State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
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BILL RICHARDSON
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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 27, 2007

Donald L. Winchell, Jr., Manager
Los Alamos Site Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

Richard S. Watkins. Associate Director
Environment, Safety, Health, & Quality
Los Alamos National Security, LLC
Los Alamos Research Park
4200 Jemez Road, Suite 400
Los Alamos, NM 87544

SUBJECT: NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT OPERATING PERMIT FOR LOS NATIONAL LABORATORY, NEW MEXICO EPA ID NUMBER: NM0890010515

Dear Messrs. Winchell and Watkins:

Enclosed is a copy of the draft Hazardous Waste Facility Permit, Public Notices and Fact Sheet for the hazardous and mixed waste management units at Los Alamos National Laboratory (LANL). The draft Permit was prepared by the New Mexico Environment Department (NMED). NMED is providing for a 60-day public comment period and opportunity to request a public hearing. LANL will be notified by certified mail if a public hearing is scheduled. LANL may submit comments on the draft Permit to as provided in the enclosed public notice. The public comment period will end at **5:00 p.m. MST, October 26, 2007**.

NMED will give due consideration and the weight it deems appropriate to all comments received during the public comment period. Based on public comment, NMED may make reasonable modifications to the permit, within the framework of the Hazardous Waste Management Regulations, 20.4.1 NMAC. At the time that any final permit decision is made, NMED will issue a response to all comments submitted during the public notice period.

31313

If you have any questions regarding this matter, please contact me at (505) 476-6035.

Sincerely,

John E. Kieling
Program Manager
Permits Management Program
Hazardous Waste Bureau

Enclosures

cc: J. Bearzi, NMED HWB
D. Cobrain, NMED HWB
S. Pullen, NMED HWB
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K. Roberts, NMED HWB
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J. Ellvinger, LANS
D. Hall, LANS
File: LANL 2007 and Reading

NEW MEXICO
ENVIRONMENT DEPARTMENT

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Lieutenant Governor

RON CURRY
Secretary

CINDY PADILLA
Deputy Secretary

FACT SHEET
AUGUST 2007

INTENT TO ISSUE A HAZARDOUS WASTE FACILITY PERMIT UNDER THE NEW MEXICO HAZARDOUS WASTE ACT LOS ALAMOS NATIONAL LABORATORY (LANL) LOS ALAMOS COUNTY, NEW MEXICO

Facility Name:	Los Alamos National Laboratory
EPA Identification Number:	NM0890010515
Type of Facility:	LANL is a national laboratory that conducts research on nuclear weapons and other national defense and civilian programs. LANL maintains includes in: nuclear, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine; health and biotechnology; and industrial partnerships.
Facility Location:	Los Alamos National Laboratory (LANL or Facility) is located in Los Alamos County, an incorporated county in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. LANL occupies approximate 40 square miles on the Pajarito Plateau.

Facility Owner and Co-Operator: U.S. Department of Energy

Facility Co-Operator: Los Alamos National Security, LLC

INTRODUCTION

The U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS), hereafter referred to as the Applicants, are the owner (DOE) and operators (DOE and LANS) of hazardous waste management units at LANL and are therefore required to obtain a hazardous waste facility permit from the New Mexico Environment Department (Department). This permit will allow the Applicants to store, for greater than 90 days, and treat hazardous and mixed waste pursuant to the New Mexico's Hazardous Waste Act (HWA) and the federal Resource Conservation and Recovery Act (RCRA). Prior to issuing a final permit, the Department is required to release a draft permit for public comment pursuant to 20.4.1.901.A (3) NMAC. This Fact Sheet is intended to facilitate public review of that draft Permit.

By their processes and operations that produce hazardous waste at LANL, the Applicants are classified as generators, and LANL is a hazardous waste treatment, storage, and disposal facility (TSDF) under the HWA, Sections 74-4-1 through 74-4-14, NMSA 1978, as amended, and the RCRA, 42 U.S.C. 6901 through 6992. Hazardous waste is generated at the Facility primarily from research and development (R&D) activities, general Facility operations, environmental restoration (ER) activities, and decontamination and decommissioning (D&D) projects. Mixed waste (i.e., hazardous wastes with a radioactive component), both low-level and transuranic (TRU), are generated primarily from R&D activities, processing and recovery operations, general Facility operations, D&D projects, and ER activities. High explosives (HE)-contaminated waste is generated primarily from R&D activities, ER activities, wastewater treatment processes, and building maintenance and modification activities. Hazardous and mixed waste is generated at Technical Areas (TAs) throughout the Facility. Small quantities of waste are generally accumulated in containers at less-than-90-day storage areas, or satellite accumulation areas, and then packed in containers (e.g., drums, boxes, crates) for transport to a permitted TSDF as necessary. The generation and subsequent management of these wastes at areas at LANL other than the permitted units are not regulated under the permit but rather other portions of the HWMR, principally 20.4.1.300 NMAC.

The Applicants are required to apply for and obtain a permit from the Department to manage hazardous waste at a TSDF pursuant to the HWA and RCRA. The Department's issuance of the draft Permit is in response to the submission of the Applicants' Permit Renewal Application. The draft Permit addresses hazardous waste management at treatment and storage units. The Applicants do not seek and the Department is not issuing an operating permit for hazardous waste disposal units. However, the draft Permit does address the closure and post-closure care of disposal units located at TA-54 Areas G, H, and L. The draft Permit also addresses how the Applicants will conduct corrective action activities for solid waste management units (SWMUs) and areas of concern (AOCs), and conduct groundwater monitoring and remediation facility-wide. The draft Permit also addresses how corrective actions under the March 1, 2005 Compliance Order on Consent integrate with closure and corrective action under the Permit.

REGULATORY BACKGROUND

In 1976 the RCRA was passed by the U.S. Congress to regulate "cradle to grave" management of hazardous waste. RCRA was enacted as an amendment to the Solid Waste Disposal Act of 1965, is comprised of the first solid waste statutes and all subsequent amendments. RCRA mandates the development of regulations governing the actions of owners or operators of facilities that generate, transport, treat, store, or disposal of solid wastes.

On November 19, 1980, the RCRA regulations became effective and it became unlawful to treat, store, or dispose of hazardous waste without having, or having applied for, a permit. For existing TSDFs the requirement to submit an application is satisfied by submitting the "Part A" portion of the application; the "Part B" portion may be submitted at a later time. These Parts are clarified in 40 CFR § 270.10. The United States Environmental Protection Agency (EPA) has authorized the State of New Mexico to implement and enforce how management requirements, including corrective action requirements, under its own hazardous waste management program. The State's enabling authority for the program is the HWA, which: 1) authorizes the State's Environmental Improvement Board (EIB) to adopt hazardous waste management regulations; and 2) authorizes the Department to implement and enforce the provisions and regulations of the HWA, the Hazardous Waste Management Regulations (HWMR).

As part of the State's program, the EIB has adopted regulations relating to, among other things, the issuance of hazardous waste permits. These regulations incorporate by reference pertinent sections of the Code of Federal Regulations (CFR) – 40 CFR Parts 260 through 270, 273, and 280 – and are codified in the HWMR, 20.4.1 NMAC.

The HWA and HWMR require each person owning or operating an existing facility or planning to construct a new facility for the treatment, storage, or disposal of hazardous waste to have a RCRA permit (see 42 U.S.C. 6925 and 20.4.1.900 NMAC (incorporating 40 CFR § 270.1)). However, a treatment, storage, or disposal facility in existence on or before November 19, 1980 is eligible for "interim status (IS)." Interim status authorizes an existing facility to operate, subject to the interim status standards set forth in 20.4.1.600 NMAC, incorporating 40 CFR Part 265, until the Department issues or denies a RCRA permit or until interim status is otherwise terminated. LANL was eligible for interim status in November of 1980 and a portion of LANL's hazardous waste management units retain that status until Permit issuance.

The HWA and HWMR further require corrective action for all releases of hazardous waste or hazardous constituents from any SMWU at a facility seeking a permit regardless of the time at which waste was placed in such a unit (42 U.S.C. 6924(u), Section 74-4-4.2(B), NMSA 1978, and 20.4.1.500 NMAC, incorporating 40 CFR § 264.101(a)). Corrective action is also required beyond the facility boundary (42 U.S.C. 6924(v) and 20.4.1.500 NMAC incorporating 40 CFR § 264.101(c)).

On January 26, 1983, RCRA subjected "units" managing and disposing of hazard waste to the closure and post-closure standards of 40 CFR Part 264, Subpart G and Part 265, Subpart G and required a special post-closure care permit in some circumstances.

On January 25, 1985, the State of New Mexico received from EPA authorization to implement its hazardous waste program under New Mexico's Hazardous Waste Act in lieu of the federal program. 50 Fed. Reg. 1515 (Jan. 11, 1985). Subsequent program revision applications were approved effective on April 10, 1990, July 25, 1990, December 4, 1992, August 23, 1994, December 21, 1994, July 10, 1995, January 2, 1996, March 10, 1997, June 13, 1998, and October 9, 2001.

On November 8, 1985, RCRA mandated the termination of interim status for land disposal units which had been granted interim status before November 8, 1984, unless the owner/operator had submitted a Part B portion of an application and had submitted certification of compliance with the ground-water compliance requirements.

On July 25, 1990, the State of New Mexico received from EPA authorization to expand its hazardous waste program under the HWA in lieu of the federal program, including the authority to regulate the hazardous component of mixed waste. 55 Fed. Reg. 28397 (July 11, 1990).

On January 2, 1996, the State of New Mexico received from EPA authorization to implement the corrective action program under the HWA. See 60 Fed. Reg. 53,708 (Oct. 17. 1995); 61 Fed. Reg. 2450 (Jan. 26, 1996).

Application Requirements

Owners or operators of hazardous waste management facilities, including interim status facilities, are required to submit a comprehensive permit application covering all aspects of design, operation, maintenance, and closure of their facilities. The Permit Application consists of Parts A and B; Part A of the Permit Application (Part A Application) is a short, standard form that summarizes general information about a facility including the name of the owner/operator, a list of the types of wastes managed, a facility layout diagram, and the activities requiring a permit. Part B of the Permit Application (Part B Application) is an extensive document submitted in a narrative, tabular, and schematic format that describes the facility operations in detail and includes information necessary to establish corrective action requirements for releases from SWMUs and Areas of Concern (AOCs).

LANL PERMIT HISTORY

On August 13, 1980, the Applicants submitted to the EPA a "Notification of Hazardous Waste Activity" for the Facility pursuant to RCRA. On November 19, 1980 the Applicants submitted a Part A RCRA Permit Application for the Facility. The Applicants also sent a copy of the Part A application to the Environmental Improvement Division of the New Mexico Department of Health and Environment, the predecessor to the Environment Department. The Application covered hazardous waste treatment, storage, and disposal activities at TA-54, and included approximately 130 hazardous waste streams. The Applicants have revised the Part A Permit

Application several times since it was first submitted, including, among other things, to notify the Department that LANL would not seek a permit for hazardous waste disposal activities.

On November 8, 1989, the Department's predecessor agency issued a Hazardous Waste Facility Permit (Permit) to the Applicants to operate a hazardous waste treatment and storage facility at the Facility pursuant to Section 74-4-4.2 of the HWA. The Permit covered hazardous waste container storage areas at TA-16, TA-50, and TA-54, hazardous waste storage and treatment tanks at TA-54, and hazardous waste incinerators at TA-16 and TA-50. Two of the four treatment tanks at TA-54 were removed in accordance with an approved closure plan in 1996. The remaining two tanks were removed from the site in 2002 and the Department approved the closure report for these tanks in February 2007. LANL closed the incinerator at TA-16 in accordance with an approved closure plan, and the Department approved the Closure Certification Report in October 2001. The Applicants closed the incinerator at TA-50 in accordance with an approved closure plan, and the Department approved the Closure Certification Report in July 1998.

In the late 1980's, the Applicants identified Potential Release Sites (PRSs) for EPA, including SWMUs and AOCs where hazardous wastes, hazardous constituents, solid wastes, or mixed wastes may have been disposed or released. Of those sites, EPA identified over 1200 as sites to be investigated and included on the Hazardous and Solid Waste Amendments (HSWA) portion (known as the "HSWA Module") of the Applicants' RCRA Permit. On March 8, 1990, EPA issued the HSWA portion of the Permit to the Applicants, effective on May 23, 1990, covering those requirements of RCRA added by the HSWA of 1984. The EPA portion of the permit required corrective action for continuing releases of hazardous waste and hazardous waste constituents at and from the Facility pursuant to Section 3004(u) and (v) of RCRA, 42 U.S.C. § 6924(u) and (v).

The Permit, which was originally set to expire in November 1999, was administratively extended pursuant to 20.4.1.900 NMAC (incorporating 40 CFR § 270. 51) because the Applicants submitted a Part B Permit Renewal Application in August 1996. The original permit in modified form remains in effect.

On May 2, 2002, pursuant to Sections 74-4-10.1 and 74-4-13 of the HWA, the Department issued a Determination of an Imminent and Substantial Endangerment to Health and the Environment and a Draft Order proposing a series of investigation and corrective action tasks to DOE and the University of California. On November 26, 2002, the Department issued to the Applicants a Final Order containing a set of investigation, monitoring, and corrective action tasks and a schedule for implementation of those tasks. The parties engaged in settlement negotiations from December 2002 through March 2005. On September 1, 2004, the Department released a draft Compliance Order on Consent (Consent Order) for public review and comment. On March 1, 2005 the parties entered into a final Consent Order governing corrective action under RCRA and HSWA. The Consent Order is described further under Permit Part 11 below.

On June 1, 2006 LANS replaced the University of California as co-operator of the Facility.

Part A Permit Application

In April 2006, the Applicants submitted to the Department the most recent version of its Part A Permit Renewal Application, Revision 5.0. This Part A Application is the Department's primary basis for the list of units to be permitted at the Facility, the waste management processes the Applicants propose to utilize at those units, and the specific EPA Hazardous Waste Numbers (i.e., waste codes) applied to waste to be managed at those units. The Applicants have submitted several revised Part A permit applications since the initial submission to renew their Permit in August 1996. Revision 5.0 replaced Revision 4.0 submitted in December 2004, reflecting the transfer of co-operator responsibilities from the Regents of the University of California to LANS. Revision 5.0 also updates approved unit closures, changes the EPA Hazardous Waste Numbers managed at particular units, and corrects typographical errors.

Part B Permit Application

In August 2003, the Applicants submitted to the Department their most recent version of their General Part B Permit Renewal Application, Revision 2.0. This General Part B Application addresses the requirements that apply to hazardous and mixed waste treatment and storage facility operations at the Facility and contains a description of the Facility and its various operating plans (i.e., waste analysis, inspection, personnel training, contingency, closure, and post-closure). Previous Part B permit renewal applications were submitted to the Department in August 1996 (Revision 0.0; LANL, 1996) and January 1999 (Revision 1.0; LANL, 1998a). Versions of the Part B application subsequent to the initial submittal were revisions presented in Responses to Supplemental Information submitted to the Department in June 2000 and November 2001, and in a Response to a Notice of Deficiency submitted to the Department in August 2002.

The TA-3 Part B Application for permitted and interim status units was submitted in September 1999. The TA-16 Part B Application for permitted and interim status units was initially submitted in June 1995 and the final version was submitted in August 2003. The TA-50 Part B Permit Application for permitted and interim status units was initially submitted in January 1999 and the final version was submitted in July 2002. The TA-54 Part B Permit Application for permitted and interim status units was initially submitted in January 1999 and the final version was submitted in August 2003. The TA-55 Part B Permit Application for interim status units was initially submitted in June 1996 and the final version was submitted in August 2003. And the Part B permit applications for interim status units at TA-14, TA-36 and TA-39 were submitted to the Department in or before May 1999.

TYPES OF HAZARDOUS WASTES MANAGED AT LANL

The criteria for establishing a waste as a hazardous waste are provided in 20.4.1.200 NMAC. A waste is considered hazardous if it meets the definition of a solid waste described in 20.4.1.200 NMAC, incorporating 40 CFR § 261.2; is not exempted from regulation as a hazardous waste under 40 CFR § 261.4; and exhibits any of the characteristics of hazardous waste identified in 40 CFR Part 261, Subpart C; or is listed in 40 CFR Part 261, Subpart D.

Waste streams at the Facility include spent solvents, contaminated solid wastes, paint and related wastes, photographic and photocopier wastes, corrosive liquids, solid metals and metallic compounds, contaminated non-corrosive aqueous and non-aqueous solutions and sludges, mercury wastes, used batteries and battery fluids, unused off-specification commercial chemical products, gas cylinder waste, ER soils and sludges, ER aqueous liquids, and ER debris. Hazardous waste streams may be of uniform physical composition (i.e., homogeneous) or of dissimilar/diverse composition (i.e., heterogeneous). Homogeneous waste contains only one material, substance, or waste of which its components are mixed and when a sample of the waste is collected, samples are consistent. Homogeneous waste streams can be either solids or liquids. Heterogeneous waste contains multiple components that are different because of density, specific gravity, or other physical properties, are located in different places within the mixture, or are discrete and different articles. Heterogeneous wastes (e.g., debris) do not lend themselves to representative sampling and analysis.

The following hazardous wastes codes, "F", "U", "K", and "D", identified at 20.4.1.200 NMAC (incorporating 40 CFR 261, Subparts C and D), are the EPA Hazardous Waste Numbers that are assigned to specific hazardous waste categories that are managed at LANL. They are described as follows: 1) D codes signify wastes exhibiting the characteristics of ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004- D043); 2) F codes signify wastes from non-specific sources; 3) K codes signify wastes from specific sources; and 4) P and U codes signify wastes that are discarded commercial chemical products, off-specification species, container residues, and spill residues thereof, with the P codes signifying acutely hazardous wastes and the U codes signifying toxic wastes.

Waste codes proposed to be permitted to allow storage in containers include the following: D001-D043, F001-F012, F019-F028, F032, F034, F035, F037-F039, K044-K047, K084, K101, K102, P001-P018, P020-P024, P026-P031, P033, P034, P036-P051, P054, P056-P060, P062-P078, P081, P082, P084, P085, P087-P089, P092-P099, P101-P106, P108-P116, P118-P123, P127, P128, P185, P188-P192, P194, P196-P199, P201-P205, U001-U012, U014-U053, U055-U064, U066-U099, U101-U103, U105-U138, U140-U174, U176-U194, U196, U197, U200-U211, U213-U223, U225-U228, U234-U240, U243, U244, U246-U249, U271, U278-U280, U328, U353, U359, U364, U367, U372, U373, U387, U389, U394, U395, U404, and U409-U411.

Waste codes proposed to be permitted to allow storage in tanks include the following: D002, and D004-D011.

Waste codes proposed to be permitted to allow treatment by open burning include the following: D001-D003, D005-D009, D011, D018, D022, D028-D030, D035, D036, D038, D040, F001-F005, K044, K045, U019, U022, U044, U112, U154, U159, U169, U196, U220, and U239.

Waste codes proposed to be permitted to allow treatment by stabilization include the following: D002, D004-D012, D018, D019, D021, D022, D027, D028, D030, and D032-D043.

Waste codes disposed of at TA-54, MDA L and proposed to be permitted to undergo closure include the following: D001-D004, D006-D009, D011, D016, F002, P015, P087, U002, U019, U069, U080, U122, U151, U154, U159, U161, U165, U220, U226, U228, and U239.

Waste codes disposed of at TA-54, MDA G and proposed to be permitted to undergo closure include D004-D011.

Waste codes disposed of at TA-54, MDA H and proposed to be permitted to undergo closure include D003.

UNITS TO BE PERMITTED, THEIR LOCATION, AND THE QUANTITY OF WASTES MANAGED

The Department proposes to issue a hazardous waste permit that allows the Applicants to perform the following (note – waste quantity amounts specified in gallons denotes volumes and not necessarily liquid wastes):

- To store and otherwise safely manage specific hazardous wastes in containers in the following units:

  TA-3, Building 29 Rooms 9010, 9020, 9030 (18,500 total gallons);

  TA-50, Building 69, Indoor & Outdoor Area (31,500 total gallons);

  TA-54, Area G, Pads 1, 3, 5, 6, 9, 10, and 11; Storage Shed 8; and Building 33 (3,664,150 total gallons);

  TA-54, Area L (408,480 total gallons);

  TA-54 West, Indoor and Outdoor Units (11,660 total gallons); and

  TA-55, Building 4, Rooms B05, B40, B45, and K13, Vault, and Outdoor Pad (178,500 total gallons).

- To store and otherwise safely manage specific hazardous wastes in tanks in the following unit:

  TA-55, Building 4 (137 total gallons);

- To treat by stabilization and otherwise safely manage specific hazardous wastes at the following unit:

  TA-55, Building 4 (150 total gallons);

- To treat by open burning and otherwise safely manage high explosive hazardous wastes at the following units:

TA-16, Structure 388 – (250 lbs bulk HE per treatment and 20,000 lbs per year); TA-16, Structure 388 – (1,000 lbs HE contaminated waste per treatment and 20,000 lbs per year); and

TA-16, Structure 399 (1000 lbs per treatment and 20,000 lbs per year).

- To close the following disposal units:

  TA-54 Area G;

  TA-54 Area H; and

  TA-54 Area L

PERMIT ORGANIZATION

The draft Permit is comprised of Parts (1-16) and Attachments (A-R). The Parts contain draft permit requirements the Department requires the Applicants to adhere to while treating and storing of hazardous waste, and closing disposal units, at the Facility. The Attachments consist principally of the Applicants' permit application assurances and commitments; any application language in the Attachment that conflicts with the draft Permit Parts has been altered by the Department to coincide and be consistent with the Permit Parts. Such instances occurred in Attachments A (*General Facility Conditions*), C (*Waste Analysis Plan*), D (*Contingency Plan*), E (*Inspection Plan*), F (*Personnel Training Plan*), and I (*Open Burn Unit Management*).In the case of conflicts, draft permit conditions override language in the Permit Attachments, as explained in Permit Section 1.7.2.

Permit conditions are established to ensure compliance with New Mexico's HWA and HWMRs and are derived from applicable regulatory requirements, the Applicants' commitments, or are requirements established by the Department to ensure adherence with the regulations and/or to protect human health or the environment as provided at 20.4.1.900 NMAC, incorporating by reference 40 CFR § 270.32(b).

The draft Permit generally follows the EPA permit writer's guidance in format, style, and general conditions, including but not limited to: *Model RCRA Permit For Hazardous Waste Management Facilities* (Draft), U.S. EPA (September, 1988); *Model Permit For Hazardous and Solid Waste Amendments* (Draft), U.S. EPA (July, 1995); *RCRA Guidance Manual for Subpart G Closure and Post Closure Care Standards and Subpart H Cost Estimating Requirements,* OSWER 9476.00-5 (January, 1987); and *Open Burning/Open Detonation Permitting Guidelines* (Draft), U.S. EPA (February 2002).

Each draft Permit Part is briefly described below, including specific requirements identified in that particular Part.

Part 1: ***General Permit Conditions*** contains permit conditions that apply to all hazardous waste management permits, most of which are based on mandatory permit conditions set forth in 20.4.1.900 NMAC, incorporating 40 CFR Part 270. Part 1 also references Permit Attachment A

(*General Facility Description*), Permit Attachment B (*Permit Application Part A*), Permit Attachment D (*Contingency Plan*), Permit Attachment O (*Hazardous Waste Management Units*), Permit Attachment P (*SWMUs and AOCs*), and Permit Attachment R (*Figures*).

Part 2: *General Facility Conditions* contains permit conditions the Applicants must follow for the operation of hazardous waste management units at LANL set forth in 20.4.1.500, incorporating 40 CFR Part 264 Subparts B through E. Permit requirements in this Permit Part include, but are not limited to:

One-Year Storage Limitation - Waste shall not be stored at the Facility, or anywhere at the entirety of LANL, for more than one year, even if it is stored for less than one year each at two or more storage units.

Dilution Prohibition - Dilution of hazardous waste is to avoid an applicable treatment standard, including either ineffective treatment that does not destroy, remove, or permanently immobilize hazardous constituents, or the addition of solid waste to reduce a hazardous constituent's concentration, is prohibited.

Waste Characterization - Specific requirements for waste characterization address the following:

- the identification of excluded wastes, the characterization of radionuclides, and annual waste characterization verification;
- the documentation of all uses of Acceptable Knowledge (AK), including all background information assembled and used in the characterization process;
- the reporting of all hazardous constituents analytical test methods are capable of measuring; and
- analytical method practical quantification limits must not be higher than the applicable LDR treatment standard.

Record Keeping - Specific requirements concerning record-keeping address the following:

- documenting in the Facility Operating Record all off-site treatment and monitoring associated with LDR activity and all waste characterization information (with assigned traceable identification numbers to this documentation to facilitate access);
- maintaining paper copies of inspection logs in the Facility Operating Record
- substituting electronic operating records in lieu of written records with an unalterable electronic record capable of producing a paper copy; and

- making the Facility Operating Record available, upon request by the Department, for inspection.

Ignitable, Reactive or Incompatible Waste Locating - Containers holding ignitable or reactive wastes must be located at least 15 meters (50 feet) from the facility boundary, defined as the TA-specific boundary identified in the TA-specific map.

Emergency Equipment - Specific requirements concerning emergency equipment address the following:

- the replacement of any non-functioning equipment;
- that malfunctioning equipment is clearly marked as "Out of Use";
- the notification and training to facility employees of the presence of substitute emergency equipment;
- the accessibility of all emergency communication devices;
- the dissemination of the Contingency Plan to each applicable permitted unit and referenced emergency responders;
- the annual review of the Contingency Plan;
- the prominent posting of emergency evacuation routes at the principle entrances to all permitted units and buildings within those units; and
- the recording of all emergency situations (e.g., fires, explosions, releases) planned or unplanned, in the Facility Operating Record.

Closure Cost Estimate and Financial Assurance - LANS, the Facility's co-operators, must establish closure and post-closure cost estimates, prepared in accordance with 40 CFR §§ 264.142 and 264.144. Cost estimates must be provided for closure of each unit listed in Attachment O (*List of Hazardous Waste Management Units*).

Permit Part 2 also references Permit Attachments B (*Part A Application*), Permit Attachment C (*Waste Analysis Plan*), Permit Attachment D (*Contingency Plan*), Permit Attachment E (*Inspection Plan*), Permit Attachment F (*Personnel Training Plan*), Permit Attachment G (*Container Management*), Permit Attachment H (*Tank Management*), Permit Attachment I (*Open Burn Unit Management*), Permit Attachment O (*Hazardous Waste Management Units*), Permit Attachment P (*SWMUs and AOCs*), and Permit Attachment Q (*Off-Site Facilities*).

Part 3: ***Storage in Containers*** contains permit conditions the Applicants must follow when storing hazardous waste in container storage areas at the Facility. It addresses the requirements for managing hazardous waste in containers in accordance to 40 CFR Part 264, Subpart I. Permit requirements in this Permit Part include, but are not limited to:

Unit Delineation – Lines of demarcation must be identified at all container storage areas (CSA).

Container Storage Configuration and Minimum Aisle Space - Storage configuration at all CSUs must be maintained including maximum stacking heights and adequate aisle space.

Container Weather Protection - Waste container contact with atmospheric precipitation is prohibited.

Container Storage Orientation and Labeling - Specific requirements address the following:

- secondary containment structures at CSUs where liquids are stored;
- labeling containers that do not contain free liquids; and
- organizing storage areas in a manner that allows for labels to be read without having to physically move containers.

Permit Part 3 also references Permit Attachment B (*Part A Application*), Permit Attachment C (*Waste Analysis Plan*), and Permit Attachment G (*Container Management*) which list the wastes the Permittees are authorized to store. In addition, it cites Attachment O (*Hazardous Waste Management Units*) which identifies the only units in which the Permittees may store containers of hazardous wastes for greater than 90 days. Specific facility and process information for the storage of hazardous waste at container storage units (CSUs) are provided in Permit Parts 14 (*TA-50*), Permit Part 15 (*TA-54*), and Permit Part 16 (*TA-55*).

Part 4: *Storage in Tanks* contains permit conditions the Applicants must follow when storing hazardous waste in tank units at the Facility. It addresses the requirements for managing hazardous waste in tanks in accordance with 40 CFR Part 264, Subpart J. Permit requirements in this Permit Part include, but are not limited to:

Notification of Release from a Tank – The Applicants must notify the Department of accumulated liquids within a secondary containment system.

Tank Containment System Maintenance - Secondary containment systems comprised in part by floor, wall, joint, or penetration sealants, must be installed and maintained in accordance with the sealant manufacturer's recommendations.

Air Emission Exemption Requirement – Tanks must be clearly labeled as containing wastes with a radiological component if the Applicants claim the tanks are exempt from air pollution emission controls due to the presence of the component.

Permit Part 4 also references Permit Attachment B (*Part A Application*), Permit Attachment E (*Inspection Plan*), Permit Attachment O (*Hazardous Waste Management Units*), and Permit Attachment H (*Tank Management*).

Part 5: ***Treatment by Stabilization*** contains permit conditions the Applicants must follow for treatment of hazardous waste by stabilization at a unit at the Facility. It addresses the requirements in accordance with 40 CFR Part 264, Subpart X. Permit Part 5 also references Permit Attachment B (*Part A Application*), Permit Attachment J (*Stabilization Unit Management*), and Permit Attachment O (*Hazardous Waste Management Units*).

Part 6: ***Treatment by Open Burning*** contains permit conditions the Applicants must follow for treatment by open burning of reactive and ignitable hazardous waste. It addresses operations and general closure requirements specific to open burn units in accordance with 40 CFR Part 264, Subpart X. Permit requirements in this Permit Part include, but are not limited to:

> Prohibition to Treat Radionuclides – The Applicants are prohibited from treating mixed waste at the open burn units.
>
> Removal of Combustible Materials - Combustible materials surrounding the burn units must be removed to a radius of 200 feet.

Permit Part 6 also references Attachment I (*Open Burn Unit Management*).

Part 7 (reserved) - The Department anticipates that this Permit Part will address open detonation units, should any be permitted in the future.

Part 8 (reserved) - The Department is holding this Part in reserve to address any permit modification requests to incorporate a new and different hazardous waste process, and so that all processes may be grouped together in the Permit.

Part 9: ***Closure*** contains permit conditions the Applicants must follow for closure of the Permittees' hazardous waste management units. It describes procedures the Applicants must follow for the clean closure of storage and treatment units. It explains what is required in each permitted hazardous waste management unit's closure plan, provides detailed sampling procedures the Applicants must conduct upon closure, and defines the clean-up performance standards the Applicants must achieve in order to clean close a permitted unit. It also explains the closure process the Applicants must follow for the three material disposal area units (MDAs G, H, and L) subject to closure at the Facility. Specific closure information for TA-specific units are provided in Permit Part 12 (*TA-16*), Permit Part 13 (*TA-50*), Permit Part 14 (*TA-54*), Permit Part 15 (*TA-55*), and Permit Part 16 (*TA-3*). Permit requirements in this Permit Part include, but are not limited to:

> Closure plans – The Applicants must submit detailed closure plans for each permitted unit, incorporating all the requirements identified in Permit Part 9 within 90 days after the effective date of this Permit; the submittal shall be in the form of a Class 3 Permit modification request.
>
> Records Review and Structural Assessment – The Applicants must conduct a records review and structural assessment of any hazardous waste management unit to be closed to ensure that areas in which the unit's Operating Records indicate where a spill, defect,

deterioration, damage, or hazard affecting waste containment occurred or developed during the life of the unit become incorporated into the sampling and analysis plan.

Sampling - Specific requirements address the following:

- swipe sampling for exposed piping associated with tank and cementation units;
- decontamination of walls and ceilings;
- prohibited reliance on used wash water solutions to determine if decontamination of equipment and structures is complete;
- alternate sampling approaches if buildings or structures are intended to be demolished. In this case, the Applicants shall follow applicable soil sampling procedures;
- analysis of swipe samples for radionuclides for use as indicators of contaminant releases in units where radionuclides were stored, not as surrogates for validation of clean closure at permitted units;
- soil sampling at the interface of fill and native soil or tuff beneath all areas associated with water catchments or conveyances including, but not limited to, sumps, catch basins, secondary containment areas, and drains;
- soil sampling at the interface of fill and native soil or tuff beneath any underground piping including outfall discharge locations; and
- soil sampling beneath all intersections of piping associated with the unit undergoing closure.

Decontamination – The Applicants must decontaminate all structures and equipment via pressure washing or steam cleaning. The Applicant's may not wash asphalt pads.

Removal of Asphalt/Concrete – The Applicants must remove all asphalt, asphaltic concrete, concrete, and underlying sub-grade materials if hazardous constituents are detected in underlying soils or tuff

Part 10: ***Post-Closure Care*** contains permit conditions the Applicants must follow for post-closure care of surface impoundments, waste piles, land treatment, landfills, and miscellaneous units at the Facility.

Part 11: ***Corrective Action*** contains the corrective action requirements the Applicants must follow for the hazardous waste management units that are the subject of the Permit. These permit conditions ensure the Applicants appropriately address releases of hazardous waste and hazardous constituents to the environment. Permit Part 11 also addresses requirements for groundwater monitoring. These requirements include the processes for implementing corrective action, cleanup levels, general methods and procedures for conducting field activities, laboratory

procedures, general procedures for conducting risk assessments and determining background levels, general requirements for drilling and well installation. and requirements for reporting on corrective action activities conducted under this Permit, including the approval process for corrective action document submittals.

The Department and the Permittees have agreed to a Compliance Order on Consent (Consent Order) dated March 1, 2005, which is an enforceable document pursuant to section 20.4.1.500 NMAC (incorporating 40 CFR § 264.90(f)), and section 20.4.1.900 NMAC (incorporating 40 CFR § 270.1(c)(7)). The Consent Order requires the Permittees to conduct corrective action through a comprehensive investigation and cleanup of contaminants in the environment at the Facility.

Section III.W.1 of the Consent Order identifies four circumstances in which corrective action is to be conducted under the Permit rather than the Consent Order. These are: 1) new releases and newly discovered releases of hazardous waste or hazardous constituents from operating units at the Facility; 2) to comply with closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to operating units at the Facility; 3) for implementation of the controls, including long-term monitoring, for any SWMU or AOC on the Permit's Corrective Action Complete with Controls list; and 4) for any corrective action to address releases of hazardous waste or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates. Permit Part 11 applies only to these circumstances.

Part 12: ***TA-16*** contains the permit conditions the Applicants must follow for operating the two open burn units at TA-16 (388 and 399). It references Permit Part 6 (*Treatment by Open Burning*) and Permit Attachment I (*Open Burn Unit Management*). Permit requirements in this Permit Part include, but are not limited to:

Prohibition of Concurrent Burning at Burn Units - Concurrent burns are prohibited at the two open burn units.

Prohibition of Continuous Waste Feed – The Applicants must utilize a non-continuous (batch) thermal treatment process for the open burning of hazardous waste at TA-16.

Inspection and Maintenance of Drainage Controls – The Applicants must conduct annual inspection and maintenance of the drainage control features at the open burn units and document such activities.

Annual Soil Sampling – Soil samples must be collected annually around the concrete pads at the burn units.

Net Explosive Weight Limits - Air dispersion model analyses set per burn and annual treatment limits to ensure the prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in soil and air.

Burn Support Fuel Limitation - Propane shall be the sole fuel source at TA-16-388.

Part 13: ***TA-50*** contains the permit conditions the Applicants must follow for operating the two storage units at TA-50 (the indoor and outdoor units). Permit requirements in this Permit Part include, but are not limited to:

> Prohibition of Free-Liquid Storage - Storing hazardous waste containing free liquids at the TA-50 CSUs is prohibited.
>
> Maintenance of Fire Lane - Fire access lanes must be maintained between the TA-50-69 Outdoor and Indoor CSUs.

Permit Part 13 also references Permit Part 3 (*Storage in Containers*) and Permit Attachment G (*Container Management*).

Part 14: ***TA-54*** contains the permit requirements the Applicants must follow for operating container storage units at TA-54 Areas G, L, and West. Permit requirements in this Permit Part include, but are not limited to:

> Abandonment of Drain System Between Domes – The Applicants must plug and abandon the fire protection drain line system between Area G, Pad 9, Domes 229, 231, and 232.
>
> Prohibition of Storage Between Domes – The overnight storage of hazardous wastes between domes at TA-54 Area G, Pad 9 is prohibited.
>
> Dome 224 Containment System Maintenance – The Applicants must remove all fluids from the secondary containment system at Area G, Dome 224 and maintain the system in a dry state.
>
> Dome 230 Containment System Maintenance – The Applicants must remove all fluids from the secondary containment system at Area G, Dome 230, and maintain the system in a dry state.
>
> Area L Dome 215 Secondary Containment – The exterior, double-walled, 10,000 gallon, holding tank and its ancillary piping at TA-54 Area L, Dome 215 shall be considered a portion of the Dome's secondary containment.

Permit Part 14 also references Permit Part 3 (*Storage in Containers*) and Permit Attachment G (*Container Management*) and Permit Attachment O (*Hazardous Waste Management Units*).

Part 15: ***TA-55*** contains the permit conditions the Applicants must follow for operating container storage and treatment units at TA-55's seven units (B45, B40, B05, K13, the vault, 185, and the Outdoor Container Storage Pad). Permit requirements in this Permit Part include, but are not limited to:

> Secondary Containment – Hazardous waste with free liquids must be stored on secondary containment pallets except inside the following CSUs; B40, K13, and TA-55-4 Vault.

Permit Part 15 also references Permit Part 3 (*Storage in Containers*), Permit Part 4 (*Storage in Tanks*), and Permit Part 5 (*Storage in Tanks*), Permit Attachment G (*Container Management*), Permit Attachment H (*Tank Management*), Permit Attachment J (*Stabilization Unit Management*), and Permit Attachment O (*Hazardous Waste Management Units*).

Part 16: *TA-3* contains the permit conditions the Applicants must follow for operating the three container storage units at TA-3 (TA-3-29 Rooms 1010, 1020, and 1030). It references Permit Part 3 (*Storage in Containers*), Permit Attachment G (*Container Management*), and Permit Attachment O (*Hazardous Waste Management Units*).

SWMUs and AOCs - There are certain permitted units at LANL that are situated among SWMUs and AOCs (i.e., co-located). If at closure, the Permittees can not clean close a permitted unit co-located with a SWMU or AOC to the appropriate clean-up standards outlined in Permit Part 9, Section 9.3, and they are unable to distinguish if the source of the release is from the permitted unit or the SWMU or AOC, clean-up of the permitted unit shall be coordinated with action taken under the Consent Order for the SWMU or AOC in accordance with 40 CFR § 264.110(c) and Section 9.1.

TA-54 Areas G, H, and L Closure - The Department requires the Permittees to close MDAs G, H, and L in their entirety under this Permit. Closure is required under RCRA, the HWA, and the HWMR.

The first phases of closure will be conducted through the corrective measures evaluation and implementation process outlined in Section VII of the March 1, 2005 Compliance Order on Consent (Order). The Department will select remedies and issue a statement of basis for the selected remedies for each closed disposal or landfill unit using the procedures in Section VII of the Order. The remedy selection is subject to public participation in accordance with 20.4.1.901 NMAC, and as described in Section VII.D.7 of the Order.

