at the site for any reason, a full inspection must be performed immediately and then subsequently according to the inspection plan. List "NA" to show normal nonworking days. Holidays and Laboratory closures should also be noted (e.g., by writing "H" or "Closed" in the first box and drawing a line all the way down the page).

8. Communication equipment must be inspected in order to ensure availability and proper operating condition for each piece of equipment (e.g., telephones, radios, and alarms). Consultation with ESH-19 prior to use of the facility/location is available, if necessary.

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Instruction for Use of the Hazardous and Mixed Waste Facility Inspection Record Form (Continued)

9. Required signs must be legible and prominently posted. TSD units and <90-day accumulation areas must be equipped with bilingual (English/Spanish) signs with the legend "DANGER UNAUTHORIZED PERSONNEL KEEP OUT." <90-day accumulation areas must be identified with a sign with the legend "<90-DAY HAZARDOUS WASTE STORAGE AREA." TSD units are required to have signs that read "HAZARDOUS WASTE STORAGE AREA" spaced 50 feet apart and legible from 25 feet away.

10. The TSD unit or <90-day accumulation area site security must be verified. Items such as fences, gates, locks, and other access control equipment should be checked for proper operating condition.

11. Process floors and other work surfaces at TSD units must be inspected for any conditions that could lead to a spill or an accident.

12. Hazardous or mixed waste TSD units and <90-day accumulation areas must have fire control and spill control equipment. TSD units will be in compliance with the Laboratory's Hazardous Waste Facility Permit Contingency Plan. Equipment must be present, in proper operating condition, and appropriate for the material in question. Outdoor fire-water supply systems must be checked for freezing and damage.

13. If present, eyewashes and safety showers must be inspected to ensure proper operating condition. Outdoor locations must be checked for freezing.

14. Wind socks, where present at TSD units, must be inspected to ensure that they are in proper operating condition and checked for damage.

15. Secondary containment structures for hazardous or mixed waste operations must be inspected to verify proper operating condition and to ensure adequate capacity. Structures must also be inspected for the presence of standing water or hazardous/mixed waste. For certain operations, secondary containment includes inspection of gloves, gloveboxes, hoods, and ventilation systems. For locations where inflatable "Porta Berms" are used, inspectors must ensure that they are adequately inflated. All monitoring and leak detection systems must also be checked.

16. Run-on and runoff controls, wherever present, must be checked. The integrity should be inspected by looking for signs of damage, erosion, ponding, or any other conditions that could lead to a spill or an accident.

17. All tanks and containers used for treating or storing hazardous or mixed waste must have the cover or lid securely in place. Containers are not considered to be closed until the lid/cover is fastened in the manner the manufacturer originally intended. However, the lid may be off of a tank or container during treatment (if it is part of the treatment), and while waste is being placed into or removed from a container.

18. All containers and tanks containing hazardous or mixed waste must be labeled with the words "HAZARDOUS WASTE."

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Instruction for Use of the Hazardous and Mixed Waste Facility Inspection Record Form (Continued)

19. All containers and tanks of hazardous or mixed waste in <90-day accumulation areas must be marked with the accumulation start date. This date must be legible. At <90-day accumulation areas, containers must be marked with the accumulation start date at the time the container first receives any waste. For <90-day accumulation areas, no containers may exceed 90 days from the accumulation start date to the time they are delivered to a permitted treatment, storage, or disposal unit. At TSD units, all containers must be dated when they arrive at the facility. At TSD units, no hazardous or mixed waste may be stored for over one year, unless specifically exempted.

20. All hazardous or mixed waste containers holding materials that may be incompatible with any other materials at that location must be separated from those materials by dikes, berms, or other physical barriers to prevent a possible reaction.

21. All containers and tanks must be checked for structural integrity, leakage, corrosion, or damage. This includes checking the condition of all construction materials, fixtures, seams, and auxiliary equipment. There are special inspection criteria for tank systems (see item 25 below).

22. Loading and unloading areas must be inspected daily when in use for signs of damage or deterioration that may lead to an accident or spill. This includes asphalt covered areas and areas where containers or tanks are handled or the contents thereof are transferred.

23. Adequate aisle space must be maintained to allow for inspection and for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency. All containers of hazardous and mixed waste must be stored in a manner that ensures a minimum 2 foot aisle space, unless otherwise specified for the facility.

24. Hazardous or mixed waste containers at TSD units and <90-day accumulation areas must be stored on pallets, elevated, or otherwise protected from contact with accumulated liquid.

<u>TANKS SYSTEMS</u>:

25. For tank systems used for treatment or storage of hazardous or mixed waste, all aboveground portions of the tank system, including any and all ancillary plumbing, must be inspected for signs of leaking, corrosion, deterioration, or improper operation. Tanks must be operated with a minimum freeboard of 6 inches. If the tank system includes discharge controls, overtopping controls, tank level alarms, or other monitoring equipment, including leak detection equipment, all controls and relevant data must be checked to ensure they are operating properly and that operation is within design specifications for the system.

26. Hazardous and mixed waste treatment tanks must be operated within the design specifications and in accordance with standard operating procedures and work plans. Tanks must be inspected for leakage or damage prior to operation.

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Instruction for Use of the Hazardous and Mixed Waste Facility Inspection Record Form (Continued)

SHAFTS:

27. Shafts used for retrievable storage should have their covers securely in place and the surrounding area should show no evidence of erosion.

FILTER VESSELS:

28. The condition and adequacy of sand must be inspected in filter vessels. The vessels must also be inspected for deterioration and damage.

OPEN BURNING UNITS:

29. Open burning units must be inspected for deterioration, leakage, vegetation that could catch fire, and the condition of sand (as appropriate). Inspectors must also look for explosives and debris not consumed during the burn.

OPEN DETONATION UNITS:

30. Open detonation units must be inspected for deterioration, leakage, or vegetation that could catch fire. Inspectors must also look for explosives and debris not consumed by the detonation.

CEMENTATION UNITS:

31. The structural integrity and condition of equipment and systems must be inspected on cementation units. Units must also be inspected for signs of leaking, corrosion, deterioration, or improper operation.

FOR ALL INSPECTIONS:

32. Record of the date of the current inspection. Only one date is given for each inspection, whether a team or an individual performs the inspection.

33. Record of the time of the current inspection. Only one time is given for each inspection, whether a team or an individual performs the inspection.

34. Signature of each inspector involved in the current inspection.

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Instruction for Use of the Hazardous and Mixed Waste Facility Inspection Record Form (Continued)

Part II

List any action required. Document any action taken immediately and express any plans for future action to be taken. If necessary, attach additional sheets to IRF to efficiently cover the action taken or required. Initial any information or comments added, and if more than one action is required or conducted, assign a number to each AR.

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APPENDIX C

PERSONNEL TRAINING PLAN

DRAFT

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LIST OF ABBREVIATIONS/ACRONYMS

20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
E	Environmental Science and Waste Technology Division
EDS	Employee Development System
EM&R	LANL's Emergency Management and Response Office
EMP	Emergency Management Plan
ES&H	environment, safety, and health
ESH-10	LANL's Hazardous Materials Response Group
ESH-13	LANL's ES&H Training Group
ESH-19	LANL's Hazardous and Solid Waste Group
FWO	Facility and Waste Operations Division
JCNNM	Johnson Controls Northern New Mexico
LANL	Los Alamos National Laboratory
OJT	on-the-job training
PTLA	Protection Technology Los Alamos
RCRA	Resource Conservation and Recovery Act
TSDF	treatment, storage, and disposal facility
USC	United States Code

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APPENDIX C
PERSONNEL TRAINING

This section describes the personnel training program for Los Alamos National Laboratory (LANL) treatment, storage, and disposal facility (TSDF) workers. Training requirements for TSDF personnel are specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, 264.16, "Personnel Training," revised June 14, 2000 [6-14-00], and are included herein, as required by 20 NMAC 4.1, Subpart IX, 270.14(b)(12) [6-14-00]. The primary objective of the training program is to prepare personnel to operate and maintain safely those areas managing hazardous and/or mixed waste, in accordance with 20 NMAC 4.1, Subpart V, Part 264 [6-14-00]. This training program applies to all employees of the U.S. Department of Energy, the University of California, and any subcontractors who work regularly at LANL TSDFs and manage hazardous and/or mixed waste. The degree of training varies with the job duties.

C.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 LANL division or group. Waste management groups within the Environmental Science and Waste Technology (E) and Facility and Waste Operations (FWO) Divisions are responsible for most centralized waste management activities at LANL. The Hazardous and Solid Waste Group (ESH-19) is responsible for providing waste management regulatory guidance to all LANL personnel and operations. Other personnel at LANL that may provide assistance in various waste management activities are discussed in the following paragraph and in Appendix D in Chapter 1 of this permit.

Laboratory-contracted support services (e.g., Johnson Controls Northern New Mexico [JCNNM]) provide trained personnel to assist in waste-handling activities. Personnel in the Health Physics Operations Group, the Occupational Medicine Group, the Industrial Hygiene and Safety Group, the Criticality Safety Group, the Occurrence Investigation Group, the Hazardous Materials Response Group (ESH-10), the Air Quality Group, the Water Quality and Hydrology Group, the Ecology Group, and personnel in ESH-19 are trained in their respective specialties to provide emergency response support. Protection Technology Los Alamos (PTLA) is responsible for LANL security, and provides workers trained in traffic and site-access control.

The Emergency Management and Response Office (EM&R) provides emergency planning and response at LANL and has the overall responsibility for LANL's Emergency Management Plan (EMP)

training. The Environment, Safety, and Health Division Training Group (ESH-13) is responsible for developing and delivering LANL-wide environment, safety, and health (ES&H) training. Courses on hazardous and/or mixed waste are designed with substantial input from ESH-19, the E and FWO Divisions waste management groups, and other subject matter experts, as appropriate.

C.2 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES [20 NMAC 4.1, Subpart IX, 270.14(b)(12) and 20 NMAC 4.1, Subpart V, 264.16(a), (b), (d), and (e)]

The training program instituted at LANL includes a combination of LANL-wide courses, facility-specific training, and on-the-job training (OJT). LANL-wide courses are provided internally or through external vendors. They are usually classroom-based and may be received off-site. Facility-specific training may be developed and delivered within a particular TSDF, and OJT consists of supervised and documented training focused primarily on procedures performed by individual workers. Each of these types of training is described briefly in Sections C.2.1 through C.2.3. All LANL employees and LANL contract and support personnel who handle hazardous and/or mixed waste at TSDFs receive the appropriate level of training within six months of their date of hire or transfer for work at a TSDF. Personnel will not work in unsupervised waste handling positions at TSDFs until they have successfully completed the appropriate level of training for their positions and responsibilities.

Records of LANL-wide training currently sponsored or administered by ESH-13 are entered by that group into the Employee Development System (EDS), the official LANL training database. These records document that the required training has been successfully completed by the worker. Training records of former workers are kept for at least three years from the date that they last worked at the TSDF. It is required that records documenting successful completion of facility-specific, on-the-job, or externally provided training be kept by the sponsoring LANL organization. LANL will maintain, at a minimum, hard or electronic copies of TSDF training records for currently employed workers until the TSDF closes.

Table C-1 presents components of the LANL-wide training program as administered through ESH-13. This table includes a listing of the relevant training courses, a summary of topics, and a designation of the relevant courses for each job category. Categories of workers presented in Table C-1 include TSDF hazardous/mixed waste workers, managers and supervisors of TSDF hazardous/mixed waste workers, emergency responders, and uncontrolled area potential release site workers. Table C-2 summarizes the components of facility-specific training and OJT that workers receive, as applicable. Each training element has been designed to ensure that every worker involved in hazardous and/or mixed waste handling operations is properly trained in the procedures relevant to the positions in which they are employed. Tracking the completion of training

is possible through the EDS training plans. If a worker is no longer involved in hazardous and/or mixed waste handling operations, continued training to meet the components of the relevant hazardous waste management program is not required.

TSDF Hazardous/Mixed Waste Workers are responsible for handling hazardous/mixed wastes at a TSDF. In addition, they are responsible for assisting in TSDF spill and emergency response activities, as required.

Managers and Supervisors of TSDF Hazardous/Mixed Waste Workers are directly responsible for day-to-day operations related to TSDF waste management activities. They are also responsible for assuring that personnel safety and training requirements are met.

Emergency Responders are trained emergency response personnel (e.g., ESH-10, Technical Area 55 Emergency Response Team) that respond to emergencies (e.g., spills, fires, explosions) involving hazardous and/or mixed wastes. Emergency Responders also provide support for emergency response activities.

Uncontrolled Area Potential Release Site Workers conduct investigations and remedial activities at potential release sites. They are also responsible for proper remediation waste management from generation to disposal, including waste characterization, treatment, and storage.

Training materials of LANL-wide training courses are on file in the ES&H Training Center and are available for review by all hazardous/mixed waste management and handling personnel, emergency response personnel, and regulatory agencies. Course content will be reviewed annually and updated as required to remain current with hazardous waste management regulations. Alternative forms of training (e.g., paper-based self-study courses, computer-based training) may be taken to meet specific training requirements. Such alternate forms of training must be approved by ESH-13 personnel and be determined to be equivalent in content to more traditional classroom-based training courses. Files listing the requisite skills, education, and training for workers who handle hazardous and/or mixed waste and the duties and responsibilities for each job description, as well as the name of each worker filling a job description, are maintained at LANL, as required by 20 NMAC 4.1, Subpart V, 264.16(d)(2) [6-14-00].

C.2.1 LANL-Wide Courses

Hazardous waste management courses for TSDF personnel include Waste Generation Overview, Resource Conservation and Recovery Act (RCRA) Personnel Training, and RCRA Refresher training. Additional LANL-wide courses may be required for specific job functions.

An introductory course, "Waste Generation Overview," provides information needed to identify wastes that are subject to hazardous waste regulations in 20 NMAC 4.1, Subpart II [6-14-00]. The training defines and addresses the identification of hazardous waste and hazardous constituents (including hazardous components in mixed waste). Waste minimization, storage requirements, and waste disposal are also presented.

The course "RCRA Personnel Training" provides an overview of state and federal hazardous waste management regulations and emphasizes compliance with the RCRA requirements that apply to job-related activities, such as the safe handling of hazardous and mixed waste. Instructors are trained in hazardous and mixed waste management programs and procedures and in RCRA *(42 United States Code [USC] 6901 et seq.)*. ESH-13, with guidance from ESH-19, provides an annual refresher of applicable hazardous waste management requirements. The course "RCRA Refresher Training" is intended to update personnel on LANL procedures and changes in RCRA *(42 USC 6901 et seq.)* provisions and 20 NMAC 4.1 regulations and to provide them with an overview of their introductory training. TSDF personnel who handle hazardous and/or mixed waste and/or clean up spills or releases of hazardous and/or mixed waste at TSDFs and the managers and supervisors of these workers also receive instruction on appropriate topics listed in Table C-1.

C.2.2 Facility-Specific Training [20 NMAC 4.1, Subpart V, 264.16(a)(3)]

Waste-handling personnel will participate in facility-specific training at their particular work locations, as appropriate. Table C-2 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 will become familiar with emergency procedures, equipment, and systems at their particular facility, including emergency and monitoring equipment use, inspection, repair, and replacement, as appropriate. In addition, they will receive instruction on 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.

C.2.3 On-the-Job Training

Supervised and documented OJT may be developed and delivered by supervisors or other subject matter experts who are able to evaluate worker proficiency and determine appropriate training for the procedures required of each function-specific position. OJT topics may include implementation of facility-specific procedures, maintenance of operating records, reporting requirements, and TSDF-specific inspection requirements. TSDF emergency response personnel receive TSDF-specific training regarding emergency response and shutdown procedures at the TSDF to which they are assigned.

C.2.4 Training Coordinator [20 NMAC 4.1, Subpart V, 264.16(a)(2)]

The ESH-13 Group Leader directs the LANL-wide ES&H training program. The Group Leader (or designee) serves as the Training Coordinator for LANL-wide waste management training. The Training Coordinator is trained in the operation of hazardous and mixed waste management facilities, waste management practices, and emergency procedures and is responsible for coordinating training courses.

C.3 EMERGENCY TRAINING [20 NMAC 4.1, Subpart V, 264.16(a)(3) and (c)]

If called upon by the EM&R Office, additional non-LANL emergency response personnel (e.g., JCNNM, PTLA) may assist the LANL Incident Commander at the scene of a hazardous or mixed waste emergency. These workers are trained in their specialties (e.g., heavy equipment operation, hazardous material cleanups, traffic control, and security). At all times during an emergency, these workers are coordinated by the Incident Commander in the Incident Command System or by the designated Emergency Manager, as appropriate. The Contingency Plan (Appendix D in Chapter 1 of this permit) provides a more detailed discussion of emergency procedures, personnel, and equipment.

To ensure maximum protection of life and property and to mitigate the consequences of an emergency situation, TSDF personnel involved in waste handling and emergency response must be knowledgeable about appropriate building and operating area emergency procedures. These workers receive training in TSDF-specific emergency procedures or participate in the LANL-wide emergency training program. Group leaders and immediate supervisors are responsible for ensuring that education and training in TSDF-specific emergency procedures are provided to all personnel under their supervision. Training in TSDF-specific emergency procedures is given by the operating group. Periodic exercises may be used to familiarize workers with emergency procedures. Training

may also be provided to workers through instructional displays or presentations and discussions in safety meetings.

Immediate supervisors ensure that each new or transferred worker is informed on the general and specific emergency procedures related to the work area. The immediate supervisor also ensures that each worker is advised of any changes to emergency procedures and that each worker is provided with an annual refresher of these procedures. The organization that develops and delivers TSDF-specific emergency training maintains these training records.

Specialized training is given to personnel assigned special functions or specific emergency duties. Emergency response personnel are required to attend training on the implementation of the RCRA contingency plan (Appendix D in Chapter 1 of this permit), spill response, and Occupational Safety and Health Administration emergency response provisions. The EM&R office provides training related to implementing LANL's EMP. In addition, TSDF waste management and handling personnel participate in a training program in which they are instructed in emergency procedures pertinent to their work areas. The operating group is responsible for providing this site-specific instruction. Personnel responsible for shipping or transporting hazardous and/or mixed waste also require supplementary training, as necessary.

C.4 IMPLEMENTATION OF TRAINING PROGRAMS [20 NMAC 4.1, Subpart V, 264.16(b) and (c)]

TSDF personnel receive instruction on appropriate topics as listed in Table C-1. All TSDF workers who handle hazardous and/or mixed waste or releases of hazardous and/or mixed waste at the TSDF are required to complete Waste Generation Overview and RCRA Personnel Training. They must attend annual RCRA refresher training. Line managers and group leaders also receive this training and are responsible for ensuring that personnel participate in the appropriate introductory and annual courses.

Table C-1

Los Alamos National Laboratory-Wide Training Program Outline

Courses[a]	TSDF[b] Hazardous/Mixed Waste Worker	Manager/Supervisor of TSDF Hazardous/Mixed Waste Workers	Emergency Responder	Uncontrolled Area Potential Release Site Worker
HAZWOPER[c]: First Responder (Operations Level) (provides an overview of hazardous materials emergency response, including recognition and identification of hazardous materials and associated risks, required actions, and relationships with other emergency responders)			X[d]	
HAZWOPER: General Site Worker (40 hours) (provides general information on hazardous waste operations and emergency response for general site workers engaged in corrective action, remediation, or decontamination and decommissioning activities)				X
HAZWOPER: Refresher (provides general information on hazardous waste operations)			X	X
RCRA[e] Personnel Training (includes an overview of the Code of Federal Regulations, Title 40, Parts 260-265, 268; the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, revised June 14, 2000; Department of Transportation shipping regulations; internal and external protocol for facility inspections; operating equipment, communication systems, security systems; contingency plan; and emergency equipment use, inspection, and repair)	X	X	*[f]	*

Refer to footnotes at end of table.

Table C-1 (continued)

Los Alamos National Laboratory-Wide Training Program Outline

Courses[a]	TSDF[b] Hazardous/Mixed Waste Worker	Manager/Supervisor of TSDF Hazardous/Mixed Waste Workers	Emergency Responder	Uncontrolled Area Potential Release Site Worker
RCRA Refresher Training (includes regulatory and legislative updates, occurrence reports and lessons learned, audit findings, modification/review of the contingency plan; provides required retraining)	X	X	*	*
Waste Generation Overview (includes waste management regulations and policies, definition of hazardous waste, waste minimization, cycle of waste management at Los Alamos National Laboratory, storage and disposal)	X	X	X	X
Respirators: Air-Purifying (provides required annual retraining for operation and inspection of device, changing filters, donning and doffing)	*	*	X	*
Respirators: Self-Contained Breathing Apparatus (provides required annual retraining for operation and inspection, changing compressed air bottles, donning and doffing, safety features, care and cleaning, fitting)	*	*	X	*

[a] Additional training courses (not listed in this attachment) may also be taken by personnel depending on the types of hazards (e.g., chemical) associated with a particular job description.
[b] TSDF = Treatment, storage, and disposal facility
[c] HAZWOPER = Hazardous Waste Operations and Emergency Response
[d] X indicates a required course.
[e] RCRA = Resource Conservation and Recovery Act
[f] * indicates that a course may be required for specific job tasks and/or work areas.

Table C-2

Outline of Facility-Specific and On-the-Job Training for Treatment, Storage, and Disposal Facility Operations

Facility-specific and/or on-the-job training (OJT) is provided to treatment, storage, and disposal facility (TSDF) workers to ensure that operations are performed in a safe manner and that actual job tasks are conducted in accordance with safe operating procedures.

Facility-specific training will include, as applicable, the following topics:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Response to groundwater contamination incidents
- Shutdown of operations.

OJT will include the following topics, as applicable:

- Implementation of facility-specific procedures
- Maintenance of operating records
- Reporting requirements
- TSDF-specific inspection requirements.

OJT and facility-specific training must be documented by the sponsoring organization and training records must be maintained for a minimum of three years from the date that the trainee last worked at the TSDF.