Upon selection of the remedies for closure of each of the disposal or landfill units, the Permittees shall be required to submit a Corrective Measures Implementation (CMI) Work Plan to the Department for approval on a schedule established by the Department. The CMI Work Plan is equivalent to a Closure Plan. All inspection, monitoring, and operation and maintenance (O & M) of remediation systems installed as part of CMI Work Plan (Closure Plan) implementation shall be proposed in the Post-Closure Care Plans for MDAs G, H, and L as described in Permit Part 10 (*Post-Closure Care*).

SWMUS AND AOCS

As part of the draft Permit, the Department has provided a list of SWMUs and AOCs which require corrective action (Attachment P, Table P-1). These are units that are not included on the current Permit (AOCs, newly identified SWMUs, Canyons). Discussions of each SWMU and AOC are included as the Attachment to this Fact Sheet (*Fact Sheet Attachment*). All Canyons at the Laboratory have been identified as AOCs by the Permittees on Table B-1 in their *Installation*

Work Plan for Environmental Restoration, Revision 7, dated November 1998. The Canyons are therefore incorporated into the draft Permit.

UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

Unclassified controlled nuclear information (UNCI) is included in both the Part A and Part B portions of the LANL permit applications and is considered sensitive information. Therefore, its access is restricted to Department-HWB personnel only and not for release to the public. UCNI information, stored in a separate, secure location at the Department, generally consists of floor plans depicting hazardous waste storage and treatment unit locations. In the event that the public has particular questions regarding UCNI information, they are instructed to contact Thomas Granich, Security Officer at LANL, directly at 505-667-3401.

PUBLIC REVIEW OF THE DRAFT PERMIT

The Administrative Record for this proposed action consists of the Permit application, the draft Permit, this Public Notice, the Fact Sheet, and supporting documentation. The Administrative Record may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: *Pam Allen*

A copy of the draft Permit, the Public Notice, this Fact Sheet, and an electronic version of the Administrative Record for the Permit, are available on the Department's website at: www.nmenv.state.nm.us/HWB/lanlperm.html under LANL Draft Permit. To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pam Allen at (505) 476-6000, or at address given above. The Department will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

The Department issued a public notice on **August 27, 2007**, to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MDT, October 26, 2007**. Any person who wishes to comment on the draft Permit or request a public hearing should submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the respective address below. Only comments and/or requests received before **5:00 p.m. MDT** on **October 26, 2007** will be considered.

John E. Kieling, Program Manager
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
E-mail: john.kieling@state.nm.us
Ref: LANL Draft Permit

Written comments must be based on reasonably available information and include, to the extent practicable, all referenced factual materials. Documents in the administrative record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for Public Hearing must be filed with Mr. John Kieling on or before **5:00 p.m. MDT, October 26, 2007**. The Department will provide a thirty (30) day notice of a public hearing, if scheduled.

All written comments submitted will be considered in formulating a final decision and may cause the draft Permit to be modified. The Department will respond in writing to all public comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final decision and the reasons for the changes; and briefly describe and respond to all public comments raised during the public comment period. All persons presenting written comments or who requested notification in writing will be notified of the decision by mail. These responses will also be posted on the Department's website.

After consideration of all the written public comments received, the Secretary of the New Mexico Environment Department may issue a final permit. The Secretary will make the final decision publicly available and shall notify the Applicants by certified mail. All persons submitting written public comment, who filed an Entry of Appearance, or requested notification in writing, shall be notified in the decision by first class regular mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Judy Bentley at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9872. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

DRAFT
HAZARDOUS WASTE FACILITY PERMIT

Issued to:

Los Alamos National Laboratory

EPA No. NM890010515-1

Issued by:

New Mexico Environment Department

Issued on:

August 2007

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Los Alamos National Laboratory

Hazardous Waste Permit

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PART 1: GENERAL PERMIT CONDITIONS

1.1 PERMITTEES

The Secretary of the New Mexico Environment Department issues this Permit for hazardous waste management at the Los Alamos National Laboratory (LANL) to the United States Department of Energy (DOE), the owner and co-operator of LANL (EPA ID Number NM 0890010515-1), and Los Alamos National Security, LLC (LANS), co-operator of LANL.

1.2 PERMITTED ACTIVITY

This Permit authorizes DOE and LANS (the Permittees) to manage, store, and treat hazardous waste at LANL, and establishes the general and specific standards for these activities, pursuant to the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§ 74-4-1 to 74-4-14, and the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC. This Permit also establishes standards for closure and post-closure care of permitted units at LANL pursuant to the HWA and HWMR.

1.3 CITATIONS

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

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

Permit terms and conditions that may potentially extend beyond requirements of other regulations are supported by 40 CFR § 270.32(b)(2).

1.4 EFFECT OF PERMIT

Compliance with this Permit for those management practices specifically authorized by this Permit during its term shall constitute compliance, for purposes of enforcement, with Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 et. seq., and/or the HWA, and/or the implementing regulations at 40 CFR Parts 264, 266 and 268 except for those requirements that become effective by statute after the Permit has been issued (40 CFR § 270.4).

Compliance with this Permit shall not constitute a defense to any order issued or any action brought under: §§ 74-4-10, 74-4-10.1, or 74-4-13 of the HWA; §§ 3008(a), 3008(h), 3013, 7002(a)(1)(B), or 7003 of RCRA; §§ 104, 106(a), 107, or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601 to 9671; or any other federal, state or local law providing for protection of public health or the environment.

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

1.4.1 Effect of this Permit on Interim Status Units

Interim status units that the Permittees intend to permit in the future are listed in Table O-5 (*Interim Status Units Actively Managing Hazardous Waste*) in Attachment O (*Hazardous Waste Management Units*). These interim status units will continue to operate under the interim status provisions in 40 CFR § 270.1(c)(4) and are not regulated under this Permit.

1.5 EFFECT OF INACCURACIES IN PERMIT APPLICATION

This Permit is based on the assumption that the information submitted in the Permittees' Application is true and correct and the Facility and permitted units were constructed and will be operated and maintained as specified in the Application. The Application has numerous iterations; however this Permit is based on the most recent submittal identified as follows:

1. the Part A Application dated April 2006;
2. the General Part B Permit Application dated August 2003;
3. the TA-3-29 CMR Part B Application dated September 1999;
4. the TA-16 Part B Permit Application dated June 2003;
5. the TA-50 Part B Permit Application dated August 2002;
6. the TA-54 Part B Permit Application dated June 2003; and
7. the TA-55 Part B Permit Application dated September 2003.

Any inaccuracies found in the Application may be grounds for the termination, revocation and re-issuance, or modification of the Permit in accordance with 40 CFR §§ 270.41, 270.42, and 270.43 which are incorporated herein by reference, and for enforcement action.

The Permittees shall inform the Department of any deviation from, or changes in, the information contained in the Application that would affect the Permittees' ability to comply with this Permit. The Permittees shall promptly provide this information in writing to the Department in accordance

with Permit Sections 1.9.14 and 1.9.15 and 40 CFR §§ 270.30(l)(11) and 270.43(a)(2), which are incorporated herein by reference.

Portions of the Application are incorporated into the Permit as Attachments. Any conflicting language between permit conditions and Application commitments is addressed at Permit Section 1.7.2. Certain figures referenced in the Permit Parts are figures the Department has extracted from the Permittees various Application attachments and renamed.

1.6 PERMIT ACTIONS

1.6.1 Duration of Permit

This Permit shall be effective for a fixed term not to exceed ten (10) years from its effective date. The effective date of this Permit shall be 30 days after notice of the Department's decision has been served on the Permittees or such later time as the Department may specify (40 CFR § 270.50(a)).

1.6.2 Permit Modification

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

1.6.3 Transfer of Land Ownership

The Permittees shall not transfer any land that is part of the Facility without submitting a permit modification request to the Department. The Permittees shall submit a permit modification request, in compliance with all requirements of 40 CFR § 270.42, at least 180 days prior to the proposed effective date of transfer of ownership of any land which is part of the Facility as indicated in Figure 1-1. This type of permit modification request may be submitted as a Class 3 permit modification or the Permittees may request a determination that the modification is a Class 1 or 2 pursuant to the requirements of 40 CFR § 270.42(d), incorporated herein by reference.

In addition to the requirements of 40 CFR § 270.42, a permit modification request for transfer of land ownership for part of the Facility shall do the following:

1. identify the boundaries of the land proposed for transfer by providing the Department with a boundary survey certified by a registered professional surveyor;

2. provide the new owner's name, address, telephone number, ownership status, and status as a federal, state, private, public, or other entity;

3. describe the location and identity of any existing, or prior, solid waste management unit, area of concern, or permitted unit on the land proposed for transfer;

4. describe any known or suspected presence of hazardous waste, hazardous constituents, and/or radioactive waste in soil, sediment, surface water, or groundwater at any depth within the boundaries of the land proposed for transfer;

5. describe the status of any past, present, or planned investigations or remediation of contamination of soil or groundwater at any depth within the boundaries of the land proposed for transfer;

6. comply with the requirements of Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9620(h); and

7. include a revised map of the Facility (40 CFR §§ 264.101, 270.30(l)(1) and 270.42).

1.6.4 Permit Suspension, Termination, and Revocation and Re-Issuance

This Permit may be suspended, terminated, or revoked and re-issued for cause as specified in Section 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43. The filing of a request by the Permittees for a permit modification, or the notification by the Permittees of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any Permit condition (40 CFR § 270.30(f)).

1.6.5 Permit Re-Application

If the Permittees intend to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees shall submit a complete application for a new permit at least 180 days before the expiration date of this Permit unless permission for a later date has been granted by the Department in compliance with 40 CFR §§ 270.10(h) and 270.30(b). The Department will not grant permission for an application for a new permit that is submitted later than the expiration date of this Permit (40 CFR §§ 270.10(h)).

1.6.6 Continuation of Expiring Permit

If the Permittees have submitted a timely and complete application for renewal of this Permit, in compliance with 40 CFR §§ 270.10 and 270.13 through 270.29 and Permit Section 1.6.5, this Permit shall remain in effect until the effective date of the new permit if, through no fault of the Permittees, the Department has not issued a new permit on or before the expiration date of this Permit (40 CFR § 270.51).

1.6.7 Permit Review by the Department

The Department may review this Permit 5 years after the effective date of Permit issuance and may modify this Permit as necessary pursuant to Section 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.50(b). Such modification shall not extend the effective term of this Permit. Nothing shall preclude the Department from reviewing and modifying the Permit, in accordance with applicable requirements, at any time during its term.

1.7 PERMIT CONSTRUCTION

1.7.1 Severability

The provisions of this Permit are severable if any provision of this Permit, or any 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.

1.7.2 Conflict in Language

Portions of the Application are incorporated into this Permit as Attachments. The Department has modified the Application language to make it consistent in all aspects with the Permit conditions and applicable regulations. However, if there is a conflict between the language of a Permit condition and the language of the Permit Attachment, the language of the Permit condition shall control over the language in the Permit Attachment.

This Permit and 40 CFR Parts 264, 266, and 268 establish the minimum requirements for the design, construction, operation, and maintenance of the Facility. Any language in an Attachment, which states or implies discretion to not comply with the minimum requirements of this Permit or 40 CFR § 270.32(b)(1), is not effective and the requirements of this Permit and 40 CFR § 270.32(b) shall control.

1.8 DEFINITIONS

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

Acceptable Knowledge means generator knowledge of the process that generated a waste, including but not limited to, process knowledge, waste analysis data from generators of similar wastes, and facility records of analysis performed before the effective date of RCRA.

Area of Concern (AOC) means any area having a probable release of hazardous waste or hazardous constituents, which is not from a solid waste management unit, determined to pose a current or potential threat to human health or the environment.

Compliance Order on Consent or ***Consent Order*** or ***Order*** means the March 1, 2005 Order issued to the Permittees pursuant to New Mexico's HWA and SWA requiring the Permittees to conduct Facility-wide investigations and cleanups of contaminants released to the environment.

Days means calendar days unless otherwise specified.

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

Disposal Unit means any unit at the Facility at which hazardous waste is intentionally placed into or on any land or water and at which waste will remain after closure.

Facility means the Los Alamos National Laboratory site comprised of approximately 40 square miles, located on the Pajarito Plateau in Los Alamos County in north central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe, and owned by the United States Department of Energy.

Federal Facility Compliance Act (FFCA) means the law passed by Congress (Pub. L. 102-386 (1992), codified at 42 U.S.C. sec. 6903, 6908, 6927, 6924, 6939, 6961, and 6965) that specifies federal facilities, like LANL, are subject to all civil and administrative penalties and fines, regardless of whether such penalties or fines are punitive or coercive in nature. These penalties and fines may be levied by the EPA or an authorized state such as New Mexico. Further, it is the FFCA that requires federal facilities that generate or store mixed waste to submit a Site Treatment Plan (STP) for developing treatment capacities and technologies to treat all the facility's mixed waste to the standards required for waste subject to the land disposal prohibitions set forth in Section 3004(m) of RCRA, regardless of the time the waste was generated.

Federal Facility Compliance Order (FFCO) means the Order dated October 4, 1995 issued by the Department to DOE and LANL requiring compliance with a Site Treatment Plan (STP) to create a path forward for the treatment and off-site disposal of mixed wastes. It also exempts such wastes from the mandated regulatory one-year storage limitation.

Foreign Source means a hazardous waste source outside of the United States.

Hazardous Constituent means any constituent identified in 40 CFR Part 261 Appendix VIII or any constituent identified in 40 CFR Part 264 Appendix IX.

Hazardous Waste means a solid waste that is: 1) not excluded from regulation under 40 CFR § 261.4(b); 2) is either listed in 40 CFR Part 261, Subpart D, exhibits any of the characteristics identified in 40 CFR Part 261, Subpart C, or is a mixture of solid waste; and 3) is one or more wastes listed in 40 CFR Part 261, Subpart D. However, for purposes of corrective action, "hazardous waste" shall have the meaning set forth in the HWA, Section 74-4-3(K). Hazardous waste may be a "mixed waste," which means it is waste that contains both hazardous waste subject to the HWA and RCRA, and source, special nuclear, or byproduct material subject to the Atomic Energy Act.

Hazardous Waste Management Unit means a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include an open burn unit, a stabilization unit, a landfill, a tank and its associated piping and underlying containment system, and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed. At LANL, hazardous waste management units include both permitted units and interim status units.

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

Land Disposal means placement of waste in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, land treatment facility, or in a concrete vault or a shaft intended for disposal purposes.

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

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

Permitted Unit means a hazardous waste management unit that is: 1) actively managing waste or in closure or post-closure care; 2) addressed by this Permit; 3) not an interim status unit; and 4) listed in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*), or Table O-2 (*Permitted Units Undergoing Post-Closure Care*), or Table O-4 (*Permitted Units Undergoing Closure*).

Post-Closure Care Unit means any permitted unit subject to the post-closure care requirements of 40 CFR Part 264, Subpart G.

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

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

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

Storage means the holding of hazardous waste for a temporary period at the end of which the waste is transported off-site for either treatment or disposal.

Transuranic (TRU) Waste means waste of more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: 1) high-level

radioactive waste; 2) waste that the DOE Secretary has determined, with the concurrence of the EPA Administrator, does not need the degree of isolation required by the disposal regulations; or 3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with part 61 of Title 10 Code of Federal Regulations (Pub. L. 102-579 (1992)).

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

1.9 DUTIES AND REQUIREMENTS

1.9.1 Duty to Comply

The Permittees shall comply with all conditions in this Permit, except to the extent and for the duration such noncompliance is authorized in an emergency permit pursuant to 40 CFR § 270.61. Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the HWA and RCRA and is grounds for enforcement or other Department action and may subject the Permittees to:

1. an administrative or civil enforcement action, including civil penalties and injunctive relief, under §§ 74-4-10 or 74-4-10.1 of the HWA or §§ 3008(a) and (g) or 3013, 7002, 7003 of RCRA;

2. permit modification, suspension, termination, revocation, or denial of a permit application or modification request under § 74-4-4.2 of the HWA;

3. a citizen suit under § 7002(a) of RCRA;

4. criminal penalties under § 74-4-11 of the HWA or §§ 3008(d), (e), and (f) of RCRA; or

5. a combination of the above (40 CFR § 270.30(a)).

1.9.2 Enforcement

Any violation of a condition in this Permit may subject the Permittees or their officers, employees, successors, and assigns to: 1) a compliance order under Section 74-4-10 of the HWA or Section 3008(a) of RCRA (42 U.S.C. § 6928(a)); 2) an injunction under Section 74-4-10 of the HWA or Section 3008(a) of RCRA (42 U.S.C. § 6928(a)), or Section 7002(a) of RCRA (42 U.S.C. § 6972(a)); 3) civil penalties under Section 74-4-10 of the HWA or Sections 3008(a) and (g) of RCRA (42 U.S.C. §§ 6928(a) and (g)), or Section 7002(a) of RCRA (42 U.S.C. § 6972(a)); 4) criminal penalties under Section 74-4-11 of the HWA or Sections 3008(d), (e), and (f) of RCRA (42 U.S.C. §§ 6928(d), (e), and (f)); or 5) some combination of the foregoing. The list of authorities in this paragraph is not exhaustive and the Department reserves the right to take any action authorized by law to enforce the requirements of this Permit.

1.9.3 Transfer of Permit

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

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

1.9.4 Need to Halt or Reduce Activity Not a Defense

The Permittees shall not use as a defense to an enforcement action that the Permittees must reduce permitted activities in order to maintain compliance with the conditions of this Permit (40 CFR § 270.30(c)).

1.9.5 Duty to Mitigate

In the event of noncompliance with this Permit, the Permittees shall take all reasonable steps to minimize releases of hazardous wastes and hazardous constituents to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment (40 CFR § 270.30(d)).

1.9.6 Proper Operation and Maintenance

The Permittees 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 Permittees 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 and quality control (QA/QC) procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with this Permit (40 CFR § 270.30(e)).

1.9.7 Duty to Provide Information

The Permittees shall furnish to the Department, within a reasonable time as specified by the Department, any relevant information which the Department may request to determine whether cause exists for modifying, suspending, terminating, or revoking this Permit or to determine compliance with this Permit. The Permittees shall also furnish to the Department, upon request, copies of records that are required to be kept by this Permit. Information and records requested by the Department pursuant to this condition shall be provided in paper form, or an electronic, optical, or magnetic format acceptable to the Department.

This Permit condition shall not be construed to limit in any manner the Department's authority under § 74-4-4.3 of the HWA, § 3007(a) of RCRA, or other applicable law (40 CFR §§ 264.74(a) and 270.30(h)).

1.9.8 Inspection and Entry

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

1. enter upon the Permittees' premises where the regulated facility or activity is located or conducted or where records must be kept under the conditions of this Permit;

2. have access to and photograph any facility's equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit;

3. inspect any facility's equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit;

4. have access to, and copy, any records that must be kept under the conditions of this Permit; and

5. sample or monitor, for the purposes of ensuring Permit compliance or as otherwise authorized by the HWA or RCRA, any substances or parameters at any location (40 CFR § 270.30(i)).

1.9.9 Sampling and Records

1.9.9.1 Representative Sampling

All samples and measurements taken by the Permittees under any condition in this Permit shall be representative of the activity, waste, media, equipment, or structure being sampled or measured. To obtain a representative waste sample, the Permittees shall use an appropriate method from 40 CFR Part 261, Appendix I or an equivalent method approved by the Department. Laboratory methods must be those specified in the most current edition of *Test Methods for Evaluating Solid Waste Physical/Chemical Methods SW-846*, or an equivalent method, as specified in Attachment C (*Waste Analysis Plan*) and Permit Section 2.4 (40 CFR § 270.30(j)(1)).

1.9.9.2 Records Retention

The Permittees shall retain copies of all reports and records required by this Permit including, but not limited to, records of all data used to complete the Application, data gathered or generated during the closure or post-closure process, laboratory reports, drilling logs, bench-scale or pilot scale data, and supporting information in accordance with the retention times specified for the Facility Operating Record at Permit Section 2.12.2 (40 CFR § 270.30(j)(2)).

1.9.10 Reporting Planned Changes

The Permittees shall give notice to the Department, as soon as possible, of any planned physical alterations or additions to the Facility, in compliance with 40 CFR § 270.30(l)(1), which is incorporated herein by reference.

1.9.11 Reporting Anticipated Noncompliance

The Permittees shall give advance notice to the Department of any planned changes to the Facility or any activities that may result in noncompliance with Permit requirements in compliance with 40 CFR § 270.30(l)(2), which is incorporated herein by reference.

1.9.12 Twenty-Four Hour and Subsequent Reporting

The Permittees shall report to the Department any noncompliance, any incident that requires implementation of Attachment D (*Contingency Plan*), or any incident involving hazardous waste at the Facility that may endanger human health or the environment in compliance with Permit Sections 1.9.11 and 2.11.9 (270.30(l)(6)).

1.9.12.1 Oral Report

The Permittees shall make an initial oral report within 24 hours from the time the Permittees become aware of the noncompliance or incident under Permit Section 1.9.12 or that includes the following (40 CFR § 270.30(l)(6)(i)):

1. information concerning the release of any hazardous waste or hazardous constituent which may endanger public drinking water supplies;

2. information concerning the release or discharge of any hazardous waste or hazardous constituents, or of a fire or explosion at the Facility, which may threaten the environment or human health outside the Facility; and

3. a description of the occurrence and its cause including:

    a. name, address, and telephone number of the owner and operator;

    b. name, address, and telephone number of the Facility;

    c. date, time, and type of incident;

    d. name and quantity of materials involved;

    e. the extent of injuries, if any;

    f. an assessment of actual or potential hazards to the environment and human health outside the Facility, where this is applicable; and

g. the estimated quantity and disposition of recovered material that resulted from the incident.

The oral report shall be made by calling the Hazardous Waste Bureau's main telephone number during regular business hours, or by calling the New Mexico Department of Public Safety dispatch telephone number during non-business hours, and requesting that the report be forwarded to the Department spill number.

1.9.12.2 Written Report

The Permittees shall submit a written report within five calendar days after the time the Permittees become aware of the noncompliance or incident under Permit Section 1.9.12. The Permittees' written report shall contain a description of the noncompliance or incident and its cause including the following (40 CFR § 270.30(l)(6)(iii)):

1. name, address, and telephone number of the owner and operator;
2. name, address, and telephone number of the Facility;
3. date, time, and type of incident;
4. the likely cause of the incident, if known;
5. name and quantity of materials involved;
6. the extent of injuries, if any;
7. an assessment of actual or potential hazards to the environment and human health outside the Facility, where applicable;
8. an estimated quantity and the disposition of recovered material that resulted from the incident;
9. the period of the noncompliance or incident including exact dates and times, and, if the noncompliance or incident has not been corrected, the anticipated time it is expected to be corrected; and
10. steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, incident or imminent hazard.

The Department may allow submittal of the written report within 15 calendar days in lieu of the five day requirement above if justifiable cause is provided in advance.

1.9.13 Other Noncompliance

The Permittees shall report all instances of noncompliance not reported under Permit Section 1.9.11 at the time monitoring reports are submitted. These reports shall contain the information

listed in Permit Section 1.9.12.2 and 40 CFR 270.30(1)(10), which is incorporated herein by reference.

1.9.14 Other Information

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

1.9.15 Signatory Requirement

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

1.9.16 Submissions to the New Mexico Environment Department

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

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

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

1.9.17 Confidential Information

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

1.9.18 New or Modified Permitted Units

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

1.10 INFORMATION REPOSITORY

The Permittees shall establish and maintain an Information Repository at the LANL Community Reading Room (40 CFR 270.30(m)). The Permittees shall allow public access to the Information Repository during normal business hours and shall provide access in the Information Repository in

compliance with 40 CFR §§ 124.33 and 270.30(m). The Permittees shall establish the Information Repository within 180 days of the effective date of this Permit.

The Permittee's Information Repository shall contain the following:

1. a kiosk at the LANL Community Reading Room that includes a computer linked to the NMED/HWB/LANL administrative record web site;

2. complete, legible, hard copies (and electronic copies if available) of all documents relating to the Permittee's previous activities which resulted or may have resulted in the generation, management, or actual or potential release of solid waste, hazardous waste, or hazardous constituents, including correspondence, reports, data, photographs, aerial photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices;

3. complete, legible, hard copies (and electronic copies if available) of all documents relating the Permittee's Part A and Part B Permit Applications, this Permit, and interim status Closure Plans and Post-Closure Care Plans including, but not limited to, any correspondence, photographs, aerial photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices;

4. complete, legible, hard copies (and electronic copies if available) of all documents relating any sampling, monitoring, investigation, clean up, and corrective action of solid waste, hazardous waste, or hazardous constituents conducted at LANL including, but not limited to, work plans, evaluations, historical reports, data, aerial photographs, engineering drawings, glossy photographic imprints, maps, figures, drawings, tables, attachments, enclosures, and appendices; and

5. a searchable database that contains an index of all documents stored in the repository.

The Permittees shall add new documents, reports, data, and information to the Information Repository within 30 calendar days after the new documents, reports, data, and information are submitted to the Department or placed in the Facility Operating Record.

The Permittees shall inform the public of its Information Repository by including in the public notice for any of the Permittees initiated permit modifications a statement discussing the existence of the Information Repository, its location, and its hours of availability.

The Permittees shall state the existence and identify the location of the Information Repository on the LANL web site.

The Permittees shall inform all interested persons of a change in location of the Information Repository by informing all persons on the Facility mailing list of the new location and publishing a public notice in at least the Santa Fe New Mexican, the Albuquerque Journal, and the Los Alamos Monitor.

1.11 GENERAL DOCUMENTS AND INFORMATION TO BE MAINTAINED AT THE FACILITY

The Permittees shall maintain at the Facility until the Department has approved either the closure or post-closure certification statements for applicable permitted units at the Facility, or until final closure for Facility, the following documents and all amendments, revisions, and modifications to these documents:

1. this Permit, including all attachments;
2. a general description of the Facility as required by this Permit;
3. a topographic map as required by 40 CFR §§ 264.18 and 270.13 and this Permit;
4. the chemical and physical analyses of the hazardous wastes managed or handled at particular permitted units at the Facility under this Permit including all the information required to treat or store the wastes properly under the requirements of 40 CFR Part 264 and as required by this Permit;
5. the Waste Analysis Plan as required by 40 CFR § 264.13(b) and this Permit;
6. security procedures and a listing of security equipment as required by 40 CFR § 264.14 and this Permit;
7. inspection schedules and results as required by 40 CFR § 264.15(b)(2) and this Permit;
8. preparedness and prevention procedures and a listing of related equipment as required by 40 CFR Part 264, Subpart C, and this Permit;
9. personnel training records including those for both introductory and continuing training programs used to prepare employees to safely operate and maintain the Facility in compliance with 40 CFR § 264.16(d) and this Permit;
10. the Contingency Plan and any summary reports and details of all incidents that require implementation of the Contingency Plan and a copy of all Memorandums of Agreement, Memorandums of Understanding, Mutual Aid Agreements, and contracts with emergency response contractors and suppliers required by Permit Section 2.11 and 40 CFR § 264.56(j);
11. a description of procedures, structures, or equipment used at the Facility to prevent hazards in loading and unloading operations, prevent run-off from hazardous waste handling areas to other areas of the Facility or environment or to prevent flooding, prevent contamination of water supplies, mitigate the effects of equipment failure and power outages, prevent undue exposure of personnel to hazardous waste, and prevent releases to the atmosphere as required under this Permit;

12. special precautions for ignitable, reactive, or incompatible wastes as required by 40 CFR § 264.17 and this Permit;

13. the Facility Operating Record, as required by 40 CFR § 264.73 and Permit Section 2.12.2;

14. Closure Plans for each permitted unit as required by 40 CFR § 264.112 and this Permit;

15. Post-Closure Care Plans; and

16. financial assurance documentation.

The Permittees shall maintain the information and records referenced in this Permit Section in paper form, or in an electronic, magnetic, or optical form acceptable to the Department.

1.12 COMMUNITY RELATIONS PLAN

The Permittees shall establish and implement a Community Relations Plan to inform the public of investigation and cleanup activities conducted under this Permit and to inform the public of safety issues concerning hazardous wastes and hazardous constituents released at the Facility and beyond its boundary. The Permittees shall post the Plan on the Permittee's web site within 180 days of the effective date of this Permit.

The Permittees shall consult with the Pueblos of San Ildefonso and Santa Clara when developing the Community Relations Plan in an effort to ensure the program is responsive to the needs of the neighboring communities. The Permittees shall document in the Facility Operating Record such consultation and any agreements or disagreements between the Permittees and the Pueblos regarding the Community Relations Plan. The Permittees shall maintain and implement the Community Relations Plan until completion of corrective action or any post-closure care period at the Facility (40 CFR §§ 264.101 and 270.32(b)(2)).

The Permittees shall develop and maintain an electronic mailing (e-mail) list of interested parties to notify members of the public concerning actions identified in this Permit requiring e-mail notification. The Permittees shall provide a link on the LANL home page <http://www.lanl.gov> whereby members of the public may review the actions requiring email notification and submit a request to be placed on this list.

The Permittees shall inquire to all interested parties annually how they may be made better informed of issues related to this Permit. The Permittees shall on September 1st of each year publicize on the Permittee's web site a compilation of all such interested party comments together with the Permittees' responses to those comments.

1.13 DISPUTE RESOLUTION

In the event the Permittees disagree, in whole or in part, with a condition or disapproval of any submittal, the Permittees may seek dispute resolution.

1.13.1 Notice to the Department

To invoke dispute resolution, the Permittees shall notify NMED in writing within 30 calendar days of receipt of the Department's approval with conditions or disapproval of a submittal. Such notice shall set forth the specific matters in dispute, the position the Permittees asserts should be adopted, the basis for the Permittees' position, and any matters considered necessary for the Department's determination.

1.13.2 Agreement or Disagreement between Parties

The Department and the Permittees shall have 30 calendar days from the Department's receipt of notification provided under Permit Section 1.13.1 to meet or confer to resolve any disagreement. In the event an agreement is met, the Permittees shall comply with the terms of such agreement or if appropriate, submit a revised submittal and implement the same in accordance with and within the time frame specified in such agreement.

1.13.3 Final Decision of the Department

If an agreement is not reached within the 30 calendar day period, the Department will notify the Permittees in writing of its decision on the dispute and the Permittees shall comply with the terms and conditions of the decision. Such a decision shall be the final resolution of the dispute and shall be incorporated as an enforceable part of this Permit. The Permittees shall implement the decision in accordance with and within the time frame specified in such a decision.

1.13.4 Actions Not Affected by Dispute

With the exception of those conditions under dispute, the Permittees shall proceed to take any action required by those portions of the submission and of this Permit that the Department determines not to be affected by the dispute.

1.14 COMPLIANCE SCHEDULE

The Permittees shall submit documents to the Department for its approval, or perform other actions required by this Permit, in accordance with the schedule provided in Attachment N (*Compliance Schedule*) (40 CFR § 270.33(a)). The Permittees shall provide the Department written notification of its compliance with the schedule no later than 14 days following the scheduled date unless a submittal requirement is met.

Schedules required to be submitted by the conditions of this Permit are, upon approval of the Department, incorporated into this Compliance Schedule by reference and become an enforceable condition of this Permit. Any non-compliance with approved schedules shall be deemed noncompliance with this Permit. Extension of submittal or activity due dates may be granted by the Department in accordance with 40 CFR §§ 270.41 or 270.42.

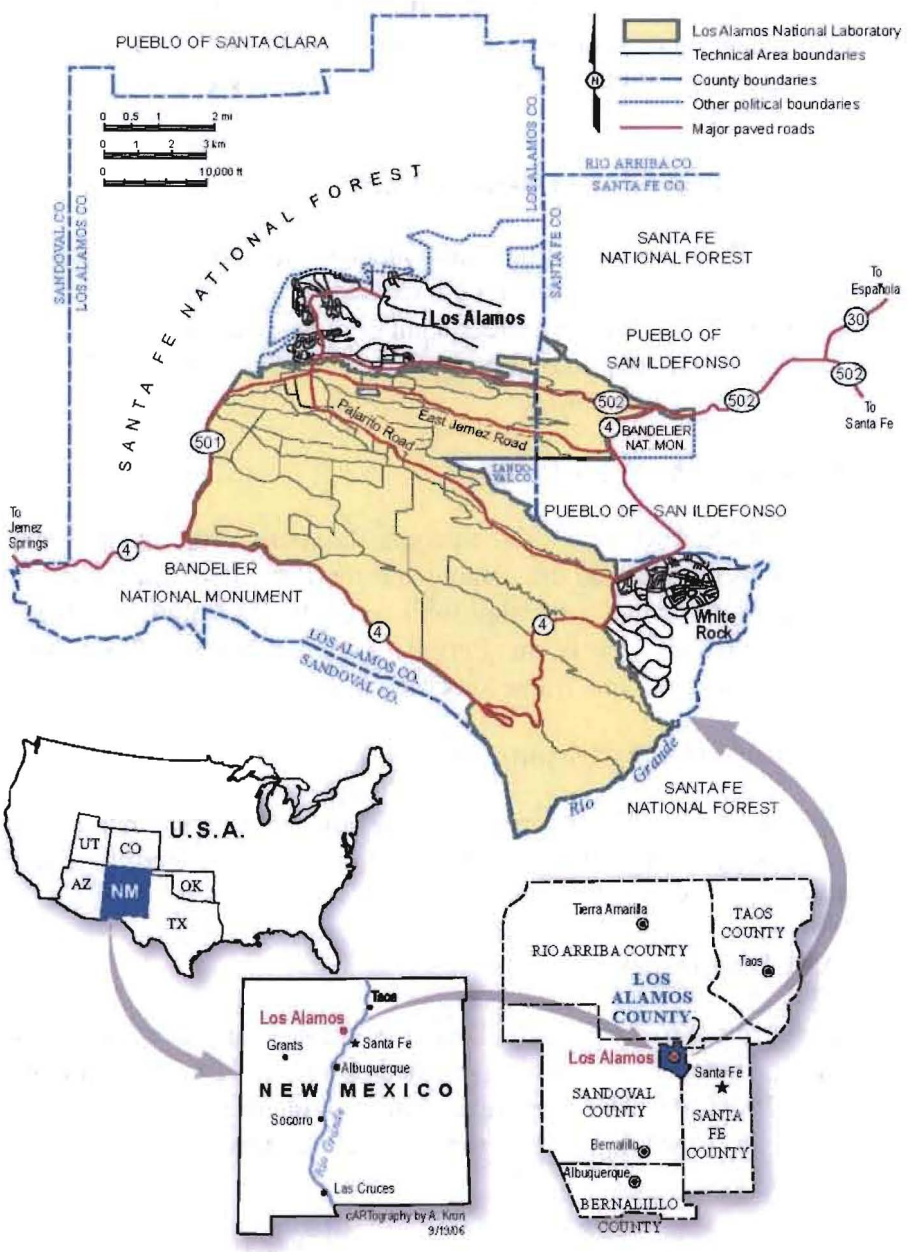

Figure 1-1
Regional Location Map of Los Alamos National Laboratory and Surrounding Land Use

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PART 2: GENERAL FACILITY CONDITIONS

2.1 DESIGN, CONSTRUCTION, MAINTENANCE, AND OPERATION OF THE FACILITY

The Permittees shall design, construct, maintain, and operate the Facility to minimize the possibility of fire, explosion, or any unplanned, sudden, or non-sudden release of hazardous waste or hazardous constituents to air, soil, groundwater, or surface water that could threaten human health or the environment (40 CFR § 264.31).

2.2 AUTHORIZED WASTES

The Permittees shall accept, store, treat, or otherwise manage at permitted units at the Facility only those hazardous wastes the Permittees proposed to manage at the units in the Permit Application, which are those wastes bearing the EPA Hazardous Waste Numbers (waste codes) listed in Attachment B (*Part A Application*).

2.2.1 Hazardous Waste from Off-Site Sources

The Permittees may accept, store, treat or otherwise manage at permitted units at the Facility only those hazardous wastes from the following off-site sources:

1. one of the sources listed in Attachment Q (*Off-Site Facilities*);
2. hazardous waste generated by the Permittees at TA-57 (the Fenton Hill site); and
3. hazardous waste generated by the Permittees as a result of investigation or remediation of a solid waste management unit (SWMU) or area of concern (AOC) listed in Attachment P (*Listing of SWMUs and AOCs*).

2.2.2 Prohibited Wastes

2.2.2.1 Hazardous Waste Imports

The Permittees shall not accept, store, treat, or otherwise manage at permitted units at the Facility hazardous wastes from foreign sources.

2.2.2.2 PCB-Contaminated Waste

The Permittees shall not store liquid hazardous wastes containing polychlorinated biphenyls (PCBs) at concentrations greater than or equal to 50 parts per million (ppm) unless such storage is for less than one year from the date the waste is placed in storage and is in compliance with all requirements of 40 CFR § 761.65(b) (40 CFR § 268.50(f)).

2.3 LAND DISPOSAL RESTRICTION COMPLIANCE

2.3.1 Hazardous Waste Long-Term Storage

The Permittees shall not store hazardous wastes beyond one year from the date that the wastes were first placed into storage at a permitted unit unless the Permittees are able to demonstrate to the Department that one of the following conditions exist:

1. that such storage is solely for the purpose of accumulating such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal;

2. that the waste meets all of the applicable LDR treatment standards; or

3. that a mixed waste is included in the Site Treatment Plan (STP) under the Federal Facility Compliance Order (FFCO) and such storage is otherwise in compliance with all requirements of the STP and FFCO (40 CFR §§ 268.50(b) and (e)).

The one year storage limit applies cumulatively to all permitted units at the Facility. Except as provided in items 1 through 3 above, waste shall not be stored at the Facility for more than one year even if it is stored for less than one year each at two or more storage units (40 CFR § 270.32(b)).

The Permittees shall ensure that each container of hazardous waste that is placed into storage at a permitted unit is clearly marked to identify the date the period of storage began (40 CFR § 268.50(a)(2)(i)). Further, the Permittees shall ensure that each tank at a permitted unit into which hazardous waste is placed is clearly marked to identify the date the period of accumulation began (40 CFR § 268.50(a)(2)(ii)).

2.3.2 Prohibition on Dilution

The Permittees shall not dilute a waste that is prohibited from land disposal or the residue from treatment of a prohibited waste as a substitute for treatment as specified at 40 CFR § 268.3, which is incorporated herein by reference. Dilution to avoid an applicable treatment standard includes, but is not limited to, the addition of solid waste to reduce a hazardous constituent's concentration or ineffective treatment that does not destroy, remove, or permanently immobilize hazardous constituents. Aggregating or mixing wastes as part of a legitimate treatment process is not impermissible dilution for purposes of this Permit.

2.3.3 Documentation of Exclusion or Exemption

The Permittees shall place a one-time notice in the Facility Operating Record for any land disposal prohibited wastes that the Permittees determine to be excluded from the definition of hazardous or solid waste or determine to be exempted from Subtitle C regulation under 40 CFR §§ 261.2 through 261.6 subsequent to the point of generation (40 CFR §§ 268.7(a)(7)). Exemptions required to be documented include, but are not limited to, deactivated characteristic hazardous waste managed in wastewater treatment systems subject to the Clean Water Act (CWA) as specified at 40 CFR 261.4(a)(2) or that are CWA-equivalent. The Permittees shall include in this

documentation a description of the waste's generation process, a description of why it is exempted or excluded, and a description of the waste's disposition.