APPENDIX D

CONTINGENCY PLAN

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LIST OF ABBREVIATIONS/ACRONYMS

20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
BEP	building emergency plan
CAS	Central Alarm Station
DOE	U.S. Department of Energy
DX	Dynamic Experimentation
E	Environmental Science and Waste Technology
EM&R	Emergency Management and Response
EMP	Emergency Management Plan
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
ESH	Environment, Safety, and Health
ESH-1	Health Physics Operations Group
ESH-2	Occupational Medicine Group
ESH-5	Industrial Hygiene and Safety Group
ESH-7	Occurrence Investigation Group
ESH-10	Hazardous Materials Response Group
ESH-17	Air Quality Group
ESH-18	Water Quality and Hydrology Group
ESH-19	Hazardous and Solid Waste Group
ESH-20	Ecology Group
HAZMAT	Hazardous Materials
HMGS	Hazardous Materials Group Supervisor
IC	Incident Commander

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LIST OF ABBREVIATIONS/ACRONYMS
(Continued)

ICS	Incident Command System
JCNNM	Johnson Controls Northern New Mexico
LAAO	Los Alamos Area Office
LACFD	Los Alamos County Fire Department
LACPD	Los Alamos County Police Department
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LIR	Laboratory Implementation Requirement
MOU	memorandum of understanding
NAWAS	National Warning System
NIIMS	National Interagency Incident Management System
NMED	New Mexico Environment Department
PA	public address
PPE	personal protective equipment
PTLA	Protection Technology Los Alamos
S	Security and Safeguards
SM-409	ESH-2's central medical facility
TA	technical area
UCC	Utilities Control Center

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APPENDIX D
CONTINGENCY PLAN

This appendix presents contingency measures applicable to all hazardous or mixed waste units at Los Alamos National Laboratory (LANL) included in the technical area (TA)-specific permit chapters. The contingency plan is intended to meet the requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, Part 264, Subpart D, "Contingency Plan and Emergency Procedures," and 20 NMAC 4.1, Subpart IX, 270.14(b)(7), revised June 14, 2000 [6-14-00], for hazardous waste treatment, storage, or disposal facilities. In addition, this plan is consistent with the "Los Alamos National Laboratory Emergency Management Plan" (LANL, 1998), hereinafter referred to as the LANL Emergency Management Plan (EMP), prepared by the LANL Emergency Management and Response (EM&R) Office. The provisions of this contingency plan will be carried out immediately to minimize hazards whenever there is a fire, explosion, or release of hazardous or mixed waste or hazardous or mixed waste constituents that could threaten human health or the environment, as required by 20 NMAC 4.1, Subpart V, 264.51(b) [6-14-00]. Additional contingency plan information is provided in Attachment D of TA-specific permit chapters. Individual facilities at LANL may have their own facility-specific emergency plans and/or procedures to follow in the event of a fire, explosion, or release of hazardous and/or mixed waste.

D.1 HAZARDOUS AND MIXED WASTE EMERGENCY RESPONSE RESOURCES [20 NMAC 4.1, Subpart V, 264.52(c) and 264.53]

The primary resources for management of emergency incidents at LANL reside within the EM&R Office, which is part of the Security and Safeguards (S) Division. During an emergency situation, line management (i.e., the Group Leader of the affected area) works with the Duty Emergency Manager from the EM&R Office. The Emergency Manager has primary responsibility for managing emergency response operations, making appropriate notifications, activating the emergency response organizations, and proceeding to the scene. The Emergency Manager has authority to assume the role of Incident Commander (IC) during an emergency and typically assumes full responsibility for management of the emergency response operations at the scene. (Personnel from other organizations, such as the Federal Bureau of Investigation or the Los Alamos County Fire Department [LACFD], may also assume the role of IC, depending upon the type of emergency and responding organizations.) Additional LANL resources that may provide assistance in an emergency include personnel from the Environment, Safety, and Health (ESH) Division and the Environmental Science and Waste Technology (E) Division at LANL. These groups are discussed in Sections D.1.2, D.1.3, and D.1.6.

Laboratory-contracted support services and other agencies are also available for assistance during emergencies. These are discussed in Section D.1.5 and include the contracted services of Protection Technology Los Alamos (PTLA) for security, Johnson Controls Northern New Mexico (JCNNM) for facility maintenance and heavy equipment operation, and the LACFD. Other outside response agencies are discussed in Section D.1.7 and include the Los Alamos County Police Department (LACPD) and the Los Alamos Medical Center (LAMC). The LACPD and the LAMC each provide assistance under a memorandum of understanding (MOU) with the U.S. Department of Energy (DOE).

Emergency response protocol at LANL is currently being modified to be consistent with the National Interagency Incident Management System (NIIMS). The NIIMS is a national standard that provides consistency in terminology/methodology and allows for an integrated emergency response both locally and nationally, if necessary. Consequently, this contingency plan may undergo further modification, when required.

The IC (e.g., Duty Emergency Manager) coordinates all groups and agencies responding to the emergency and personnel operating at the scene in what is called the Incident Command System (ICS). The general emergency notification structure, illustrated on Figure D-1, is designed to expand and contract, as appropriate, to include the response groups/agencies needed to address any particular emergency.

The IC may appoint and utilize a network of support personnel to assess, plan for, and mitigate emergencies. These personnel include, but are not limited to, a Safety Officer, a Public Information Officer, and a Liaison Officer that report directly to the IC and are responsible for issues related to safety, information, and the interaction of various groups associated with the overall emergency. Also reporting directly to the IC are an Operations Section Chief, Logistics Section Chief, Planning Section Chief, and an Administrative Section Chief. The Operations Section Chief oversees the Fire Branch and the Emergency Medical Services Branch, and is responsible for the actual emergency response. The Logistics Section Chief is responsible for providing support personnel and equipment necessary for the emergency response. The Planning Section Chief is responsible for planning the active mitigation and recovery for the emergency, and the Administrative Section Chief is responsible for keeping records of expenditures. In some instances, one person may be assigned more than one of these positions. During an emergency at LANL, assistance may be provided to the IC and the IC's appointees by a large variety of response groups/agencies. The responsibilities and/or assistance

available from the various response groups/agencies are listed in Table D-1 and discussed briefly in Sections D.1.2 through D.1.7.

A current copy of this contingency plan will be retained by each of the emergency response groups/agencies and the appropriate facility operators. LANL's Hazardous and Solid Waste Group (ESH-19) is responsible for the controlled distribution of the contingency plan. Amendments to the contingency plan are discussed in Section D.12.

D.1.1 Emergency Management and Response Office [20 NMAC 4.1, Subpart V, 264.52(d) and 264.55]

The Director of LANL has delegated the authority and responsibility for administering and implementing LANL's emergency management program to the S Division, which includes the EM&R Office. The EM&R Office coordinates and issues the LANL EMP and provides response coordination for emergencies. The EM&R Office also provides a 24-hour Duty Emergency Manager to respond to emergencies, including hazardous and mixed waste releases. The LANL Emergency Manager is the functional equivalent of the Emergency Coordinator (20 NMAC 4.1, Subpart V, 264.55 [6-14-00]). The EM&R Office maintains an Emergency Operations Center (EOC) in a ready condition, should a center be required. The primary EOC is located at TA-59, Building 1 (TA-59-1). An alternate EOC is located at TA-49-113. Should an EOC be activated during an emergency, all other emergency personnel, including the IC, fall under the control and direction of the EOC.

Assignment as the Duty (i.e., primary) Emergency Manager is rotated. The Duty Emergency Manager can be reached 24 hours a day by contacting the EM&R Office at 667-6211 or the Central Alarm Station (CAS) operator (911). Listed below is the name, address, and phone number of the current Primary Emergency Manager, as required by 20 NMAC 4.1, Subpart V, 264.52(d) [6-14-00].

George VanTiem
197 El Viento St.
Los Alamos, NM 87544
Home phone number: 662-4623
Laboratory phone number: 667-6211

The Duty Emergency Manager will respond to emergency incidents involving the release of hazardous or mixed waste to the environment, including spills, fires, and explosions. With input from the appropriate LANL groups, the Duty Emergency Manager will initially assess the possible hazards to human health or the environment and, if assuming incident command, will use whatever response

personnel and/or emergency equipment necessary in order to control and contain the waste, as necessary. In the event of an emergency, the Emergency Manager typically becomes the IC with full responsibility for field activities (including logistics, planning, and operations or establishing these positions within the ICS). As described previously, the exception to this is when on-site personnel can adequately address the emergency and maintain incident command internally. At the scene of the emergency, the IC will assemble the ICS, as required, for response to the emergency.

The Duty Emergency Manager responding to an emergency will have access to a copy of the appropriate building emergency plan(s) (BEP) for the area in which the incident is occurring. These plans are maintained by the facility manager where a waste management unit is located and are available at the EM&R Office at TA-59; they are also located on site for use by emergency response personnel. The various response groups will obtain specific information relating to the facilities involved (including the layout of all affected buildings; the location of evacuation routes, equipment, and personnel; properties of the materials/wastes managed at the facility; and the hazards associated with these materials/wastes) from the BEP(s) and other site-specific information.

D.1.2 Hazardous Materials Response Group

The Hazardous Materials (HAZMAT) Team is comprised of personnel from the Hazardous Materials Response Group (ESH-10). The HAZMAT Team is responsible for the aggressive mitigation of chemical, radiological, hazardous waste, and mixed waste emergencies, including field decontamination of responders and response equipment. At the request of the IC, the HAZMAT Team may provide limited field decontamination support for victims. The HAZMAT Team is capable of providing a decontamination station at the scene of a hazardous material incident to process people working in a contaminated area and is prepared to perform decontamination of personnel. LANL standards require that the HAZMAT Team meet the training criteria for emergency response personnel specified in the Code of Federal Regulations, Title 29 (29 CFR), Subparts 1910.120(q)(6)(iii), (iv), and (v). The HAZMAT Team acts as part of the IC's reporting through the HAZMAT Group Supervisor (HMGS). The LANL HMGS coordinates the HAZMAT Team and radiological field monitoring activities.

During an emergency response, ESH-10 may also provide site field monitoring to determine the nature and extent of contamination, provide information on correct handling of chemicals, make recommendations on protective clothing and equipment, and provide exposure and treatment information to responders. To operate effectively, ESH-10 may obtain resources from other ESH

groups, such as the Health Physics Operations Group (ESH-1) and the Industrial Hygiene and Safety Group (ESH-5).

D.1.3 E and ESH Division Response Groups

At the scene, representatives and technical advisors from the E and ESH Divisions and other response personnel are coordinated by the IC. In addition to their post-emergency duties, they may also be responsible for on-scene emergency operations such as planning. Depending on the type of emergency and the associated hazards, an individual from the most relevant group in the ESH Division will assume the position of the Environmental Safety and Health Advisor, will provide technical support, and will ensure LANL compliance with applicable federal, state, and local regulations.

D.1.3.1 E Division

Subject matter experts from the E Division may provide guidance on proper treatment, storage, and transportation of hazardous and mixed waste at LANL.

D.1.3.2 Air Quality Group

The Air Quality Group (ESH-17) provides field surveys of air to determine environmental impacts and dose equivalent to members of the public after a radiological emergency. In addition, ESH-17 provides expertise in meteorology to project short- and long-term environmental effects of emergency conditions.

D.1.3.3 Water Quality and Hydrology Group

After an emergency, the Water Quality and Hydrology Group (ESH-18) provides sampling of surface water runoff and sediments to determine environmental effects of an emergency and performs assessments for regulatory reporting requirements. ESH-18 also provides expertise in hydrogeology to establish short- and long-term environmental effects of emergency conditions.

D.1.3.4 Hazardous and Solid Waste Group

ESH-19 provides guidance on regulatory requirements to other LANL groups. After an emergency, ESH-19 provides field sampling (e.g., of soil, spills, or potentially hazardous waste) to determine environmental effects of exposure.

D.1.3.5 Ecology Group

The Ecology Group (ESH-20) provides field surveys of soil, foodstuffs, and biota to determine environmental effects of exposure after an emergency.

D.1.4 Other LANL Response Resources

Emergency response personnel from the Nuclear Materials Technology Division at TA-55 have been trained to respond to emergencies at that facility. Dynamic Experimentation (DX) Division personnel are responsible for the hazardous waste management units at TA-14, TA-36, and TA-39. DX personnel responsible for these units are trained in emergency procedures and may provide information and/or assistance during emergencies involving explosive waste. Engineering Sciences and Applications Division personnel are responsible for waste management units at TA-16. These personnel are also trained in emergency procedures and may provide information and/or assistance during emergencies involving units at TA-16.

D.1.5 Contracted Response Groups

Contracted response groups' representatives may report directly to the IC Post, if requested. If the IC deems it necessary, the IC may designate an Operations Section Chief to aid in the coordination and direction of these groups. In addition, contracted response groups may report to a staging area, with a representative going either to the IC Post or, if activated, to the EOC.

D.1.5.1 Protection Technology Los Alamos

PTLA is responsible for LANL security and provides this service under contract to LANL. During an emergency, PTLA activities include maintaining security, directing traffic within LANL, and controlling access to the emergency scene. PTLA maintains the necessary equipment (such as crowd-control equipment and patrol vehicles) to perform these functions. In addition, the CAS at TA-64-1 is manned by PTLA personnel 24 hours a day.

D.1.5.2 Johnson Controls Northern New Mexico

JCNNM provides a maintenance support force under contract to LANL. This support force is under LANL's direction in an emergency. JCNNM also provides a representative to LANL in the event of an emergency and participates, as necessary, in post-emergency cleanup under the direction of a Recovery Manager designated by the IC. (The duties of the Recovery Manager are discussed in Section D.10)

D.1.5.3 Los Alamos County Fire Department

The LACFD provides fire protection and ambulance coverage for the residential communities of Los Alamos and White Rock and for LANL. In the case of an emergency within LANL, the LACFD coordinates fire suppression and Emergency Medical Services. The IC retains overall responsibility for the emergency response effort. A copy of the contract between the DOE and the Incorporated County of Los Alamos has been provided to the New Mexico Environment Department (NMED).

D.1.6 LANL Support Groups

D.1.6.1 Health Physics Operations Group

LANL's Health Physics Operations Group (ESH-1) provides field personnel to perform routine site evaluation and monitoring to determine radiological conditions in facilities. ESH-1 also provides guidance on radiological decontamination. In addition, this group augments the assessment and monitoring functions of the HAZMAT Team.

D.1.6.2 Occupational Medicine Group

LANL maintains its own medical facility operated by the Occupational Medicine Group (ESH-2). ESH-2 provides appropriate medical treatment for occupation-related illnesses and injuries and monitors employees to assess the effectiveness of health protection programs. In addition to promoting early identification and prevention of illnesses or injuries that may arise from exposures to hazardous or radioactive materials, ESH-2 maintains records of the health status of employees and related occupational medicine activities.

Although ESH-2 is not routinely involved with on-scene emergency response, the group maintains a central medical facility with a fully equipped emergency room and decontamination facilities at TA-3, Building 409 (SM-409). The location of this and other emergency facilities are shown on Figure D-2. Medical staff at these facilities include physicians, physician's assistants, nurses, technicians, and counselors. All full-time physicians and nurses receive radiation accident training. ESH-2 also maintains access to a database that provides the clinical staff with timely toxic exposure and treatment information.

D.1.6.3 Industrial Hygiene and Safety Group

ESH-5 assists ESH-2 with its ability to obtain additional exposure and treatment information. In addition, ESH-5 maintains computer access to the National Institute of Occupational Safety and Health Technical Information Center and the Registry of Toxic Effects of Chemical Substances.

During routine operations, ESH-5 performs site evaluations and field testing to determine the nature and extent of chemical contamination and specifies protective clothing and equipment.

D.1.6.4 Occurrence Investigation Group

Occurrence Investigation Group (ESH-7) personnel assist the facility manager in investigating all adverse environmental, safety, health, and operational occurrences (on site and off site), determining the causal factors, identifying the appropriate corrective actions, and assisting in the preparation of reports documenting the occurrence to DOE. This group tracks corrective actions associated with such occurrences and maintains the information in an on-site database.

D.1.7 Outside Response Agencies

During an emergency, outside response agencies report directly to the IC. An Operations Section Chief, designated by the IC, may aid in coordinating and directing the groups responding to an emergency.

D.1.7.1 Los Alamos County Police Department

The LACPD has only minimal interaction with LANL in an on-site emergency. This interaction is limited to traffic control on DOE roads with public access, handling criminal activity, and criminal investigations. A copy of the MOU between the DOE and the Incorporated County of Los Alamos has been provided to the NMED.

D.1.7.2 Los Alamos County Emergency Management Coordinator

Los Alamos County has an agreement with LANL's EM&R Office to provide assistance in certain emergency situations. If an emergency occurs on LANL property that may affect the communities of Los Alamos and White Rock, the EM&R Office will notify the Los Alamos County Emergency Management Coordinator, who will coordinate necessary emergency actions throughout the county.

D.1.7.3 Los Alamos Medical Center

LANL maintains a fully equipped decontamination room adjacent to the emergency room at the LAMC. In the event that a case is sent to LAMC, support for the emergency room staff is provided by ESH-2 medical personnel. ESH-1, ESH-5, and ESH-10 personnel also provide assistance to the emergency room staff; assistance from additional ESH resources are provided, as necessary. Assistance is coordinated through the EM&R Office. A copy of the MOU between the DOE and LAMC has been provided to the NMED.

D.2 EMERGENCY EQUIPMENT AND COMMUNICATIONS [20 NMAC 4.1, Subpart V, 264.52(e)]

D.2.1 Emergency Equipment

20 NMAC 4.1, Subpart V, Part 264, Subpart D [6-14-00], requires a listing of all emergency response equipment available that can be used in the event of an emergency. Table D-2 lists emergency equipment available for use at any of LANL's hazardous or mixed waste units. The list includes emergency equipment available in the HAZMAT vehicles and trailers as well as supplemental emergency equipment maintained by the LACFD, JCNNM, and ESH-2. A list of emergency equipment available for use at specific hazardous and/or mixed waste units is presented in Attachment D of TA-specific permit chapters.

D.2.2 Emergency Communications [20 NMAC 4.1, Subpart V, 264.56(a)]

Effective emergency response at LANL requires an efficient communication system that will integrate required personnel into the emergency response. The initial phase of an emergency may involve a small number of individuals at the affected area, require notification of the Duty Emergency Manager, and utilize local communication equipment and/or systems. When responding to hazardous and/or mixed waste emergencies, the EM&R Office can provide communications between response units and emergency organizations.

D.2.2.1 Central Alarm Station

The LANL CAS is located at TA-64-1. This station is manned by PTLA personnel 24 hours a day and is equipped with telephones (including direct-line telephones), medium- and short-range radios, a National Warning System (NAWAS) station, and an emergency power system. The fire alarm board at the control room gives the location of automatic and manual fire alarm equipment. The CAS receives alarms from several sources and, in turn, notifies the Duty Emergency Manager of a hazardous or mixed waste emergency. Sources include:

- Telephone communication (911)
- Automatic fire alarms
- Manual pull alarms
- Computer interface (to warn of critical events at selected facilities)
- Security alarms
- Radio communications.

Upon receipt of an alarm, the CAS operator notifies the LACFD and the Duty Emergency Manager. The Emergency Manager, the EOC communicator, and/or the CAS operator may request emergency

response groups to respond. Should the LANL 911 system fail, the Los Alamos County System, located at the LACPD Station, will be used to activate emergency response groups.

D.2.2.2 Utilities Control Center

The Utilities Control Center (UCC) is located at TA-3-223 and is maintained 24 hours a day. Alarms at the UCC are connected to LANL experiments, equipment, and/or buildings to record outages and hazardous conditions. Any conditions that activate these alarms will be reported immediately to the building management or to the CAS operator for notification and response.

D.2.2.3 Additional Communication Systems

Internal communication systems at LANL include:

- The Centrex telephone system
- A telephone paging system
- A variety of frequency modulated very high frequency simplex repeater systems, including:
  - Multiple base stations
  - Mobile and hand-held units
  - Links to New Mexico public safety agencies
- An ultrahigh frequency radio system, including:
  - Multiple antenna sites
  - Mobile and base units
  - Links with the LACPD, the LACFD, and the State Medical System
- A 400-megahertz trunked radio system that includes a link with the LACFD
- Transmission and reception (through the EOC) for:
  - Secure telephone
  - Secure fax
  - Secure still video
  - Microwave telephone communication
  - Secure videoconference system (to all DOE EOCs and DOE Headquarters)
- Access to all radio systems outlined above (through the EOC).

Off-site communications with federal, state, tribal, county, and other agencies are available through the following:

- A Centrex telephone system

- Private telephone lines (if Centrex fails)
- Two NAWAS stations
- A link to KRSN radio (local radio station)
- The local cable television
- The Community Alert Network.

The LANL EOC, maintained by the EM&R Office, operates radio systems on key LANL and off-site channels. Emergency personnel responding to on-site incidents have the benefit of wide-area radio coverage using EOC facilities. The Duty Emergency Manager is responsible for activating whatever support personnel, equipment, or services are needed 24 hours a day.

D.3 CONTINGENCY PLAN IMPLEMENTATION [20 NMAC 4.1, Subpart V, 264.56]

The following sections discuss guidelines used to implement this contingency plan, emergency notification, emergency manager actions, and the responses to be taken in various types of emergencies.

D.3.1 Guidelines For Implementation [20 NMAC 4.1, Subpart V, 264.51(b) and 264.56]

The decision to implement this contingency plan depends upon whether an imminent or actual incident involving a release of hazardous or mixed waste to the environment could threaten human health or the environment. The Duty Emergency Manager or IC will use the guidelines listed below to decide whether to implement this plan.

This contingency plan will be implemented immediately in the following situations involving releases or potential releases of hazardous or mixed waste:

- Spills:
  - If a hazardous or mixed waste spill cannot be contained with secondary containment or application of sorbents
  - If precipitation threatens to move spilled material off site
  - If a hazardous or mixed waste spill causes the release of flammable material, creating a fire or explosion hazard
  - If a hazardous or mixed waste spill results in toxic fumes that threaten human health
  - If an earthquake or other natural disaster threatens containment integrity.

- Explosions:
  - If an unplanned explosion involving hazardous or mixed waste occurs
  - If an imminent danger of an explosion involving hazardous or mixed waste exists.
- Fires:
  - If a fire involving hazardous or mixed waste occurs
  - If any building, grass, forest, or nonhazardous waste fire exists that threatens to volatilize or ignite hazardous or mixed waste.

D.3.2 Emergency Notification [20 NMAC 4.1, Subpart V, 264.56(a) and (b)]

Emergency notification shall be conducted in accordance with Laboratory Implementation Requirement (LIR) 201-00-04.0, "Los Alamos National Laboratory Incident Reporting Process" (LANL, 1997). The LIR requires immediate notification of 911 or the EM&R Office upon discovery of an imminent or actual incident involving solid waste (including hazardous and mixed waste). During nonworking hours, personnel will report all imminent or actual incidents involving solid waste to the Emergency Manager or the CAS operator at 667-6211. In the case of fire involving solid waste, notification of these individuals is superseded by the LANL fire alarm system. A fire is reported by dialing 911 (from telephone exchanges 667 and 665) or 667-7080 (from all exchanges, including cellular phones), activating automatic alarms, or activating a fire alarm pull box. All fire alarms alert the CAS operator the LACFD, and PTLA, who in turn notify the Duty Emergency Manager.