2.4 WASTE ANALYSIS

2.4.1 General Waste Characterization Requirements

The Permittees shall accept, store, treat, or otherwise manage at permitted units at the Facility only those hazardous wastes that have been fully characterized in accordance with the requirements of 40 CFR § 264.13, which is incorporated herein by reference, these Permit conditions, and Attachment C (*Waste Analysis Plan*).

At a minimum, the Permittees must obtain and document all of the information that must be known to treat, store, or otherwise manage a hazardous waste in accordance with 40 CFR Parts 264 and 268, which are incorporated herein by reference, including but not limited to the following:

1. all applicable EPA hazardous waste numbers;
2. waste characteristics necessary to determine whether the waste is prohibited from land disposal;
3. waste characteristics necessary to prevent the mixing or placing of incompatible wastes in the same container (40 CFR §§ 264.17 and 264.177) or in a tank system (40 CFR § 264.199) and to prevent the impairment of containers (40 CFR § 264.172) and secondary containment by associated wastes (40 CFR § 264.193(c)(1));
4. waste characteristics necessary to prevent accidental ignition or reaction of ignitable or reactive wastes (40 CFR § 264.17), including spontaneous ignition, in containers (40 CFR § 264.177) and tank systems (40 CFR § 264.198);
5. whether the waste has a radiological component (40 CFR § 270.32(b)); and
6. the presence of free liquids.

The Permittees shall document the following for each hazardous waste managed under this Permit:

1. the waste name;
2. the unique waste identifier;
3. the waste generation location (e.g. building and room number); and
4. a detailed description of the waste generation process that includes all material inputs or other information that identifies the chemical content and physical form of the waste.

The Permittees shall characterize waste by using current sampling and analysis, acceptable knowledge, or a combination of the two methods. When acceptable knowledge is insufficient to

fully characterize a waste, the Permittees shall utilize sampling and analysis to complete that characterization.

2.4.2 Sampling and Analysis for Hazardous Wastes

The Permittees shall perform all sampling and analytical procedures used for waste characterization in accordance with the most recent version of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (U.S. EPA Publication SW-846) or an equivalent method that has received prior approval from the Department.

The Permittees shall ensure that samples collected and analyzed for waste characterization are representative of both the chemical composition and the entire volume of the waste under consideration.

The Permittees shall ensure that procedures used to collect a representative sample of a waste preserve its original physical form and composition and ensure prevention of contamination or changes in concentration of the constituents to be analyzed.

The Permittees shall conduct a quality assurance program to ensure that sample collection and analytical procedures used to support waste characterization required under this Permit are technically accurate and statistically valid. This quality assurance program must comply with the quality assurance requirements in *SW-846*. The Permittees shall identify and perform the appropriate number of control samples associated with each sample collected (e.g., trip and field blanks, field duplicates, field spikes).

When performing laboratory analysis, the Permittees, or a laboratory under contract to the Permittees, shall analyze the appropriate number of method blanks, laboratory duplicates, and laboratory control samples to assess the quality of the data resulting from laboratory analytical programs.

The Permittees shall maintain a record in the Facility Operating Record of all quality assurance procedures utilized in the sampling and analysis of wastes.

If the Permittees use an independent contract laboratory to perform analyses, the Permittees shall enter into a written contract with the laboratory that requires the analytical laboratory to operate in accordance with the waste analysis conditions set forth in this Permit. Copies of all such contracts with independent contract laboratories shall be kept in the Facility Operating Record (40 CFR § 270.32(b)).

If the Permittees choose to propose an analytical method that deviates from an established method in *SW-846*, the Permittees must demonstrate and document to the Department that the proposed analytical procedure is equal to, or superior to, the corresponding method in *SW-846* in terms of its sensitivity, accuracy, and precision (i.e., reproducibility). The Permittees must submit a written request to the Department 90 days prior to using the proposed sampling or analytical procedure. This request must include the following information:

1. a statement of the need and justification for the proposed action;

2. a full description of the proposed method (i.e., a standard operating procedure) including all procedural steps and equipment used in the method;

3. a description of the types of wastes, or waste matrices, for which the proposed method may be used;

4. performance data;

5. comparative results obtained from using the proposed method with those obtained from using the relevant or corresponding methods prescribed in *SW-846* and 40 CFR Parts 261 and 264;

6. an assessment of any factors which may interfere with or limit the use of the proposed method; and

7. a description of the quality control procedures necessary to ensure the sensitivity, accuracy, and precision of the proposed method.

The Department must issue a written approval of the alternative method before the Permittees may substitute it for an approved method under this Permit.

2.4.3 Acceptable Knowledge

The Permittees may use acceptable knowledge (AK) to characterize waste in lieu of, or to supplement, sampling and analysis. The Permittees shall document all uses of AK, and include in the AK documentation all of the background information assembled and used in the characterization process whether or not the information supports the decision to use AK (40 CFR § 270.32(b)). The record must document the resolution of any data discrepancies between different sources of AK. Acceptable knowledge documentation must be maintained in an auditable form in the Facility Operating Record. The Permittees shall assign a traceable identification number to this documentation to facilitate both access to this information and its verification by the Permittees and the Department.

2.4.4 Wastes Received from Off-Site

If any hazardous waste is received at the Facility from an off-site generator, the Permittees shall obtain from the generator a detailed characterization of a representative sample of such hazardous waste. If AK is used for the waste characterization, the Permittees shall require the generator to provide all AK documentation used to characterize the waste (40 CFR § 270.32(b)). In addition, the Permittees shall ensure that all applicable waste characterization requirements specified in Permit Section 2.4 have been met and documented.

The Permittees shall ensure that the waste matches the identity of the waste designated on the accompanying manifest or shipping paper. If discrepancies between the waste received and the information on the manifest are found, the Permittees shall notify the Department of the discrepancy within five days, and shall return the waste to the off-site generator within 90 days,

unless the generator provides an acceptable resolution to the discrepancy within 90 days after receipt of the waste at the Facility.

2.4.5 Treatment-Derived Waste

The Permittees shall characterize treatment-derived wastes by determining whether the treatment residues meet the applicable treatment standard in accordance with 40 CFR § 268.7(b), which is incorporated herein by reference, unless the Permittees have documented that the purpose of the treatment process is not to attain the applicable treatment standard. The Permittees shall ensure adherence to notification and recordkeeping requirements specified at 40 CFR § 268.7(b)(3)(ii). If the waste remains a hazardous waste, the Permittees shall further characterize it in compliance with the applicable requirements of Permit Section 2.4.

2.4.6 Thermal Treatment

The Permittees shall sufficiently analyze any waste which has not been previously treated in the thermal process (open burning) to establish appropriate operating conditions (including waste quantity and auxiliary fuel feed) and to determine the type of pollutants which might be emitted (40 CFR § 270.32(b)). At a minimum, the analysis must determine:

1. heating value of waste;
2. waste constituent emission factors;
3. halogen and sulfur content in the waste; and
4. concentrations of lead and mercury in the waste, unless the Permittees have written, documented data that show that these elements are not present.

2.4.7 Waste Characterization Review

The Permittees shall ensure that the initial characterization of any hazardous waste stream managed under the Permit is reviewed or repeated to verify that the characterization is accurate and up-to-date (40 CFR § 264.13(b)(4)).

The Permittees shall perform the following:

1. at a minimum, annually re-characterize all regenerated hazardous waste streams managed under this Permit to verify the accuracy of initial and subsequent characterization results;
2. re-characterize hazardous wastes managed under this Permit whenever there is a change in either the waste-generating processes that may affect the physical or chemical properties, the listed status of the waste stream, or the LDR status of the waste;
3. annually verify the waste characterization of one percent of hazardous waste streams characterized solely utilizing AK (40 CFR §§ 264.13(b)(4) and 270.32(b)). Such waste characterization verification shall be performed by quantitative chemical analysis appropriate for the waste as specified in Attachment C (*Waste Analysis Plan*). The one

percent of wastes whose characterization is to be verified shall be determined in relation to the total number of unique waste streams managed at TA-54 in the previous calendar year. To count wastes within a year, each waste material generated from a single process and distinguishable from other waste material by input materials, physical form, hazardous constituents, EPA Hazardous Waste Numbers, and LDR status, shall be counted as a single unique waste stream. The waste streams whose characterization is to be verified shall be chosen without further bias and the selection procedure shall be documented in the Facility Operating Record. Wastes not required to undergo this annual verification and not to be counted toward the total number of wastes managed in the previous year include mixed TRU wastes, hazardous debris, and hazardous wastes that are hazardous only because they are listed at 40 CFR Part 261, Subpart D; and

4. re-characterize a hazardous waste stream managed under this Permit whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within 24 hours of their receipt of such a discrepancy notice from a receiving facility.

Wastes listed at 40 CFR § 261.33 (i.e., discarded commercial chemical products, off-specification species, container residues, and spill residues thereof) and for which the Permittees possess a Material Safety Data Sheet (MSDS), or equivalent information from the manufacturer identifying chemical content, are exempt from the re-evaluation requirements of this Permit condition.

2.4.8 Waste Characterization for Compliance with RCRA Air Emission Requirements

The Permittees shall characterize hazardous wastes managed in containers and tanks to determine the average volatile organic compound (VOC) concentration relative to 500 parts per million by weight (ppmw) at the point of waste origination in compliance with 40 CFR Part 264, Subpart CC. The Permittees shall determine the average VOC concentration either by utilizing verifiable AK or by using the procedures specified in 40 CFR § 264.1083(a). The Permittees shall review and update this determination at least once every 12 months following the date of the initial determination in compliance with 40 CFR § 264.1082(c)(1).

The Permittees shall not be required to control air pollutant emissions from a container or tank and thus shall not be required to determine the average VOC concentration of the waste in the following circumstances:

1. if the container or tank manages mixed waste (40 CFR § 264.1080(b)(6)); or

2. if the container holding the wastes has a total capacity of less than 0.1 cubic meters (approximately 26 gallons).

The Permittees shall also not be required to determine the average VOC concentration of wastes if control of air pollution emissions from containers is achieved utilizing the container construction specifications and operation requirements at 40 CFR § 264.1086(b).

2.4.9 Waste Characterization for Compliance with Land Disposal Restrictions

When using laboratory analysis as part of a hazardous waste characterization, the Permittees shall require the laboratory to report concentrations of all hazardous constituents listed at 40 CFR § 268.48, *Table of Universal Treatment Standards*, that the analytical test method used is capable of measuring (40 CFR § 270.32(b)). When performing or obtaining laboratory analysis to demonstrate that a waste meets its applicable LDR treatment standard concentrations specified in 40 CFR § 268.40, *Treatment Standards for Hazardous Wastes*, in compliance with 40 CFR § 268.7(a) and (b), the Permittees shall ensure that analytical method practical quantification limits are not higher than the applicable treatment standard (40 CFR § 270.32(b)).

The Permittees shall characterize treatment-derived wastes, including wastes that have been treated so that they and are no longer characteristic hazardous waste, to determine whether the waste meets the applicable LDR treatment standards specified at 40 CFR §§ 268.40, 268.45, 268.48, and 268.49 (40 CFR § 268.7(b)), unless the Permittees have documented that the purpose of the treatment process is not to attain the applicable treatment standard. The Permittees shall characterize treatment-derived wastes to determine the presence of any of the constituents of concern for hazardous waste codes F001 through F005 and F039 and underlying hazardous constituents in characteristic wastes as defined at 40 CFR § 268.2 unless the waste will be treated and monitored off-site for all constituents (40 CFR § 268.7(b)(3)(ii)). The Permittees shall document in the Facility Operating Record such off-site treatment and monitoring (40 CFR § 270.32(b)).

2.4.10 Waste Characterization Documentation

The Permittees shall maintain all waste characterization information in the Facility Operating Record. For records that contain waste characterization information but are required to be archived elsewhere at the Facility, such as laboratory record books, the Permittees shall assign a traceable identification number to this documentation to facilitate access to this information by the Permittees and Department (40 CFR § 270.32(b)). Facility generators shall maintain this waste characterization documentation in accordance with the record retention requirements specified for the Facility Operating Record.

2.5 SECURITY

The Permittees shall prevent the unknowing entry and minimize the possibility for the unauthorized entry of persons or livestock onto permitted units within the Facility (40 CFR § 264.14). The Permittees shall adhere to the security requirements in the TA-specific Permit Parts (Parts 12, 13, 14, 15, and 16) and the requirements identified in the Permit Attachments, specifically Attachment I (*Open Burn Unit Management*) for TA-16, Attachment G (*Container Management*) for TAs 3, 50 and 54, and Attachment A (*General Facility Description*) for TA-55.

The Permittees shall ensure the security of the permitted units by maintaining the following measures:

1. a 24-hour surveillance system which continuously monitors and controls entry into the permitted units within the Facility;

2. a means to control entry to the permitted unit at all times through gates, stations, or other entrances (e.g., attendants, locked entrances, controlled roadway access); and

3. security fences.

The Permittees shall maintain and ensure the effectiveness of all security fences, entry gates, and entry stations surrounding permitted units as specified in Figures 2-1 through 2-7 in this Permit Part. The Permittees shall submit to the Department figures for TA-54 Areas G and L identifying security fences, entry gates, and entry stations within the time specified in Attachment N (*Compliance Schedule*).

2.5.1 Warning Signs

The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences around permitted units at the Facility (40 CFR § 264.14(c)). Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. The Permittees shall include on the signs the following or equivalent language:

DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS)

The Permittees shall also post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility's permitted units and the Pueblo of San Ildefonso (PO WHO GEH) and the Santa Clara Pueblo (Kha-'Po).

2.6 GENERAL INSPECTION REQUIREMENTS

The Permittees shall inspect all permitted units for malfunctions and deterioration, operator errors, and discharges which may be causing, or may lead to: 1) a release of hazardous constituents to the environment; or 2) a threat to human heath. Inspections shall be conducted of all waste management structures, base materials, containers, monitoring equipment, safety and emergency equipment, security devices, and operating equipment that are important in preventing, detecting, and responding to environmental or human health hazards associated with hazardous wastes.

The Permittees shall implement the inspection program for the permitted units at the Facility in compliance with the operating schedule, recordkeeping, and response action commitments in Attachment E (*Inspection Plan*).

The Permittees shall maintain this Permit's inspection requirements, including this Permit condition and Attachment E (*Inspection Plan*), at the administrative office of all applicable permitted units or at the permitted unit. The Permittees' ability to access an electronic version of this Permit's inspection requirements at the above locations shall be deemed to satisfy this Permit condition.

2.6.1 Inspection Schedule

The Permittees shall conduct inspections to identify problems in time to correct them before they harm human health or the environment (40 CFR § 264.15). The Permittees shall inspect permitted units at the Facility, including any containers, monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment, at least once a week, in compliance with the inspection schedules contained in Attachment E (*Inspection Plan*).

The Permittees shall inspect areas subject to spills, such as loading and unloading areas, daily when in use (CFR § 264.15(b)(4)).

2.6.2 Repair of Equipment and Structures

The Permittees shall remedy any deterioration or malfunction of equipment or structures discovered during an inspection that may lead to an environmental or human health hazard. The Permittees shall remedy such deterioration or malfunction within 24 hours of discovery of the problematic situation. The Permittees shall immediately implement remedial action where a hazard is imminent or has already occurred (40 CFR § 264.15(c)).

If a container holding hazardous waste is not in good condition (e.g., severe rust, apparent structural defects, leaks) the Permittees shall transfer the waste to a container that is in good condition within 24 hours of discovery of the problematic situation (40 CFR § 264.171).

2.6.3 Inspection Logs and Records

The Permittees shall record the results of inspections on the *Hazardous and Mixed Waste Facility Inspection Record Form* in Attachment E (*Inspection Plan*), or an equivalent form approved by the Department, for each inspection conducted under Permit Section 2.6 and Attachment E. At a minimum, the Permittees shall produce a handwritten record of the date and time of the inspection, an identification of the permitted unit and associated structures or equipment, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions (40 CFR § 264.15(d)). The Permittees shall ensure that these records are clearly legible, all handwritten information is in ink, and any errors are crossed out with one line and initialed and dated by the inspector making the correction.

The Permittees shall record the locations, dimensions, and repairs of all identified cracks or gaps in floors or base materials.

The Permittees shall also record the following observations or actions in the Facility Operating Record:

1. the results of any preventative maintenance activities including, but not limited to, maintenance on floors, secondary containment structures, unit drainage structures, and fire protection equipment at a permitted unit;

2. any malfunctions and deterioration of such equipment;

3. any operator errors at a permitted unit;

4. any discharges of hazardous waste, hazardous constituents, or fire suppression systems at a permitted unit; and

5. any occurrences that might cause, exacerbate, or otherwise affect the contamination of a permitted unit, including but not limited to, spills or liquid inundations.

The Permittees shall maintain paper copies of inspection logs in the Facility Operating Record for a minimum of three years from the date of inspection (40 CFR § 264.15(d)). The Permittees shall maintain unalterable electronic copies of inspection logs in the Facility Operating Record until closure or post-closure certification is approved for a particular permitted unit as specified in Permit Section 2.12.2 (40 CFR § 270.32(b)).

2.7 PERSONNEL TRAINING

The Permittees shall ensure that all Facility personnel who are involved in hazardous waste management activities regulated under this Permit successfully complete the training program in compliance with the training requirements of 40 CFR § 264.16 as well as the training requirements in Attachment F (*Personnel Training Plan*).

2.8 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittees shall manage ignitable, reactive, and incompatible hazardous wastes in containers and tanks in compliance with the requirements of 40 CFR §§ 264.17, 264.176, 264.177, 264.198, and 264.199, the TA-specific Permit Parts (Parts 12, 13, 14, 15, and 16), and the requirements specified in Attachment G (*Container Management*), Attachment H (*Tank Management*), and Attachment I (*Open Burn Unit Management*).

The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least 15 meters (50 feet) from the facility boundary defined as the TA-specific boundary identified in Figure 2-8 (40 CFR §§ 264.176 and 270.32(b)).

The Permittees shall take precautions during: 1) the treatment or storage of ignitable or reactive waste; 2) the mixing of incompatible waste; or 3) the mixing incompatible of wastes and other materials, to prevent reactions that could lead to or cause the following:

1. generate extreme heat, pressure, fire, explosions, or violent reactions (other than that at the Facility's open burn treatment units);

2. produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;

3. produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

4. damage the structural integrity of the container, tank, permitted unit, or other structure; and

5. threaten human health or the environment.

The Permittees shall take the following precautions to prevent accidental ignition or reaction of ignitable or reactive wastes:

1. ensure that there are no sources of open flames at the container or tank;

2. segregate and separate by distance ignitable or reactive wastes and protect them from sources of ignition or reaction such as cutting and welding, hot surfaces, frictional heat, sparks (e.g., static, electrical, mechanical), spontaneous ignition, and radiant heat;

3. maintain adequate clearance around fire hydrants that serve permitted units;

4. use only non-sparking tools when managing hazardous waste containers;

5. ensure lightning rods are attached to all storage or treatment units;

6. perform an ongoing inspection, testing, and maintenance of fire protection equipment to determine appropriate test criteria and preventative maintenance activities;

7. confine smoking and open flames to designated areas at a minimum of 50 feet from areas where ignitable or reactive waste is being handled;

8. stack containers of ignitable and reactive wastes no more than 2 drums high to comply with the National Fire Protection Association's (NFPA) *Flammable and Combustible Liquids Code*; and

9. ensure that each fire suppression system is compatible with the hazardous waste being managed in the permitted unit.

2.8.1 Compatibility Precautions

The Permittees shall ensure that a storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers is separated from the other waste or materials or is protected from them by means of a dike, berm, wall, or other device not to include the container, in order to, in the event of leakage from containers under conditions normally incident to storage, prevent the commingling of the incompatible wastes or materials (40 CFR § 264.177(c)).

The Permittees shall ensure that incompatible wastes or materials are not stored within or on the same secondary containment structure.

The Permittees shall ensure that all waste and materials are segregated and stored in accordance with the Department of Transportation's (DOT) compatibility groupings or classes (49 CFR § 177.848).

Cyanides and cyanide mixtures or solutions may not be stored with acids if a mixture of the materials would generate hydrogen cyanide. Class 8 (corrosive) liquids may not be stored above or adjacent to Class 4 (flammable) or Class 5 (oxidizing) wastes except when it is known that the mixture of the wastes would not cause a fire or a dangerous evolution of heat or gas.

The Permittees shall ensure that hazardous wastes are not placed in an unwashed container or tank that previously held an incompatible waste or material (40 CFR §§ 264.177(b) or 264.199(b) respectively).

2.9 WASTE MINIMIZATION PROGRAM

The Permittees shall institute a waste minimization program to reduce the volume and toxicity of hazardous wastes generated by the Facility's operation to the degree determined by the Permittee to be economically practicable (40 CFR 264.73(b)(9)). The waste minimization program shall include proposed, practicable methods of treatment and storage currently available to the Permittees which minimize the present and future threat to human health and the environment. The Waste Minimization Program shall address or identify the following items:

1. any written policy or statement that outlines goals, objectives, and methods for source reduction and recycling of hazardous waste at the Facility;

2. any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities for all hazardous wastes;

3. any source reduction or recycling measures implemented in the last five years or planned for the next federal fiscal year;

4. an itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;

5. factors that have prevented implementation of source reduction or recycling;

6. sources of information on source reduction and recycling received at the Facility (e.g., local government, trade associations, suppliers);

7. an investigation of additional waste minimization efforts that could be implemented at the Facility that analyzes the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means including an assessment of the technical feasibility, cost, and potential waste reduction for each option;

8. a flow chart detailing all hazardous wastes (the Facility produces) by quantity, type, building or area, and program; and

9. demonstration of the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes, available technology, or available alternative processes that would produce less volume or less toxic waste.

The Permittees shall submit to the Department a certified report regarding the waste minimization program annually by December 1st for the year ending the previous September 30th.

2.10 PREPAREDNESS AND PREVENTION

The Permittees shall maintain and operate the Facility in a manner that minimizes the possibility of fire, explosion or any unplanned sudden or non-sudden release of hazardous wastes or hazardous constituents to the air, soil, or surface water that could threaten human health or the environment (40 CFR § 264.31). In addition to the general preparedness and prevention requirements identified here, the Permittees shall comply with the TA-specific preparedness and prevention requirements identified in Attachment G (*Container Management*), Attachment H (*Tank Management*), and Attachment I (*Open Burn Unit Management*).

2.10.1 Required Equipment

At a minimum, the Permittees shall maintain at the Facility and at the permitted units the internal communication, alarm system devices to summon emergency assistance, fire control, spill control, and decontamination equipment listed in the tables identifying Facility-wide and site specific emergency equipment of Attachment D (*Contingency Plan*) (40 CFR § 264.32). The Permittees shall also maintain at the Facility and at the permitted units the internal communication, alarm system, spill control, and decontamination equipment referenced in Attachment G (*Container Management*), Attachment H (*Tank Management*), and Attachment I (*Open Burn Unit Management*).

The Permittees shall ensure that any changes to the emergency equipment lists adhere to the permit modification requirements at 40 CFR §§ 270.41 through 270.43 and specifically adhere to the requirements of 40 CFR § 270.42 Appendix I, Sections B.6.b and B.6.c.

The Permittees shall maintain an internal communication or alarm system at all permitted units (40 CFR §§ 264.32(a) and (b)). The communication or alarm systems shall be capable of providing immediate emergency instruction to facility personnel and summoning emergency assistance.

The Permittees shall maintain spill kits at all permitted container storage, tank, and open burn management units. These spill kits shall be capable of mitigating small containable spills of acidic, caustic, flammable, and otherwise hazardous waste present at the unit. These kits shall include, at a minimum, sorbents, neutralizers, shovels, empty containers, and all appropriate personal protective equipment. For larger spills, the Permittees shall have plugging and diking equipment, siphon pumps, and loaders readily available at the Facility.

The Permittees shall ensure that there is adequate water pressure available to the permitted units to provide water for fire suppression (40 CFR § 270.32(b)).

The Permittees shall operate and maintain the area-wide environmental monitoring network as specified in Section D.7.3 of Attachment D, (*Contingency Plan).*

The Permittees shall maintain equipment at all permitted units capable of mitigating the effects of a power outage (40 CFR §§ 270.14(b)(8)(iv) and 270.32(b)). This equipment may be either backup

batteries or generators (i.e., uninterruptible power systems) and must be capable of operating evacuation alarms, emergency communication equipment, automatic fire suppression systems, and lights in buildings without daylight illumination. The Permittees shall ensure that it is possible to provide fuel to backup generators under adverse conditions.

2.10.2 Testing and Maintenance of Equipment

The Permittees shall test and maintain the equipment specified in Permit Section 2.10.1, as necessary, to ensure its proper operation in time of emergency (40 CFR § 264.33). This equipment shall undergo, at a minimum, weekly inspection to ensure proper functionality in accordance with Attachment E (*Inspection Plan*), and conformance with this inspection requirement shall be documented in the Facility Operating Record.

If testing identifies any nonfunctioning communication equipment, alarm system or fire protection component, spill control, or decontamination equipment, the Permittees shall ensure it is promptly repaired; they shall immediately provide substitute equipment or systems during repairs. The Permittees shall ensure that Facility employees and contractors are notified of the presence of substitute equipment and, if necessary, provide them with proper training of its use (40 CFR § 270.32(b)). The Permittees shall ensure that malfunctioning equipment is clearly marked as "Out of Use" and that the location of the substitute equipment is clearly posted on or adjacent to the faulty equipment (40 CFR §§ 264.31 and 270.32(b)).

2.10.3 Access to Communications or Alarm System

Whenever hazardous waste is being managed at a permitted unit, the Permittees shall ensure that all personnel have immediate access to an internal alarm or emergency communication device either directly or through visual/vocal contact with another employee (40 CFR § 264.34(a)). The Permittees shall ensure that communication devices are easily accessible without personnel having to enter another building (40 CFR § 270.32(b)). The Department will consider waste management to be occurring whenever a person is located at a permitted unit and the unit contains hazardous waste.

The Permittees shall ensure that any employee working alone without the immediate presence of another employee at the area of operations capable of summoning external emergency assistance shall have immediate access to a device, such as a hand-held two-way radio, a cell phone, or a landline telephone (40 CFR § 264.34(b)). The Permittees shall ensure that the communication device is accessible without the employee having to enter another building.

2.10.4 Spill Response

The Permittees shall ensure that spills of hazardous wastes, including small localized spills that are capable of being managed without the assistance of emergency management personnel, are managed utilizing the following procedures, not necessarily in the following order:

1. isolate the immediate area and deny entry to all unauthorized personnel;

2. contain the spill by spreading sorbents or forming temporary dikes to prevent further migration;

3. monitor the spill and fully characterize the spilled waste and contaminated materials;

4. package the spilled waste and contaminated materials in sound containers; and

5. decontaminate the area and all involved equipment and personnel.

2.10.5 Arrangements with Local Authorities

The Permittees shall maintain its preparedness and prevention agreement with the Los Alamos County Emergency Management and Response Office and support agreements with the Los Alamos County Fire Department, the Los Alamos County Police Department, and the Los Alamos Medical Center (40 CFR § 264.37).

2.11 CONTINGENCY PLAN

2.11.1 Implementation of Contingency Plan

The Permittees shall immediately implement Attachment D (*Contingency Plan*) whenever there is a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous constituents (40 CFR § 264.51(b)). The Permittees shall ensure that an adequate number of trained emergency response personnel are available at all times, including but not limited to, holidays, nights, and weekends.

The Contingency Plan shall be implemented immediately in the following situations:

1. spills:

    a. if a hazardous waste spill cannot be contained with secondary containment or application of sorbents;

    b. if a hazardous waste spill causes a release of flammable material creating a fire or explosion hazard; or

    c. if a hazardous waste spill results in toxic fumes that threaten human health;

2. explosions:

    1. if an unplanned explosion involving hazardous waste occurs; or

    2. if an imminent danger of an explosion involving hazardous waste exists; and

3. fires:

    a. if a fire involving hazardous waste occurs; or

b. if any building, grass, forest, or non-hazardous waste fire exists that threatens to volatilize or ignite hazardous waste.

2.11.2 Content of the Contingency Plan

The Permittees shall maintain the Contingency Plan to ensure that it at all times accurately includes the following:

1. a description of the actions Facility personnel shall take to respond to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous constituents to air, soil, and/or surface water at the Facility;

2. a description of all arrangements agreed upon by local police and fire departments, hospitals, federal, state, and local emergency response teams, and tribal governments to coordinate emergency services;

3. a description of all contracts with emergency response contractors and equipment suppliers;

4. the names and phone numbers (i.e., office, home, cell, pager) of a primary and alternate individual assigned to act as Emergency Coordinator;

5. a list of all on-site emergency equipment associated with each permitted unit including fire control, spill control, communication, decontamination, and personal protective equipment including a description of where this equipment is located, a physical description of each item on the list, and a brief outline of its capabilities; and

6. an evacuation plan for Facility personnel where there is a possibility that evacuation may be necessary, including a description of the signal(s) to be used to begin evacuation as well as primary and alternate evacuation routes.

2.11.3 Distribution

At a minimum, the Permittees shall maintain copies of the Contingency Plan including all revisions and amendments at the following locations;

1. in all appropriate locations at the Facility, including all permitted units;

2. on the person of the Duty Emergency Manager;

3. at the Emergency Management and Response Office;

4. with all entities with which the Permittees have emergency Memorandums of Understanding, (MOUs) or Mutual Assistance Agreements (MAAs) including: 1) the Los Alamos County Emergency Management Coordinator; 2) the Los Alamos County Fire Department; 3) the Los Alamos County Police Department; and 4) the Los Alamos Medical Center;

5. with the Department; and

6. in the Facility Operating Record.

Distribution of the Contingency Plan shall be controlled by a system that ensures that all parties or agencies referenced in the Plan, or who rely upon the Plan, receive current copies of the Plan within five days of the effective date of this Permit and within five days of receipt of any Department approval to a modification of the Plan. The Permittees shall ensure that all copies of the Contingency Plan distributed outside the Facility are sent by certified mail with a return receipt, or by an equivalent method, demonstrating proper distribution. A record of compliance with this requirement shall be maintained in the Facility Operating Record (40 CFR § 270.32(b)).

The Permittees shall ensure that evacuation routes identified in the Contingency Plan are visibly and prominently posted at the principle entrances to all permitted units and buildings within those units (40 CFR § 270.32(b)).

2.11.4 Amendments to Plan

Pursuant to 40 CFR § 264.54, the Permittees shall review the Contingency Plan and amend the Plan, if necessary, whenever:

1. this Permit is revised;

2. the LANL Emergency Management Plan is revised;

3. the Los Alamos County Emergency Management Plan is revised and that revision is contrary to a requirement in the Contingency Plan;

4. a Building Emergency Plan (BEP) for a building which houses a permitted unit is changed and that change is contrary to a requirement in the Contingency Plan;

5. the Contingency Plan fails during a drill or an emergency;

6. the Permittees modify the Facility in either its design, construction, operation, maintenance, or other circumstances in a manner that increases the potential for fires, explosions, or releases of hazardous wastes or hazardous waste constituents;

7. the permitted unit design or operation changes the response necessary in an emergency;

8. the Permittees modify the list of Emergency Coordinators; or

9. the Permittees modify the list of emergency response equipment.

The Permittees shall ensure that all amendments to the Contingency Plan adhere to the permit modification requirements at 40 CFR §§ 270.41 through 270.43, including the modification classifications at 40 CFR § 270.42 Appendix 1, Category B.6.

The Permittees shall ensure that appropriate personnel review the Contingency Plan, at a minimum annually, and log each review in the Facility Operating Record (40 CFR § 270.32(b)).

2.11.5 Emergency Manager

The Permittees shall designate a Duty Emergency Manager or Incident Commander who shall be responsible for coordinating all emergency response measures related to the management of hazardous wastes. A Duty Emergency Coordinator shall be on call at all times. The Duty Emergency Coordinator shall be thoroughly familiar with the Contingency Plan and shall have the authority to promptly commit the personnel and financial resources needed to implement the Contingency Plan (40 CFR § 264.55).

2.11.6 Required Emergency Procedures

2.11.6.1 Immediate Actions

In the event of an imminent or actual emergency situation, the Group Leader shall immediately activate the internal facility alarm or communication systems to notify all potentially affected facility personnel. This person shall also notify the appropriate federal, tribal, state, and local agencies with designated response roles and implement the other requirements specified in 40 CFR § 264.56 and the Contingency Plan. The Permittees shall ensure that one individual shall be named as the Incident Commander and the others shall be identified in the order that they will assume responsibility as alternates.

2.11.6.2 Release, Fire, or Explosion

The Emergency Manager shall, in the event of a fire, explosion, or release of hazardous waste or constituents:

1. as soon as practicable, identify the character, exact source, amount, and aerial extent of any released materials by observation, review of facility records, or by chemical analysis (40 CFR §§ 264.56(b)); and

2. assess possible hazards to human health or the environment that may result from the release, fire, or explosion including both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat induced explosions) (40 CFR §§ 264.56(c)).

2.11.6.3 Reporting Findings

In the event that the Emergency Manager determines that there has been a release, fire, or explosion that may threaten the human health or the environment outside the boundaries of the Facility, he or she shall report the findings as follows:

1. if an assessment indicates that evacuation of local areas may be advisable, he or she shall immediately notify the appropriate local and tribal authorities and shall be available to assist appropriate officials in deciding whether local areas should be evacuated; and

2. immediately notify to either the government official designated as the on-scene coordinator for that geographical area, the New Mexico Department of Public Safety dispatcher (505-827-9329), or the 24-hour National Response Center (800-424-8802). This notification shall include:

    a. the name and telephone number of the person reporting the incident;

    b. the specific Facility location where the incident occurred;

    c. the time and type of incident;

    d. the name and quantities, to the extent known, of materials involved;

    e. the extent of any injuries, if any; and

    f. the possible hazards to human health and the environment outside the Facility.

2.11.6.4 Mitigative Measures

During an emergency, the Emergency Manager shall take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous wastes at the Facility. These measures shall include, where applicable, stopping processes and operations, collecting and containing released wastes, and removing or isolating containers.

2.11.6.5 Monitoring

In the event that the Facility stops operations in response to a fire, release, or explosion, the Emergency Manager shall monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment as appropriate.

2.11.7 Post-Emergency Procedures

Immediately after an emergency, the Emergency Manager shall provide for the treatment, storage, or disposal of recovered wastes, contaminated soils or surface water, or any other material or contaminated environmental media that resulted from the fire, explosion, or release at the Facility.

The Emergency Manager shall also ensure the following in the affected areas of the Facility:

1. no waste that may be incompatible with the released material is treated, stored, or disposed of in the impacted area until cleanup procedures are completed; and

2. all emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

2.11.8 Need for Further Corrective Action

If, after implementation of the Contingency Plan in response to a release of a hazardous waste or constituent, the Department determines that corrective action may be required to address the release, the Department may require the Permittees to conduct corrective action pursuant to Permit Part 11 (*Corrective Action*).

2.11.9 Notification and Record Keeping

After implementation of the Contingency Plan in response to a release of a hazardous waste or hazardous constituent, the Permittees shall notify the Department in compliance with Permit Section 1.9.12. The Permittees shall notify the Department and appropriate local and tribal authorities that the Facility is in compliance with Permit Section 2.11.7 before operations resume in the Facility's affected areas.

The Permittees shall record in the Facility Operating Record any instance of fire, explosion, or release from or at a permitted unit regardless of whether the incident requires implementation of the Contingency Plan (40 CFR § 270.32(b)).

For purposes of unit closure, the Permittees shall document in the Facility Operating Record all instances where an indoor fire suppression system has been activated resulting in fire suppressants contacting a waste storage pad, regardless of whether the activation of the fire suppression system is for an emergency, emergency testing purposes, or the result of an accident or break in a suppression system (40 CFR § 270.32(b)).

2.12 RECORD KEEPING AND REPORTING

The Permittees shall comply with the record keeping and reporting requirements specified throughout this Permit and at CFR § 264.73(a).

2.12.1 Manifest Systems

The Permittees shall comply with the manifest requirements of 40 CFR §§ 264.71, 264.72, and 264.76 whenever a shipment of hazardous waste is either received at, or initiated from, the Facility. The Permittees shall not accept any hazardous waste from an off-site source without an accompanying manifest.

2.12.2 Operating Record

The Permittees shall maintain a written Facility Operating Record for each permitted unit at the Facility until the Department has approved either the closure or post-closure certification statements specified at Permit Sections 9.5 and 10.2.3 respectively (40 CFR § 264.73). For documents that address the entire Facility (e.g., certifications of a Facility program to reduce the volume and toxicity of hazardous waste) the Permittees shall maintain these documents until the Permit is terminated. Unless specifically prohibited by this Permit, an unalterable electronic record capable of producing a paper copy shall be deemed to be a written record (40 CFR § 270.32(b)).

The Permittees shall incorporate into the Facility Operating Record the following information as soon as it becomes available:

1. a description of hazardous waste received, stored, or treated, the quantity managed, and the methods and dates of storage and/or treatment at each permitted unit in accordance with Appendix I of 40 CFR Part 264, which is incorporated herein by reference;

2. the location of each type of hazardous waste within each permitted unit and the total quantity of all wastes and waste types at each unit (the location shall be identified as one of the permitted units listed in Attachment O (*Hazardous Waste Management Units*) and any subordinate unit (e.g., room or structure));

3. records and results of waste analyses and waste determinations that are performed pursuant to Permit Section 2.4, Attachment C (*Waste Analysis Plan*), and 40 CFR §§ 264.1083, 268.7, 268.7(a)(7), and 268.9;

4. incident reports and details of all incidents that required the implementation of Attachment D (*Contingency Plan*) as specified in that Plan and Permit Section 11;

5. records and results of inspections as required in Permit Section 2.6 and Attachment E (*Inspection Plan*) (these records and results shall be kept for the period specified in Permit Section 2.6);

6. monitoring, testing, analytical data, and response actions when required by 40 CFR §§ 264.191, 264.193, 264.195, 264.602 , 264.1063(d) through 264.1063(i), 264.1064, and 264.1082 through 264.1090;

7. notices to off-site generators as specified in 40 CFR § 264.12(b);

8. all closure cost estimates as specified in Attachment R (*Cost Estimates for Financial Assurance*)(40 CFR § 270.32(b));

9. an annual certification that there is a Facility program in place to reduce the volume and toxicity of hazardous waste generated;

10. for treated wastes, the information contained in the notice and certification required under 40 CFR § 268.7(b);

11. for wastes left in the ground after closure (i.e., disposal units), the information required of a treatment facility under 40 CFR § 268.7(b); and

12. for stored wastes, the notice (or information contained in the notice for wastes generated on-site) and certification required at 40 CFR § 268.7.

2.12.3 Availability of Facility Operating Record

The Permittees shall furnish and make readily available for inspection, upon request by any officer, employee, or representative of the Department, the Facility Operating Record and all

other records required under 40 CFR Part 264 or this Permit (40 CFR § 264.74(a) and pursuant to 74-4-4.3 NMSA 1978). Information and records requested by the Department pursuant to this condition shall be made available for inspection in paper or electronic form, or both, as specified by the Department (40 CFR § 270.32(b)).

2.12.4 Record Retention

The Permittees shall retain all records required in this Permit during the course of any unresolved enforcement action regarding the Facility or as required by the Department (40 CFR § 264.74(b)).

2.12.5 Biennial Report

The Permittees shall submit a biennial report, which includes all of the information specified in 40 CFR § 264.75 to the Department by March 1st of each even numbered year.