Upon recognition of a hazardous or mixed waste emergency, the first arriving emergency-trained person will become the Facility Command Leader. Once the EM&R Office is notified of the emergency, the Duty Emergency Manager will proceed to the scene and be briefed by the Facility Command Leader, building/area personnel, and/or other emergency units/teams. The Emergency Manager will then assume the position of IC. If necessary, the IC may recommend that the EOC be activated and that the necessary members of the emergency management team be determined. The IC will form an ICS and contact the HMGS. The HMGS will notify the appropriate emergency response groups. The IC may determine from the list of response groups described in Table D-1 which groups to contact in an emergency. Each response group maintains an on-call person and/or a call-down procedure to respond to emergencies.

The EM&R Office will be notified of any potential hazardous or mixed waste emergency (e.g., spills, fires, or explosions). The IC and the HMGS will use whatever means are available (including the

assistance of other response groups, computer data searches, and sampling) to determine if a hazardous or mixed waste is being or has been generated and/or released.

D.3.3 Emergency Manager Actions [20 NMAC 4.1, Subpart V, 264.56(b-h)]

Upon notification of an incident, the Duty Emergency Manager may:

- Make an initial assessment of the incident and, in conjunction with the IC, obtain resources to determine the source, quantities, and types of hazardous or mixed waste involved and the areal extent of any released materials.
- Request resources needed and have EOC staff begin notifications.
- Proceed directly to the scene.
- Assess the nature of the incident (e.g., through communication with the IC).
- Assume incident command after a direct briefing with the Facility Command Leader.
- Based on the guidelines in Section D.3.1 of this plan, determine if implementation of this contingency plan is warranted.
- Recommend activation of the EOC, if necessary.

Upon deciding to implement this contingency plan, the IC will, when appropriate:

- Assess the hazards to human health and the environment, including both direct and indirect effects, such as generation of toxic, irritating, or asphyxiating gases and/or hazards of runoff of water or chemicals used for fire suppression. An individual designated by the IC will use the guidelines in Section D.3.1 to assess the hazards to human health and the environment. If any of the criteria under Section D.3.1 are met and if the responsible Group or Section Leader has not already accomplished evacuation of the area, the IC will initiate shelter in place or evacuation of the immediate area.
- Direct the EOC staff to initiate protective actions and immediately notify appropriate response groups and personnel as per the EM&R checklist. The IC may activate one or more of the following community alert mechanisms: the Community Alert (telephone) Network, the KRSN radio remote input system, or the cable television capture system, sitewide area network radios, and public radio and television channels.
- In the case of fire or release of any type, confirm that all response personnel at the scene are aware of actual or imminent special hazards associated with hazardous or mixed waste.
- In emergency situations, contact the appropriate ESH representative to notify the NMED at (505) 827-9329 and the National Response Center at (800) 424-8802, reporting:
  - The name and telephone number of the ESH representative

- The name and address of the facility
- The time and type of incident
- The name and quantity of material involved, to the extent known
- The extent of injuries, if any
- The possible hazards to human health or the environment outside the facility.

- Advise the response groups of hazards in order to minimize personnel exposure and expedite mitigation.

- When an emergency occurs at hazardous or mixed waste treatment units, ensure that appropriate LANL personnel monitor for leaks, pressure buildup, gas generation, or equipment ruptures, as necessary.

Once control of the emergency is established, the IC will take all reasonable measures to minimize the occurrence, recurrence, or spread of fires, explosions, or releases. In addition, the IC will delegate cleanup and decontamination responsibilities to include:

- Arranging for site cleanup.
- Assisting with arrangements for proper handling of recovered waste, contaminated soil, or contaminated surface/groundwater.
- Assisting with arrangements for decontamination of equipment, as needed.
- Arranging for replacement and/or repair of equipment, as needed.
- Requesting that testing is conducted to verify successful cleanup.

Within 15 days of the incident, DOE Los Alamos Area Office (LAAO) will submit a report to the Secretary of the NMED. The contents of this report will be generated by several LANL groups responding to the emergency, as detailed in Section D.11.

D.4 SPILLS [20 NMAC 4.1, Subpart V, 264.56(e)]

Sudden releases may include spills of hazardous or mixed waste that pose a significant threat to human health or the environment. Spill incidents resulting in a sudden release of hazardous or mixed waste that present a potential threat to human health or the environment, as listed in Section D.3.1, require implementation of this contingency plan.

Hazardous and mixed wastes are stored on site at LANL in a variety of containers. Volumes of hazardous or mixed waste managed will vary from unit to unit. The general steps in handling hazardous and/or mixed waste spills are as follows:

- Isolate the immediate area and deny entry to all unauthorized personnel.
- Contain the spill by spreading sorbents or forming temporary dikes to prevent further migration (performed by properly trained personnel, if safe).
- Monitor the spill area and sample the spilled waste and contaminated media.
- Package the waste and contaminated media in sound containers.
- Decontaminate the area and all involved equipment and personnel (followed by testing to assure adequate cleanup).
- Remove the waste and contaminated media (performed by appropriate waste management personnel).

The IC will determine the steps to be taken for spill mitigation. If initial mitigation of the spill is necessary and can be accomplished safely (by appropriately trained personnel) before the Emergency Manager arrives, a qualified member of the affected area's operating group will serve as the Facility Command Leader.

Hazardous and/or mixed waste spills will be stabilized, if necessary, and cleaned up. During spill control and cleanup, all personnel will wear appropriate personal protective equipment (PPE). ESH-5 will conduct monitoring to ensure that chemical exposure is minimized. ESH-1 will conduct health physics monitoring whenever mixed waste is involved to ensure that radiation exposure is also minimized. The collected material may be treated as hazardous or mixed waste, depending on the components present. Runoff from spills of listed hazardous or mixed waste that have migrated outside waste management areas must be contained and managed as hazardous or mixed waste, as appropriate. If the spill was from a characteristic hazardous or mixed waste and if it is determined that the runoff does not exhibit the characteristic (i.e., ignitability, corrosivity, reactivity, and/or toxicity), the runoff need not be managed as characteristic waste. Temporary dikes may be constructed to contain runoff.

D.4.1 Spill Control Procedures

When a flammable organic solvent spill, a highly acidic spill, or a highly caustic spill has been stabilized with the contents of an organic solvent spill kit, an acid spill kit, or a caustic spill kit, respectively, the resulting material may be sorbed using a nonbiodegradable sorbent. Nonbiodegradable sorbent can be used to control any spill if it is known to be compatible with the spilled material. Appropriate containers or packaging will be used to collect all spilled material and contaminated sorbent. Attachment D of TA-specific permit chapters provides lists of emergency

equipment available for spill control at specific units. The ultimate disposition of any contaminated sorbent or waste material will be determined by appropriate waste management personnel, according to hazardous waste management regulatory requirements.

D.4.1.1 Tank System Spill Control and Reporting

A tank system will be removed from service immediately using approved shutdown procedures if a leak or spill occurs from the tank system or its secondary containment system, or if the system is determined to be unfit for use. Further addition of waste to the tank system or containment system will cease and the system will be visually inspected to determine the cause of the leak or spill. If a leak occurs from a tank system, as much of the waste as is necessary to prevent further release of waste will be removed within 24 hours after detection or as early as practicable, and the system will be inspected and repaired. All released waste will be removed within 24 hours or as soon as possible if a leak occurs to a tank's containment system.

If a spill from a tank is not immediately contained and cleaned up and exceeds a quantity of 1 pound, the release will be reported to the NMED within 24 hours of its detection, in accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.196(d)(1) [6-14-00]. In addition, a written report will be submitted to the NMED within 30 days describing the likely migration route of the release; soil characteristics at the site; monitoring and sampling data relevant to the release; proximity to downgradient drinking water, surface water, and populated areas; and response actions taken or planned.

D.4.1.2 Tank System/Secondary Containment Repair and Closure

If the integrity of a tank system, including its secondary containment, has not been damaged by a spill, the system may be returned to service. Service may not resume until after all released waste is removed and repairs, if necessary, are made. Any tank system that cannot satisfy the criteria described above will undergo closure in accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.197 [6-14-00].

D.4.1.3 Certification of Major Repairs

If a tank system undergoes extensive repairs (e.g., installation of an internal liner, tank system piping retrofit), the tank system will not be returned to service until a certification by an independent, qualified registered professional engineer is obtained, verifying that the repaired system is capable of handling wastes without release for the intended life of the system. This certification will be submitted to the NMED within seven days after returning the tank system to use.

D.4.2 Decontamination Verification

Decontamination will be accomplished at the spill site. After the spilled material has been sorbed, the material will be containerized. If the spill occurs on a cemented or asphaltic concrete area, water or an appropriate solvent will be used to clean the area. Liquids (i.e., spilled material and cleaning water or solvents used to clean a spill) may be sorbed with a compatible, nonbiodegradable sorbent and containerized. If a spill is from an identifiable source, the spilled material may be characterized as a newly-generated waste using acceptable knowledge or may be analyzed, as applicable, for the hazardous waste constituents known to be components of the waste managed at that unit. 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 parameters listed in Table D-3. All personnel conducting decontamination verification will wear appropriate PPE. ESH-1 will conduct health physics monitoring whenever mixed waste is involved to ensure that radiation exposure is maintained as low as reasonably achievable. Any hazardous or mixed waste collected from decontamination activities will be handled appropriately.

In order to establish baseline data, a sample of decontamination water or solvent (and nonbiodegradable sorbent material, as applicable) will be taken prior to the start of the decontamination effort. A sample of the final washwater (or the used sorbent) will then be taken. The baseline samples and final washwater/used sorbent samples will be analyzed for the applicable parameters given in Table D-3. If the decontamination samples contain hazardous constituents that are not present in the baseline samples and the levels exceed established health-based levels, the decontamination procedure will be repeated. An alternative demonstration of decontamination may be proposed and justified to the NMED, 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 NMED. 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" (U.S. Environmental Protection Agency [EPA], 1986), and approved updates, or other approved methods, as applicable.

If a hazardous/mixed waste spill occurs on soil, any free liquid present will be collected and containerized. Liquids may be sorbed with a compatible nonbiodegradable sorbent prior to containerization. For such a spill, contaminated soil will be excavated and containerized. ESH-5 will conduct industrial hygiene monitoring, and if mixed waste is involved, ESH-1 will conduct health physics monitoring, if deemed necessary, to minimize exposure during soil removal operations. To

establish comparative background data, one or more samples will be collected from an unaffected area near the spill site. The spill site will then be characterized, and the data will be compared to the background data to ensure that contaminated material has been removed.

If a hazardous/mixed waste spill occurs in an area with flooring, the floor will either be removed in lieu of decontamination, or the floor will be decontaminated. If the decision is made to decontaminate the floor, swipe samples or other types of sampling appropriate for the contaminant will be collected at random and characterized for decontamination verification. If, after several decontamination efforts, it is subsequently determined that the affected floor area cannot be decontaminated, the floor material will be removed. In all cases, wastes generated during the decontamination and/or removal process will be managed appropriately.

D.5 EXPLOSION

Explosions and resultant releases may result in a significant threat to human health or the environment. The potential exists for hazardous or mixed waste to be released during an explosion. Implementation of this contingency plan is required whenever a sudden release that cannot be contained or that presents a threat to human health or the environment occurs as a result of an explosion.