2.12.6 Personnel and Telephone Number Changes

The Permittees shall inform the Department in writing of changes in their management personnel and telephone numbers referenced in this Permit within 15 days of the change.

2.13 COST ESTIMATE FOR FACILITY CLOSURE AND POST-CLOSURE

LANS must establish closure and post-closure cost estimates, prepared in accordance with 40 CFR §§ 264.142 and 264.144. Cost estimates must be provided for closure of each unit listed in Attachment O (*List of Hazardous Waste Management Units*), Table O-1 (*Permitted Unit Actively Managing Hazardous Waste*) and Table O-2 (*Permitted Units Undergoing Post-Closure Care*). Cost estimates for post-closure care shall be submitted in conjunction with the associated post-closure care plan for any unit undergoing post-closure care.

Attachment R (*Cost Estimates for Financial Assurance*) contains detailed written estimate(s) in current dollars, of the cost of hiring a third party to perform closure of the units listed in Table O-1 in Attachment O. LANS shall submit, for Department approval, closure cost estimates for all units listed in Table O-2 in Attachment O within 180 days of the effective date of this Permit. The initial Estimated Cost of Work shall include all necessary costs to implement closure in accordance with the closure requirements included in Permit Part 9 (*Closure*). A third party means a party who: 1) is neither a parent nor a subsidiary of LANS; and 2) does not share a common parent or subsidiary with LANS. The Estimated Cost of Work shall not be reduced by the amount of any salvage value that may be realized from the sale of Facility real property, structures, equipment, vehicles, product, materials, or other assets associated with the Facility. The Estimated Cost of Work shall be prepared in accordance with 40 CFR Part 264, Subpart G and substantially in compliance with the requirements of 40 CFR §§ 264.142 and 264.144.

2.13.1 Adjustments to the Cost Estimates

LANS must adjust the closure and post-closure cost estimates for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with 40

CFR §§ 264.143 and 264.145. LANS must adjust the closure and post-closure cost estimates for inflation within 30 days after the close of the firm's fiscal year and before submission of updated information to the Department, as specified in 40 CFR §§ 264.142(b) and 264.144(b).

2.13.2 Revision of the Cost Estimate

LANS must revise the closure cost estimates or post-closure cost estimates whenever there is a change in the Facility's Closure Plan or Post-Closure Care Plan as required by 40 CFR §§ 264.142(c) and 264.144(c).

2.13.3 Records of the Cost Estimates

LANS must keep at the Facility records of the latest closure cost estimates and post-closure cost estimates as required by 40 CFR §§ 264.142(d) and 264.144(d) in accordance with Permit Section 2.12.

2.14 FINANCIAL ASSURANCE FOR CLOSURE AND POST-CLOSURE

LANS shall establish an instrument(s) for financial assurance no later than 180 days after the closure and post-closure cost estimate(s) are approved by the Department. LANS shall demonstrate continuous compliance with 40 CFR §§ 264.143, 264.145, 264.147, and 264.151 by providing documentation of financial assurance, as required by 40 CFR § 264.151, in at least the amount of the cost estimates required in Attachment R (*Cost Estimates for Financial Assurance*). Changes in the financial assurance mechanisms for closure or post-closure care must be approved by the Department pursuant to 40 CFR §§ 264.143 and 264.145.

2.15 LIABILITY REQUIREMENTS

LANS shall demonstrate continuous compliance with the requirement of 40 CFR § 264.147(a) to have and maintain liability coverage for sudden and accidental occurrences in the amount of at least $1 million per occurrence, with an annual aggregate of at least $2 million, exclusive of legal defense costs. LANS also shall demonstrate continuous compliance with the requirement of 40 CFR § 264.147(b) to have and maintain liability coverage for non-sudden accidental occurrences in the amount of at least $3 million per occurrence, with an annual aggregate of at least $6 million, exclusive of legal defense costs.

2.16 INCAPACITY OF OPERATORS, GURANTORS, OR FINANCIAL INSTITUTIONS

LANS shall comply with 40 CFR § 264.148, whenever necessary, in the case that the owner/operator, guarantors, or financial institutions become incapable of fulfilling the financial assurance obligations required by 40 CFR Part 264, Subpart H.

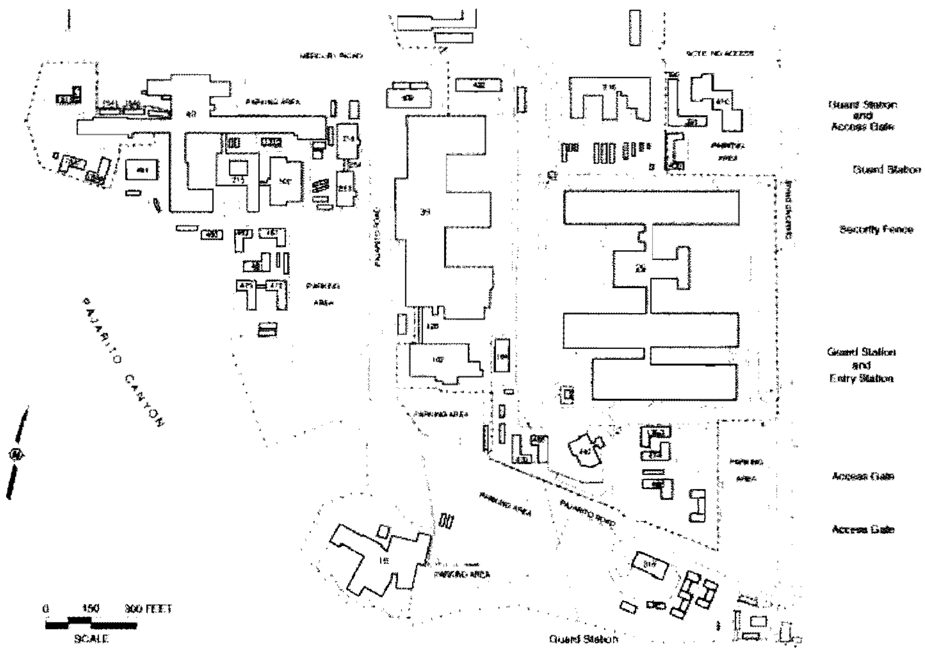

Figure 2-1
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 3

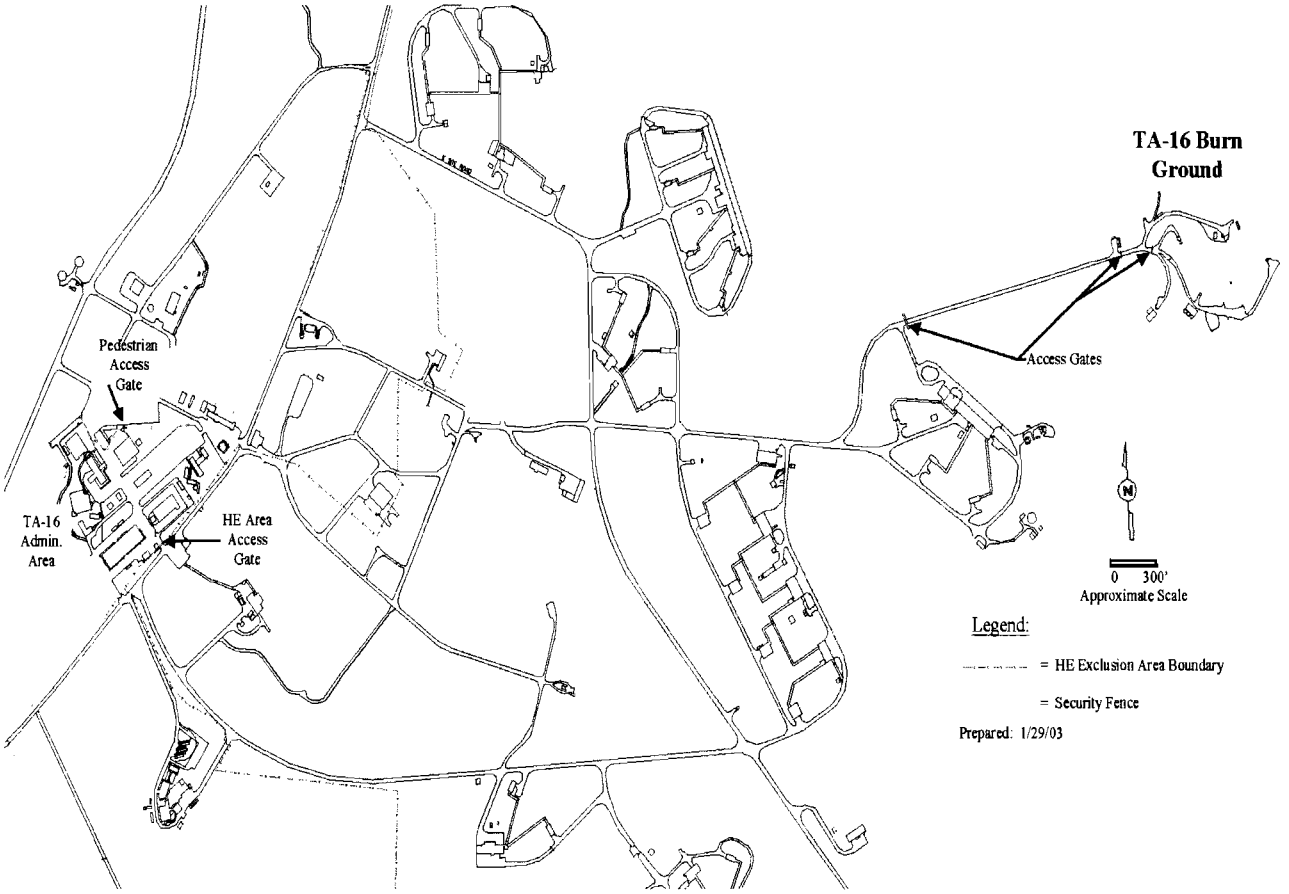

Figure 2-2

Location Map of Access Gates, HE Exclusion Area Boundary, and Security Fences in the Vicinity of Technical Area 16

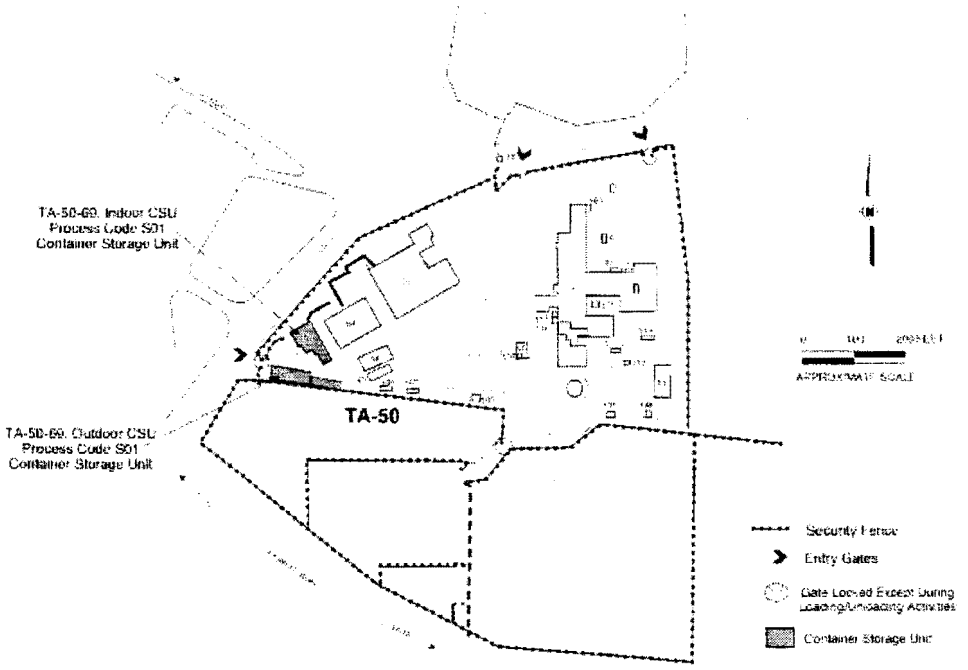

Figure 2-3
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 50

Figure 2-4 (Forthcoming in Compliance Schedule)

Location map showing security fences and entry gates at Technical Area (TA) 54 Area G

Figure 2-5 (Forthcoming)

Location map showing security fences and entry gates at Technical Area (TA) 54 Area L

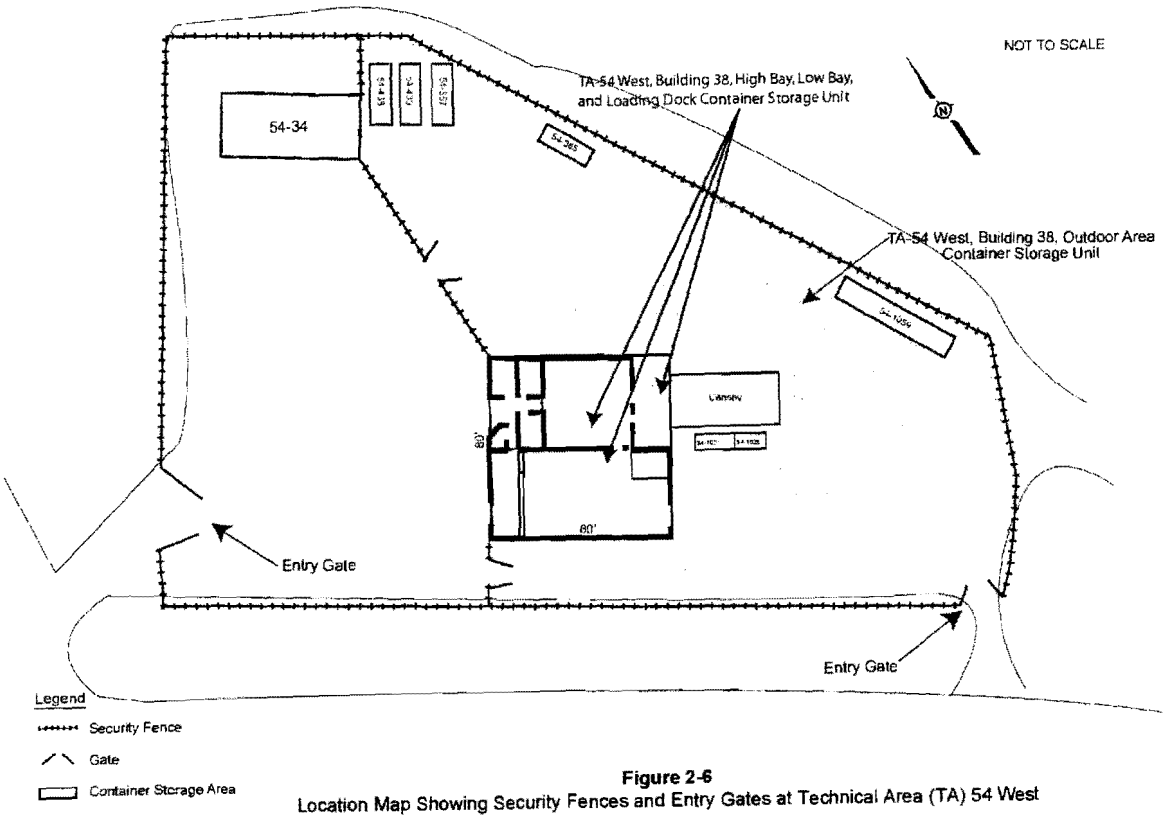

Figure 2-6
Location Map Showing Security Fences and Entry Gates at Technical Area (TA) 54 West

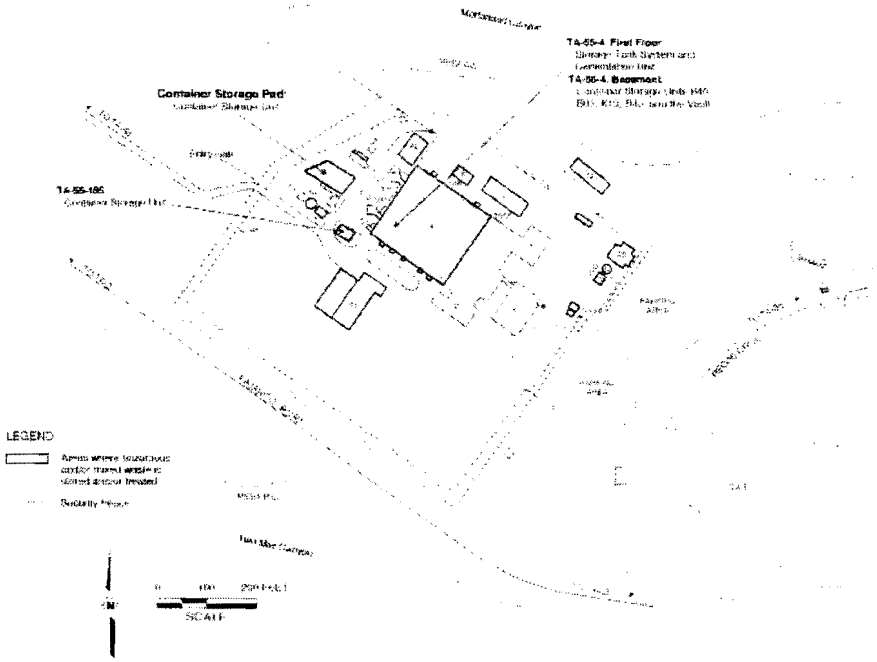

Figure 2-7
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 55

1

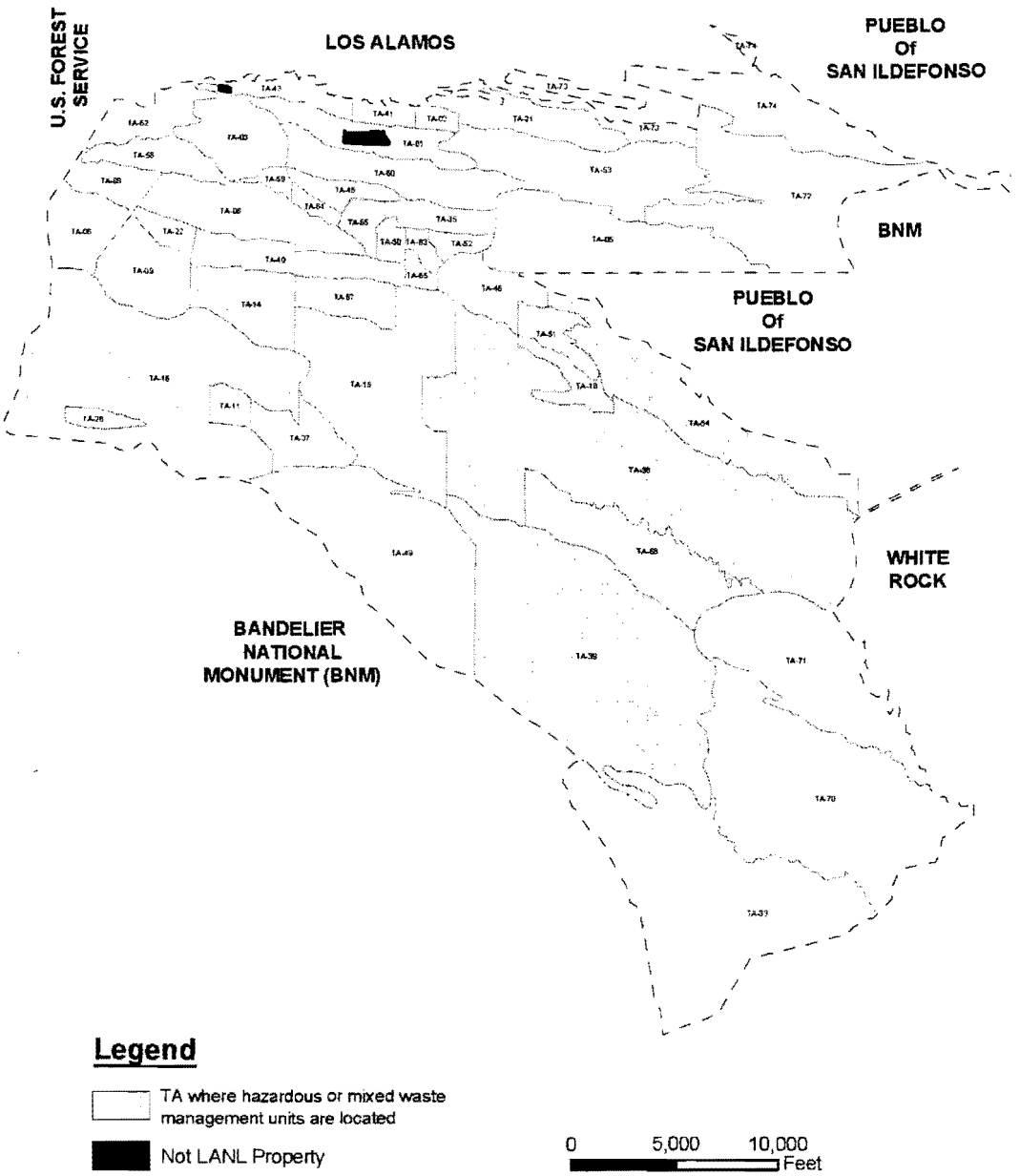

Figure 2-8
Location Map of Los Alamos National Laboratory (LANL) Technical Areas (TAs)

Created by ERSS GIS TEAM Map Number 06-0108 September12, 2005
State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)
This map was created for work processes associated with the Environmental &Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff
Boundary of Department of Energy Property I Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation, Infrastructure Planning Office 10 February 2006
Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory, Los Alamos National Laboratory, SSMO Site Planning & Project Initiation, 01 February 2003 as captured 07 September 2004.

2

PART 3: STORAGE IN CONTAINERS

3.1 GENERAL CONDITIONS

The Permittees shall store and otherwise manage containers of hazardous waste in accordance with the requirements of this Permit Part, in accordance with the requirements of 40 CFR Part 264, Subpart I, which is incorporated herein by reference, in accordance with the requirements of Part 13 (*TA-50 Specific Permit Conditions*), Part 14 (*TA-54 Specific Permit Conditions*), Part 15 (*TA-55 Specific Permit Conditions*), and Part 16 (*TA-3 Specific Permit Conditions*), and in accordance with the requirements in Attachment G (*Container Management*).

The Permittees shall only store containers at the permitted units identified as utilizing waste process code S01 and specified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*). The Permittees are authorized to store only those wastes identified by EPA Hazardous Waste Numbers (waste codes) listed in Attachment B (*Part A Application*) and identified as utilizing waste process code S01. The Permittees shall not store containers of hazardous waste in excess of the maximum capacities for each permitted container storage unit identified in Attachment B.

3.2 CONDITION OF CONTAINERS

The Permittees shall ensure that all containers used to store hazardous wastes subject to this Permit are in good condition (e.g., no severe rusting or apparent structural defects) in accordance with 40 CFR § 264.171, which is incorporated herein by reference. If a container is not in good condition or begins to leak, the Permittees shall:

1. transfer the waste from such a container into a container that is in good condition; and

2. repair or over-pack the container or repackage the waste in a container that is in good condition.

3.3 ACCEPTABLE STORAGE CONTAINERS

The Permittees shall only use containers that comply with DOT shipping container regulations (49 CFR § 173 - *Shippers - General Requirements for Shipment and Packaging,* and 49 CFR § 178 - *Specifications for Packaging*) for storage of hazardous waste at CSUs.

3.4 COMPATABILITY OF WASTE WITH CONTAINERS

The Permittees shall use containers made of, or lined with, materials that are compatible with and will not react with the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired (40 CFR § 264.172).

3.5 MANAGEMENT OF CONTAINERS

The Permittees shall ensure that all containers are kept closed during storage except when waste is added to or removed from the container or when a container's contents need to be repackaged (40 CFR § 264.173(a)).

The Permittees shall not open, handle, or store a container holding hazardous waste in a manner that may rupture the container or cause the container to leak (40 CFR 264.173(b)).

The Permittees shall establish and maintain lines of demarcation which identify the boundaries of all container storage area permitted units. The line can be identified by paint, tape, or other permanent, visible marking on the floor or base material (40 CFR § 270.32(b)). A permanent fence marking the unit boundary satisfies this requirement.

The Permittees shall ensure that drums stored in removable buildings (e.g., modular buildings, transportainers) with non-grated floors are stored on wheeled drum dollies, steel pallets, or are otherwise elevated.

The Permittees shall ensure that when waste containers are moved during storage their waste package identification numbers (bar codes), origin and destination, and package changes (e.g., over-pack volumes and dimensions) are documented in accordance with Permit Section 2.12 (40 CFR § 264.73(b)(2)).

3.5.1 Storage Configuration and Minimum Aisle Space

The Permittees shall maintain adequate aisle space at all times to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the permitted CSUs. Additionally, emergency egress aisles with a minimum aisle space of two feet must be maintained at all personnel doors (40 CFR § 264.35).

The Permittees are authorized to stack containers of hazardous waste to a maximum height of 10 feet, 2 inches (40 CFR § 270.32(b)). Containers stacked greater than two high shall be located on an absolutely level surface.

The Permittees shall ensure that hazardous waste containers are not stored within five feet of the perimeter fence, within five feet of any structure, or within five feet of the paved or unpaved roadway.

The Permittees shall store hazardous waste gas cylinders in cylinder racks, baskets, or on specially constructed pallets that provide support and restraint.

The Permittees shall ensure that hazardous waste containers that are stored outdoors and are not being actively managed are precluded from contact with precipitation using weather protective equipment (e.g., containment shell, secured tarp) (40 CFR § 270.32(b)).

3.6 WASTE CONTAINER LABELING

The Permittees shall ensure that all containers storing hazardous waste have a "Hazardous Waste" label that lists the generator's name, address, and EPA Identification number, the accumulation start date, and all applicable EPA Hazardous Waste Number(s). All containers holding mixed waste shall include a "Radioactive Materials/Radioactive Waste" label. Records for all containers will be maintained in accordance with Permit Section 2.12.

The Permittees shall ensure that all containers not stored on a secondary containment system, including a secondary containment pallet, are clearly labeled as not containing free liquids (40 CFR § 270.32(b)).

3.7 CONTAINMENT SYSTEMS

3.7.1 Containers with Free Liquids

The Permittees shall maintain secondary containment systems in all CSUs used to store wastes which contain free or residual liquids in compliance with 40 CFR § 264.175, which is incorporated herein by reference. The Permittees shall store containers of hazardous wastes in a manner that prevents contact with any liquids that may be present within the secondary containment system.

The Permittees shall remove spilled or leaked waste and accumulated precipitation from any sumps or other collection areas within 24 hours of detection. The Permittees shall maintain the base of secondary containment systems to ensure they are impervious in order to contain leaks, spills, and/or accumulated precipitation until the collected liquids are detected and removed. The Permittees shall also ensure that the containment system have adequate structural strength to withstand the stresses of daily operations.

The Permittees shall seal or coat concrete secondary containment structures with a material that is compatible with and impervious to the wastes stored in the container storage area. If a coating or sealant is used, the Permittees shall maintain documentation in the Facility Operating Record that the coating or sealant was applied in accordance with the manufacturer's specifications that includes, but is not limited to, the manufacturer's specifications and a demonstration that the coating or sealant was applied in accordance with the manufacturer's specifications and that the coating or sealant is re-applied in accordance with the manufacturer's specifications. If the base of the containment unit has expansion or construction joints, the Permittees shall install and maintain chemically resistant water stops, which are embedded in the concrete, or equivalent external systems (e.g. sealant systems) (40 CFR § 270.32(b)).

If a flexible liner is used, the Permittees shall maintain documentation in the Facility Operating Record that includes, but is not limited to, the manufacturer's specifications and demonstration that the flexible liner was installed in accordance with the manufacturer's specifications and that the flexible liner is maintained in accordance with the manufacturer's specifications (40 CFR § 270.32(b)).

If the base, liner or coating is cracked or otherwise damaged, the Permittees shall repair the damage promptly and properly, within 15 calendar days of detecting the problem. The Permittees shall perform any concrete or asphalt repair using an appropriate repair method (e.g., ACI standards or manufacturer's recommendations), which will prevent future damage at the same location (40 CFR § 264.15(c) & 40 CFR § 270.32(b)). The Permittees shall apply coatings or sealants, if applicable, to the repaired area before waste storage activities resume. The Permittees must record any damage or repair to containment systems in the inspection logs required by Part 2, Section 2.6.3.

3.7.2 Containers without Free Liquids

For container storage areas that will only store wastes without free liquids, the Permittees shall ensure that:

1. the storage areas are sloped or otherwise designed and operated to drain and remove liquid resulting from precipitation or other liquids (40 CFR § 264.175(c)(1)); or

2. the containers are elevated or otherwise protected from contact with accumulated liquids (40 CFR § 264.175(c)(2)).

The Permittees shall comply with the secondary containment requirements for hazardous wastes that do not contain free liquids and have the following waste codes: F020, F021, F022, F023, F026 and F027 (40 CFR § 264.175(d)(1)).

The Permittees shall ensure that the permitted units identified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*), as managing "non-liquid wastes only" only manage non-liquid wastes.

3.8 INSPECTION SCHEDULES AND PROCEDURES

The Permittees shall inspect the permitted container storage units at least weekly for evidence of leaks or deterioration of the containment system by corrosion, cracking, differential settlement or other factors (40 CFR § 264.174).

The Permittees shall store containers in a manner that allows the containers to be inspected for leaks, corrosion, deterioration, and for container labels to be read without moving them (40 CFR § 264.174 & 40 CFR § 270.32(b)).

3.9 VOLATILE ORGANIC AIR EMISSIONS

The Permittees shall control air pollutant emissions from each hazardous waste container at a permitted unit in accordance with the standards specified in 40 CFR §§ 264.1084 and 264.1086, which are incorporated herein by reference. The Permittees shall also manage hazardous wastes subject to emission controls in accordance with Attachment G (*Container Management*) and Attachment E (*Inspection Plan*).

The Permittees shall not be required to control air pollutant emissions from a container:

1. if all hazardous waste entering the container has an average VOC concentration at the point of origin of the waste of less that 500 ppmw;
2. if the container manages solely radioactive mixed waste (40 CFR § 264.1080(b)(6)); or
3. if the container holding the wastes has a total capacity of less than 0.1 cubic meters (approximately 26 gallons).

If the Permittees claim an exemption from air pollution emission controls due to a container holding radioactive mixed waste, the Permittees shall clearly label the container as containing a radioactive component.

A suitable method to control container air pollution emissions is the utilization of the container construction specifications and operation requirements at 40 CFR § 264.1086(b). This emission control method is met if the containers meet the following requirements:

1. the containers have a capacity of greater than 0.1 cubic meters and less than 0.46 cubic meters (approximately 119 gallons);
2. the containers meet U.S. Department of Transportation (DOT) specifications under 49 CFR Part 178;
3. the containers are kept closed during storage; and
4. the containers are inspected weekly to ensure lids and openings are securely closed and there in no possibility of air emissions (40 CFR §§ 264.1086(c)(3) and (4)).

Containers may be opened for the purpose of adding or removing waste or as otherwise allowed at 40 CFR § 264.1086(c)(3).

The Permittees shall characterize hazardous wastes subject to emission controls in accordance with Permit Section 2.4 (*Waste Analysis*) and Attachment C (*Waste Analysis Plan*).

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PART 4: STORAGE IN TANKS

4.1 GENERAL CONDITIONS

The Permittees shall store hazardous waste in tanks in accordance with the requirements of this Permit Part, in accordance with 40 CFR Part 264, Subpart J, which is incorporated herein by reference, in accordance with the TA-55 tank storage specific requirements of Part 15 (*TA-55*), and in accordance with the requirements specified in Attachment H (*Tank Management*).

The Permittees shall store hazardous waste only in those tanks associated with permitted units identified with process code S02 in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Unit Actively Managing Hazardous Waste*). Further, the Permittees shall store no more hazardous waste than the operating capacity identified in the Table.

The Permittees shall store in tanks only those wastes with the EPA Hazardous Waste Numbers listed in association with the applicable storage tanks in Attachment B (*Part A Application*).

The Permittees shall ensure that hazardous wastes or treatment reagents are not placed in a tank system if they could cause the tank, its ancillary equipment, or the containment system to rupture, leak, corrode, or otherwise fail (40 CFR § 264.194(a)).

The Permittees shall use appropriate controls and practices to prevent spills and overflows from tank or containment systems in accordance with 40 CFR § 264.194(b), which is incorporated herein by reference.

4.2 EXISTING TANK SYSTEM INTEGRITY

The Permittees shall keep in the Facility Operating Record the written integrity assessments of all existing tank systems provided with the Permittees' Permit Application.

4.3 NEW TANK SYSTEMS

The Permittees shall ensure that during the installation of new tank systems that proper handling procedures are adhered to in order to prevent damage to the system (40 CFR § 264.192(b)).

The Permittees shall ensure that prior to placing a new tank system or component in use, an independent, qualified, professional engineer registered in the State of New Mexico, trained and experienced in the proper installation of tank systems or components, inspects the new system in accordance with the requirements of 40 CFR § 264.192(b), which is incorporated herein by reference.

The new tank system shall be tested for tightness prior to being placed into use (40 CFR § 264.192(d)). If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system shall be performed prior to the system being placed into use.

The Permittees shall obtain and keep in the Facility Operating Record the written statements required at 40 CFR § 264.192.

4.4 RELEASES FROM TANKS

The Permittees shall ensure that all tank systems have associated secondary containment systems that conform to the requirements specified at 40 CFR § 264.193, which is incorporated herein by reference.

The Permittees shall ensure that spilled, leaked, or otherwise accumulated liquids are removed from the secondary containment system within 24 hours (40 CFR § 264.193(c)(4)). The Permittees shall notify the Department of any accumulated liquids within a secondary containment system within five days of discovery of such liquids (40 CFR § 270.32(b)).

The Permittees shall ensure that secondary containment systems comprised in-part by floor, wall, joint, or penetration sealants, are installed and maintained in accordance with the sealant manufacturer's recommendations, and that a copy of those recommendations and the Permittees' records of conforming to those recommendations are maintained in the Facility's Operating Record (40 CFR § 270.32(b)).

The Permittees shall ensure that all ancillary tank equipment (e.g., piping) have secondary containment in accordance with 40 CFR § 264.193(f), which is incorporated herein by reference. Above ground waste piping, including welded flanges, joints, and connections, shall be inspected for leaks each operating day.

The Permittees shall ensure that a tank system or secondary containment system from which there has been a leak or spill, or which is unfit for use, is removed from service immediately and otherwise complies with the requirements of 40 CFR § 264.196, which is incorporated herein by reference.

The Permittees shall ensure that that any release of a hazardous waste from a tank system to the environment (e.g., soil, surface water, groundwater, atmosphere) is reported to the Department within 24 hours of its detection (40 CFR § 264.196(d)). Within 30 days of detection of a release to the environment, the Permittees shall submit a report to the Department containing the information at 40 CFR § 264.196(d)(3).

The Permittees shall ensure that unless the tank system repair requirements of 40 CFR §§ 264.196(e)(2) through (4) can be satisfied to the discretion of the Department, the tank system will be closed in accordance with 40 CFR § 264.197, which are incorporated herein by reference, and the conditions of this Permit. If the Permittees repair the tank system, the Permittees shall certify that the system is capable of handling hazardous wastes without release for the intended life of the system in accordance with the requirements of 40 CFR § 264.196(f), which is incorporated herein by reference.

4.5 IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

The Permittees shall ensure that hazardous waste stabilization units that manage ignitable or reactive waste do so in accordance with 40 CFR § 264.198, which is incorporated herein by reference.

The Permittees shall ensure that incompatible wastes, or incompatible wastes and materials, are not placed in the same tank system (40 CFR § 264.199).

4.6 VOLATILE ORGANIC AIR EMISSIONS

The Permittees shall control air pollutant emissions from each hazardous waste tank at a permitted unit in accordance with the standards specified in 40 CFR §§ 264.1084 and 264.1086, which are incorporated herein by reference. The Permittees shall also manage hazardous wastes subject to emission controls in accordance with Attachment H (*Tank Management*) and Attachment E (*Inspection Plan*).

The Permittees shall not be required to control air pollutant emissions from a tank under the following circumstances:

1. if all hazardous waste entering the tank has an average VO concentration at the point of origin of the waste of less that 500 ppmw; or

2. if the tank manages solely radioactive mixed waste (40 CFR § 264.1080(b)(6)).

If the Permittees claim exemption from air pollution emission controls due to a tank managing radioactive mixed waste, the Permittees shall clearly label the tank as containing a radioactive component (40 CFR § 270.32(b)).

The Permittees shall characterize hazardous wastes subject to emission controls in accordance with Permit Section 2.4.

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PART 5: TREATMENT BY STABILIZATION

5.1 GENERAL CONDITIONS

The Permittees shall treat hazardous waste by stabilization in accordance with the requirements of this Permit Part, in accordance with 40 CFR Part 264, Subpart X, which is incorporated herein by reference, and in accordance with the requirements specified in Attachment J (*Stabilization Unit Management).*

The Permittees shall treat hazardous waste by stabilization only in those permitted units identified with process code X01 in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*). The Permittees shall treat no more hazardous waste at a stabilization unit than the operating capacity identified in the Table.

The Permittees shall treat in a stabilization unit only those waste with the EPA Hazardous Wastes Numbers listed in association with the applicable treatment unit in Attachment B (*Part A Application*).

The Permittees shall ensure that hazardous waste to treatment reagents are not placed in the treatment system in they could cause the system or its containment system to rupture, leak, corrode, or otherwise fail (40 CFR § 264.194(a)).

The Permittees shall use appropriate controls and practices to prevent spills and overflows from the treatment system (40 CFR § 264.194(b)).

5.2 RELEASES FROM STABILIZATION UNITS

The Permittees shall ensure that all stabilization units have associated secondary containment systems that conform to the requirements specified at 40 CFR § 264.193, which is incorporated herein by reference.

The Permittees shall ensure that spilled, leaked, or otherwise accumulated liquids are removed from the secondary containment system within 24 hours (40 CFR § 264.193(c)(4)). The Permittees shall notify the Department of any accumulated liquids within a secondary containment system within five days of discovery of such liquids (40 CFR § 270.32(b))

The Permittees shall ensure that secondary containment systems comprised in part by floor, wall, joint, or penetration sealants, are installed and maintained in accordance with the sealant manufacture's recommendations, and that a copy of those recommendations and the Permittees' records of conforming to those recommendations are maintained in the Facility's Operating Record (40 CFR § 270.32(b)).

The Permittees shall ensure that all ancillary stabilization unit equipment (e.g., piping) have secondary containment in accordance with 40 CFR § 264.193(f), which is incorporated herein by reference. Above ground waste piping, including welded flanges, joints, and connections, shall be inspected for leaks each operating day.

The Permittees shall ensure that a stabilization unit or associated secondary containment system from which there has been a leak or spill, or which is unfit for use, is removed from service immediately and otherwise complies with the requirements of 40 CFR § 264.196, which is incorporated herein by reference.

The Permittees shall ensure that that any release of a hazardous waste from a stabilization unit to the environment (e.g., soil, surface water, groundwater, atmosphere) is reported to the Department within 24 hours of its detection (40 CFR § 264.196(d)). Within 30 days of detection of a release to the environment, the Permittees shall submit a report to the Department containing the information at 40 CFR § 264.196(d)(3).

5.3 VOLATILE ORGANIC AIR EMISSIONS

The Permittees shall ensure that all hazardous wastes treated in stabilization units are done so in accordance with 40 CFR Part 264, Subparts BB and CC, which are incorporated herein by reference.