In the event of an explosion at LANL, all personnel will immediately evacuate the area. Any injured personnel will be decontaminated at the site, if required and if time allows. An LACFD ambulance will transport these personnel to LAMC for treatment. If an injury is severe and requires immediate medical evacuation, the injured person will be wrapped to contain contamination, if necessary. In the case of an actual or potential explosion, on-site personnel will contact the EM&R Office immediately so that the Emergency Manager can ensure that all necessary emergency response personnel are alerted. The LACFD is notified automatically upon central alarm system activation. The Emergency Manager assumes incident command and will remain near but at a safe distance from the site in order to inform personnel responding to the explosion of the known hazards.

If a fire results from an explosion, the LACFD Senior Officer will, upon arrival at the scene, evaluate all available information and determine the appropriate firefighting methods and tactics. The LACFD Senior Officer will direct firefighting operations as the acting IC until EM&R formally assumes command.

D.6 FIRE

Fires and resultant releases of hazardous or mixed waste may result in a significant threat to human health or the environment. Implementation of this contingency plan is required whenever a fire incident results in a sudden release of hazardous or mixed waste that cannot be contained or that presents a threat to human health or the environment.

Fire alarms will be sounded automatically or manually to alert personnel that a fire hazard exists and to evacuate the area immediately if in the vicinity. Descriptions and information related to the various fire alarms at the specific units are included, as appropriate, in Attachment D of TA-specific permit chapters.

Depending on the size of the fire and the fuel source, portable fire extinguishers may be used. However, LANL policy does not encourage the use of portable fire extinguishers by employees unless properly trained. Instead, LANL policy encourages immediate evacuation of the area and notification of the CAS operator by dialing 911. For any fire, including a fire that involves hazardous or mixed waste, the responsible Group Leader and the EM&R Office must be contacted immediately. The Emergency Manager will alert the LACFD and all other necessary emergency response personnel. If the fire spreads or increases in intensity, all personnel must follow protective actions as designated by the Emergency Manager. The Emergency Manager assumes incident command and will remain near the scene to advise personnel responding to the fire of the known hazards.

Upon arrival at the scene, the LACFD Senior Officer will evaluate all available information and determine the appropriate firefighting methods and tactics. The LACFD Senior Officer will direct firefighting operations as the acting IC until EM&R formally assumes command.

D.7 UNPLANNED NONSUDDEN RELEASES

Nonsudden releases include those incidents that, if uncontrolled, impact the environment over a long period of time. Such incidents include minor leaks from containers and loss of secondary containment integrity.

D.7.1 Responsibility

Appropriate LANL personnel are responsible for correction of a nonsudden release from a hazardous or mixed waste unit if the correction can be performed safely with normal maintenance and management procedures. Personnel from the EM&R Office may provide assistance in mitigating

releases. Any correction methods for nonsudden releases that have resulted in an impact to the environment will be coordinated with the NMED.

D.7.2 Nonsudden Releases

In general, the response to a nonsudden release will be to contain the release, to correct the cause of the release, and to clean up any release to a level that protects human health and the environment.

Appropriate LANL personnel will conduct regularly scheduled inspections to detect failure of containment at the unit(s) addressed in TA-specific permit chapters. Secondary containment systems will be inspected regularly to ensure that the integrity of the containment systems has not deteriorated. If an inspection reveals that containers are leaking or that secondary containment has deteriorated, LANL personnel will ensure that maintenance or replacement of containment is performed, as appropriate.

D.7.3 Nonsudden Release Surveillance

In addition to routine inspection and site-specific sampling and testing, LANL has established an areawide environmental monitoring network maintained by ESH. Monitoring and sampling locations for various types of measurements are organized into three main groups. Regional monitoring stations located within the five counties surrounding Los Alamos County are placed up to 80 kilometers (50 miles) from LANL. These stations serve to determine background conditions. Perimeter stations, located within approximately 4 kilometers (2.5 miles) of the LANL boundary, document conditions in residential areas surrounding LANL. On-site stations, most of which are accessible only to employees during normal working hours, are within the LANL boundary.

Routine surveillance conducted at these stations includes measuring radiation and collecting samples of air particulates, surface waters, groundwaters, soil, sediment, and foodstuffs for subsequent analysis. Additional samples provide information about particular events, such as major runoff events and nonroutine releases. Data from these efforts are used for comparison with standards, for determining background levels, and for radiation dose calculations.

D.8 EXPOSURE TO HAZARDOUS OR MIXED WASTE

If a person is exposed to hazardous or mixed waste, the affected person, a co-worker, or line management will notify the EM&R Office. Appropriate first aid should be administered immediately. An EM&R Office representative will make appropriate notifications as soon as possible, so that

exposure levels and decontamination requirements can be established. The affected person will then be transported to the ESH-2 medical facility or to LAMC for evaluation. If possible, the material involved in the exposure will be ascertained, and the information will be given to the medical staff.

Other potential exposures will necessitate evacuation of the area, if appropriate, or under any of the following conditions:

- Irritation of the eyes, breathing passages, or skin
- Difficulty in breathing
- Nausea, lightheadedness, vertigo, or blurred vision.

The affected person will be transferred to the ESH-2 medical facility or to LAMC. An ESH-1, ESH-5, or ESH-10 representative will attempt to ascertain what, if any, exposure occurred and what corrective measure is appropriate.

D.9 EVACUATION [20 NMAC 4.1, Subpart V, 264.52(f)]

A facility will be evacuated upon the voice command to evacuate the area or upon the sounding of the evacuation or fire alarm. The IC may call for sheltering in place when evacuation is impractical due to significant airborne hazards. Shelter in place may be possible in a designated area or in a building where all exterior windows and doors may be closed and outdoor air ventilation equipment turned off. Once the airborne hazard has decreased, personnel would then be evacuated.

D.9.1 Emergency Process Shutdown Prior To Evacuation

Personnel are instructed to shut down equipment prior to evacuating a building/area unless an immediate building/area evacuation is announced or signaled. To ensure efficient shutdown, training and exercises addressing the shutdown process are performed. In the case of an immediate evacuation, a selected team may shut down designated equipment in an evacuated area. The team will be equipped with the proper equipment, clothing, and breathing apparatus. If they are on location, ESH-1, ESH-5, and/or ESH-10 will provide advice and assistance. Process-shutdown procedures apply mainly to hazardous or mixed waste treatment units and are addressed, as appropriate, in Attachment D of TA-specific permit chapters.

D.9.2 Evacuation Plan

Emergency situations may warrant the shutdown and evacuation of areas or buildings in order to protect personnel and property, to anticipate the emergency condition, or to enhance the appropriate

response. Table D-4 lists the criteria for evacuation, persons responsible for initiating evacuations, and reentry conditions. Figures in Attachment D of TA-specific permit chapters show evacuation routes and assembly/muster areas for specific hazardous and/or mixed waste management units.

To initiate the evacuation of a building/area, the evacuation or fire alarm is sounded and/or the public address (PA) system may be used. Evacuation alarms cannot be silenced and reset by site personnel. Only the Fire Alarm Maintenance Section at 667-4027 and the LACFD Battalion Chief at 667-7026 can silence and reset alarms. To evacuate a portion of a building or area, use of the PA system may be more appropriate. The PA system will notify the occupants of the area to be evacuated and will advise personnel throughout the building of the existence of a problem in a specific area. Once evacuation has been initiated and if conditions allow, personnel will turn off all equipment that could contribute to the hazard if left unattended. All personnel will then proceed from the affected area to the assembly/muster area.

In the event of evacuation of a building, an outbuilding, or an outlying work area, the responsible Group or Section Leader (or designee) will determine a control point at the closest safe location (e.g., considering wind direction). The designated area will be outside the affected area and will serve as an assembly/muster area where the Group or Section Leader (or designee) can oversee evacuation operations and work to prevent further spread of the hazard.

As personnel exit an affected building/area, a primary sweep of the building/area will be performed to ensure that all personnel have evacuated. If the building/area is evacuated, a Group or Section Leader designee will take attendance at the assembly/muster area and report personnel accountability to the IC. The evacuation procedure is as follows:

- The person discovering the accident or emergency will call 911 to ensure that line management and the EM&R Office are notified.
- Site-specific BEPs and/or emergency action procedures will be followed concerning evacuation, sweep, personnel accountability, and equipment shutdown procedures.

A responsible on-site person may direct the initial evacuation and the central alarm system may be activated. The EM&R Office will be notified immediately and will dispatch the Duty Emergency Manager. A responsible on-site person may implement the evacuation process until the Duty Emergency Manager arrives at the scene to assume that responsibility.

D.10 SALVAGE AND CLEANUP [20 NMAC 4.1, Subpart V, 264.56(g) and (h)]

Appropriate representatives from the ESH groups will survey the affected area before salvage and cleanup begin. They will conduct visual inspections and sampling of the affected area to determine whether cleanup is complete. If gases or fumes, electrical or radiological problems, or other conditions present a hazardous situation, personnel or selected teams equipped with proper breathing apparatus and protective clothing will reenter the area to perform designated decontamination tasks, repairs, and salvage to allow the return to normal operations. After an emergency, the IC will turn the operation over to a designated Recovery Manager, who will:

- Provide for proper handling of recovered waste, contaminated soil or surface water, or any other material that results from a spill, fire, or explosion. Contaminated material will be managed appropriately and temporarily stored at one of the hazardous or mixed waste storage areas at LANL. Waste management personnel will be responsible for determining the final disposition of the waste. This determination will be made in compliance with hazardous waste management regulations.
- Arrange to monitor for damage or improper operation of the unit and associated equipment as a result of the emergency or of plant shutdown in response to the emergency.
- Arrange for site cleanup procedures to be completed and ensure that no waste that may be incompatible with the released material is treated or stored in the same area.
- Ensure that emergency equipment is cleaned, decontaminated, and fit for its intended use before operations are resumed. Equipment will be inspected visually and then sampled, if necessary, to determine the type and degree of contamination and to determine appropriate cleanup measures.

Prior to resuming operations, the appropriate facility management at LANL will verify that the previously mentioned tasks have been performed. The owner/operator (DOE/LAAO) will notify appropriate state and local authorities that cleanup procedures are completed and that emergency equipment is clean and fit for its intended use.

The IC assumes the coordination of post-emergency actions (particularly during the time period immediately following the emergency) until a Recovery Manager is appointed. The Recovery Manager then assumes this coordination role. The Recovery Manager is the functional equivalent of the Emergency Coordinator for post-emergency actions. The post-emergency actions include cleanup operations, vital equipment repair, or interim hazard-removal operations (such as arranging for demolition of unstable walls). The services of affected operational organizations, ESH groups, JCNNM, and other on-site resources will also be used to estimate cleanup costs and operational impact.

D.11 EMERGENCY RESPONSE RECORDS AND REPORTS [20 NMAC 4.1, Subpart V, 264.56(j)]

Any emergency that requires implementation of the contingency plan will be documented by the Group or Section Leader responsible for the hazardous or mixed waste unit associated with the emergency, and reported in writing within 15 days to the NMED. The incident report, submitted by DOE/LAAO, will include the following data:

- Name, address, and phone number of owner or operator
- Name, address, and phone number of the facility
- Date, time, and type of incident (e.g. fire, explosion, spill)
- Name of material(s) involved
- Quantity of material(s) involved
- Extent of injuries (if any)
- Assessment of actual or potential hazards to human health or the environment
- Estimated quantity and disposition of material recovered from the incident.