PART 6: TREATMENT BY OPEN BURNING

6.1 GENERAL CONDITIONS

The Permittees shall conduct open burning operations in accordance with this Permit Part, in accordance with 40 CFR Part 264, Subpart X and 40 CFR §§ 268.7(b) and 270, which are incorporated herein by reference, in accordance with Permit Part 12 (*TA-16*), and Attachment I (*Open Burn Unit Management*).

The Permittees shall treat by open burning only those hazardous wastes that have an explosive component in order to remove the characteristics of reactivity (D003) and ignitability (D001).

The Permittees shall not treat by open burning any hazardous waste containing a radionuclide component (40 CFR § 270.32(b)).

The Permittees shall limit open burning treatment activities to waste that would result in detonation or deflagration .This includes the following HE-contaminated materials:

1. water;
2. solvent waste;
3. used oil;
4. solid and scrap;
5. commercial chemical products;
6. wet HE;
7. solid waste;
8. equipment; and
9. liquid acids, bases, and/or inorganic salt solutions.

6.2 MANAGEMENT OF OPEN BURNING UNITS

The Permittees shall maintain run-on and run-off controls (40 CFR § 270.14(b)(8)(ii)), including the following structures:

1. berms or ditches of sufficient size up-gradient of the OB unit to prevent run-on;
2. covers to prevent precipitation from contacting treatment residue (thus preventing residue run-off); and

3. berms or ditches of sufficient size down-gradient of the OB unit to ensure proper drainage run-off.

The Permittees shall ensure burning operations occur during daylight hours only (i.e., from one-hour after sunrise to one-hour before sunset).

The Permittees shall ensure burning operations occur when wind speed ranges do not exceed 15 mph.

The Permittees shall ensure that burning operations do not occur when an electrical storm(s) exists within three miles of the permitted unit.

The Permittees shall ensure that burning operations do not occur during precipitation or inclement weather or if storms are forecasted for the location of the permitted unit within a four-hour period.

The Permittees shall ensure that burning operations do not occur during a weather inversion or if an inversion is forecasted for the location of the permit unit within a four-hour period.

The Permittees shall remove any and all combustible material at a minimum radius of 200 ft from the open burn treatment location as a fire prevention measure.

The Permittees shall ensure that wastes be placed in the open burn treatment unit only if treatment is planned within four hours. If oversized equipment requires complex staging, the Permittees may stage the equipment on a burn pad for 48-hours and the Department will not consider the staging inappropriate storage; however the equipment and the unit must be covered.

The Permittees shall maintain a minimum temperature of 400 degrees Celsius during open burning to ensure complete thermal degradation of HE wastes.

The Permittees shall use secondary containment (i.e., additional pan or tray) when burning HE-contaminated liquids.

The Permittees shall cover the containment devices (e.g., pans, trays, or flash pads) within eight hours of the last open burn event while awaiting collection of treatment residue.

The Permittees shall clean open burn unit containment devices of any treatment residue within 24 hours after any open burning event. These residues shall be managed as a hazardous waste until determined otherwise based on waste analyses.

The Permittees shall wait a minimum of 24 hours between open burning events before burn pan/flash pad reuse to allow the surface to cool.

The Permittees shall cover open burn unit containment devices (e.g., pans, trays, or flash pads) when not in use to prevent the collection and runoff of precipitation.

6.3 GENERAL CLOSURE REQUIREMENTS

At the time of closure, the Permittees shall meet the closure performance standards outlined in Permit Part 9, Section 9.3 for any open burn unit at the Facility, or any portion of an open burn unit, in accordance with this Permit Part, 40 CFR §§ 264.110 through 264.116, 40 CFR Part 264, Subpart X, incorporated herein by reference, and any applicable portions of Permit Part 12 and Attachment K (*Closure Plan*).

The Permittees shall collect soil samples at the open burn units at the surface and at depths of three and five feet below ground surface directly adjacent to the pad sides (in the center), and at the four corners, as well as directly beneath any sumps, drains, or catch basins. If contamination is detected five feet below ground surface, the Permittees shall collect samples at two-foot intervals below the five-foot depth until contamination is no longer detected in order to define the vertical extent of contaminant releases.

The Permittees shall delineate the horizontal extent of contamination by repeating the sampling protocol by moving away from the unit along lines emanating from the center of the unit to the next sampling location at 20-foot intervals beyond any location where contamination is detected. All soil samples shall be submitted to a contract laboratory for analysis of explosive compounds, perchlorate, VOCs, SVOCS, and Target Analyte List (TAL) metals. Sampling and analysis procedures shall conform to Attachment C (*Waste Analysis Plan*).

In the event clean closure of an open burn unit cannot be achieved, the Permittees shall submit to the Department a post-closure care plan for the site in accordance with Permit Part 10 and as required by 40 CFR §§ 264.117 through 264.120. The Post-Closure Care Plan must provide provisions to stabilize the site as part of a permit modification request that includes, but is not limited to, planned monitoring activities, inspection and maintenance activities, and the frequencies at which these activities will be performed.

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PART 7: (RESERVED)

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PART 8: (RESERVED)

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PART 9: CLOSURE

9.1 GENERAL CONDITIONS

At the time of closure of storage and treatment units, the Permittees shall meet the closure performance standards outlined in Permit Section 9.3 at any permitted unit at the Facility, or any portion of a permitted unit, in accordance with 40 CFR §§ 264.110 through 264.116, 264.178, 264.197, 264.228, 264.310, 40 CFR Part 264, Subpart X (all are incorporated herein by reference), this Permit Part, and any applicable portions of Permit Parts 3, 4, 5, 6, 12, 13, 14, 15, and 16, and Attachment K (*Closure Plan*). If, upon completion of closure at any unit, the clean closure performance standard defined in Permit Section 9.3 is not achieved, the Permittees shall submit a Permit modification request to the Department to conduct post-closure care. For disposal units (TA-54 Areas L, G & H), the Permittees shall conduct such corrective action and closure activities as required by the Department under the Consent Order (Order) and this Permit Part (9), respectively, and submit a permit modification request for a post-closure care permit (40 CFR § 270.32(b)).

If a permitted unit undergoing closure is situated among solid waste management units (SWMU) or areas of concern (AOC) and cannot achieve clean closure as defined in Permit Section 9.3, clean-up of the permitted unit shall be coordinated with corrective action for the SWMUs or AOCs in accordance with 40 CFR § 264.110(c)(1), which is incorporated herein by reference.

The Permittees shall close open burning units in accordance to the requirements in this Permit Part as well as those conditions included in Permit Part 6 (*Treatment by Open Burning*) and Part 12 (*TA-16 Specific Permit Requirements*).

9.2 STORAGE AND TREATMENT UNITS

With respect to closure of each permitted storage and treatment unit, the Permittees shall abide by the following requirements.

9.2.1 Closure Plan

For every permitted unit at the Facility, the Permittees shall submit a Closure Plan to the Department for approval which identifies all steps necessary to perform closure. The Permittees shall prepare the Closure Plans in accordance with 40 CFR § 264.112, incorporated herein by reference, and include all of the requirements addressed in Permit Sections 9.2.4 (*Closure Activities for Indoor Storage and Treatment Units*) and 9.2.5 (*Closure Activities for Outdoor Storage and Treatment Units*). The Closure Plans shall, at a minimum, describe how each permitted unit, or portion of a permitted unit, will be closed to meet the closure performance standards. The Permittees shall include in each Closure Plan a Sampling and Analysis Plan (SAP) for each permitted unit based on Permit Section 9.2.1.1. The Department must approve all SAPs before sampling activities begin.

The Permittees shall establish a comprehensive list of contaminants of potential concern for each permitted unit undergoing closure by identifying the following:

1. all hazardous wastes managed within the permitted unit; and

2. all hazardous constituents contained within those wastes.

The comprehensive list of contaminants of potential concern shall be utilized to select the analytical methods capable of detecting the contaminants associated with the unit.

The Permittees shall submit detailed Closure Plans for each permitted unit incorporating all the requirements identified in this Permit Part in the form of a Class 3 permit modification request. The Permittees shall submit these Closure Plans for each permitted unit at the TAs listed below in accordance with the following schedule:

1. TA-54 Area L and TA-50 – within 90 days of the effective date of this Permit;

2. TA-54 Area G and TA-55 – within 180 days of the effective date of this Permit; and

3. TA-54 West, TA-3, and TA-16 – within 270 days of the effective date of this Permit.

The Permittees shall include in each permitted unit's Closure Plan a schedule for completing the requirements in this Permit Part in accordance with 40 CFR § 264.112(b)(6), which is incorporated herein by reference.

The Permittees may propose additional or alternate sampling activities in the SAP that address unit-specific conditions.

9.2.1.1 Sampling and Analysis

The Permittees' SAP shall provide for:

1. verification sampling to ensure that equipment, structures, and/or buildings are decontaminated and to determine whether there has been a release of hazardous constituents to environmental media;

2. investigative sampling if a release of hazardous constituents to environmental media is identified in step 1 above in order to determine the nature and extent of the release; and

3. confirmatory sampling to confirm completion of clean-up of media affected by any such release.

All SAPs shall, at a minimum, include:

1. *Number and locations of the verification/ investigative/confirmatory samples to be collected.* The rationale for the number and locations of samples proposed that will confirm achievement of the closure performance standard and a site plan depicting the boundaries of the regulated unit as well as sampling locations (e.g., sumps, catch basins, conveyance systems, and other potential release locations, and locations of spills or other releases of hazardous waste or hazardous constituents during operation of the unit);

2. *Type of verification/ investigative/confirmatory samples.* The type of samples to be collected (e.g., wash-water, swipe, core, chip, soil) and the rationale for the selection of sample types;

3. *Field sampling methods.* A description of the methods and procedures that will be used to collect each type of sample;

4. *Quality Assurance Procedures.* A description of the quality assurance/quality control procedures that include, but are not limited to:

   a. duplicates, trip blanks, equipment blanks;

   b. a description of methods for decontamination of re-usable sampling equipment;

   c. a description of all sample preservation, handling, labeling, and chain-of-custody procedures;

5. *Contaminants of Potential Concern.* A list of contaminants of potential concern that the Permittees shall sample; and

6. *Cleaning Solutions.* The Permittees shall make certain that all cleaning solutions to be used during closure are identified in the unit-specific Sampling and Analysis Plan.

9.2.2 Amendment of the Closure Plan

The Permittees shall submit a permit modification request to authorize a change in the approved Closure Plan upon the occurrence of events listed in 40 CFR §§ 264.112(c)(1) - (4) and 270.42, which are incorporated herein by reference. The written request must include a copy of the amended Closure Plan and all proposed modifications to the Plan.

9.2.3 Closure Schedule

9.2.3.1 Notification of Closure

The Permittees shall notify the Department in writing at least 45 days prior to the date on which they expect to begin partial or final closure of a permitted unit, or a portion of a unit, according to 40 CFR § 264.112(d)(1), which is incorporated herein by reference. The Permittees shall begin closure of a permitted unit no later than 30 days after the date on which the unit receives the known final volume of hazardous waste or, if there is a reasonable possibility that the permitted unit will receive additional hazardous wastes, no later than one year after the date on which the unit received the most recent volume of hazardous wastes, in accordance with 40 CFR § 264.112(d)(2)(i).

9.2.3.2 Time Allowed for Closure

The Permittees shall complete all partial or final closure activities in compliance with this Permit Part within 180 days after receiving the final volume of hazardous waste at a permitted unit

unless an extension is approved by the Department (40 CFR §§ 264.113(a)(1) and (2) or 264.113(b)(1) and (2), which are incorporated herein by reference).

9.2.4 Closure Activities for Indoor Storage and Treatment Units

The Permittees shall outline, and implement at closure, the procedures in Permit Sections 9.2.4.1 through 9.2.4.8 in each unit-specific Closure Plan in order to ensure attainment of the closure performance standards at Permit Section 9.3.

9.2.4.1 Removal of Hazardous Waste

Within 90 days after receiving the final volume of hazardous waste at a permitted unit, the Permittees shall treat, remove from the unit, or dispose of on-site, all hazardous waste in accordance with a Department approved Closure Plan (40 CFR §§ 264.113 and 264.178 (which are incorporated herein by reference)).

9.2.4.2 Records Review and Structural Assessment

The Permittees shall conduct a records review for, and a structural assessment of, each permitted unit prior to closure. The Permittees shall, during the records review, update the list of COPCs in Section 9.2.1(2) to accurately reflect the hazardous wastes managed at the unit.

The Permittees shall review the permitted unit's Operating Record, including but not limited to, inspection and contingency plan implementation records, to determine if any spills, defects, deterioration, damage, or hazards affecting waste containment occurred or developed during the life of the unit. If the records indicate any such problems (e.g., spills or releases, damage to the flooring or other building materials) the Permittees shall include these sites in the SAP as sample locations for release assessment purposes (40 CFR § 270.32(b)).

The Permittees shall notify the Department a minimum of 60 calendar days prior to conducting the structural assessment of the unit to be closed to provide the Department the opportunity to participate in the unit's physical condition review. If the assessment reveals any evidence of release (e.g., staining) to the flooring or building materials, the Permittees must also incorporate these sample locations into the SAP (40 CFR § 270.32(b)).

Upon completion of the structural assessment and records review, the Permittees shall submit an updated SAP in the Closure Plan (Permit Section 9.2.2) for the permitted unit to be closed in accordance with the requirements in this Permit Section and Permit Sections 9.2.4.6 and 9.2.5.6 which includes all additional sampling locations, methods, and procedures identified as necessary during the records review and structural assessment (40 CFR § 264.112(c)).

9.2.4.3 Decontaminate or Remove all Structures and Equipment at Units Undergoing Closure

The Permittees shall decontaminate all equipment (e.g., moveable equipment, ventilation systems, secondary containment pallets, transportainers) and structures (e.g., walls, floors, ceilings, stairs, railings) associated with the permitted unit being closed in accordance with the

requirements for Closure Plans in 40 CFR §§ 264.112(b)(4) and 264.114, which are incorporated herein by reference.

The Permittees shall decontaminate all structures and equipment by pressure washing or steam cleaning. The Permittees shall ensure that washing activities are repeated until decontamination is verified in accordance with Permit Section 9.2.4.6 (40 CFR § 270.32(b)). The Permittees shall ensure that any structures or equipment that cannot be decontaminated are removed (or containerized) in accordance with 40 CFR § 264.114, which is incorporated herein by reference, and managed in compliance with all applicable waste management regulations (Permit Section 9.2.4.5). All cleaning solutions used to decontaminate buildings, structures, and equipment shall be containerized, characterized, and managed in compliance with all applicable waste management regulations.

9.2.4.4 Disposal Procedures

The Permittees shall dispose of any equipment, structures, decontamination waste, and environmental media associated with the permitted unit being closed that could not be decontaminated in accordance with this Permit Part and 40 CFR § 264.114, which is incorporated herein by reference. This includes but is not limited to:

1. demolitioned debris;
2. contaminated media (e.g., soils);
3. containerized waste; and
4. decontamination waste.

The Permittees shall comply with all applicable state, federal, and local requirements for the disposal of waste generated during closure activities.

9.2.4.5 Management of Waste Generated During Closure

By removing any hazardous wastes or hazardous waste constituents during partial or final closure, the Permittees become a generator of hazardous waste. The Permittees shall manage the waste in compliance with all applicable waste management regulations (40 CFR § 264.114).

9.2.4.6 Verification Sampling

After decontamination and removal (Permit Section 9.2.4.3) the Permittees shall conduct verification sampling activities, as described in this Permit Section, and include them in each permitted unit's SAP. Such verification sampling activities will ensure the decontamination of equipment and structures and assist the Permittees in determining whether a release of hazardous constituents to environmental media has occurred.

The Permittees shall collect one sample every 250 square feet in loading and unloading zones, and one sample every 500 square feet on walls and floors of the permitted unit. The type of

sample collected (e.g., wash-water, swipe, chip, core, soil) shall depend on the material being sampled and the constituents being analyzed. The Permittees shall provide the rationale for proposing the types of samples to be collected.

The Permittees shall collect samples at locations identified during the records review and structural assessment where stains, cracks, gaps, or other damaged conditions are present as well as where the Operating Record indicates any instances of spills or releases.

If samples collected from any equipment or surfaces indicate the presence of contamination above Department approved closure performance standards included in Permit Section 9.3, the contaminated area must be re-washed and re-sampled. The Permittees shall continue this process until decontamination is achieved or it is determined that Permit Section 9.3 standards cannot be attained.

If verification samples on floors detect hazardous constituents, the Permittees shall follow the release investigation procedures identified in Permit Section 9.2.4.7.

The Permittees shall collect one swipe sample for every 10 feet of exposed piping (40 CFR § 270.32(b)).

At container storage units, the Permittees shall decontaminate the entire room, including but not limited to walls, floors, ceilings, and include these sites in the sampling area grid locations (40 CFR § 270.32(b)).

The Permittees may collect swipe samples analyzed for radionuclides for use as indicators of contaminant releases in units where radionuclides were stored. The Permittees shall not however use these as surrogates for validation of clean closure at permitted units (40 CFR § 270.32(b)).

If the Permittees plan to demolish the permitted structure or building, then an alternate sampling approach shall be proposed in the SAP. In this case, the Permittees shall follow the soil verification sampling procedures identified in Permit Section 9.2.5.6 (40 CFR § 270.32(b)).

The Permittees' verification samples in zones constructed of asphalt or asphaltic concrete shall consist of collecting soil samples from the subgrade and soils beneath the asphalt at intervals approved by the Department. If verification soil samples detect contamination, the Permittees shall remove all of the asphalt (or asphaltic concrete) and follow the soil contamination investigation procedures identified in Permit Section 9.2.4.7.

9.2.4.7 Investigative Sampling to Determine the Extent of a Release

The Permittees must determine the extent of any releases of contamination detected during closure activities if contamination is discovered. If contamination is discovered at any sampling point, the Permittees shall determine the extent of the contamination by collecting and analyzing samples of the surrounding and underlying soils. The Permittees shall collect additional samples, if soil contamination in these samples is detected, in order to determine both the lateral and vertical extent of contamination of any release from the permitted unit (40 CFR § 270.32(b)).

9.2.4.8 Confirmatory Sampling to Confirm Clean-Up

The Permittees shall remove all contaminated media if samples collected from beneath any permitted unit indicate the presence of hazardous constituents above levels established in Permit Part 11 (*Corrective Action*). After removal, the Permittees shall demonstrate via confirmatory sampling that clean-up levels stated in Permit Section 9.3 and Permit Part 11 have been achieved (40 CFR § 264.114).

9.2.5 Closure Activities for Outdoor Storage Units

The Permittees shall outline, and implement at closure, the procedures in Permit Sections 9.2.5.1 through 9.2.5.8 in each unit-specific Closure Plan in order to ensure attainment of the closure performance standards specified at Permit Section 9.3.

9.2.5.1 Removal of Hazardous Waste

Within 90 days after receiving the final volume of hazardous waste at a permitted unit, the Permittees shall treat or remove from the unit all hazardous waste in accordance with 40 CFR § 264.112 through 114, which are incorporated herein by reference.

9.2.5.2 Records Review and Structural Assessment

The Permittees shall conduct the records review and structural assessment for outside storage units in accordance with Permit Section 9.2.4.2.

9.2.5.3 Decontaminate or Remove all Structures and Equipment at Units Undergoing Closure

The Permittees shall follow the decontamination and removal requirements outlined in Permit Section 9.2.4.3.

9.2.5.4 Disposal Procedures

The Permittees shall dispose of all wastes generated during closure of outdoor storage units in accordance with Permit Section 9.2.4.4.

9.2.5.5 Management of Waste Generated During Closure

The Permittees shall manage all remediation waste in accordance with Permit Section 9.2.4.5.

9.2.5.6 Verification Sampling

After decontamination and removal as discussed in Permit Section 9.2.5.3, the Permittees shall conduct the following verification sampling activities to determine if environmental media at the permitted unit has been contaminated as a result of waste management operations.

The Permittees shall provide in the SAP one sample every 250 square feet in loading and unloading zones and one sample for every 500 square feet in the storage areas. The type of sample

collected (e.g., swipe, building materials, core, soil) shall depend on the material being sampled and the chemical analyses being conducted.

The Permittees shall collect a soil sample at the interface of fill and native soil or tuff beneath all areas associated with water catchments or conveyances including, but not limited to, sumps, catch basins, secondary containment areas, and drains (40 CFR § 270.32(b)).

The Permittees shall collect a soil sample at the interface of fill and native soil or tuff beneath any underground piping at 10 foot intervals and outfall discharge locations (40 CFR § 270.32(b)).

The Permittees shall collect soil samples at the locations of all cracks, gaps, and all other locations where damage to the unit structure has occurred, and at all locations where staining or other evidence of releases were identified during the records review and structural assessment. The Permittees shall collect a soil sample beneath all intersections of piping associated with the unit undergoing closure. The Permittees shall collect one soil sample every 30 feet beneath the axis of the lowest portions of any open conveyance drainage system in any permitted unit that has sloped flooring (40 CFR § 270.32(b)).

The Permittees shall remove all asphalt, asphaltic concrete, concrete, and underlying subgrade materials if hazardous constituents are detected in underlying soils or tuff (40 CFR § 270.32(b)).

The Permittees may sample for radionuclides for use as indicators of contaminant releases at units where radionuclides were stored. The Permittees shall not use these samples to demonstrate the absence of contaminants for validation of clean closure at permitted units (40 CFR § 270.32(b)).

9.2.5.7 Investigative Sampling to Determine the Extent of a Release

The Permittees shall conduct all investigative sampling in accordance with Permit Section 9.2.4.7.

9.2.5.8 Confirmatory Sampling to Confirm Clean-Up

The Permittees shall conduct all confirmatory sampling in accordance with Permit Section 9.2.4.8.

9.3 CLOSURE PERFORMANCE STANDARDS

At the cessation of hazardous waste management operations at a permitted unit, or portion of a permitted unit, the Permittees shall clean close the unit, or portion of a unit, by performing the following:

1. removing all waste and waste residues;
2. minimizing the need for further maintenance;
3. controlling, minimizing, or eliminating, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents,

leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or atmosphere;

4. complying with all applicable closure requirements of 40 CFR Part 264, Subparts F, G, I, J, K, N, and X ;and

5. complying with all applicable post-closure requirements of 40 CFR Part 264, Subparts F, G, J, K, N, and X.

(40 CFR § 264.111)

Clean closure for permitted units will be achieved when all structures, equipment, and media associated with the permitted unit have been decontaminated or removed in accordance with this Permit Part.

If the Permittees can not achieve clean closure standards as defined above for 40 CFR Part 264, Subparts K, N, and X units, the Permittees shall submit a Post-Closure Care Plan according to 40 CFR § 264.117, which is incorporated herein by reference. The Post-Closure Care Plan shall be submitted to the Department as part of a permit modification request.

Clean closure for 40 CFR Part 264, Subparts I and J units is attained when sampling and analysis results of equipment and structures associated with the permitted unit demonstrate that hazardous waste, hazardous waste residues, and hazardous waste constituents are not present on equipment and structures and that contaminated media does not contain concentrations of hazardous constituents greater than the clean-up levels specified in Permit Part 11 (*Corrective Action*).

9.4 CLOSURE REPORT

At the completion of closure of any permitted unit, the Permittees shall submit a closure report for Department approval that summarizes all activities conducted during closure including, but not limited to, the following:

1. the results of all investigation;

2. remediation waste management;

3. decontamination;

4. verification/confirmation sampling activities; and

5. results of all chemical analyses and other characterization activities.

Such closure reports shall be submitted to the Department no later than 90 days after completion of unit closure. The Department may require interim reports that document the progress of closure.

9.5 CERTIFICATION OF CLOSURE TO THE DEPARTMENT

Within 60 days after the date of completion of closure of a permitted unit, or a portion of a permitted unit, and within 60 days of completion of final closure of the Facility, the Permittees shall submit to the Department, by registered mail, a certification that the permitted unit or the Facility has been closed in compliance with the specifications in this Permit Part and the approved Closure Plans. The certification must be signed by the Permittees and by an independent professional engineer registered in the State of New Mexico (40 CFR § 264.115).

If the Permittees leave waste in place, they shall submit to the Department a survey plat as required by 40 CFR § 264.116 in conjunction with the certification of closure. Documentation supporting the independent registered professional engineer's certification must be furnished to the Department upon request until the Permittees are released from the financial assurance requirements for closure under 40 CFR § 264.143.

9.6 DISPOSAL UNITS AND UNITS TO BE CLOSED AS LANDFILLS

The disposal or landfill units, Material Disposal Areas (MDAs) G, H, and L, are no longer accepting hazardous waste and must undergo closure. The first phases of closure will be conducted through the corrective measures evaluation and implementation process outlined in Section VII of the March 1, 2005 Compliance Order on Consent (Order). The Permittees are required, in accordance with the Order, to submit to the Department for approval a Corrective Measures Evaluation Report (CME) for MDAs G, H (submitted), and L on September 12, 2008 and January, 18, 2008, respectively. The Department will select remedies and issue a statement of basis for the selected remedies for each closed disposal or landfill unit in accordance with Section VII of the Order. The remedy selection is subject to public comment in accordance with 20.4.1.901 NMAC and as described in Section VII.D.7 of the Order. The selected remedies that will achieve closure of MDAs G, H, and L shall be protective of human health and the environment and attain the appropriate clean-up levels as specified in Permit Part 11 (*Corrective Action*).

Upon the Department's selection of the remedies for closure of each of the disposal or landfill units, the Permittees shall be required to submit a Corrective Measures Implementation (CMI) Work Plan to the Department for approval on a schedule established by the Department. The CMI Work Plan for each disposal or landfill unit shall satisfy the requirements for Closure Plans specified in 40 CFR § 264.112, which is incorporated herein by reference. All inspection, monitoring, and operation and maintenance (O & M) of remediation systems installed as part of CMI Work Plan (Closure Plan) implementation shall be proposed in the Post-Closure Care Plans for MDAs G, H, and L as described in Permit Part 10 (*Post-Closure Care*).

Upon approval of the Closure Plan, the Department will establish a due date for the Permittees' submission of a Closure Report addressing the results of the execution of the Closure Plan.

The selected remedies that will achieve closure of MDAs G, H, and L shall meet the human health and ecological risk cleanup levels referenced in Permit Sections 11.4 and 11.5.

PART 10: POST-CLOSURE CARE

10.1 POST-CLOSURE CARE

If, upon closure of a permitted unit, the Permittees cannot achieve the closure performance standards described in Permit Part 9 (*Closure*), the Permittees shall conduct post-closure care for that unit in accordance with the requirements of this Permit Part, pursuant to 40 CFR § 270.1(c)(6)(iii). All post-closure care activities shall be conducted in accordance with the provisions in 40 CFR §§ 264.117 through 264.120, which are incorporated herein by reference.

Post-closure care for each hazardous waste management unit shall continue for 30 years after the date of closure of that unit unless the Department:

1. shortens the post-closure care period if it is found that the reduced period is sufficient to protect human health and the environment; or

2. extends the post-closure care period if it is found that an extended period is necessary to protect human health and the environment.

(40 CFR §§ 264.117(2)(i) and (ii))

The Permittees shall submit an application for a Post-Closure Care Permit no later than 90 calendar days from the date that the Permittees determine that the permitted unit will be closed with waste in place, in accordance with 40 CFR §§ 264.117 through 120.

10.1.1 Post-Closure Care Plan

The Permittees shall submit to the Department for approval a Post-Closure Care Plan in accordance with 40 CFR § 264.118, which is incorporated herein by reference. The Post-Closure Care Plan must identify all activities, including inspection and monitoring activities that will be carried on after closure, as well as the frequency of these activities. Post-closure activities to be addressed include, but are not limited to:

1. the actions necessary for controlling, minimizing, or eliminating, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or atmosphere;

2. descriptions of the monitoring and reporting that will be performed in accordance with the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X;

3. descriptions of the procedures for maintaining and monitoring the waste containment systems in accordance with the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X to ensure:

4. the integrity of the cap and final cover or other containment systems in accordance with the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X;

5. the function of the monitoring systems in accordance with the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X; and

6. the name, address and contact information of the person(s) or office to contact regarding the unit during the post-closure care period.

10.1.2 Amendment of the Post-Closure Care Plan

The Permittees shall modify the Post-Closure Care Plan as required by 40 CFR § 264.118(d)(2), which is incorporated by reference. The Permittees shall attain prior approval from the Department by means of a permit modification request whenever: 1) a change to the approved Post-Closure Care Plan is planned; 2) there is a change in the expected year of final closure; or 3) other events occur during the active life or post-closure period of the facility that affect the approved Post-Closure Care Plan.

10.2 NOTICES AND CERTIFICATIONS

10.2.1 Notification Requirements

The Permittees shall maintain in the Facility Operating Record copies of all documentation submitted to the local zoning authority or the authority with jurisdiction over local land use. The Permittees shall submit to the Department a record of the type, location, and quantity of hazardous wastes and hazardous constituents remaining within each cell or permitted unit. For hazardous wastes disposed of before January 12, 1981, the Permittees shall identify the type, location, and quantity of the hazardous wastes in accordance with all records retained (40 CFR § 264.119(a)).

10.2.2 Record Requirements

The Permittees shall maintain documentation of certification of closure of all hazardous waste disposal units in accordance with 40 CFR § 264.119(b), which is incorporated herein by reference.

The Permittees shall record a notation on the deed to the Facility property, or on some other instrument that is normally examined during the title search, that will in perpetuity notify any potential purchaser of the property of the following:

1. the land has been used to manage hazardous wastes;

2. its use is restricted under 40 CFR Part 264, Subpart G; and

3. the survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the Facility have been filed with the Department (40 CFR § 264.119(b)(1)).

10.2.3 Completion of Post-Closure Requirements

No later than 60 days after completion of the established post-closure care period for each permitted unit required to conduct post-closure care, the Permittees shall submit to the Department, by registered mail, a certification that the post-closure care for the hazardous waste disposal unit was performed in accordance with the specifications in the approved Post-Closure Care Plan. The certification must be signed by the Permittees and an independent, New Mexico registered professional engineer. Documentation supporting the independent, registered professional engineer's certification must be furnished to the Department in conjunction with the certification (40 CFR § 264.120).

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PART 11: CORRECTIVE ACTION

This Permit Part addresses corrective action at the Facility where releases of hazardous waste or hazardous constituents to the environment have occurred. Corrective action is divided into two categories, 1) corrective action for permitted units, and 2) corrective action for units covered under the March 1, 2005 Compliance Order on Consent (Order).

11.1 CORRECTIVE ACTION REQUIREMENTS UNDER THE CONSENT ORDER

The Department and the Permittees have agreed to a Compliance Order on Consent (Consent Order) dated March 1, 2005, which requires the Permittees to conduct corrective action at all solid waste management units (SWMUs) and Areas of Concern (AOCs), at the Facility to fulfill the requirements of 40 CFR § 264.101. The Consent Order is an enforceable document pursuant to 40 CFR §§ 264.90(f) and 270.1(c)(7).

11.2 CORRECTIVE ACTION REQUIREMENTS UNDER THE PERMIT

Section III.W.1 of the Consent Order expressly identifies four circumstances in which corrective action is to be conducted under this Permit (or other enforceable document) rather than the Consent Order:

1. new releases and newly discovered releases of hazardous waste or hazardous constituents from permitted units at the Facility;

2. the closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to permitted units at the Facility;

3. implementation of the controls, including long-term monitoring, for any SWMUs or AOCs on Permit Attachment P (*Listing of SWMUs and AOCs*), Table P-2 (*Corrective Action Complete with Controls*); and

4. any corrective action to address releases of hazardous waste or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates.

In circumstances where Corrective Action is required under the Permit, the Permittees shall conduct corrective action pursuant to this Permit in accordance with sections 74-4-4(A)(5)(h) and (i) and 74-4-4.2(B) of the HWA. The Permittees shall coordinate all corrective action conducted under this Permit with corrective action conducted under the Consent Order. Corrective action for releases from operating units that co-mingle with releases originating from other sources shall be conducted under the Consent Order. Any SWMU or AOC for which corrective action is required that is not subject to corrective action under the Consent Order shall be subject to corrective action under this Permit Part and 40 CFR §§ 264.100 and 264.101, which are incorporated herein by reference.

11.2.1 Identification of SWMUs and AOCs Requiring Corrective Action

Attachment P, Table P-1 (*SWMUs and AOCs Requiring Corrective Action*) includes a list of SWMUs and AOCs at the Facility for which corrective action is required under the Consent Order. If any additional SWMUs or AOCs are discovered while the Consent Order is in effect, corrective action for such units shall be conducted under the Consent Order. Table P-1 will be modified to include any newly identified SWMUs and AOCs for tracking purposes.

Attachment P, Table P-2 includes a list of SWMUs and AOCs at the Facility for which corrective action is complete with controls.

Attachment P, Table P-3 (*Corrective Action Complete without Controls*) includes a list of SWMUs at the Facility for which corrective action is complete without controls and do not require monitoring.

Attachment P, Table P-1 (*Permitted Units Actively Managing Hazardous Waste*) includes lists of hazardous waste management units at the Facility and their status (*e.g.*, interim status, permitted operating, closed) of each unit.

11.3 GENERAL CONDITIONS

11.3.1 Groundwater Monitoring

The Permittees shall conduct groundwater monitoring for all hazardous waste management units at the Facility subject to the groundwater monitoring requirements of 40 CFR §§ 264.98 and 264.99 and subject to corrective action under this Permit.

11.3.1.1 Detection Monitoring

The Permittees shall conduct detection monitoring in accordance with the requirements of 40 CFR § 264.98, which is incorporated herein by reference, to ensure the earliest possible detection of contaminants in groundwater. The Permittees shall coordinate such monitoring with the monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the Order.

The Permittees shall notify the Department, in writing, of any new detections of hazardous waste and hazardous constituents in groundwater at any location within seven days of detection. Such detections of hazardous waste or hazardous constituents shall also be highlighted in the periodic groundwater monitoring report submitted to the Department, in accordance with Permit Section 11.7, summarizing the groundwater monitoring results for the appropriate monitoring period.

11.3.1.2 Compliance Monitoring

The Permittees shall conduct compliance monitoring in accordance with the requirements of 40 CFR § 264.99, which is incorporated herein by reference, to monitor the progress of cleanup of contaminants in groundwater. The Permittees shall coordinate such monitoring with the

monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the Order.

11.3.2 Groundwater Monitoring Reporting

The Permittees shall submit to the Department periodic monitoring reports the Department in accordance with the schedule in the Interim Facility Wide Groundwater Monitoring Plan or the Department-approved watershed-specific Long-term Groundwater Monitoring Plans. The reports shall be prepared in accordance with Permit Section 11.12. The Permittees shall submit to the Department periodic groundwater monitoring reports for all groundwater monitoring data generated pursuant to this Permit. The Permittees shall propose a schedule for such reporting to the Department for approval. Such reporting shall be coordinated with, and may be combined with, the reporting conducted under section IV.A.6 of the Consent Order.

11.3.3 Corrective Action Beyond the Facility Boundary

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.11, upon discovering that a release of hazardous waste or hazardous constituents has migrated beyond the Facility boundary or has the potential to migrate beyond the Facility boundary.

In the event that hazardous waste or hazardous constituents migrate beyond the Facility boundary, the Permittees shall implement corrective action beyond the Facility boundary as necessary to protect human health and the environment, unless the Permittees demonstrate to the Department that, despite the Permittees' best efforts, the Permittees are unable to obtain the necessary permission to undertake such actions. The Permittees are not relieved of any responsibility to clean up a release that has migrated beyond the Facility boundary where off-site access has been denied. On-site measures to address such releases shall be taken, to be determined on a case-by-case basis (40 CFR § 264.101(c)).

11.3.4 Off-Site Access

To the extent that any corrective action requirement of this Permit requires access to property not owned or controlled by the Permittees, the Permittees shall use their best efforts to obtain access from the present owners of such property to conduct the required activities and to allow the Department access to such property to oversee such activities. In the event that the Permittees do not obtain such access, the Permittees shall notify the Department in writing regarding its best efforts and its failure to obtain such access.

11.3.5 Newly Discovered Releases

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.11, upon discovery of any previously unknown release of hazardous waste or hazardous constituents into soil, sediment, surface water, or groundwater. The Department may determine that further investigation of the release is needed. The Department may also

determine that corrective action is needed to address the release. If the Department makes such a determination, it will notify the Permittees in writing.

11.3.6 Field Activities

The Permittees shall notify the Department in writing of any field sampling or other field activities undertaken pursuant to any corrective action requirement of this Permit, and shall allow the Department to collect split samples upon request of the Department. For such sampling or other field activities, the Permittees shall notify the Department no less than 15 days prior to the commencement of such sampling.

11.3.7 Health and Plan

The Permittees shall prepare Health and Safety Plans for all field activities. The Health and Safety Plans shall be prepared in accordance with all applicable provisions of this Permit and all local, State and federal regulations and be developed as stand-alone documents.

11.3.8 Recordkeeping

The Permittees shall maintain all monitoring data, including sampling procedures, records of field measurements, laboratory analytical data, quality assurance/quality control documents, chain-of-custody records, well completion reports and periodic monitoring reports in the Facility Operating Record for a minimum of three years after the end of the operating life of the Facility and a minimum of three years after the end of any post-closure care periods.

11.4 CLEANUP LEVELS

The Department and the New Mexico Water Quality Control Commission (WQCC) have separately specified certain cleanup goals and methods of calculating cleanup levels. The Department has also specified certain reporting requirements for sites where corrective action is required in response to releases to the environment. In general, the Department has selected a human health target risk level of 10^{-5} for carcinogenic substances and a Hazard Index (HI) of 1.0 for non-carcinogenic substances as cleanup goals for establishing site-specific cleanup levels for one or more contaminants for which toxicological data are published. The Permittees shall follow the cleanup and screening levels described in this Permit Part in implementing the corrective action requirements of this Permit. In addition, cleanup levels for the protection of the environment shall address ecological risk consistent with the Department's risk assessment guidance. Cleanup levels for structures and equipment, decontaminated during closure of permitted units, shall be to concentration levels less than the detection limits established in EPA SW-846 for each analytical method used.

11.4.1 Groundwater

Groundwater cleanup levels shall be based on existing standards (e.g., drinking water standards) when they are available. Any cleanup level based on a risk assessment must be approved by the Department.

11.4.1.1 Groundwater Cleanup Levels

The cleanup levels for all contaminants in groundwater shall be the WQCC groundwater quality standards, 20.6.2.3103 NMAC, the toxic pollutant clean-up levels referenced in 20.6.2.7.WW, and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the federal Safe Drinking Water Act (42 U.S.C. §§ 300f to 300j-26) or the New Mexico Environmental Improvement Board (EIB), 20.7.10 NMAC. If both a WQCC water quality standard and an MCL have been established for an individual substance, then the lower of the levels shall be the cleanup level for that substance.

The most recent version of the EPA Region VI Human Health Medium-Specific Screening Level (HHMSSL) for tap water shall be used to establish the cleanup level if either a WQCC standard or an MCL has not been established for a specific substance. If no WQCC groundwater standard or MCL has been established for a contaminant for which toxicological information is published, the Permittees shall use a target excess cancer risk level of 10^{-5} for carcinogenic substances and a HI of 1.0 for non-carcinogenic substances as the basis for proposing a cleanup level for the contaminant. If the naturally occurring (background) concentration of a contaminant exceeds the standard then the cleanup goal defaults to the background concentration for that specific substance.