Various LANL personnel responding to the emergency will record the details of any incident requiring implementation of this plan. The CAS operator, the EOC communicator, the Emergency Manager, and/or the Group or Section Leader responsible for the hazardous or mixed waste management area in which the emergency occurred will record the date, time, location of the incident, wastes/materials involved, injuries (if any), property damage (if any), and a detailed description of the incident. This information will be maintained in the facility operating record. ESH-7 will supply information concerning any follow-up actions. Appropriate LANL personnel will provide details regarding the removal and disposition of hazardous and mixed wastes associated with the emergency.

D.12 CONTINGENCY PLAN AMENDMENT [20 NMAC 4.1, Subpart V, 264.54]

This contingency plan will be reviewed periodically by appropriate division personnel. The plan will be amended immediately if determined to be inadequate to handle releases (spills, explosions, and/or fires) and whenever:

- The facility permit is revised.
- There is change in the design or operation of the facility (e.g., quantities of waste handled and handling techniques) that increases the likelihood of an emergency and requires changes in emergency response.
- The Primary Emergency Manager changes.
- The list of emergency equipment changes significantly.

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, 1998, "Los Alamos National Laboratory Emergency Management Plan," Los Alamos National Laboratory, Emergency Management and Response Office, LA-12900 Rev. 1, LIR 403-00-01.0, Los Alamos, New Mexico.

LANL, 1997, "Los Alamos National Laboratory Incident Reporting Process," LIR 201-00-04.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

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Table D-1

Response Groups and Agencies Available to the Emergency Management and Response Office for Guidance and/or Emergency Assistance

LANL[a]-Controlled Response Group	Telephone	Responsibilities
ESH-1, Health Physics Operations	667-7171	Provides routine guidance on radiological decontamination. Provides routine site evaluation and monitoring to determine the nature and extent of contamination (radiological).
ESH-2, Occupational Medicine	667-7251	Provides emergency medical treatment.
ESH-5, Industrial Hygiene and Safety	667-5231	Provides guidance on industrial hygiene equipment and operational safety. Provides routine site evaluation/support field testing to determine the nature and extent of contamination (chemical).
ESH-7, Occurrence Investigation	667-0598	Reports occurrences and tracks follow-up actions.
ESH-10, Hazardous Materials Response	665-5237	Provides emergency site evaluation/field monitoring (chemical and radiological). Specifies protective clothing and equipment. Dispatches Hazardous Materials Response Team. Provides support for chemical, radiological, hazardous, and mixed waste incidents and decontamination of responders and response equipment.
ESH-17, Air Quality	665-0235	Provides information on meteorological conditions.
ESH-18, Water Quality and Hydrology	665-0453	Provides information on hydrologic conditions.
ESH-19, Hazardous and Solid Waste	667-0666	Provides guidance on regulatory requirements. Conducts field surveys to determine spread of contamination and adequacy of cleanup.
ESH-20, Ecology	665-8961	Provides information on biotic conditions.
Environmental Science and Waste Technology Division	667-2211	Provides guidance on proper treatment, storage, and off-site shipment of hazardous and mixed waste.
PTLA, Protection Technology Los Alamos	667-4437	Provides traffic control and security.
JCNNM, Johnson Controls Northern New Mexico	667-6191	Dispatches maintenance personnel and equipment. Assists in waste cleanup under the direction of the Recovery Manager.

Refer to footnotes at end of table.

Table D-1 (continued)

Response Groups and Agencies Available to the Emergency Management and Response Office for Guidance and/or Emergency Assistance

LANL[a]-Controlled Response Group	Telephone	Responsibilities
NMT, Nuclear Materials Technology Division	667-2556	Provides initial emergency site evaluation at Technical Area (TA) 55 and conducts activities related to the prevention, notification, and control of emergencies at TA-55. In the event of an emergency at TA-55, monitors for leaks, pressure buildup, gas generation, or equipment ruptures, if necessary. Maintains and operates TA-55 Emergency Response Team. Writes TA-55 emergency plans and procedures.
DX, Dynamic Experimentation Division	667-5653	Provides information and/or assistance during emergencies involving units at TA-14, TA-36, and TA-39.
ESA, Engineering Sciences and Applications Division	667-4136	Provides information and/or assistance during emergencies involving units at TA-16.
Non-LANL[a]–Controlled Response Group	**Telephone**	**Responsibilities**
Los Alamos County Fire Department	911 667-7026	Dispatches firefighting personnel and equipment and provides Emergency Medical Services.
Los Alamos County Police Department	662-8222	Provides traffic control on public access roads.
Los Alamos Medical Center[b]	662-4201	Provides medical services. Provides and maintains Emergency Room.

[a] Los Alamos National Laboratory.
[b] Medical services related to hazardous and mixed waste injuries are provided under the direction of ESH-2.

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Table D-2

Los Alamos National Laboratory-Wide Emergency Equipment

Hazardous Materials (HAZMAT) Vehicles and Associated Emergency Equipment:

HAZMAT vehicles and trailers are located at Technical Area (TA) 64, Building 39 (TA-64-39). They are available to the Environment, Safety, and Health (ESH) Hazardous Materials Response Group (ESH-10) for emergency response to all of the TAs at Los Alamos National Laboratory (LANL). ESH-10 is responsible for maintaining the supplies of appropriate emergency equipment in each vehicle and trailer.

The HAZMAT vehicles and trailers are equipped with safety and emergency equipment, personal protective clothing, and other supplies, which may include, but are not limited to:

- assorted personal protective equipment, T-shirts, and gloves
- safety goggles, safety glasses, and face shields
- boots and booties
- totally encapsulating suits and boots
- Level A and B suits
- flash suits
- self-contained breathing apparatus (SCBA) and SCBA bottles
- respirators and cartridges
- hazardous chemical reference books and other reference materials
- shovels
- siphon pumps
- assorted spill kits and sorbents
- chemical burn and neutralizing solutions
- two-way radios, cellular phones, and other communication equipment
- bottles of leak detector and leak repair kits
- emergency repair packs
- HAZMAT bags
- gas detectors and chemical monitoring equipment
- radiological monitoring equipment
- sponges and cleaners
- warning signs and barricade tape
- traffic control barriers
- flashlights
- cameras and film
- knives
- portable power supplies
- warning and signal horns
- harnesses and belts
- portable emergency oxygen
- decontamination equipment
- sampling equipment
- lifting equipment
- assorted tools, tape, and other supplies

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Table D-2 (continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Supplemental emergency equipment and personnel available from the Los Alamos County Fire Department (LACFD):

Engine companies
Fire engines
Mini-pumpers
Modular ambulances
Rescue vehicles
Crash-Fire-Rescue (CFR) unit
SCBA units
SCBA air tanks
Ladders with pumps
Personnel with 120 hours Emergency Medical Technician training
Personnel with Advanced Life Support training
Water tankers

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Table D-2 (continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Supplementary emergency equipment and personnel available from Johnson Controls Northern New Mexico (JCNNM):

TRANSPORTATION EQUIPMENT:

Pickups, 1/2 through 3/4 ton
Trucks, 1 through 3 ton
Vans, panels, and carryalls

SPECIAL EQUIPMENT:

Graders
Loaders
Snowplows and snow blowers
Bulldozers
Scrapers
Semitrailers
Chain saws
Street flushers
Mobile transceivers
Generators
Handsets (2-way)
Pageboys (1-way)
Welders
Mobile site logistics support equipment/associated heavy equipment
Fully equipped spill response unit
Utilities equipment and emergency utility support
Fuel trucks
Light banks
Dump trucks
Backhoes
Potable water trucks

TRAINED PERSONNEL:

Heavy equipment operators
Dispatchers
Mechanics
Power saw operators
Radio and telephone operators
Truck drivers

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Table D-2 (continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Emergency equipment and personnel at the Occupational Medicine Clinic, Occupational Medicine Group (ESH-2):

At TA-3 (SM-409) Central Clinic:

PERSONNEL:

Physicians
Physician's Assistants
Nurses
X-ray Technician
Clinical Laboratory Technicians
Clinical Testing Technicians
Clinical Psychologist
Counselors

SPECIAL EQUIPMENT-PORTABLE:

Multichannel emergency receiver base station
Two-way radio on the State Med Net, the LANL Emergency Management channel, and the LANL Health-Safety Net
Cardiac monitors and defibrillators
Crash cart emergency equipment with E-tank oxygen (O_2)
Portable physicians' bag with medications
Portable suction unit
Portable stretchers (ambulance gurney, folding)
Wheelchairs
O_2 tanks
Manual resuscitators
Intravenous (IV) stands
IV solutions
Otoscopes/ophthalmoscopes
Portable sphygmomanometers
Stethoscopes
Anticontamination apparel
Eye irrigation solution
Industrial first-aid kits
Extrication and cervical collars, crutches, canes
Suture sets
Protective apparel
Morgan lends and irrigation sets
Decontamination equipment (portable)

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Table D-2 (continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Emergency equipment and personnel at the Occupational Medicine Clinic, ESH-2 (Continued):

At TA-3 (SM-409) Central Clinic (continued):

SUPPLIES-GENERAL:

Bedding/pillows
Rescue blankets
Burn blankets
Thermal/icing pouches
Multitrauma dressings, surgical and first aid supplies
Disposable ice bags

SPECIAL FACILITIES - NONPORTABLE:

Fully equipped decontamination room at the Occupational Medicine Clinic
Completely equipped emergency room with ambulance entrance
Emergency lighting system
Complete X-ray suite
Protective clothing and wound counters
12-lead electrocardiograph
Fully equipped crash cart with Life Pak defibrillator/external pacer, intubation equipment, emergency medications
Fully equipped decontamination room at Los Alamos Medical Center (LAMC) adjacent to the LAMC emergency room

TRANSPORTATION:

Full ambulance service is available within minutes to the central facility.

COMMUNICATION:

Base station on State Medical Net and Los Alamos County Fire Department trunked radio system.

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Table D-3

Waste Analysis Parameters and Test Methods[a]

Parameter	Test Method	Reference[b]
Ignitability	Pensky-Martens closed-cup method Setaflash closed-cup method Ignitability of solids	(L, S) SW1010, SW1020 (S) SW1030 (L, S) ASTM D93-80
Reactivity	Test method to determine hydrogen cyanide released from waste Test method to determine hydrogen sulfide released from waste	(L, S) SW, Section 7.3
Corrosivity	Electrometric (pH of aqueous solution)	(L) SW9040B
Toxicity characteristic (TC)	Toxicity characteristic leaching procedure (TCLP) extraction	(S) SW1311
TC Metals:	Graphite furnace atomic absorption (AA) spectroscopy, gaseous hydride AA, or direct aspiration AA, manual cold-vapor technique	
Mercury	Manual cold-vapor technique	(L) SW7470A, (S) SW7471A[c]
Arsenic		(L, S) SW7060A[d], SW7061A
Barium		(L, S)SW7080A[e], SW7081[d]
Cadmium		(L, S) SW7130[e], SW7131A[d]
Chromium		(L, S) SW7190[e], SW7191[d]
Lead		(L, S) SW7420[e], SW7421[d]
Selenium		(L, S) SW7740[d], SW7741A
Silver		(L, S) SW7760A[e], SW7761[d]
Volatile organics	Gas chromatography (GC)/mass spectrometry (MS) GC/MS capillary column technique	(L, S) SW8260B
Semivolatile organics	GC/MS GC/MS capillary column technique	(L, S) SW8270C (S) SW8275A
Organochlorine pesticides	Thermal extraction/GC/MS	(L, S) SW8081A
Chlorinated herbicides	GC	(L, S) SW8151A
Cyanide, free and total	Distillation and colorimetric ultraviolet	(L, S) SW9010B, SW9012A
Total chromium	Colorimetric method for hexavalent chromium	(L, S) SW7196A
Sulfide	Colorimetric titration	(L, S) SW9030B

Refer to footnotes at end of table.

Table D-3 (continued)

Waste Analysis Parameters and Test Methods[a]

Parameter	Test Method	Reference[b]
Total RCRA metals[f]	Acid digestion	(L) SW3010A, (S) SW3050B
	Inductively coupled plasma atomic emission spectroscopy	(L, S) SW6010B
Arsenic		(L, S) SW6010B
Barium		(L, S) SW6010B
Cadmium		(L, S) SW6010B
Chromium		(L, S) SW6010B
Lead		(L, S) SW6010B
Selenium		(L, S) SW6010B
Silver		(L, S) SW6010B
Mercury	Manual cold-vapor technique	(L) SW7470A, (S) SW7471A
Free liquids	Paint Filter Liquids Test	(L, S) SW9095

[a] At Los Alamos National Laboratory, current analytical capabilities include limited analyses of mixed waste samples. These analyses include gross alpha, beta, and gamma screening.

[b] "ASTM" refers to American Society for Testing and Materials standards.
"SW" refers to U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
(L) refers to liquid waste.
(S) refers to solid waste.

[c] Method being revised per the January 1998 *SW-846* Draft Update IVA.

[d] Method being integrated into Method 7000B, per the January 1998 *SW-846* Draft Update IVA.

[e] Method being integrated into Method 7010, per the January 1998 *SW-846* Draft Update IVA.

[f] See also atomic absorption methods. Total metals may be substituted for TCLP metals, if appropriate. RCRA = Resource Conservation and Recovery Act.

Table D-4

Evacuation Determination and Reentry Conditions

Reason for Evacuation	Evacuation Determination Made by	Reentry Conditions[a]
Fire	[1]Fire or evacuation alarm, Group Leader or alternate, Lead Engineer, Senior Staff Member present, Senior Technician, or Emergency Manager	Following survey by the person designated by the IC[b]
Explosion	Same as 1 above	Same as above
Loss of ventilation	[2]Group Leader or alternate, Senior Staff Member, Lead Engineer, or Senior Technician	Same as above
Loss of electric power	Same as 2 above	Same as above
Extensive contamination	Same as 2 above or ESH-1[c] Representative	Same as above
Airborne contamination	Same as 2 above or Radiation Monitor	Same as above
Escape or release of toxic or hazardous gas or fumes	Group Leader or alternate, Senior Staff Member, Lead Engineer, Senior Technician, or Emergency Manager	Same as above
Bomb or bomb threat	EM&R[d] or PTLA[e] representative, R&D[f] Section Leader or alternate, Senior Staff Member, or Lead Engineer	Same as above

[a] All reentries are authorized by the EM&R Incident Commander.
[b] "IC" refers to the Incident Commander as defined in 29 CFR 1910.120.
[c] "ESH-1" refers to the Health Physics Operations Group.
[d] "EM&R" refers to the Emergency Management and Response Office.
[e] "PTLA" refers to Protection Technology Los Alamos.
[f] "R&D" refers to the Research and Development Section.

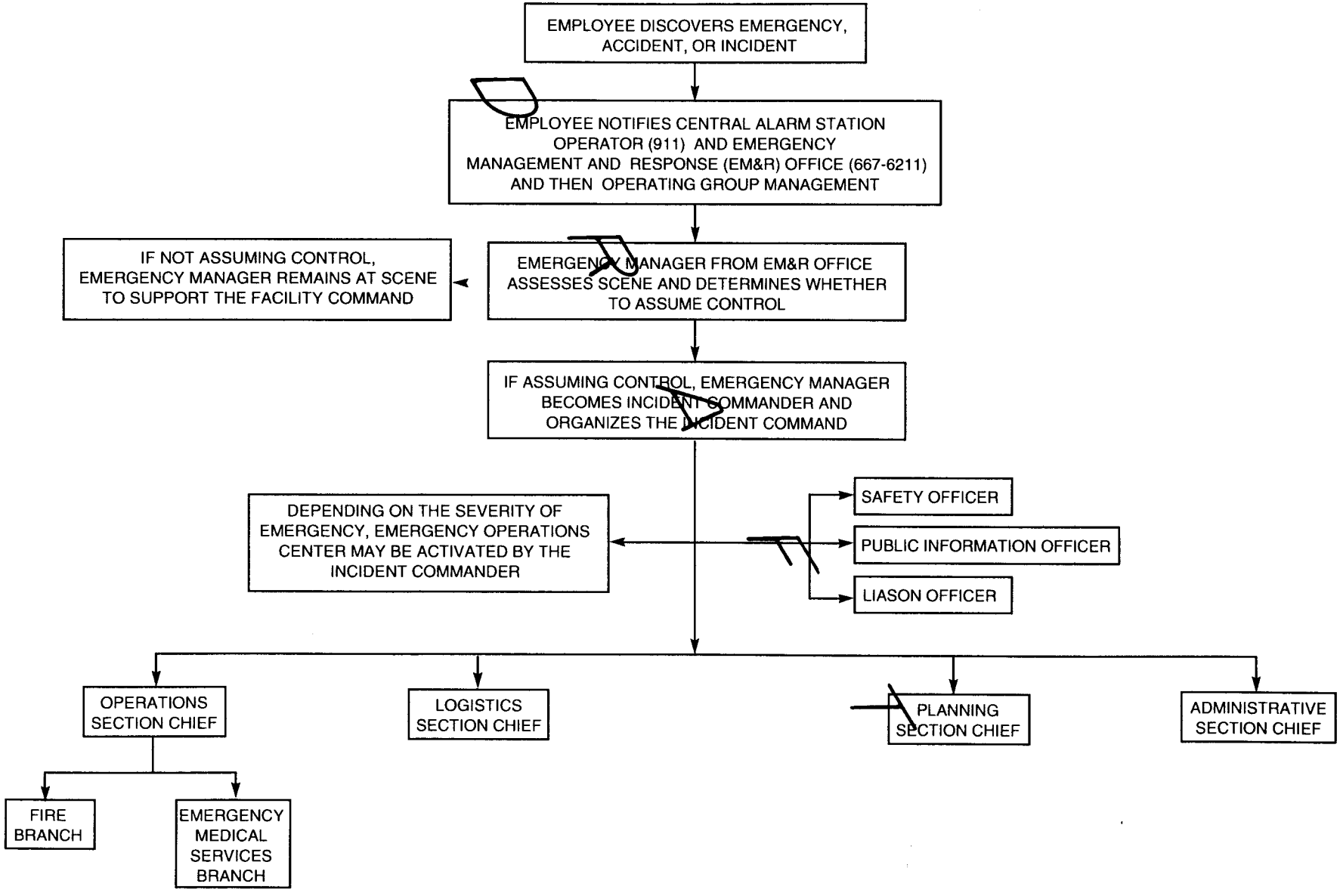
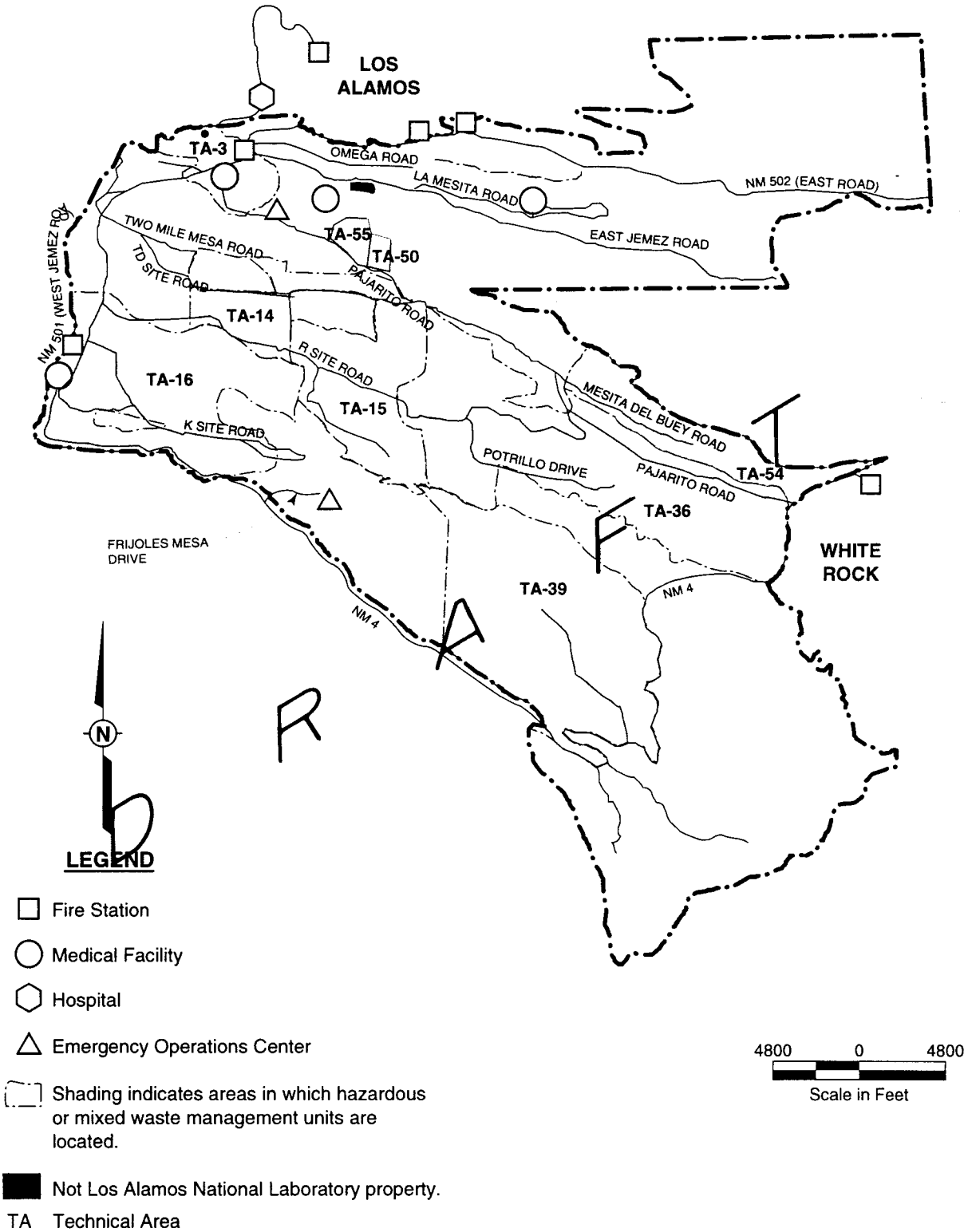


Figure D-1
General Hazardous and Mixed Waste Emergency Notification Structure



LEGEND

- Fire Station
- Medical Facility
- Hospital
- Emergency Operations Center
- Shading indicates areas in which hazardous or mixed waste management units are located.
- Not Los Alamos National Laboratory property.
- TA Technical Area

4800 0 4800
Scale in Feet

Figure D-2
Emergency Facilities

APPENDIX E

CLOSURE PLAN

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APPENDIX E

CLOSURE PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(13), and 20 NMAC 4.1, Subpart V, Part 264, Subpart G, revised June 14, 2000, closure requirements are addressed in Attachment E of TA-specific permit chapters.

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