11.4.1.2 Groundwater Cleanup Level for Perchlorate

If, during the term of this Permit, the WQCC adopts a groundwater quality standard for perchlorate, or EPA or the EIB adopts an MCL for perchlorate, such standard or MCL shall be the cleanup level in accordance with Section 11.2.1.1 above. If perchlorate is detected, the Permittees shall evaluate the nature and extent of the perchlorate contamination. In the absence of a groundwater quality standard or MCL, if perchlorate is detected at concentrations at or greater than 4 μg/L, then the cleanup level shall be established using a HI of 1.0 in accordance with Permit Section 11.4.1.1 above.

11.4.2 Soil and Sediment

The cleanup levels for soil and sediments shall be the cleanup levels for soil set forth in this Permit Section (11.4.2). Any cleanup level based on a risk assessment must be approved by the Department.

11.4.2.1 Soil Cleanup Levels

The Department has specified soil-screening levels that are based on a target total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 for residential and industrial land use. The Department may determine that a dilution attenuation factor of one, as calculated using the Department-approved methods, for contaminated soils is appropriate to achieve clean closure, where soil to groundwater migration is a concern. Soil cleanup levels shall be the target soil screening levels listed in the Department's *Technical Background Document for Development of Soil Screening Levels* (as updated). If a Department soil screening level has not been established for a substance for which toxicological information is published, the soil cleanup level shall be established using the most recent version of the EPA

Region VI HHMSSL for residential and industrial soil for compounds designated as "n" (non-carcinogen effects), "max" (maximum concentration), and "sat" (soil saturation concentration), or ten times the EPA Region VI HHMSSL for compounds designated "c" (carcinogen effects). The cumulative risk shall not exceed a total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 at sites where multiple contaminants are present.

If the current and reasonably foreseeable future land use is one for which the Department has not established soil screening levels, the Permittees may propose cleanup levels to the Department based on a risk assessment and a target excess cancer risk level of 10^{-5} for carcinogenic substances or an HI of 1.0, based on current and reasonably foreseeable future land use (e.g., residential, recreational, industrial).

11.4.2.2 Soil Polychlorinated Biphenyls Cleanup Levels

The soil cleanup level for PCBs is either a concentration of 1 milligram per kilogram (mg/kg) or a risk-based PCB concentration level established through performing a health risk assessment using a target excess cancer risk level of 10^{-5} for carcinogenic substances or an HI of 1.0. (NMED *Risk-based Remediation of Polychlorinated Biphenyls at RCRA Corrective Action Sites* (March 2000)).

11.4.3 Surface Water

The Permittees shall comply with the surface water quality standards outlined in the Clean Water Act (33 U.S.C. §§ 1251 to 1387), the New Mexico WQCC Regulations (20.6.2 NMAC), and the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

11.5 ECOLOGICAL RISK EVALUATION

Screening for ecological risk shall be conducted using the LANL Ecological Screening Levels (ESLs), which are included in LANL's *"Screening Level Ecological Risk Assessment Methods"*, (LA-UR-99-1405 and as updated and approved by the Department). In the absence of ESLs, the Permittees may use U.S. EPA's ECO-SSLs with the Department approval. If the LANL's ESL database does not contain a screening value for the receptor or contaminant, the Permittees shall derive a screening level using the methodology in the Department's *"Guidance for Assessing Ecological Risks Posed by Chemicals: Screening –Level Ecological Risk Assessment"* or in LANL's *"Screening Level Ecological Risk Assessment Methods"*, (LA-UR-99-1405). Ecological risk at each site shall be evaluated in a manner consistent with the Department's *Guidance for Assessing Ecological Risks Posed by Chemicals: Screening- Level Ecological Risk Assessment* (March, 2000 as updated).

11.6 VARIANCE FROM CLEAN-UP LEVELS

The Permittees may seek a variance from a particular cleanup level in accordance with this Permit Section (11.6).

11.6.1 Water Quality Standards

For a cleanup level based on a water quality standard set by the WQCC, the Permittees may seek approval of an alternative abatement standard in accordance with the process specified in the WQCC Regulations, 20.6.2.4103.E and F NMAC.

11.6.2 Other Cleanup Levels

For all other cleanup levels, the Permittees may seek approval of a variance from a cleanup level by submitting to the Department a written request for a determination that attainment of the cleanup level is impracticable. The request must include a demonstration that attaining the cleanup level is technically or physically impossible or otherwise impractical using potential corrective action remedies. The request shall include, at a minimum, the following:

1. a discussion of the effectiveness of potential corrective action remedies;
2. a discussion of whether the proposed variance would result in a present or future hazard to public health or the environment;
3. proposed alternate cleanup levels that are practical, based on potential corrective action remedies and a site-specific risk assessment;
4. all supporting documentation and analyses; and
5. any other information requested by the Department.

If the Department approves the Permittee's impracticability demonstration, it will notify the Permittees in writing, and such notice will describe the specific action to be taken by the Permittees.

11.7 PERMIT MODIFICATION FOR CORRECTIVE ACTION COMPLETE

The Permittees may submit to the Secretary a request for a Class 3 permit modification to change the status of the unit from "corrective action required" to "corrective action complete." The permit modification will move the SWMU from Permit Attachment P (*Listing of SMWUs and AOCs*), Table P-1 (*SWMUs and AOCs Requiring Corrective Action*) to either Attachment P, Table P-2 (*Corrective Action Complete with Controls)* or Attachment P, Table P-3 (*Corrective Action Complete without Controls*) pursuant to the terms of this Permit. The Department's determination that corrective action is complete for a SWMU or AOC placed on either the *Corrective Action Complete with Controls* list or the *Corrective Action Complete without Controls* list will be subject to the Secretary's reservation of rights for new information or unknown conditions. In the event the Secretary seeks to require additional work at any SWMU or AOC contained on either of the two lists, the Secretary will initiate a permit modification to remove the SWMU or AOC from the corrective action complete lists.

11.8 CORRECTIVE ACTION PROCEDURES

The Permittees shall conduct corrective action at sites where releases of hazardous waste or hazardous constituents have occurred. If corrective action is necessary to protect human health or the environment, the Department will direct the Permittees to complete one or more of the requirements included in this Permit Section. The conditions listed below apply to all corrective action conducted under this Permit unless otherwise specified in Permit Parts 6, 9, 10 or 12.

11.8.1 Release Assessment

11.8.1.1 Release Assessment Report

If required by the Department, the Permittees shall submit a Release Assessment Report for newly discovered releases from any Permitted unit. Any revisions to the Release Assessment Report required by the Department shall be submitted within 30 calendar days of receipt of the Department's comments on the Release Assessment Report.

The Release Assessment Report shall, at a minimum, include the following information:

1. location of unit(s) on a topographic map of appropriate scale, as required under 40 CFR § 270.14(b)(19);
2. designation of type and function of unit(s);
3. general dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);
4. dates that the unit(s) was operated;
5. all available site history information;
6. specifications of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous waste or hazardous constituents in the wastes; and
7. all available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include ground water data, soil analyses, air, and surface water data).

11.8.1.2 Requirement to Proceed

The Department will review the Release Assessment Report to determine whether any further investigative action is required. The Department will notify the Permittees of the need for confirmatory sampling, if necessary, or notify the Permittees that an Investigation Work Plan is required in accordance with the requirements in Permit Section 11.8.5.1. The Department will notify the Permittees of any corrective action complete decision.

11.8.2 Interim Measures

11.8.2.1 Department-Initiated Interim Measures

Upon written notification by the Department, the Permittees shall prepare and submit an Interim Measures (IM) Work Plan at any permitted or interim status unit where the Department determines that interim measures are necessary to minimize or prevent the migration of hazardous waste or hazardous constituents and limit actual or potential human and environmental exposure to hazardous waste or hazardous constituents while long term corrective action remedies are evaluated and implemented. The Permittees shall submit its IM Work Plan to the Department within 30 calendar days of the Department's notification, unless another time period is specified by the Department. Such interim measures may be conducted concurrently with any required corrective action. The Permittees shall prepare and submit IM Work Plans in accordance with the work plan format included in Permit Section 11.12 (*Reporting Requirements*).

11.8.2.2 Permittees-Initiated Interim Measures

The Permittees may initiate interim measures at a unit by notifying the Department, in writing, at least 30 calendar days prior to beginning the Interim Measures. The Department will approve the Permittees-initiated IM, conditionally approve the IM, or require submittal of an IM Work Plan for the Department approval prior to implementation of the IM.

11.8.3 Emergency Interim Measures

The Permittees may determine, during implementation of site investigation activities, that emergency interim measures are necessary to address an immediate threat of harm to human health or the environment. The Permittees shall notify the Department within one business day of discovery of the facts giving rise to the threat, and shall propose emergency interim measures to address the threat. If the Department approves the emergency interim measures in writing, the Permittees may implement the proposed emergency interim measures without submitting an IM Work Plan. If circumstances arise resulting in an immediate threat to human health or the environment such that initiation of emergency interim measures are necessary prior to obtaining written approval from the Department, the Permittees shall notify the Department within one business day of taking the emergency interim measure. The notification shall contain a description of the emergency situation, the types and quantities of contaminants involved, the emergency interim measures taken, and contact information for the emergency coordinator handling the situation. The notification shall also include a written statement justifying the need to take the emergency action without prior written approval from the Department. This requirement shall not be construed to conflict with 40 CFR §§ 264.1(g)(8) or 270.61.

11.8.4 IM Work Plan Requirements

The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with, and integrated into, any final corrective measures at the Facility. The IM Work Plan shall include the interim

measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

11.8.4.1 Interim Measures Implementation

11.8.4.1.i Implementation and Completion of Approved IM Work Plan

The Permittees shall implement interim measures required under Permit Section 11.8.2 in accordance with the Department-approved IM Work Plan. The Permittees shall complete interim measures within 180 calendar days of the start of implementation of the interim measure. The Permittees may submit a written request to the Department to extend the period for implementation of the interim measure. The request must provide justification for the extension and a proposed schedule for completion of the interim measure. The Department will notify the Permittees, in writing, of the approval or disapproval of the request within 30 calendar days of receipt of the IM implementation extension request.

11.8.4.1.ii Notification of Changes

The Permittees shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan required by the Department under Permit Section 11.8.2.1 or initiated by the Permittees in accordance with Permit Section 11.8.2.2.

11.8.4.1.iii Interim Measures Reports

The Permittees shall submit to the Department for review and approval, within 90 calendar days of completion of interim measures, an IM Report summarizing the results of interim measure implementation. The IM Report shall contain, at a minimum, the following information:

1. a description of interim measures implemented;
2. summaries of results;
3. summaries of all problems encountered during IM investigations;
4. summaries of accomplishments and/or effectiveness of interim measures; and,
5. copies of all relevant laboratory/monitoring data, maps, logs, and other related information.

11.8.5 Corrective Action Investigations

11.8.5.1 Investigation Work Plan

11.8.5.1.i Investigation Work Plan Submittal

The Permittees shall submit to the Department Investigation Work Plans for permitted or interim status units where the Department determines that corrective action is necessary to investigate releases to the environment.

11.8.5.1.ii Investigation Work Plan Requirements

Investigation Work Plans shall meet the requirements specified in Permit Section 11.12 (*Reporting Requirements*). Investigation Work Plans shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and ground water. The Permittees shall provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a unit or a media/pathway associated with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in an Investigation Work Plan. Such deletions of a unit, medium, or pathway from the work plan(s) are subject to the approval of the Department. The Permittees shall provide sufficient written justification for any omissions or deviations from the minimum requirements specified in Permit Section 11.12 (*Reporting Requirements*). Such omissions or deviations are subject to the approval of the Department. In addition, Investigation Work Plans shall include all investigations necessary to ensure compliance with 40 CFR § 264.101.

11.8.5.1.iii Historical Documents

The Permittees shall submit to the Department a summary of the historical information and assessment of potential contaminant releases relating to each unit in conjunction with the unit-specific Investigation Work Plan including complete, legible copies of all associated photographic imprints, maps, figures, drawings, tables, attachments, enclosures, appendices and other relevant supporting documentation. Such summaries shall be submitted as separate documents and not as part of the site-specific Investigation Work Plans.

11.8.5.1.iv Investigation Work Plan Implementation

The Permittees shall implement Investigation Work Plans as approved by the Department. The Permittees shall notify the Department at least 15 calendar days prior to any permit or corrective action-related field activity (e.g., drilling, sampling).

11.8.5.2 Corrective Action Investigation Reports

The Permittees shall prepare and submit to the Department Investigation Reports for the investigations conducted in accordance with Investigation Work Plans submitted under Permit Section 11.8.5.1. The Permittees shall submit the Investigation Reports to the Department for review and approval in accordance with the schedules included in its approved Investigation Work Plans.

The Investigation Reports shall include an analysis and summary of all required investigations conducted under this Permit. The summary shall describe the type and extent of contamination at each unit investigated, including sources and migration pathways identify all hazardous waste or constituents present in all media, and describe actual or potential receptors. The Investigation Report shall also describe the extent of contamination (qualitative and quantitative) in relation to background levels for the area. If the Investigation Report concludes that further work is necessary, the report shall include a schedule for submission of a work plan for the next phase of investigation.

11.8.5.2.i Cleanup Levels

The Investigation Reports shall identify the applicable cleanup levels in accordance with Permit Sections 11.4 through 11.6 for each hazardous waste or hazardous constituent found at each unit where corrective action is required. The Permittees shall propose in the Investigation Report or in a subsequent Risk Assessment or Corrective Measures Evaluation appropriate cleanup levels for those hazardous wastes or hazardous constituents without established cleanup levels based upon human and ecological risk.

11.8.5.2.ii Requirement to Proceed

Based upon the Department's review of the Investigation Report, the Department will notify the Permittees of the need for further investigative action, if necessary, and inform the Permittees, if not already notified, of the need for a Corrective Measures Evaluation. The Department will notify the Permittees if corrective action is complete. If the Department determines that further investigation is necessary, the Department will require the Permittees to submit a work plan for approval that includes a proposed schedule for additional investigation(s).

11.8.5.3 Risk Assessment

The Permittees shall attain the cleanup goals outlined in Permit Sections 11.4 through 11.6. If the Department determines that the cleanup levels included in Permit Sections 11.4 through 11.6 cannot be achieved at a site, the Department will require performance of risk analyses to establish alternate cleanup levels. Such risk analyses shall be prepared in the format included in the Permit Section 11.12 (*Reporting Requirements*). The Permittees shall submit to the Department for approval a Risk Assessment Report in accordance with this Permit Section (11.8.5.3) according to the schedule set forth by the Department for sites where risk analyses are conducted.

11.8.6 Corrective Measures Evaluation

11.8.6.1 General

The Department will require corrective measures at a unit if the Department determines, based on the Investigation Report and other relevant information available to the Department, that there has been a release of contaminants into the environment at the site and that corrective action is necessary to protect human health or the environment from such a release. Upon making such a determination, the Department will notify the Permittees in writing. The Department will specify a date for the submittal of the necessary reports and evaluations in the written notification.

11.8.6.2 Corrective Measures Evaluation Report

Following written notification from the Department that a corrective measures evaluation is required, the Permittees shall submit to the Department for approval a Corrective Measures Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report format outlined in Permit Section 11.12 (*Reporting Requirements*). The corrective measures

evaluation shall evaluate potential remedial alternatives and shall recommend a preferred remedy that will be protective of human health and the environment and that will attain the appropriate cleanup goals. The Corrective Measures Evaluation Report shall, at a minimum, comply with Permit Section 11.12 (Reporting Requirements) and include the following:

1. a description of the location, status, and current use of the site;
2. a description of the history of site operations and the history of releases of contaminants;
3. a description of site surface conditions;
4. a description of site subsurface conditions;
5. a description of on- and off-site contamination in all affected media;
6. an identification and description of all sources of contaminants;
7. an identification and description of contaminant migration pathways;
8. an identification and description of potential receptors;
9. a description of cleanup standards or other applicable regulatory criteria;
10. an identification and description of a range of remedy alternatives;
11. remedial alternative pilot or bench scale testing results;
12. a detailed evaluation and rating of each of the remedy alternatives, applying the criteria set forth in Permit Section 11.12 (Reporting Requirements);
13. an identification of a proposed preferred remedy or remedies;
14. design criteria of the selected remedy or remedies; and
15. a proposed schedule for implementation of the preferred remedy.

11.8.6.3 Cleanup Standards

Following written notification from the Department that a corrective measures evaluation is required, the Permittees shall submit to the Department for approval a Corrective Measures Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report format outlined in Permit Section 11.12 (*Reporting Requirements*). The corrective measures evaluation shall evaluate. The Permittees shall select corrective measures that are capable of achieving the clean-up standards and goals outlined in Permit Sections 11.4 through 11.6 (*Clean-up Levels*) including, as applicable, approved alternate clean-up goals established by a risk assessment.

11.8.6.4 Remedy Evaluation Criteria

11.8.6.4.i Threshold Criteria

The Permittees shall evaluate each of the remedy alternatives for the following threshold criteria. To be selected, the remedy alternative must:

1. be protective of human health and the environment;
2. attain media cleanup standards;
3. control the source or sources of releases so as to reduce or eliminate, to the extent practicable, further releases of contaminants that may pose a threat to human health and the environment; and
4. comply with applicable standards for management of wastes.

11.8.6.4.ii Remedial Alternative Evaluation Criteria

The Permittees shall evaluate each of the remedy alternatives for the factors described in this Permit Section (11.8.6.4). These factors shall be balanced in proposing a preferred alternative.

11.8.6.4.iii Long-term Reliability and Effectiveness

The remedy shall be evaluated for long-term reliability and effectiveness. This factor includes consideration of the magnitude of risks that will remain after implementation of the remedy; the extent of long-term monitoring, or other management that will be required after implementation of the remedy; the uncertainties associated with leaving contaminants in place; and the potential for failure of the remedy. The Permittees shall give preference to a remedy that reduces risks with little long-term management, and that has proven effective under similar conditions.

11.8.6.4.iv Reduction of Toxicity, Mobility, or Volume

The remedy shall be evaluated for its reduction in the toxicity, mobility, and volume of contaminants. The Permittees shall give preference to a remedy that uses treatment to more completely and permanently reduce the toxicity, mobility, and volume of contaminants.

11.8.6.4.v Short-Term Effectiveness

The remedy shall be evaluated for its short-term effectiveness. This factor includes consideration of the short-term reduction in existing risks that the remedy would achieve; the time needed to achieve that reduction; and the short-term risks that might be posed to the community, workers, and the environment during implementation of the remedy. The Permittees shall give preference to a remedy that quickly reduces short-term risks, without creating significant additional risks.

11.8.6.4.vi Implementability

The remedy shall be evaluated for its implementability or the difficulty of implementing the remedy. This factor includes consideration of installation and construction difficulties; operation and maintenance difficulties; difficulties with cleanup technology; permitting and approvals; and the availability of necessary equipment, services, expertise, and storage and disposal capacity. The Permittees shall give preference to a remedy that can be implemented quickly and easily, and poses fewer and lesser difficulties.

11.8.6.4.vii Cost

The remedy shall be evaluated for its cost. This factor includes a consideration of both capital costs, and operation and maintenance costs. Capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. Operation and maintenance costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances. All costs shall be calculated based on their net present value. Permittees shall give preference to a remedy that is less costly, but does not sacrifice protection of health and the environment.

11.8.6.5 Approval of Corrective Measures Evaluation Report

The Department will review and approve the Corrective Measures Evaluation Report in accordance with Permit Section 11.9. If the Department disapproves the Corrective Measures Evaluation Report, the Department will notify the Permittees in writing of the Corrective Measures Evaluation Report's deficiencies and specify a due date for submission of a revised Corrective Measures Evaluation Report. Upon receipt of such notification of disapproval, the Permittees shall submit to the Department, within the specified time, a revised Corrective Measures Evaluation Report that corrects the deficiencies. If the Department approves the Corrective Measures Evaluation Report, the Department will notify the Permittees in writing.

11.8.6.6 Relationship to Corrective Action Requirements

The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes of RCRA compliance [See 55 Fed. Reg. 30875-77 (July 27, 1990) (proposed 40 CFR §§ 264.520 through 264.524)].

11.8.6.7 Statement of Basis

Upon approval of the Corrective Measures Evaluation Report, the Department will select a remedy or remedies for the unit. The Department may choose a different remedy from that recommended by the Permittees. The Department will issue a Statement of Basis for selection of the remedy, and will receive public comment on the remedy. The public comment period will extend for at least 45 days from the date of the public notice of the Statement of Basis. The Department will provide an opportunity for a public hearing on the remedy, at which all

interested persons will be given a reasonable chance to submit data, views or arguments orally or in writing and to examine witnesses testifying at the hearing. The comment period will automatically be extended to the close of the public hearing. The public hearing will follow the hearing requirements under section 20.4.1.901.F NMAC. The Department will select a final remedy and issue a response to public comments to all commenters, after the end of the public comment period. In selecting a remedy, the Department will follow the public participation requirements applicable to remedy selection under 40 CFR § 270.41 and 20.4.1.901 NMAC.

The administrative record for the Facility will be made available to the public for review at the Department's offices in Santa Fe, New Mexico. All significant written and signed comments, including e-mailed comments, will be considered by the Department prior to approving a final remedy or remedies.

The Department's decision on the final remedy or remedies shall follow the requirements under section 20.4.1.901 NMAC, Secretary's Decision. The Department will issue a response to public comments at the time of the Department's final decision.

11.8.7 Corrective Measures Implementation

11.8.7.1 General

The Permittees shall implement the final remedy selected by the Department.

11.8.7.2 Corrective Measures Implementation Plan

Within 90 days after the Department's selection of a final remedy, or as otherwise specified by the schedule contained in the approved Corrective Measure Evaluation Report or as specified by a schedule required by the Department in the written approval notification, the Permittees shall submit to the Department for approval a Corrective Measures Implementation Plan outlining the design, construction, operation, maintenance, and performance monitoring for the selected remedy, and a schedule for its implementation. The implementation plan shall be submitted to the Department for review in accordance with the procedures in Permit Section 11.9. The Corrective Measures Implementation Plan shall, at a minimum, include the following elements:

1. a description of the selected final remedy;
2. a description of the cleanup goals and remediation system objectives;
3. an identification and description of the qualifications of all persons, consultants, and contractors that will be implementing the remedy;
4. detailed engineering design drawings and systems specifications for all elements of the remedy;
5. a construction work plan;
6. an operation and maintenance plan;

7. the results of any remedy pilot tests;

8. a plan for monitoring the performance of the remedy, including sampling and laboratory analysis of all affected media;

9. a waste management plan;

10. a proposed schedule for submission to the Department of periodic progress reports; and

11. a proposed schedule for implementation of the remedy.

11.8.7.3 Health and Safety Plan

The Permittees shall conduct all activities in accordance with a site-specific or facility-wide Health and Safety Plan during all construction, operation, maintenance, and monitoring activities conducted during corrective measures implementation.

11.8.7.4 Progress Reports

The Permittees shall submit to the Department progress reports in accordance with the schedule approved in the Corrective Measures Implementation Plan. The progress reports shall, at a minimum, include the following information:

1. a description of the remedy work completed during the reporting period;

2. a summary of problems, potential problems, or delays encountered during the reporting period;

3. a description of actions taken to eliminate or mitigate the problems, potential problems, or delays;

4. a discussion of the remedy work projected for the next reporting period, including all sampling events;

5. copies of the results of all monitoring, including sampling and analysis, and other data generated during the reporting period; and

6. copies of all waste disposal records generated during the reporting period.

11.8.8 Remedy Completion

11.8.8.1 Remedy Completion Report

Within 90 days after completion of remedy, the Permittees shall submit to the Department a Remedy Completion Report. The report shall, at a minimum, include the following items:

1. a summary of the work completed;

2. a statement, signed by a registered professional engineer, that the remedy has been completed in accordance with the Department approved work plan for the remedy;

3. as-built drawings and specifications signed and stamped by a registered professional engineer;

4. copies of the results of all monitoring, including sampling and analysis, and other data generated during the remedy implementation, if not already submitted in a progress report;

5. copies of all waste disposal records, if not already submitted in a progress report; and

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

11.8.9 Accelerated Clean-up Process

If the Permittees identify a corrective action or measure that, if implemented voluntarily, will reduce risks to human health and the environment to levels acceptable to the Department, will reduce cost and/or will achieve cleanup of a unit ahead of schedule, the Permittees may implement the corrective measure as provided in this Permit Section (11.8.9), in lieu of the process established in Permit Section 11.8. The accelerated cleanup process shall be used at sites to implement presumptive remedies at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the field work will be accomplished within 180 days of the commencement of field activities. The proposed accelerated cleanup will be documented in an Accelerated Corrective Measure Work Plan, which shall include:

1. a description of the proposed remedial action, including details of the unit or activity that is subject to the requirements of this Permit;

2. an explanation of how the proposed cleanup action is consistent with the overall corrective action objectives and requirements of this Permit;

3. the methods and procedures for characterization and remediation sample collection and analyses; and

4. a schedule for implementation and reporting on the proposed cleanup action.

The Permittees shall notify the Department of the planned accelerated corrective measure a minimum of 30 days prior to the commencement of any accelerated field activity. The notification shall include the submittal of the Plan if not already submitted to the Department.

11.8.9.1 Accelerated Corrective Measures Work Plan

The Permittees shall obtain approval of an Accelerated Corrective Measures Work Plan prior to implementation. The Permittees shall prepare the Work Plan in general accordance with the requirements of Permit Section 11.12 (*Reporting Requirements*). The Work Plan shall be submitted to the Department for review in accordance with the procedures in Permit Section 11.9. If the Department disapproves the Accelerated Corrective Measures Work Plan, the Department will notify the Permittees in writing of the Plan's deficiencies and specify a due date for submission of a revised Accelerated Corrective Measures Work Plan. The Permittees shall include an implementation schedule in the revised Accelerated Corrective Measures Work Plan.

11.8.9.2 Accelerated Corrective Measures Implementation

The Permittees shall implement the accelerated corrective measures in accordance with the approved Accelerated Corrective Measures Work Plan. Within 90 days of completion of the accelerated corrective measures, the Permittees shall submit to the Department for approval a Remedy Completion Report in a format approved by the Department in general accordance with Permit Section 11.12 (*Reporting Requirements*). If upon review, the Department identifies any deficiencies in the Remedy Completion Report, the Department will notify the Permittees in writing.

11.9 APPROVAL OF SUBMITTALS

All monitoring plans; work plans, including Investigation Work Plans, Interim Measures Work Plans, Accelerated Corrective Measures Work Plans, and Corrective Measures Implementation Plans; Corrective Measures Evaluation Reports; and all associated schedules that the Permittees prepare under the terms of this Permit must be approved by the Department. Upon receiving a work plan or other document for approval, the Department will review the document and either approve the document, approve it with modifications or direction, or disapprove it. If the Department approves the document, it will notify the Permittees in writing. If the Department approves the document with modifications, the Department will notify the Permittees in writing of the necessary modifications, and the reasons for the modifications. If the Department disapproves a document, it will notify the Permittees in writing of the disapproval and the deficiencies in the document or other reasons for the disapproval. A notice of disapproval may also state modifications necessary for the Department approval. Upon receipt of a notice of disapproval, the Permittees shall revise the work plan or other document to incorporate all modifications and correct all deficiencies. Within 30 days after receipt of a notice of disapproval, or such other time as specified by the Department, the Permittees shall submit the revised work plan or other document to the Department for approval.

Upon Department approval, all monitoring plans, work plans, and Corrective Measures Evaluation Reports, and associated schedules are incorporated herein by reference and become

an enforceable part of this Permit, and therefore become enforceable under the provisions of the HWA and RCRA.

Investigation Reports, Monitoring Reports, Interim Measures Reports, Corrective Measures Implementation Reports, Remedy Completion Reports or other documents required under 20.4.1 NMAC must also be submitted to the Department, but the Department will not necessarily approve such documents. After submittal of such a report, the Department may nevertheless require the Permittees to revise such reports to correct deficiencies or conduct additional work before the Department concludes that corrective action is complete.

11.10 METHODS AND PROCEDURES

The Permittees shall submit to the Department, for review and written approval, site-specific work plans for sites prior to the commencement of field activities where environmental investigation, corrective action, sampling or monitoring is being conducted or proposed. The site-specific work plans shall include the methods to be used to conduct all activities at each site or unit and shall be prepared in accordance with the format described in the Permit Section 11.12 (*Reporting Requirements*). The Permittees shall provide notification to the Department of corrective action field activities a minimum of 15 days prior to commencing the activity.

The methods used to conduct investigation, remediation, and monitoring activities shall be sufficient to fulfill the requirements of this Permit and provide accurate data for the evaluation of site conditions, the nature and extent of contamination and contaminant migration, and for remedy selection and implementation, where necessary. The methods presented in this Permit Section (11.10) are minimum requirements for environmental investigation and sampling, and are not intended to include all methods that may be necessary to fulfill the requirements of this Permit. The methods for conducting investigations, corrective actions, and monitoring at the Facility must be determined based on the conditions and contaminants that exist at each site or unit.

11.10.1 Standard Operating Procedures

The Permittees shall provide a brief description of investigation, sampling or analytical methods and procedures in documents submitted to the Department that includes sufficient detail to evaluate the quality of the acquired data. Facility standard operating procedures (SOPs) shall not be substituted for such descriptions.

11.10.2 Investigation, Sampling, and Analysis Methods

11.10.2.1 Introduction and Purpose

This Permit Section (11.10.2) provides minimum requirements for field investigations, sample collection, handling and screening procedures, field and laboratory sample analysis, and quality assurance procedures for samples of the medium being investigated or tested at the Facility.

The purpose of this Section is to: 1) provide minimum requirements for drilling and sample collection in exploratory borings and other excavations; 2) provide minimum requirements for sampling of the target media; 3) provide minimum requirements for monitoring of groundwater

and vadose zone conditions; and 4) identify minimum required screening, analytical, and quality assurance procedures that shall be implemented during field sampling activities and laboratory analyses.

The quality assurance procedures referenced in the previous paragraph include: 1) the Facility investigation data quality objectives; 2) the requirements for QA/QC to be followed during field investigations and by the analytical laboratories; and 3) the methodology for the review and evaluation of the field and laboratory QA/QC results and documentation.

11.10.2.2 Field Exploration Activities

Exploratory borings shall be advanced at locations specified in the Department approved site-specific work plans. The Department may require additional exploratory borings to fulfill the requirements of this Permit. Any additional boring locations, if required, will be determined or approved by the Department. The depths and locations of all exploratory and monitoring well borings shall be specified in the site-specific work plans submitted to the Department for approval prior to the start of the respective field activities. The Department must approve proposed unit aggregates grouped for the purpose of site investigation, remediation, and/or monitoring activities.

11.10.2.3 Sub-Surface Features/Utility Geophysical Surveys

The Permittees shall conduct surveys to locate underground utilities, pipelines structures, drums, debris, and other buried features, including buried waste, in the shallow subsurface prior to the start of field exploration activities. The methods used to conduct the surveys, such as magnetometer, ground penetrating radar, resistivity, or other methods, shall be selected based on the characteristics of the site and the possible or suspected underground structures. The results of the surveys shall be included in the investigation reports submitted to the Department.

11.10.2.4 Drilling and Soil, Rock, and Sediment Sampling

11.10.2.4.i Drilling

Exploratory and monitoring well borings shall be drilled using the most effective, proven, and practicable method for recovery of undisturbed samples and potential contaminants. The Department shall approve the drilling methods selected for advancement of each boring prior to the start of field activities. Based on the drilling conditions, the borings shall be advanced using one of the following methods:

1. hollow-stem auger;
2. air rotary;
3. mud rotary;
4. percussion hammer;
5. sonic;

6. dual wall air rotary;
7. direct Push Technology (DPT);
8. cryogenic; and
9. cable tool.

Hollow-stem auger or DPT drilling methods are preferred if vapor-phase or VOC contamination is known or suspected to be present. The type of drilling fluid used, if necessary, shall be approved by the Department prior to the start of drilling activities or prior to use at any site.

All drilling equipment shall be in good working condition and capable of performing the assigned task. Drilling rigs and equipment shall be operated by properly trained, experienced, and responsible crews. The Permittees are responsible for ensuring that contaminants from another site or facility are not introduced into the site under investigation due to malfunctioning equipment or poor site maintenance. The drilling equipment shall be properly decontaminated before drilling each boring.

Exploratory borings shall be advanced to unit- and location-specific depths specified or approved by the Department. The Permittees shall propose drilling depths in the site-specific work plans submitted for each subject area. Unless otherwise specified by the Department, the borings shall be advanced to the following minimum depths:

1. in all borings, 25 ft below the deepest detected contamination based on field screening, laboratory analyses, and/or previous investigations at the site;
2. 20 ft below the base of disposal units if contamination is not detected;
3. five ft below the base of shallow structures such as tanks, piping or building sumps, or other building structures;
4. 50 ft below the deepest known intermediate perched groundwater zone;
5. 50 ft below the top of the regional aquifer; and
6. depths specified by the Department based on regional or unit specific data needs.

The Permittees shall notify the Department as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the depths specified by the Department or proposed in an approved work plan so that alternative actions may be discussed. Precautions shall be taken to prevent the migration of contaminants between geologic, hydrologic, or other identifiable zones during drilling and well installation activities. Contaminant zones shall be isolated from other zones encountered in the borings.

The drilling and sampling shall be accomplished under the direction of a qualified engineer or geologist who shall maintain a detailed log of the materials and conditions encountered in each boring. Both sample information and visual observations of the cuttings and core samples shall be

recorded on the boring log. Known site features and/or site survey grid markers shall be used as references to locate each boring prior to surveying the location as described in Permit Section 11.10.2.6. The boring locations shall be measured to the nearest foot, and locations shall be recorded on a scaled site map upon completion of each boring.

Trenching and other exploratory excavation methods shall follow the applicable general procedures outlined in this Permit Section. The particular methods proposed for use by the Permittees for exploratory excavation and sampling at any specific unit shall be included in the site-specific investigation work plan submitted to the Department. The Department will include any changes or additional requirements for conducting exploratory excavation and sampling activities at the subject unit in its response to the Permittees after review of the investigation work plans.

11.10.2.4.ii Soil and Rock Sampling

Relatively undisturbed discrete soil and rock samples shall be obtained, where possible, during the advancement of each boring for the purpose of logging, field screening, and analytical testing. Generally, the samples shall be collected at the following intervals and depths:

1. at 5-ft intervals, 10-ft intervals, continuously, or as approved by the Department;
2. at the depth immediately below the base of the disposal unit or facility structure;
3. at the maximum depth of each boring;
4. at the depths of contacts or first encounter, observed during drilling, with geologic units of different lithology, changes in structural or textural characteristics, or zones of relatively higher or lower permeability;
5. of soil or rock types relatively more likely to sorb or retain contaminants than surrounding lithology;
6. at the depth of the first encounter, during drilling, with shallow or intermediate saturated zones;
7. at intervals suspected of being source or contaminated zones;
8. at the top of the regional aquifer; and
9. at other intervals approved or required by the Department.

The sampling interval for the borings may be modified, or samples may be obtained from a specific depth, based on field observations. A decontaminated split-barrel sampler lined with brass sleeves, a coring device, or other method approved by the Department shall be used to obtain samples during the drilling of each boring.

A split barrel sampler lined with brass sleeves or a coring device is the preferred sampling method for borehole soil, rock, and sediment sampling. The following procedures should be followed if a

split barrel sampler is used. Upon recovery of the sample, one or more brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves covered with Teflon tape or foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical laboratory. If brass sleeves are not used, a portion of the sample shall be placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. The remaining portions of the sample shall be used for logging and field screening, as described in Sections 11.10.2.4.v and 11.10.2.4.vi of this Permit Part, respectively.

Discrete samples shall be collected for field screening and laboratory analyses. Homogenization of discrete samples collected for analyses other than for VOC and SVOC analyses shall be performed by the analytical laboratory, if necessary. The Permittees may submit site-specific, alternative methods for homogenization of samples in the field to the Department for review and written approval.

Samples to be submitted for laboratory analyses shall be selected based on: 1) the results of the field screening or mobile laboratory analyses; 2) the position of the sample relative to groundwater, suspected releases, or site structures; 3) the sample location relative to former or altered site features or structures; 4) suspected migration pathways and the stratigraphy encountered in the boring; and 5) the specific objectives and requirements of this Permit and the approved site-specific work plan. The proposed number of samples and analytical parameters shall be included as part of the site-specific work plan submitted to the Department for approval prior to the start of field investigation activities at each unit. The work plans shall allow for flexibility in modifying the project-specific tasks based on information obtained during the course of the investigation. Modifications to site-specific work plan tasks must be pre-approved in writing by the Department.

11.10.2.4.iii Sediment Sampling

Sediment samples shall be collected in the same manner as described in Permit Section 11.10.2.4.ii for soil and rock sampling where borings are drilled to explore alluvial subsurface conditions. The sampling device shall be a decontaminated, hand-held stainless steel coring device, shelby tube, thin-wall sampler, or other device approved by the Department where sediment sampling is conducted without the use of the drilling methods described in Permit Section 11.10.2.4.i. The samples shall be transferred to pre-cleaned laboratory prepared containers for submittal to the laboratory. Samples obtained for volatiles analysis shall be collected using shelby tubes, thin-wall samplers, or other device approved by the Department. The ends of the samplers shall be lined with Teflon tape or aluminum foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical laboratory.

The physical characteristics of the sediment (such as mineralogy, ASTM soil classification, AGI (American Geological Institute) rock classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations shall be recorded in the field log.

11.10.2.4.iv Drill Cuttings (Investigation Derived Waste)

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) shall be contained and characterized using methods based on the boring

location, boring depth, drilling method, and type of contaminants suspected or encountered. Proposed IDW management shall be included with the unit-specific investigation work plan submitted to the Department for approval prior to the start of field investigations. The Department shall approve the method of containment for drill cuttings prior to the start of drilling activities. Borings not completed as groundwater or vapor monitoring wells shall be properly abandoned in accordance with the methods listed in Permit Section 11.11.6 or other method approved by the Department. Borings completed as groundwater monitoring wells shall be constructed in accordance with the requirements described in Permit Section 11.11.3.2 (*Well Construction Methods*).

11.10.2.4.v Logging of Soil/Rock and Sediment Samples

Samples obtained from all exploratory borings and excavations shall be visually inspected and the soil or rock type classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488, or AGI Methods for soil and rock classification. Detailed logs of each boring shall be completed in the field by a qualified engineer or geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling shall be recorded on the logs. Field boring logs, test pit logs, and field well construction diagrams shall be converted to the format acceptable for use in final reports submitted to the Department. If requested, draft boring logs, test pit logs, and well construction diagrams shall be submitted to the Department for review within 30 days after the completion of each boring or monitoring well.

11.10.2.4.vi Soil, Rock, and Sediment Sample Field Screening

Samples obtained from borings shall be screened in the field for evidence of the potential presence of contaminants. Field screening results shall be recorded on the exploratory boring and excavation logs. Field screening results are used as a general guideline to determine the nature and extent of possible contamination. In addition, screening results shall be used to aid in the selection of soil, rock, sediment, and vapor-phase samples for laboratory analysis. The Department recognizes that field screening alone will not detect the possible presence or full nature and extent of all contaminants that may be encountered at the site.

The primary screening methods to be used shall include: 1) visual examination; 2) headspace vapor screening for VOCs; and 3) metals screening using X-ray fluorescence (XRF). Additional screening for site- or release-specific characteristics such as pH, High Explosives (HE), Total Petroleum Hydrocarbons (TPH), nitrates, or for other specific compounds using field test kits shall be conducted where appropriate.

Headspace vapor screening shall target VOCs and shall be conducted by placing a soil or rock sample in a plastic sample bag or a foil-sealed container allowing space for ambient air. The container shall be sealed and then shaken gently to expose the soil or rock to the air trapped in the container. The sealed container shall be allowed to rest for a minimum of five minutes while vapors equilibrate. Vapors present within the sample bag headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature shall be recorded on the field boring or test pit log

for each sample. The monitoring instruments shall be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp, combustible gas indicator, or other instrument approved by the Department shall be used for VOC field screening. The limitations, precision, and calibration procedures of the instrument to be used for VOC field screening shall be included in the site-specific investigation work plan prepared for each unit.

XRF may be used to screen soil, rock, or sediment samples for the presence of metals. XRF screening requires proper sample preparation and proper instrument calibration. Sample preparation and instrument calibration procedures shall be documented in the field logs. The methods and procedures for sample preparation and instrument calibration shall be approved by the Department prior to the start of field activities. Field XRF screening results for selected metals may be used in lieu of laboratory analyses upon written approval by the Department; however, the results shall, at a minimum, be confirmed by laboratory analyses at a frequency of 20 percent (1 sample per every 5 analyzed by XRF analysis).

Field screening results are site- and boring-specific and the results vary with instrument type, media screened, weather conditions, moisture content, soil or rock type, and type of contaminant. The Permittees shall record on the field logs all conditions capable of influencing the results of field screening. The Permittees shall submit to the Department conditions potentially influencing field screening results as part of the site-specific investigation, remediation, or monitoring reports.

At a minimum, the Permittees shall submit the samples with the greatest apparent degree of contamination, based on field observations and field screening, for laboratory analysis. The Permittees shall also use the location of the sample relative to groundwater, stratigraphic units or contacts, and the proximity to significant site or subsurface features or structures as a guideline for sample selection. In addition, the Permittees shall submit the samples with no or little apparent contamination, based on field screening, for laboratory analysis if the intention is to confirm that the base (or other depth interval) of a boring or other sample location is not contaminated.

11.10.2.4.vii Soil, Rock, and Sediment Sample Types

The Permittees shall collect soil, rock, and sediment samples at the frequencies outlined in the site-specific investigation, corrective action, or monitoring work plans for each unit, or other site submitted by the Permittees for review and written approval by the Department. The samples collected shall be representative of the media and site conditions being investigated or monitored. The Permittees shall collect QA/QC samples to monitor the validity of the soil, rock, and sediment sample collection procedures. Field duplicates will be collected at a rate of ten percent. The Permittees shall collect equipment blanks from all sampling apparatus at a frequency of ten percent for chemical analysis. Equipment blanks shall be collected at a frequency of one per day if disposable sampling equipment is used. The Permittees shall collect field blanks at a frequency of one per day for each medium (with the exception of air samples) at each unit, or other site. Reagent blanks shall be used if chemical analytical procedures requiring reagents are employed in the field as part of the investigation or monitoring program. The resulting data will provide information on the variability associated with sample collection, handling, and laboratory analysis

operations. The blanks and duplicates shall be submitted for laboratory analyses associated with the project-specific contaminants, data quality concerns, and media being sampled.

11.10.2.5 Sample Point and Structure Location Surveying

The horizontal and vertical coordinates of the top of each monitoring well casing and the ground surface at each monitoring well location shall be determined by a registered New Mexico professional land surveyor in accordance with the State Plane Coordinate System (NMSA 1978 47-1-49-56 (Repl. Pamp. 1993)). The surveys shall be conducted in accordance with Sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions shall be measured to the nearest 0.1-ft, and vertical elevations shall be measured to the nearest 0.01-ft. The Permittees shall prepare site map(s), certified by a registered New Mexico professional land surveyor, presenting all surveyed locations and elevations including relevant site features and structures for submittal with all associated reports to the Department.

Site attributes (e.g., soil sample locations, sediment sample locations, springs, outfalls, pertinent structures, monitoring stations, as well as staked out sampling grids), shall be located by using the global positioning system (GPS), another the Department-approved surveying system, or by using a registered New Mexico Registered Land Surveyor using the methods described in the paragraph above. If using GPS, horizontal locations shall be measured to the nearest 0.5 ft. The Permittees shall provide the Department a statement of accuracy for survey data upon request.

11.10.2.6 Subsurface Vapor-Phase Monitoring and Sampling

Samples of subsurface vapors shall be collected from vapor monitoring points from both discrete zones, selected based on investigation and field screening results, and as total well subsurface vapor samples where required by the Department.

During subsurface drilling explorations at sites where there is a potential for vapor-phase contamination to be present, soil gas samples shall be obtained at the Department-approved intervals for field screening and/or laboratory analyses. An inflatable packer shall be dropped to isolate the bottom two to three feet of the borehole. The isolated portion of the borehole shall be purged by slowly removing approximately five times the volume of the annular space beneath the packer, followed by a VOC measurement using a PID equipped with a 11.7 eV lamp, a combustible gas indicator or other instrument approved by the Department. The data shall be logged and also used for determining the samples to be sent to an analytical laboratory.

The Permittees shall, as directed by the Department, collect vapor samples for field measurement of the following during subsurface vapor monitoring activities:

1. percent oxygen;
2. organic vapors (using a photo-ionization detector with an 11.7 eV (electron volt) lamp, a combustible vapor indicator or other method approved by the Department);
3. percent carbon dioxide;

4. static subsurface pressure; and

5. other parameters (such as carbon monoxide and hydrogen sulfide) as required by the Department.

The Permittees also shall collect vapor samples for laboratory analysis of the following as required:

1. percent moisture;

2. VOCs; and

3. other analytes required by the Department.

Vapor samples analyzed by the laboratory for percent moisture and VOCs shall be collected using SUMMA canisters or other sample collection method approved by the Department. The samples shall be analyzed for VOC concentrations by EPA Method TO-15, as it may be updated or equivalent VOC analytical method.

Field vapor measurements, the date and time of each measurement, and the instrument used shall be recorded on a vapor monitoring data sheet. The instruments used for field measurements shall be calibrated daily in accordance with the manufacturer's specifications and as described in Permit Section 11.10.4. The methods used to obtain vapor-phase field measurements and samples shall be approved by the Department in writing prior to the start of air monitoring at each Facility site where vapor-phase monitoring is conducted.

11.10.2.7 Groundwater Monitoring

11.10.2.7.i Groundwater Levels

Groundwater level measurements shall be obtained at intervals required by the Department. Groundwater levels also shall be obtained prior to purging in preparation for a sampling event. Measurement data and the date and time of each measurement shall be recorded on a site monitoring data sheet. The depth to groundwater shall be measured to the nearest 0.01 feet. The depth to groundwater shall be recorded relative to the surveyed well casing rim or other surveyed datum.

Groundwater levels shall be measured in all wells at the facility (or the number of wells otherwise specified in a Department approved groundwater monitoring work plan) within 14 days of the commencement of the monitoring activities. The Permittees shall conduct periodic measuring events, the schedule for which shall be provided in the groundwater monitoring work plans.

11.10.2.8 Groundwater Sampling

Groundwater samples shall initially be obtained from newly installed monitoring wells between ten and 30 days after completion of well development. Groundwater monitoring and sampling shall be conducted at an interval approved by the Department after the initial sampling event. The Permittees shall sample all saturated zones screened to allow entry of groundwater into each

monitoring well during each sampling event (or as otherwise specified in the Department approved groundwater monitoring work plan). All requests for variances from the groundwater sampling schedule shall be submitted to the Department, in writing, no less than 30 days prior to the start of scheduled monitoring and sampling events. Groundwater samples shall be collected from all saturated zones, where possible, within exploratory borings not intended to be completed as monitoring wells prior to abandonment of the borings.

Water samples shall be analyzed in accordance with the Department-approved groundwater monitoring work plan for one or more of the following general chemistry parameters as required by the Department:

nitrate/nitrite	sulfate	chloride	sodium
dissolved CO_2	alkalinity	carbonate/bicarbonate	boron
fluoride	manganese	calcium	silicon
ferric/ferrous iron	ammonia	potassium	phosphorus/phosphate
sulfide	bromide	magnesium	methane
TKN	total organic carbon	total dissolved solids	

11.10.2.8.i Well Purging

All zones in each monitoring well shall be purged by removing groundwater prior to sampling and in order to ensure that formation water is being sampled. Purge volumes shall be determined by monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen concentrations, turbidity, redox potential, and temperature during purging of volumes and at measurement intervals approved by the Department in writing. The groundwater quality parameters shall be measured using a flow-through cell and instruments approved by the Department in writing. The volume of groundwater purged, the instruments used, and the readings obtained at each interval shall be recorded on the field monitoring log. In general, water samples may be obtained from the well after the measured parameters of the purge water have stabilized to within ten percent for three consecutive measurements. Well purging may also be conducted in accordance with the Department's Position Paper "Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring" (October 30, 2001). The Permittees may submit, to the Department for approval, a written request for a variance from the described methods of well purging for individual wells no later than 90 days prior to scheduled sampling activities. The Department will respond to the request, in writing, within 60 days of receipt of the variance request.

11.10.2.8.ii Groundwater Sample Collection

Groundwater samples shall be obtained from each well after a sufficient amount of water has been removed from the well casing to ensure that the sample is representative of formation water. Groundwater samples shall be obtained using methods approved by the Department within twenty-four hours of the completion of well purging. Sample collection methods shall be documented in the field monitoring reports. The samples shall be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures are described in Permit Section 11.10.2.9. Decontamination procedures shall be established for reusable water sampling equipment as described in Permit Section 11.10.4.

All purged groundwater and decontamination water shall be temporarily stored at satellite accumulation areas or transfer stations in labeled 55-gallon drums, less-than-90-day storage areas or other containers approved by the Department until proper characterization and disposal can be arranged. The methods for disposal of purge/decontamination water shall be approved by the Department prior to removal from the temporary storage area. Disposable materials shall be handled as described in Permit Section 11.10.5.

Groundwater samples intended for metals analysis shall be submitted to the laboratory as total metals samples. If required by the Department, the Permittees shall obtain groundwater samples for dissolved metals analysis to be filtered using disposable in-line filters with a 0.45 micron or other mesh size approved by the Department.

11.10.2.8.iii Surface Water Sample Collection

Surface water samples shall be collected using methods approved by the Department. Samples shall be collected in clean laboratory-prepared sampling containers. The methods and instruments used to measure field parameters shall be approved by the Department prior to conducting surface water sampling. The sampling and monitoring techniques used and the measurements obtained shall be recorded in the field monitoring reports.

11.10.2.8.iv Groundwater and Surface Water Sample Types

Groundwater samples shall be collected from each monitoring well and surface water samples shall be collected at predetermined locations. Field duplicates, field blanks, equipment rinseate blanks, reagent blanks, if necessary, and trip blanks shall be obtained for quality assurance during groundwater and surface water sampling activities. The samples shall be handled as described in Permit Section 11.10.2.9.

Field duplicate surface water and groundwater samples shall be obtained at a frequency of ten percent. At a minimum, one duplicate sample per sampling event shall always be obtained.

Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater or surface water samples, to the analytical laboratory for the appropriate analyses.

Equipment rinsate blanks shall be obtained for chemical analysis at the rate of five percent but no fewer than one rinsate blank per sampling day. Equipment rinsate blanks shall be collected at a rate of one per sampling day if disposable sampling apparatus is used. Rinsate samples shall be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample then shall be placed in the appropriate sample container and submitted with the groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of ten percent but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during water sampling activities.

Trip blanks shall accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks shall consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an appropriate sample container. The trip blank shall be prepared by the analytical laboratory prior to the sampling event and shall be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks shall be analyzed at a frequency of one for each shipping container of samples.

11.10.2.9 Sample Handling

At a minimum, the following procedures shall be used at all times when collecting samples during investigation, corrective action, and monitoring activities unless otherwise specified in a Department-approved work plan:

1. neoprene, nitrile, or other protective gloves shall be worn when collecting samples. New disposable gloves shall be used to collect each sample;

2. all samples collected of each medium for chemical analysis shall be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in brass sleeves, shelby tubes, thin wall samplers, or in Encore™ samplers. Upon recovery of the sample collected using split barrel samplers with brass sleeves, the brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves shall be lined with Teflon tape or foil and sealed with plastic caps. The caps shall be fastened to the sleeve with tape for storage and shipment to the analytical laboratory. Samples collected in shelby tubes or thin wall samplers shall be capped in a similar fashion. The sample depth and the top of the sample shall be clearly marked. Sample container volumes and preservation methods shall be in accordance with EPA SW-846 and established industry practices for use by accredited analytical laboratories. Sufficient sample volume shall be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and

3. sample labels and documentation shall be completed for each sample following procedures included in the site-specific work plans approved by the Department. Immediately after the samples are collected, they shall be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described in Permit Section 11.10.2.14.ii, shall be followed for all samples collected. All samples shall be submitted to the laboratory

soon enough to allow the laboratory to conduct the analyses within the method holding times. All samples shall be submitted to the laboratory within 48 hours after their collection.

Shipment procedures shall include the following:

1. individual sample containers shall be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler shall be sealed and secured in case of sample container leakage. Temperature blanks shall be included with each shipping container;

2. each cooler or other container shall be delivered directly to the analytical laboratory;

3. glass bottles shall be separated in the shipping container by cushioning material to prevent breakage;

4. plastic containers shall be protected from possible puncture during shipping using cushioning material;

5. the chain-of-custody form and sample request form shall be shipped inside the sealed storage container to be delivered to the laboratory;

6. chain-of-custody seals shall be used to seal the sample-shipping container in conformance with EPA protocol; and

7. signed and dated chain-of-custody seals shall be applied to each cooler prior to transport of samples from the site.

11.10.2.10 In-Situ Testing

In-situ permeability tests, remediation system pilot tests, stream flow tests, and other tests conducted to evaluate site and subsurface conditions shall be designed to accommodate specific site conditions and to achieve the test objectives. The testing methods shall be approved, in writing, by the Department prior to implementation. The tests shall be conducted in order to appropriately represent site conditions and in accordance with USGS, ASTM or other methods generally accepted by the industry. Detailed logs of all relevant site conditions and measurements shall be maintained during the testing events. If requested, a summary of the general test results, including unexpected or unusual test results and equipment failures or testing limitations shall be reported to the Department within 30 days of completion of the test. The summary shall be presented in a format acceptable to the Department and in general accordance with the report formats outlined in Permit Section 11.12 (*Reporting Requirements*). A report summarizing the results of each test shall be submitted to the Department within 120 days of completion of each test.

11.10.2.11 Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. A designated decontamination area shall be established for decontamination of drilling equipment, reusable sampling equipment and well materials. The drilling rig shall be decontaminated prior to entering the site or unit. Drilling equipment or other exploration equipment that may come in contact with the borehole shall be decontaminated by steam cleaning, by hot-water pressure washing, or by other method approved by the Department prior to drilling each new boring.

Sampling or measurement equipment, including but not limited to, stainless steel sampling tools, split-barrel or core samplers, well developing or purging equipment, groundwater quality measurement instruments, and water level measurement instruments, shall be decontaminated in accordance with the following procedures or other methods approved by the Department before each sampling attempt or measurement:

1. brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. rinse with potable tap water;
3. wash with nonphosphate detergent or other detergent approved by the Department (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
4. rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;
5. rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. rinse with potable tap water; and
7. double rinse with deionized water.

All decontamination solutions shall be collected and stored temporarily as described in Permit Section 11.10.5. Decontamination procedures and the cleaning agents used shall be documented in the daily field log.

11.10.2.12 Field Equipment Calibration Procedures

Field equipment requiring calibration shall be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks shall be conducted daily, or at other intervals approved by the Department, and the instruments shall be recalibrated, if necessary. Calibration measurements shall be recorded in the daily field logs. If field equipment becomes inoperable, its use shall be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument shall be used.

11.10.2.13 Collection and Management of Investigation Derived Waste

Investigation derived waste (IDW) includes general refuse, drill cuttings, excess sample material, water (decontamination, development and purge), and disposable equipment generated during the course of investigation, corrective action, or monitoring activities. All IDW shall be properly characterized and disposed of in accordance with all Federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The Permittees shall include a description of anticipated management of IDW as part of the applicable work plan submitted to the Department for approval prior to disposal of any IDW produced during investigation, corrective action, or monitoring activities. The Permittees may submit a request to the Department to dispose of IDW on a case-by-case basis prior to submittal of the applicable work plan.

All water generated during sampling and decontamination activities shall be temporarily stored at satellite accumulation areas or transfer stations in labeled 55-gallon drums or other containers approved by the Department until proper characterization and disposal can be arranged. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste. The methods for waste characterization and disposal of IDW shall be approved by the Department prior to removal from the temporary storage area.

11.10.2.14 Documentation of Field Activities

11.10.2.14.i General

Daily field activities, including observations and field procedures, shall be recorded on appropriate forms. The original field forms shall be maintained at the Facility. Copies of the completed forms shall be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink shall be used to record all field activities. Photographic documentation of field activities shall be performed, as appropriate. The daily record of field activities shall include the following:

1. site or unit designation;
2. date;
3. time of arrival and departure;
4. field investigation team members including subcontractors and visitors;
5. weather conditions;
6. daily activities and times conducted;
7. observations;
8. record of samples collected with sample designations and locations specified;
9. photographic log;

10. field monitoring data, including health and safety monitoring if conditions arise that require modification of required work;

11. equipment used and calibration records, if appropriate;

12. list of additional data sheets and maps completed;

13. an inventory of the waste generated and the method of storage or disposal; and

14. signature of personnel completing the field record.

11.10.2.14.ii Sample Custody

All samples collected for analysis shall be recorded in the field report or data sheets. Chain-of-custody forms shall be completed at the end of each sampling day, prior to the transfer of samples off site, and shall accompany the samples during shipment to the laboratory. A signed and dated custody seal shall be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form shall be signed as received by the laboratory, and the conditions of the samples shall be recorded on the form. The original chain-of-custody form shall remain with the laboratory and copies shall be returned to the relinquishing party. The Permittees shall maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records (either paper copies or electronically scanned in PDF format) shall be included with all draft and final laboratory reports submitted to the Department.

11.10.3 Chemical Analyses

The Permittees shall submit all samples for laboratory analysis to accredited contract laboratories. The laboratories shall use the most recent EPA and industry-accepted extraction and analytical methods for chemical analyses for target analytes as the testing methods for each medium sampled. The Permittees shall use the most sensitive laboratory methods (with the lowest detection limits) available unless specific conditions preclude their use.

The Permittees shall submit a list of analytes and analytical methods to the Department, for review and written approval as part of each site-specific investigation, corrective action, or monitoring work plan. The detection limits for each method shall be less than applicable background, screening, and regulatory cleanup levels. The preferred method detection limits are a maximum of 20 percent of the cleanup, screening, or background levels. Analyses conducted with detection limits that are greater than applicable background, screening, and regulatory cleanup levels shall be considered data quality exceptions and the reasons for the elevated detection limits shall be reported to the Department. These data cannot be used for statistical analyses. All analytical data (non-detects, estimated blanks, and detects) shall be included in the electronic or magnetic copy of the investigation report in Microsoft™ Excel format with qualifiers as attached from the analytical laboratory. The summary tables shall include only detects of the data based on the corresponding qualifiers. The Permittees shall not censor the data based on detection limits, quantitation limits, or measurement uncertainty.

11.10.3.1 Laboratory QA/QC Requirements

The following requirements for laboratory QA/QC procedures shall be considered the minimum QA/QC standards for the laboratories employed by the Permittees that provide analytical services for environmental investigation, corrective action, and monitoring activities conducted at the Facility. The Permittees shall provide the names of the contract analytical laboratories and copies of the laboratory quality assurance manuals to the Department within 90 days of awarding a contract for analytical services to any contract laboratory.

11.10.3.1.i Quality Assurance Procedures

Contract analytical laboratories shall maintain internal quality assurance programs in accordance with EPA and industry-wide accepted practices and procedures. At a minimum, the laboratories shall use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories shall establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories shall establish internal QA/QC that meets EPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

11.10.3.1.ii Equipment Calibration Procedures and Frequency

The laboratories' equipment calibration procedures, calibration frequency, and calibration standards shall be in accordance with the EPA test methodology requirements and documented in the laboratories' quality assurance and SOP manuals. All instruments and equipment used by the laboratory shall be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Operation, calibration, and maintenance shall be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance shall be kept on file at the laboratory.

11.10.3.1.iii Laboratory QA/QC Samples

Analytical procedures shall be evaluated by analyzing reagent or method blanks, surrogates, MS/MSDs, BS/BSDs, and laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed shall be documented in the cited EPA or DOE test methodologies. At a minimum, the laboratory shall analyze laboratory blanks, MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs requiring EPA test methods and at a frequency of one in ten for non-EPA test methods. Laboratory batch QA/QC samples shall be specific to the project.

11.10.3.1.iv Laboratory Deliverables

The laboratory analytical data package submitted to the Department shall be prepared in accordance with EPA-established Level II analytical support protocol. The laboratory analytical data package kept on file at the Facility shall be prepared in accordance with EPA-established Level III or IV analytical support protocol. The following shall be provided by the contract

analytical laboratories to the Permittees in the analytical laboratory reports submitted to the Permittees either electronically, magnetically or in hard (paper) copy for each project:

1. transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report;

2. sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; soil, rock, or sediment sample results in consistent units (mg/kg) or micrograms per kilogram in dry-weight basis; water sample results in consistent units (milligrams per liter or micrograms per liter (μg/L)); vapor sample results in consistent units (ppm or $\mu g/m^3$); and detection limits for undetected analytes. Results shall be reported for all field samples, including field duplicates and blanks, submitted for analysis;

3. method blank results, including detection limits for undetected analytes;

4. surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only);

5. MS/MSD and/or BS/BSD spike concentrations, percent recoveries, relative percent differences (RPDs), and corresponding control limits;

6. laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits;

7. sample chain-of-custody documentation;

8. holding times and conditions;

9. conformance with required analytical protocol(s);

10. instrument calibration;

11. blanks;

12. detection/quantitation limits;

13. recoveries of surrogates;

14. variability for duplicate analyses;

15. completeness;

16. data report formats.

The following data deliverables for organic compounds shall be required from the laboratory:

1. a cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported;

2. report of sample collection, extraction, and analysis dates, including sample holding conditions;

3. tabulated results for samples in units as specified, including data qualification in conformance with EPA protocol, and definition of data descriptor codes;

4. reconstructed ion chromatograms for gas chromatograph/mass spectrometry (GC/MS) analyses for each sample and standard calibration;

5. selected ion chromatograms and mass spectra of detected target analytes (GC/MS) for each sample and calibration with associated library/reference spectra;

6. gas chromatograph/electron capture device (GC/ECD) and/or gas chromatograph/flame ionization detector (GC/FID) chromatograms for each sample and standard calibration;

7. raw data quantification reports for each sample and calibrations, including areas and retention times for analytes, surrogates, and internal standards;

8. a calibration data summary reporting calibration range used and a measure of linearity [include decafluorotriphenylphosphine (DFTPP) and p-bromofluorobenzene (BFB) spectra and compliance with tuning criteria for GC/MS];

9. final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitation limit for each analyte;

10. analyte concentrations with reporting units identified, including data qualification in conformance with the CLP Statement of Work (SOW) (include definition of data descriptor codes);

11. quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample;

12. recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts); and

13. report of tentatively identified compounds with comparison of mass spectra to library/reference spectra.

The following data deliverables for inorganic compounds shall be required from the laboratory:

1. a cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications; including signature from authority representative certifying to the quality and authenticity of data as reported;

2. report of sample collection, digestion, and analysis dates, with sample holding conditions;

3. tabulated results for samples in units as specified, including data qualification in conformance with the CLP SOW (including definition of data descriptor codes);

4. results of all method QA/QC checks, including inductively coupled plasma (ICP) Interference Check Sample and ICP serial dilution results;

5. tabulation of instrument and method practical detection/quantitation limits;

6. raw data quantification report for each sample;

7. a calibration data summary reporting calibration range used and a measure of linearity, where appropriate;

8. final digestate volumes (and dilutions required), sample size, and wet-to-dry weight ratios;

9. quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample; and

10. recovery assessments and a replicate sample summary, including post-digestate spike analysis; all MS data (including spike concentrations) for each sample, if accomplished; all MS results (recoveries and spike amounts); and laboratory control sample analytical results).

The Permittees shall present summary tables of these data and Level II QA/QC results to the Department in the formats described in Permit Section 11.12 (*Reporting Requirements*). The raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory support data for samples from this project, shall be compiled and kept on file at the Facility for reference. The Permittees shall make the data and all Level III or Level IV QA/QC data available to the Department upon request.

11.10.3.2 Review of Field and Laboratory QA/QC Data

The Permittees shall evaluate the sample data, field, and laboratory QA/QC results for acceptability with respect to the data quality objectives (DQOs). Each group of samples shall be compared with the DQOs and evaluated using data validation guidelines contained in EPA guidance documents, the latest version of SW-846, and industry-accepted QA/QC methods and procedures.

The Permittees shall require the laboratory to notify the Facility project manager of data quality exceptions within one business day of discovery in order to allow for sample re-analysis, if

possible. The Facility project manager shall contact the Department within one business day of receipt of laboratory notification of data quality exceptions that may affect the ability to meet the objectives of the investigation or compliance activity in order to discuss the implications and determine whether the data will still be considered acceptable or if sample re-analysis or resampling is necessary. The Facility project manager shall summarize the results of the discussion with the Department project leader regarding the data quality exceptions in a memorandum. The Permittees shall submit the memorandum to the Department by fax or electronic mail within three business days of the conclusion of the data quality discussion.

11.10.3.3 Blanks, Field Duplicates, Reporting Limits, and Holding Times

11.10.3.3.i Blanks

The analytical results of field blanks and field rinsate blanks shall be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks shall be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample transport containers. The analytical results of laboratory blanks shall be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If contaminants are detected in field or laboratory blanks, the sample data shall be qualified, as appropriate.

11.10.3.3.ii Field Duplicates

Field duplicates shall consist of 2 samples either split from the same sample device or collected sequentially. Field duplicate samples shall be collected at a minimum frequency of 10 percent of the total number of samples submitted for analysis. RPDs for field duplicates shall be calculated. A precision of no more than 20 percent for duplicates shall be considered acceptable for soil, rock, and sediment sampling conducted at the Facility. The analytical DQO for precision shall be used for water duplicates.

11.10.3.3.iii Method Reporting Limits

Method reporting limits for sample analyses for each medium shall be established at the lowest level practicable for the method and analyte concentrations and shall not exceed soil, groundwater, surface water, or vapor emissions background levels, cleanup standards, and screening levels. The preferred method detection limits are a maximum of 20 percent of the background, screening, or cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air emissions cleanup standards, screening levels, or background levels and are reported as "not detected" shall be considered data quality exceptions and an explanation for the exceedance and its acceptability for use shall be provided.

11.10.3.3.iv Holding Times

The Permittees shall review the sampling, extraction, and analysis dates to confirm that extraction and analyses were completed within the recommended holding times, as specified by EPA protocol. Appropriate data qualifiers shall be noted if holding times were exceeded.

11.10.3.4 Representativeness and Comparability

11.10.3.4.i Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. The Permittees shall implement procedures to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. The Permittees shall note any procedures or variations that may affect the collection or analysis of representative samples and shall qualify the data.

11.10.3.4.ii Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, the Permittees shall report analytical results in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and shall implement standard collection and analytical procedures. Any procedure or variation that may affect comparability shall be noted and the data shall be qualified.

11.10.3.5 Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

Upon receipt of each laboratory data package, data shall be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria shall be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers shall be submitted as appendices or attachments to investigation and monitoring reports prepared in accordance with Permit Section 11.12 (*Reporting Requirements*). Data validation procedures for all samples shall include checking the following, when appropriate:

1. holding times;
2. detection limits;
3. field equipment rinsate blanks;
4. field blanks;
5. field duplicates;
6. trip blanks;
7. reagent blanks;
8. laboratory duplicates;
9. laboratory blanks;
10. laboratory matrix spikes;

11. laboratory matrix spike duplicates;

12. laboratory blank spikes;

13. laboratory blank spike duplicates; and

14. surrogate recoveries.

If significant quality assurance problems are encountered, appropriate corrective action shall be implemented. All corrective action shall be defensible and the corrected data shall be qualified.

11.10.4 Human Health and Ecological Risk Assessments

The Permittees shall prepare a Human Health and Ecological Risk Assessment Report for determination of clean closure, risk-based closure, and/or in support of corrective action. Risk assessments shall be conducted in accordance with current and acceptable EPA, Regional EPA, and Department guidance and methodology.

11.10.4.1 Human Health Risk Assessment Methods

A risk assessment may be required for human receptors that are potentially exposed to site-related chemicals in environmental media. The risk assessment shall contain a conceptual site model (CSM), which shall aid in understanding and describing each site. The CSM shall address the following components:

1. identification of suspected sources;
2. identification of contaminants;
3. identification of contaminant releases;
4. identification of transport mechanisms;
5. identification of affected media;
6. identification of land use scenarios;
7. identification of potential receptors under current land use scenario;
8. identification of potential receptors under future land use scenario; and
9. identification of potential routes of exposure.

Potential human receptors under current and/or future land use scenarios may include residential, industrial, construction, and recreational. Other special receptors may be required on a site-specific basis.

11.10.4.1.i Exposure Pathways

The identification of exposure pathways shall include of discussion of all potential pathways and justify whether the pathways are complete. Pathways that shall be considered include soil, groundwater, air, surface water, sediment, and biota. An evaluation of the potential for contaminants to migrate from soil to groundwater shall also be provided. The risk assessment shall also address exposure mechanisms for each exposure pathway, including ingestion, inhalation, dermal, and inhalation of volatile organic compounds volatilized from soil and/or groundwater.

11.10.4.1.ii Data Quality Assurance

The risk assessment shall include an evaluation of analytical data and the usability of the data in the assessment. Data validation shall be conducted in accordance with current EPA guidelines. The evaluation of data shall also include a comparison of detection limits with appropriate and current risk-based screening levels. Current EPA methodology for handling non-detects and replicates in the risk assessment shall be applied.

11.10.4.1.iii Constituents of Potential Concern

Appropriate EPA and/or the Department guidance shall be used to identify constituents of potential concern (COPCs). With the exception of chemicals attributed to field or laboratory contamination, all analytes detected in sampled media (i.e., soil, air, surface water, groundwater, biota, and/or sediment) shall be retained or eliminated as COPCs using one or more of the following processes:

1. site attribution analysis;
2. essential nutrients; and/or
3. risk-based toxicity screen.

Unless sufficient evidence and special circumstances can be provided by the Permittees, all detected organics not attributable to field or laboratory contamination shall be retained and treated as site-related chemicals.

Inorganics detected in site media shall be compared to an appropriate background data set to determine if concentrations are present at levels significantly above background. The site attribution analysis may consist of a tiered approached as follows:

1. comparison of maximum detected site concentrations to a background reference value (e.g., upper tolerance limit, UTL);
2. if the site maximum exceeds the background reference value, and sample size is sufficient, statistically compare the site data set to the background data set using appropriate statistical analyses (e.g., Wilcoxon Rank Sum Test);

3. conduct a graphical analysis of site data and background data (e.g., histograms and/or box and whisker plots);

4. conduct a geochemical analysis of site data to a background reference chemical; and/or

5. evaluate essential nutrients and compare to recommended daily allowances and/or upper intake limits.

All inorganics for which the site attribution analyses indicate are present above natural background shall be retained as COPCs for the risk assessments.

11.10.4.1.iv Risk-based Toxicity Screen

The Permittees may conduct a risk-based screening assessment to identify the COPCs that are likely to contribute significantly to risks calculated for each exposure scenario and exposure medium in order to focus the risk assessment on those chemicals that contribute the greatest significance to overall risk. The risk-based screening assessment shall consist of the comparison of the maximum detected site concentration to an appropriate risk-based screening level (e.g., New Mexico Soil Screening Levels or EPA Region 6 Soil Screening Levels). Chemicals for which the maximum detected site concentrations exceed the respective risk-based screening levels shall be retained for further risk analysis.

11.10.4.1.v Exposure Point Concentrations

The Permittees shall determine exposure point concentrations (EPCs) that are representative of the concentrations of chemicals in each given medium to which a receptor may be exposed. EPA recommends a 95% estimate of the upper confidence limit (95% UCL) on the arithmetic mean be used as an EPC for chronic exposures. For acute exposures, the maximum detected site concentration shall be used as the EPC.

The EPCs shall be determined using statistical analyses that are data distribution and size dependent. EPA and/or the Department accepted guidance and methodologies shall be used, such as the ProUCL software.

EPCs shall be calculated for soil, groundwater, surface water, sediment, and biota.

EPA does not recommend estimating intakes for the air inhalation pathway, but rather compares estimated volatile/particulate air concentrations adjusted for exposure frequencies, duration, and time. For inhalation of volatiles/particulates from soil, EPCs shall be determined based upon the current EPA and/or Department methodology, based upon the volatilization factor or particulate emission factor. Indoor air concentrations shall be determined using EPA and Department accepted approaches, such as the EPA-recommended Johnson and Ettinger model.

11.10.4.1.vi Exposure Assumptions

The Permittees shall use EPA and/or Department approved exposure assumptions. Exposure assumptions may be based upon site-specific data.

11.10.4.1.vii Toxicity Assessment

The Permittees shall use the most recently available toxicity factors to calculate carcinogenic and noncarcinogenic risks/hazards based upon the currently acceptable hierarchy of sources for toxicity data. Generally, the approved hierarchy is as follows:

1. EPA's Integrated Risk Information System (IRIS);
2. provisional EPA National Center for Environmental Assessment (NCEA);
3. agency for Toxic Substances and Disease Registry (ASTDR); and
4. other EPA publications (such as the Health Effects Assessment Summary Tables (HEAST), Water Quality Criteria, and Health Advisories).

The Permittees shall quantitatively estimate the potential for carcinogenic (risk) and non-carcinogenic (hazard) effects for all chemicals with toxicity data and provide a discussion of uncertainties associated with the risk assessment. Cumulative effects for risk and hazard shall be determined.

For those chemicals without toxicity data, appropriate surrogate data may be applied. If surrogate toxicity data are not available, risks/hazards shall be qualitatively addressed in the uncertainties section of the report.

11.10.4.1.viii Uncertainties

The Permittees shall provide an uncertainties section that discusses all assumptions, professional judgments, and data which may result in uncertainties in the final estimates of risk and hazard. The uncertainties shall also discuss whether risks/hazards may have been under or overestimated due to the assumptions made in the assessment.

11.10.5 Ecological Risk Assessment Methods

An ecological risk assessment may be required for receptors that are potentially exposed to site-related chemicals in environmental media. The ecological risk assessment process shall consist of a scoping assessment, a screening-level assessment, and if warranted, a site-specific assessment. Based upon the results of the scoping assessment, the Permittees shall demonstrate whether additional analyses are warranted. If the scoping assessment indicates that there is potential for ecological hazard, a screening-level ecological risk assessment shall be conducted. Based upon the results of the screening assessment, a site-specific ecological risk assessment may or may not be necessary.

11.10.5.1 Scoping Assessment

In order to assess whether ecological hazards are a concern at the site, the Permittees shall conduct a scoping assessment. The Department's "Site Assessment Checklist" and/or other

current EPA and/or Department guidance shall be used for conducting the scoping assessment. The site assessment checklist and/or scoping report shall contain the following information:

1. scope and intent;
2. specific site information (including site location and site characterization);
3. findings of a site investigation (including habitat and exposure pathway evaluation);
4. identification of ecological receptors of potential concern; and
5. preliminary conceptual site exposure model (including complete exposure pathways).

If the scoping assessment indicates that there are any rare, threatened, endangered or otherwise protected species using the property, and/or there are any species which are considered a recreational or a commercial resource, and/or plants or animal species using the affected property for habitat or foraging and could come into contact with site contaminants, then the Permittees shall conduct a screening level ecological risk assessment.

11.10.5.2 Screening Level Ecological Risk Assessment

The screening level ecological risk assessment shall be conducted in accordance with current EPA and/or the Department approved methodologies. The Permittees shall establish ecologically based screening levels (EBSL) calculated using dietary exposure models and toxicity reference values (TRVs). The screening level hazard quotient shall be calculated for each constituent of potential ecological concern (COPEC) in each media using the maximum detected site concentration and the calculated ecologically-based screening level (EBSL). The assessment of overall risk shall include cumulative risk if more than one COPEC is present at a site.

11.10.5.3 Site-Specific Ecological Risk Assessment

If the screening level ecological risk assessment indicates unacceptable risk, then the Permittees shall conduct a site-specific ecological risk assessment. The assessment shall be conducted using EPA and/or the Department approved guidance and methodologies. The ecological risk assessment shall follow the same methodologies outlined above in the human health risk assessment for determining COPEC and data quality assurance.

11.10.6 Determination of Background

The Permittees shall determine an appropriate background data set for inorganic constituents at the site. The Permittees shall determine whether one or more background data sets are appropriate depending on soil types and geology at the site. Background concentrations for groundwater shall be collected from upgradient wells. The background data set shall be representative of natural conditions unaffected by site activities and shall be statistically defensible. A sufficient number of background samples shall be collected for use in the risk assessment, including conducting site attribution analyses and comparison of data sets.

The Permittees shall provide summary statistics for background metals concentrations in each medium of concern and include the following information:

1. number of detects;
2. total number of samples;
3. frequency of detection;
4. minimum detected concentration;
5. maximum detected concentration;
6. minimum sample quantitation limit (SQL);
7. maximum SQL;
8. arithmetic mean;
9. median;
10. standard deviation; and
11. coefficient of variation.

The Permittees shall determine the 95% upper tolerance limit (UTL) for each metal using a distribution-based statistical method.

11.10.6.1 Comparing Site Data to Background

The 95% UTL for each metal shall be used as the background reference value for use in screening assessments and determining whether metals are present in soil/groundwater/surface water/sediment due to site activities. The site maximum detected concentration shall be compared to the 95% UTL for each metal. If the site maximum detected concentration is greater than the background reference value, then additional site attribution analyses shall be conducted.

Site attribution analyses shall be conducted in accordance with current EPA and/or the Department accepted guidance. The site attribution analyses shall consist of a statistical comparison of the background data set to the site data set, using distribution based tests such as the Wilcoxon Rank Sum Test.

If the results of the site attribution analyses indicate that the metal is present at the site above naturally occurring levels, then the Permittees shall include that metal as a site contaminant.

11.11 MONITORING WELL CONSTRUCTION REQUIREMENTS

11.11.1 Types of Monitoring Wells

Two types of groundwater monitoring wells may be installed at the Facility: single completion (containing one screened interval) and multiple screened wells. General drilling procedures are presented in Permit Section 11.11.2 and monitoring well construction requirements are presented in Permit Section 11.11.3.

11.11.2 Drilling Methods

Groundwater monitoring wells and piezometers must be designed and constructed in a manner which will yield high quality samples, ensure that the well will last the duration of the project, and ensure that the well will not serve as a conduit for contaminants to migrate between different stratigraphic units or aquifers. The design and construction of groundwater monitoring wells shall comply with the guidelines established in various EPA RCRA guidance, including, but not limited to:

1. U.S. EPA, RCRA Groundwater Monitoring: Draft Technical Guidance, EPA/530-R-93-001, November, 1992;

2. U.S. EPA, RCRA Groundwater Monitoring Technical Enforcement Guidance Document, OSWER-9950.1, September, 1986; and

3. Aller, L., Bennett, T.W., Hackett, G., Petty, R.J., Lehr, J.H., Sedoris, H., Nielsen, D.M., and Denne, J.E., Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA 600/4-89/034, 1989.

A variety of methods are available for drilling monitoring wells. While the selection of the drilling procedure is usually based on the site-specific geologic conditions, the following issues shall also be considered:

1. drilling shall be performed in a manner that minimizes impacts to the natural properties of the subsurface materials;

2. contamination and cross-contamination of groundwater and aquifer materials during drilling shall be avoided;

3. the drilling method shall allow for the collection of representative samples of rock, unconsolidated materials, and soil;

4. the drilling method shall allow the Permittees to determine when the appropriate location for the screened interval(s) has been encountered; and

5. the drilling method shall allow for the proper placement of the filter pack and annular sealants. The borehole diameter shall be at least 4 inches larger in diameter than the nominal diameter of the well casing and screen to allow adequate space for placement of the filter pack and annular sealants.

The drilling method shall allow for the collection of representative groundwater samples. Drilling fluids (which includes air) shall be used only when minimal impact to the surrounding formation and groundwater can be ensured.

A brief description of the different drilling methods that may be appropriate for the construction of monitoring wells at the Facility follows. Many of these methods may be used alone, or in combination, to install monitoring wells at the Facility. While the selection of the specific drilling procedure will usually depend on the site-specific geologic conditions, justification for the method selected must be provided to the Department.

11.11.2.1 Hollow-Stem Auger

The hollow-stem continuous flight auger consists of a hollow, steel shaft with a continuous, spiraled steel flight welded onto the exterior site of the stem. The stem is connected to an auger bit and, when rotated, transports cuttings to the surface. The hollow stem of the auger allows drill rods, split-spoon core barrels, Shelby tubes, and other samplers to be inserted through the center of the auger so that samples may be retrieved during the drilling operations. The hollow stem also acts to temporarily case the borehole, so that the well screen and casing (riser) may be inserted down through the center of the augers once the desired depth is reached, minimizing the risk of possible collapse of the borehole. A bottom plug or pilot bit can be fastened onto the bottom of the augers to keep out most of the soils and/or water that have a tendency to clog the bottom of the augers during drilling. Drilling without a center plug is acceptable provided that the soil plug, formed in the bottom of the auger, is removed before sampling or installing well casings. The soil plug can be removed by washing out the plug using a side discharge rotary bit, or augering out the plug with a solid-stem auger bit sized to fit inside the hollow-stem auger. In situations where heaving sands are a problem, potable water may be poured into the augers to equalize the pressure so that the inflow of formation materials and water shall be held to a minimum when the bottom plug is removed. The hollow-stem auger method is best suited for drilling shallow overburden wells.

11.11.2.2 Air Rotary/Air Down-The-Hole Hammer/ODEX

The air rotary method consists of a drill pipe or drill stem coupled to a drill bit that rotates and cuts through soils and rock. The cuttings produced from the rotation of the drilling bit are transported to the surface by compressed air, which is forced down the borehole through the drill pipe and returns to the surface through the annular space (between the drill pipe and the borehole wall). The circulation of the compressed air not only removes the cuttings from the borehole but also helps to cool the drill bit. The use of air rotary drilling is best suited for hard-rock formations. In soft unconsolidated formations, casing is driven to keep the formation from caving. When using air rotary, the air compressor shall have an in-line filter system to filter the air coming from the compressor. The filter system shall be inspected regularly to insure that the system is functioning properly. In addition, a cyclone velocity dissipater or similar air containment/dust-suppression system shall be used to funnel the cuttings to one location instead of allowing the cuttings to discharge uncontrolled from the borehole. Air rotary that employs the dual-tube (reverse circulation) drilling system is acceptable because the cuttings are contained within the drill stem and are discharged through a cyclone velocity dissipater to the ground surface.

The injection of air into the borehole during air rotary drilling has the potential to alter the natural properties of the subsurface. This can occur through air-stripping of the VOCs in both soil and groundwater in the vicinity of the borehole, altering the groundwater geochemical parameters (e.g., pH and re-dox potential), and potentially increasing biodegradation of organic compounds in the aquifer near the borehole. These factors may prevent the well from yielding groundwater samples that are representative of in-situ conditions.

In hard, abrasive, consolidated rock, a down-the-hole hammer may be more appropriate than the air rotary method. In this method, compressed air is used to actuate and operate a pneumatic hammer as well as lift the cuttings to the surface and cool the hammer bit. One drawback of the down-the-hole hammer is that oil is required in the air stream to lubricate the hammer-actuating device, and this oil could potentially contaminate the soil in the vicinity of the borehole and the aquifer.

The ODEX method is a variation of the air rotary method in which a casing-driving technique is used in combination with air rotary drilling. With the ODEX system, the drill bit extends outward and reams a pilot hole large enough for a casing assembly to slide down behind the drill bit assembly. As a result, casing is advanced simultaneously while drilling the hole.

11.11.2.3 Water Rotary and Mud Rotary

The water and mud rotary drilling methods consist of rotary drilling techniques where water or drilling mud is used as the circulating fluid. In both methods, the circulating fluid is pumped down through the drill pipe and is returned back up the borehole through the annular space. The circulating fluid stabilizes the borehole, cools the drill bit, and carries the drill cuttings up to the surface. While the water and mud rotary drilling techniques are rapid and effective drilling methods, the recognition of water-bearing zones is hampered by the addition of water into the system.

Mud rotary drilling is similar to water rotary drilling with the exception that mud additives are added to the water to change the properties (e.g., density, viscosity, yield point, gel strength, fluid-loss-control effectiveness, and lubricity) of the circulating fluid. Drilling muds provide greater borehole stabilization than water alone. There are several types of mud presently available, including bentonite, barium sulfate, organic polymers, cellulose polymers, and polyacrylamides. While drilling muds enhance the stability of the borehole and allow for drilling in formations not appropriate to other methods, they can adversely affect the hydrologic properties and geochemistry of the aquifer. For example, drilling fluid invasion and the buildup of borehole filter cake may reduce the effective porosity of the aquifer in the vicinity of the borehole. In addition, bentonite drilling muds may affect the pH of groundwater and organic polymer drilling muds have been observed to facilitate bacterial growth, which reduces the reliability of sampling results. If polymer emulsions are to be used in the drilling program at the Facility, polymer dispersion agents shall be used at the completion of the drilling program to remove the polymers from the boreholes. For example, if EZ Mud® is used as a drilling additive, a dispersant (e.g., BARAFOS® or five percent sodium hypochlorite) shall be used to disperse and chemically breakdown the polymer prior to developing and sampling the well. If drilling fluids are used as part of well installation, the Permittees must demonstrate that all data acquired from the well is representative of existing subsurface conditions using methods

approved by the Department. The Department may require additional sampling and testing periodically to ensure that the data collected is not affected by residual drilling fluids.

11.11.2.4 Dual-Wall Reverse Circulation

The dual-wall reverse circulation drilling method utilizes a double-wall drill pipe and has the reverse circulation of other conventional rotary drilling methods. The circulating fluid (water or air) is pumped down the borehole between the outer and inner drill pipe, and returns up the inner drill pipe. Cuttings are lifted to the surface through the inner drill pipe. The inner drill pipe rotates the bit, and the outer drill pipe acts as a casing and stabilizes the borehole. Typically, a tri-cone bit is used when drilling through unconsolidated formations and a down-the-hole hammer is used in hard rock.

The dual-wall reverse circulation rotary method is one of the better methods available for obtaining representative and continuous formation samples while drilling. If a roller cone bit is used, the formation that is being drilled is located only a few inches ahead of the double-wall pipe. As a result, the cuttings observed at the surface represent no more than one foot of the formation at any point in time.

When drilling with air, an in-line filter shall be used to remove oil or other impurities from the airstream. However, if a down-the-hole hammer is used, it must be used with caution since it requires oil in the airstream to lubricate the hammer. This could possibly introduce contaminants to the borehole and aquifer.

11.11.2.5 Resonant Sonic

Resonant sonic drilling is a method that uses a sonic drill head to produce high-frequency, high-force vibrations in a steel drill pipe. The vibrations in the pipe create a cutting action at the bit face, which allows a continuous core of the formation to move into a core barrel. The method requires no drilling fluid, drills very fast (up to one ft/sec in certain formations), drills at any angle through all formations (rock, clay, sand, boulders, permafrost, glacial till), and yields virtually no cuttings in the drilling process. While there are numerous advantages to this process, the primary disadvantage is the cost of the method. This drilling method has been proven and used at various facilities.

11.11.2.6 Cryogenic

Cryogenic drilling is a technique that uses standard air rotary drilling methods, but employs cold nitrogen gas as the circulating fluid instead of compressed air. The use of nitrogen gas as the circulation fluid freezes the borehole wall while drilling, which stabilizes unconsolidated sediments and prevents potential cross-contamination of different water-bearing zones. In addition, the method produces fewer cuttings than liquid based drilling methods, requires minimal equipment modifications to existing drill rigs, and does not add contaminants to the borehole during the drilling process due to the benign nature of nitrogen gas. The method is especially applicable for drilling through alternating hard (competent) and soft (unconsolidated) formations. This drilling method has been tested by the DOE and proposed for future use at various DOE facilities.

11.11.3 Well Construction/Completion Methods

11.11.3.1 Well Construction Materials

Well construction materials shall be selected based on the goals and objectives of the proposed monitoring program and the geologic conditions at the site. When selecting well construction materials, the primary concern shall be selecting materials that will not contribute foreign constituents or remove contaminants from the groundwater. Other factors to be considered include the tensile strength, compressive strength, and collapse strength of the materials; length of time the monitoring well will be in service; and the material's resistance to chemical and microbiological corrosion. Generally, if the monitoring program requires the analysis of organic constituents, stainless steel or fluoropolymer materials should be used. However, if the monitoring program requires only inorganic constituent analyses, polyvinyl chloride (PVC) materials may be used. PVC should not be used for monitoring wells where organic constituents will be analyzed due to its potential for sorption and leaching of contaminants.

Well screen and casing materials acceptable for the construction of RCRA monitoring wells include stainless steel (304 or 316), rigid PVC (meeting American National Standards Institute/National Sanitation Foundation Standard 14), and fluoropolymer materials (polytetrafluoroethylene, fluorinated ethylene propylene, and polyvinylidene). In addition, there are other materials available for the construction of monitoring wells including acrylonitrile butadiene styrene (ABS), fiberglass-reinforced plastic (FRP), black iron, carbon steel, and galvanized steel, but these materials are not recommended for use in long term monitoring wells due to their low resistance to chemical attack and potential contribution of contamination to the groundwater. However, these materials may be used in the construction of monitoring wells where they will not be in contact with the groundwater that will be sampled (e.g., carbon steel pipe used as surface casing).

11.11.3.2 Well Construction Techniques

11.11.3.2.i Single-cased Wells

The borehole shall be bored, drilled, or augered as close to vertical as possible, and checked with a plumb bob, level, or appropriate downhole logging tool. Slanted boreholes shall not be acceptable unless specified in the design. The borehole shall be of sufficient diameter so that well construction can proceed without major difficulties. To assure an adequate size, a minimum two-inch annular space is required between the casing and the borehole wall (or the hollow-stem auger wall). The two-inch annular space around the casing will allow the filter pack, bentonite seal, and annular grout to be placed at an acceptable thickness. Also, the two-inch annular space will allow up to a 1.5-inch outer diameter tremie pipe to be used for placing the filter pack, bentonite seal, and grout at the specified intervals.

It may be necessary to over-drill the borehole so that any soils that have not been removed (or that have fallen into the borehole during augering or drill stem retrieval) will fall to the bottom of the borehole below the depth where the filter pack and well screen are to be placed. Normally, three to five ft is sufficient for over-drilling shallow wells. Deep wells may require deeper over-drilling. The borehole can also be over-drilled to allow for an extra space for a well sump to be

installed. If the borehole is over-drilled deeper than desired, it can be backfilled to the designated depth with bentonite pellets or the filter pack.

The well casings (riser assembly) should be secured to the well screen by flush-jointed threads or other appropriate connections and placed into the borehole and plumbed by the use of centralizers, a plumb bob, or a level. No petroleum-based lubricating oils or grease shall be used on casing threads. Teflon tape can be used to wrap the threads to insure a tight fit and minimize leakage. No glue of any type shall be used to secure casing joints. Teflon "O" rings can also be used to ensure a tight fit and minimize leakage. "O" rings made of materials other than Teflon are not acceptable if the well will be sampled for organic compound analyses. Before the well screen and casings are placed at the bottom of the borehole, at least six inches of filter material shall be placed at the bottom to serve as a firm footing. The string of well screen and casing should then be placed into the borehole and plumbed. If centralizers are used, they shall be placed below the well screens and above the bentonite annular seals so that the placement of the filter pack, overlying bentonite seal, and annular grout will not be hindered. Centralizers placed in the wrong locations can cause bridging during material placement. If installing the well screen and casings through hollow-stem augers, the augers shall be slowly extracted as the filter pack, bentonite seal, and grout are tremied or poured into place. The gradual extraction of the augers will allow the materials being placed in the augers to flow out of the bottom of the augers into the borehole. If the augers are not gradually extracted, the materials will accumulate at the bottom of the augers causing potential bridging problems. After the string of well screen and casing is plumb, the filter material shall be placed around the well screen (preferably by the tremie pipe method) up to the designated depth. After the filter pack has been installed, the bentonite seal shall be placed directly on top of the filter pack up to the designated depth or a minimum of two ft above the filter pack, whichever is greater. After the bentonite seal has hydrated for the specified time, the annular grout shall be pumped by the tremie method into the annular space around the casings (riser assembly) up to within two feet of the ground surface or below the frost line, whichever is greater. The grout shall be allowed to cure for a minimum of 24 hours before the surface pad and protective casing are installed. After the surface pad and protective casing are installed, bumper guards (guideposts) shall be installed (if necessary).

11.11.3.2.ii Double-cased Wells

Double-cased wells should be constructed when there is reason to believe that interconnection of two aquifers by well construction may cause cross contamination, or when flowing sands make it impossible to install a monitoring well using conventional methods. A pilot borehole should be advanced through the overburden and the contaminated zone into a clay, confining layer, or bedrock. An outer casing (surface or pilot casing) shall be placed into the borehole and sealed with grout. The borehole and outer casing should extend into tight clay a minimum of two ft or into competent bedrock a minimum of one foot. The total depth into the clay or bedrock will vary depending upon the plasticity of the clay and the extent of weathering and fracturing of the bedrock. The size of the outer casing shall be of sufficient inside diameter to contain the inner casing and the two-inch annular space. In addition, the borehole shall be of sufficient size to contain the outer casing and the two-inch minimum outer annular space, if applicable.

The outer casing shall be grouted by the tremie method from the bottom of the borehole to within two ft of the ground surface. The grout shall be pumped into the annular space between the outer

casing and the borehole wall. This can be accomplished by either placing the tremie pipe in the annular space and pumping the grout from the bottom of the borehole to the surface, or placing a grout shoe or plug inside the casing at the bottom of the borehole and pumping the grout through the bottom grout plug and up the annular space on the outside of the casing. The grout shall consist of a Type I Portland cement and bentonite or other approved grout to provide a rigid seal. A minimum of 24 hours shall be allowed for the grout plug (seal) to cure before attempting to drill through it. When drilling through the seal, care shall be taken to avoid cracking, shattering, and washing out of the seal. If caving conditions exist so that the outer casing cannot be sufficiently sealed by grouting, the outer casing shall be driven into place and a grout seal placed in the bottom of the casing.

11.11.3.2.iii Bedrock Wells

The installation of monitoring wells into bedrock can be accomplished in two ways. The first method is to drill or bore a pilot borehole through the soil overburden into the bedrock. An outer casing is installed into the borehole by setting it into the bedrock, and grouting it into place. After the grout has set, the borehole can be advanced through the grout seal into the bedrock. The preferred method of advancing the borehole into the bedrock is rock coring. Rock coring makes a smooth, round hole through the seal and into the bedrock without cracking or shattering the seal. Roller cone bits are used in soft bedrock, but extreme caution should be taken when using a roller cone bit to advance through the grout seal in the bottom of the borehole because excessive water and bit pressure can cause cracking, eroding (washing), and/or shattering of the seal. Low volume air hammers may be used to advance the borehole, but they have a tendency to shatter the seal because of the hammering action. If the structural integrity of the grout seal is in question, a pressure test can be utilized to check for leaks. If the seal leaks, the seal is not acceptable. When the drilling is complete, the finished well will consist of an open borehole from the ground surface to the bottom of the well. The major limitation of open borehole bedrock wells is that the entire bedrock interval serves as the monitoring zone.

The second method is to install the outer surface casing and drill the borehole into bedrock, and then install an inner casing and well screen with the filter pack, bentonite seal, and annular grout. The well is completed with a surface protective casing and concrete pad. This well installation method gives the flexibility of isolating the monitoring zone(s) and minimizing inter-aquifer flow. In addition, it gives structural integrity to the well, especially in unstable areas (e.g., steeply dipping shales) where the bedrock has a tendency to shift or move when disturbed.

11.11.3.3 Well Screen and Filter Pack Design

Well screens and filter packs shall be designed to accurately sample the aquifer zone that the well is intended to sample, minimize the passage of formation materials (turbidity) into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure. The selection of the well screen length depends upon the objective of the well. Piezometers and wells where only a discrete flow path is monitored are generally completed with short screens (two ft or less). While monitoring wells are usually constructed with longer screens (usually five to ten ft), they shall be kept to the minimum length appropriate for intercepting a contaminant plume. The screen slot size shall be selected to retain from 90 to 100 percent of the filter pack material in artificially filter packed wells, and from 50 to 100 percent of the formation material in naturally packed wells. All well screens shall be factory wire-wrapped or machine slotted.

A filter pack shall be used when: 1) the natural formation is poorly sorted; 2) a long screen interval is required or the screen spans highly stratified geologic materials of widely varying grain sizes; 3) the natural formation is uniform fine sand, silt, or clay, 4) the natural formation is thin-bedded; 5) the natural formation is poorly cemented sandstone; 6) the natural formation is highly fractured or characterized by relatively large solution channels; 7) the natural formation is shale or coal that will act as a constant source of turbidity to groundwater samples; or 8) the diameter of the borehole is significantly greater than the diameter of the screen. The use of natural formation material as a filter pack is only recommended when the natural formation materials are relatively coarse-grained, permeable, and uniform in grain size.

Filter pack materials shall consist of clean, rounded to well-rounded, hard, insoluble particles of siliceous composition (industrial grade quartz sand or glass beads). The required grain-size distribution or particle sizes of the filter pack materials shall be selected based upon a sieve analysis of the aquifer materials or the formation to be monitored, or the characteristics of the aquifer materials using information acquired during previous investigations.

Where sieve analyses are used to select the appropriate filter pack particle size, the results of a sieve analysis of the formation materials are plotted on a grain-size distribution graph, and a grain-size distribution curve is generated. The 70 percent retained grain size value should be multiplied by a factor between four and six (four for fine, uniform formations and six for coarse, non-uniform formations). A second grain-size distribution curve is then drawn on the graph for this new value, ensuring that the uniformity coefficient does not exceed 2.5. The filter pack that shall be used will fall within the area defined by these two curves.

Once the filter pack size is determined, the screen slot size shall be selected to retain at least 90 percent of the filter pack material. The Permittees may propose the use of a pre-determined well screen slot size and filter pack for monitoring wells in the site-specific work plans submitted to the Department.

The filter pack shall be installed in a manner that prevents bridging and particle-size segregation. Filter packs placed below the water table shall be installed by the tremie pipe method. Filter pack materials shall not be poured into the annular space unless the well is shallow (e.g., less than 30 ft deep) and the filter pack material can be poured continuously into the well without stopping. At least two inches of filter pack material shall be installed between the well screen and the borehole wall, and two ft of material shall extend above the top of the well screen. A minimum of six-inches of filter pack material shall also be placed under the bottom of the well screen to provide a firm footing and an unrestricted flow under the screened area. In deep wells (e.g., greater than 200 ft deep), the filter pack may not compress when initially installed. As a result, filter packs may need to be installed as high as five ft above the screened interval in these situations. The precise volume of filter pack material required shall be calculated and recorded before placement, and the actual volume used shall be determined and recorded during well construction. Any significant discrepancy between the calculated and actual volume shall be explained. Prior to installing the filter pack annular seal, a one to two-ft layer of chemically inert fine sand shall be placed over the filter pack to prevent the intrusion of annular sealants into the filter pack.

Several pre-fabricated groundwater sampling systems that can be installed in open boreholes are available on the market. These include multi-level borehole completion systems (e.g., Westbay

MP System®) and pneumatically deployed inverting PVC membranes (e.g., SEAMIST). If these types of borehole completions are to be used in the Facility wells, they shall be installed under the supervision of personnel from the authorized vendor.

11.11.3.4 Annular Sealant

The annular space between the well casing and the borehole must be properly sealed to prevent cross-contamination of samples and the groundwater. The materials used for annular sealants shall be chemically inert with respect to the highest anticipated concentration of chemical constituents expected in the groundwater at the Facility. In general, the permeability of the sealing material shall be one to two orders of magnitude lower than the least permeable parts of the formation in contact with the well. The precise volume of annular sealants required shall be calculated and recorded before placement, and the actual volume shall be determined and recorded during well construction. Any significant discrepancy between the calculated volume and the actual volume shall be explained.

During well construction, an annular seal shall be placed on top of the filter pack. This seal shall consist of a high solids (10-30 percent) bentonite material in the form of bentonite pellets, granular bentonite, or bentonite chips. The bentonite seal shall be placed in the annulus through a tremie pipe if the well is deep (greater than 30 ft), or by pouring directly down the annulus in shallow wells (less than 30 ft). If the bentonite materials are poured directly down the annulus (which is an acceptable method only in wells less than 30 feet deep), a tamping device shall be used to ensure that the seal is emplaced at the proper depth and the bentonite has not bridged higher in the well casing. The bentonite seal shall be placed above the filter pack a minimum of two ft vertical thickness. The bentonite seal shall be allowed to completely hydrate in conformance with the manufacturer's specifications prior to installing the overlying annular grout seal. The time required for the bentonite seal to completely hydrate will differ with the materials used and the specific conditions encountered, but is generally a minimum of four to 24 hours.

A grout seal shall be installed on top of the filter pack annular seal. The grout seal may consist of a high solids (30 percent) bentonite grout, a neat cement grout, or a cement/bentonite grout. The grout shall be pumped under pressure (not gravity fed) into the annular space by the tremie pipe method, from the top of the filter pack annular seal to within a few ft of the ground surface. The tremie pipe shall be equipped with a side discharge port (or bottom discharge for grouting at depths greater than 100 feet) to minimize damage to the filter pack or filter pack annular bentonite seal during grout placement. The grout seal shall be allowed to cure for a minimum of 24 hours before the concrete surface pad is installed. All grouts shall be prepared in accordance with the manufacturer's specifications. High solids (30 percent) bentonite grouts shall have a minimum density of 10 pounds per gallon (as measured by a mud balance) to ensure proper setup. Cement grouts shall be mixed using six and one-half to seven gallons of water per 94-pound bag of Type I Portland cement. Bentonite (five to ten percent) may be added to delay the setting time and reduce the shrinkage of the grout.

11.11.4 Well Development

All monitoring wells shall be developed to create an effective filter pack around the well screen, correct damage to the formation caused by drilling, remove fine particles from the formation

near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development stresses the formation around the screen, as well as the filter pack, so that mobile fines, silts, and clays are pulled into the well and removed. Development is also used to remove any foreign materials (e.g., water, drilling mud) that may have been introduced into the borehole during the drilling and well installation activities, and to aid in the equilibration that will occur between the filter pack, well casing, and the formation water. The development of a well is extremely important to ensuring the collection of representative groundwater samples.

Newly installed monitoring wells shall not be developed for at least 48 hours after the surface pad and outer protective casing are installed. This will allow sufficient time for the well materials to cure before the development procedures are initiated. A new monitoring well shall be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. In most cases, the above requirements can be satisfied. However, in some cases, the pH, temperature, and specific conductivity may stabilize but the water remains turbid. In this case, the well may still contain well construction materials, such as drilling mud in the form of a mud cake or formation soils that have not been washed out of the borehole. Thick drilling mud cannot be flushed out of a borehole with one or two well volumes of flushing. Instead, continuous flushing over a period of several days may be necessary to complete the well development. If the well is pumped dry, the water level shall be allowed to sufficiently recover before the next development period is initiated. The common methods used for developing wells include:

1. pumping and over-pumping;
2. backwashing;
3. surging (with a surge block);
4. bailing;
5. jetting; and
6. airlift pumping.

These development procedures can be used, either individually or in combination, to achieve the most effective well development. However, the most favorable well development methods include pumping, over-pumping, bailing, surging, or a combination of these methods. Well development methods and equipment that alter the chemical composition of the groundwater shall not be used. Development methods that involve adding water or other fluids to the well or borehole, or that use air to accomplish well development should be avoided, if possible. Approval shall be obtained from the Department prior to introducing air, water, or other fluids into the well for the purpose of well development. If water is introduced to a borehole during well drilling and completion, then the same or greater volume of water shall be removed from the well during development. In addition, the volume of water withdrawn from a well during development shall be recorded.

11.11.5 Surface Completion

Monitoring wells may be completed either as flush-mounted wells, or as above-ground completions. A surface seal shall be installed over the grout seal and extended vertically up the well annulus to the land surface. The lower end of the surface seal shall extend a minimum of 1 foot below the frost line to prevent damage from frost heaving. The composition of the surface seal shall be neat cement or concrete. In above-ground completions, a three-foot wide, four-inch thick concrete surface pad shall be installed around the well at the same time the protective casing is installed. The surface pad shall be sloped so that drainage will flow away from the protective casing and off the pad. In addition, a minimum of one inch of the finished pad shall be below grade or ground elevation to prevent washing and undermining by soil erosion.

A locking protective casing shall be installed around the well casing (riser) to prevent damage or unauthorized entry. The protective casing shall be anchored in the concrete surface pad below the frost line and extend several inches above the well riser stickup. A weep hole shall be drilled into the protective casing just above the top of the concrete surface pad to prevent water from accumulating and freezing inside the protective casing around the well riser. A cap shall be placed on the well riser to prevent tampering or the entry of foreign materials, and a lock shall be installed on the protective casing to provide security. If the wells are located in an area that receives traffic, a minimum of three bumper guards consisting of steel pipes three to four inches in diameter and a minimum of five-foot length should be installed. The bumper guards should be installed to a minimum depth of two feet below the ground surface in a concrete footing and extend a minimum of three feet above ground surface. The pipes should be filled with concrete to provide additional strength. The pipes should be painted a bright color to reduce the possibility of vehicular damage.

If flush-mounted completions are required (e.g., in active roadway areas), a protective structure such as a utility vault or meter box should be installed around the well casing. In addition, measures should be taken to prevent the accumulation of surface water in the protective structure and around the well intake. These measures should include outfitting the protective structure with a steel lid or manhole cover that has a rubber seal or gasket, and ensuring that the bond between the cement surface seal and the protective structure is watertight.

11.11.6 Well Abandonment

All well abandonment must be conducted in accordance with 19.27.4 NMAC. Wells are usually abandoned when they are no longer required in the monitoring network or when they are damaged beyond repair. The goal of well abandonment is to seal the borehole in such a manner that the well cannot act as a conduit for migration of contaminants from the ground surface to the aquifer or between aquifers. To properly abandon a well, the preferred method is to completely remove the well casing and screen from the borehole, clean out the borehole, and backfill with a cement or bentonite grout, neat cement, or concrete. The well abandonment procedure must also comply with current EPA well abandonment guidance.

For wells with small diameter casing, abandonment shall be accomplished by overdrilling the well with a large diameter hollow-stem auger. After the well has been overdrilled, the well casing and grout can be lifted out of the ground with a drill rig, and the remaining filter pack can be drilled out. The open borehole can then be pressure grouted (via the tremie pipe method)

from the bottom of the borehole to the ground surface. After the grout has cured, the top two ft of the borehole shall be filled with concrete to insure a secure surface seal.

Several other well abandonment procedures are available for wells with larger diameter screens and casings. One method is to force a drill stem with a tapered wedge assembly or a solid-stem auger into the well casing and pull the casing out of the ground. However, if the casing breaks or the well cannot be pulled from the ground, the well will have to be grouted in place. To abandon a well in place, a tremie pipe shall be placed at the lowest point in the well (at the bottom of the screen or in the well sump). The entire well is then pressure grouted from the bottom of the well upward. The pressurized grout will be forced out through the well screen into the filter pack and up the inside of the well casing sealing off all breaks and holes in the casing. Once the well is grouted, the casing is cut off even with the ground surface and covered with concrete.

If a PVC well cannot be abandoned due to internal casing damage (e.g., the tremie pipe cannot be extended to the bottom of the screen), it may be necessary to drill out the casing with a roller cone or drag bit using the wet rotary drilling method, or grind out the casing using a solid-stem auger equipped with a carbide tooth bit. Once the casing is removed, the open borehole can be cleaned out and pressure grouted from the bottom of the borehole upward.

11.11.7 Documentation

All information on the design, construction, and development of each monitoring well shall be recorded and presented on a boring log, a well construction log, and well construction diagram. The well construction log and well construction diagram shall include the following information:

1. well name/number;
2. date/time of well construction;
3. borehole diameter and well casing diameter;
4. well depth;
5. casing length;
6. casing materials;
7. casing and screen joint type;
8. screened interval(s);
9. screen materials;
10. screen slot size and design;
11. filter pack material and size;
12. filter pack volume (calculated and actual);

13. filter pack placement method;
14. filter pack interval(s);
15. annular sealant composition;
16. annular sealant placement method;
17. annular sealant volume (calculated and actual);
18. annular sealant interval(s);
19. surface sealant composition;
20. surface seal placement method;
21. surface sealant volume (calculated and actual);
22. surface sealant interval;
23. surface seal and well apron design and construction;
24. well development procedure and turbidity measurements;
25. well development purge volume(s) and stabilization parameter measurements;
26. type and design and construction of protective casing;
27. well cap and lock;
28. ground surface elevation;
29. survey reference point elevation on well casing;
30. top of monitoring well casing elevation; and
31. top of protective steel casing elevation.

11.12 REPORTING REQUIREMENTS

11.12.1 General

The purpose of this Section is to provide the reporting requirements and report formats for corrective action activities at all SWMUs, AOCs, and permitted units required under this Permit. This Section is not intended to provide reporting requirements for every potential corrective action conducted at the Facility; therefore, the formats for all types of reports are not presented below. The described formats include the general reporting requirements and formats for site-specific investigation work plans, investigation reports, periodic monitoring reports, risk

assessment reports, and corrective measures evaluations. The Permittees shall generally consider the reports to be the equivalents of RCRA Facility Investigation (RFI) work plans, RFI reports, periodic monitoring reports, risk assessments, Corrective Measures Study (CMS) plans, and CMS reports, for the purposes of RCRA compliance. The Permittees shall include detailed, site-specific requirements in all SWMU, AOC, permitted unit and facility-wide investigation work plans, investigation reports, monitoring reports, and corrective measures evaluations. All plans and reports shall be prepared with technical and regulatory input from the Department. All work plans, reports and other documents shall be submitted to the Department in the form of two paper copies and one copy in electronic or other format acceptable to the Department. The Permittees shall submit maps and figures in a format specified by the Department (e.g., *shp, *dwg).

The reporting requirements listed in this attachment do not include all sections that may be necessary to complete each type of report listed and may include sections that are not relevant for a specific site action. The Permittees or the Department may determine that additional sections may be needed to address additional site-specific issues or information collected during corrective action or monitoring activities not listed below. However, the Permittees must submit variations of the general report format and the formats for reports not listed in this Permit Section (11.12) in outline form to the Department for approval prior to submittal of the reports. The Department will approve or disapprove, in writing, the proposed report outline within 90 days of receipt of the outline. If the Department disapproves the report outline, the Department will notify the Permittees, in writing, of the outline's deficiencies and will specify a date for submittal of a revised report outline. All reports submitted by the Permittees shall follow the general approach and limitations for data presentation described in this attachment.

11.12.2 Investigation Work Plan

The Permittees shall prepare work plans for site investigations or corrective action activities at the Facility using the general outline below. The minimum requirements for describing proposed activities within each section are included. All research, locations, depths and methods of exploration, field procedures, analytical results, data collection methods, and schedules shall be included in each work plan. In general, interpretation of data acquired during previous investigations shall be presented only in the background sections of the work plans. The other text sections of the work plans shall be reserved for presentation of anticipated site-specific activities and procedures relevant to the project. The general work plan outline is described below.

11.12.2.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and LANS representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

11.12.2.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose and scope of the investigation to be conducted at the subject site. The Facility, SWMU or AOC name,

permitted unit reference, site name, any other unit name, location, and Area designation shall be included in the executive summary.

11.12.2.3 Table of Contents

The table of contents shall list all text sections, tables, figures, and appendices or attachments included in the work plan. The corresponding page numbers for the titles of each section of the work plan shall be included in the table of contents.

11.12.2.4 Introduction

The introduction shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the current site usage and status shall be included in this section. A brief description of the purpose of the investigation and the type of site investigation to be conducted shall be provided in this section.

11.12.2.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of pertinent subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background summary and labeled on the figure, unless none exist.

This section shall identify potential receptors, including groundwater, and include a brief summary of the type and characteristics of all waste and all contaminants managed or released at the site, the known and possible sources of contamination, the history of releases or discharges of contamination, and the known extent of contamination. This section shall include brief summaries of results of previous investigations, if conducted, including references to pertinent figures, data summary tables, and text in previous reports. At a minimum, detections of contaminants encountered during previous investigations shall be presented in table format, with an accompanying figure showing sample locations. References to previous reports shall include page, table, and figure numbers for referenced information. Summary data tables and site plans showing relevant investigation locations shall be included in the Tables and Figures sections of the document, respectively.

11.12.2.6 Site Conditions

11.12.2.6.i Surface Conditions

A section on surface conditions shall provide a brief detailed description of current site topography, features and structures including a description of topographic drainages, man-made drainages, vegetation, erosional features, and basins. It shall also include a detailed description of current site usage and any current operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment

transport, surface water runoff, or contaminant fate and transport shall be included in this section.

11.12.2.6.ii Subsurface Conditions

A section on subsurface conditions shall provide a brief, detailed description of the site conditions observed during previous subsurface investigations, including relevant soil horizons, stratigraphy, presence of groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during previous investigations shall be included in the Figures section of the work plan. A brief description of the anticipated stratigraphic units that may be encountered during the investigation may be included in this subsection if no previous investigations have been conducted at the site.

11.12.2.7 Scope of Activities

A section on the scope of activities shall briefly describe a list of all anticipated activities to be performed during the investigation including background information research, health and safety requirements that may affect or limit the completion of tasks, drilling, test pit or other excavations, well construction, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot tests, and IDW storage and disposal.

11.12.2.8 Investigation Methods

A section on investigation methods shall provide a description of all anticipated locations and methods for conducting the activities to be performed during the investigation. This section shall include research methods, health and safety practices that may affect the completion of tasks, drilling methods, test pit or other excavation methods, sampling intervals and methods, well construction methods, field data collection methods, geophysical and land survey methods, field screening methods, chemical analytical testing, materials testing, aquifer testing, pilot tests, and other proposed investigation and testing methods. This information may also be summarized in table format, if appropriate.

11.12.2.9 Monitoring and Sampling Program

A section on monitoring and sampling shall provide a description of the groundwater, ambient air, subsurface vapor, remediation system, engineering controls, and other monitoring and sampling programs currently being implemented at the site.

11.12.2.10 Schedule

A section shall set forth the anticipated schedule for completion of field investigation, pilot testing, and monitoring and sampling activities. In addition, this section shall set forth a schedule for submittal of reports and data to the Department including a schedule for submitting all status reports and preliminary data.

11.12.2.11 Tables

The following summary tables may be included in the investigation work plans, if previous investigations have been conducted at the site. Data presented in the tables shall include information on dates of data collection, analytical methods, detection limits, and significant data quality exceptions. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

1. summaries of regulatory criteria, background, and applicable cleanup levels (may be included in the analytical data tables instead of as separate tables);

2. summaries of historical field survey location data;

3. summaries of historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;

4. summaries of historical soil, rock, or sediment laboratory analytical data shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;

5. summaries of historical groundwater elevation and depth to groundwater data. The table shall include the monitoring well depths, the screened intervals in each well, and the dates and times measurements were taken;

6. summaries of historical groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;

7. summary of historical surface water laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;

8. summary of historical air sample screening and chemical analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data; and

9. summary of historical pilot or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements.

11.12.2.12 Figures

The following figures shall be included with each investigation work plan for each site, including presentation of data where previous investigations have been conducted. All figures must include an accurate bar scale and a north arrow. An explanation shall be included on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps shall contain a date of preparation.

1. a vicinity map showing topography and the general location of the site relative to surrounding features and properties;

2. a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details. Off-site well locations and other relevant features shall be included on the site plan, if appropriate. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;

3. figures showing historical and proposed soil boring or excavation locations and sampling locations;

4. figures presenting historical soil sample field screening and laboratory analytical data if applicable;

5. figures presenting the locations of all existing and proposed borings and vapor monitoring well locations;

6. figures showing all existing and proposed wells and piezometers, presenting historical groundwater elevation data, and indicating groundwater flow directions;

7. figures presenting historical groundwater laboratory analytical data, if applicable. The chemical analytical data corresponding to each sampling location can be presented in tabular form on the figure or as an isoconcentration map;

8. figures presenting historical and proposed surface water sample locations and field measurement data, if applicable;

9. figures presenting historical surface water laboratory analytical data, if applicable;

10. figures showing historical and proposed air or vapor sampling locations and presenting historical air quality data, if applicable;

11. figures presenting historical pilot and other testing locations and data, where applicable, including site plans and graphic data presentation; and

12. figures presenting geologic cross-sections, based on outcrop and borehole data acquired during previous investigations, if applicable.

11.12.2.13 Appendices

A description of IDW management shall be included as an appendix to the investigation work plan. The results of historical investigations required in this Permit shall be submitted with the investigation work plan as a separate document. Additional appendices may be necessary to present additional data or documentation not listed above.

11.12.3 Investigation Report

The Permittees shall prepare investigation reports at the Facility using the general outline below. The Investigation Report shall be the reporting mechanism for presenting the results of completed Investigation Work Plans. This Permit Section describes the minimum requirements for reporting on site investigations. All data collected during each site investigation event in the reporting period shall be included in the reports. In general, interpretation of data shall be presented only in the background, conclusions and recommendations sections of the reports. The other text sections of the reports shall be reserved for presentation of facts and data without interpretation or qualifications. The general report outline is provided below.

11.12.3.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and LANS representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

11.12.3.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose, scope, and results of the investigation; site names; location; and area designation. In addition, this section shall include a brief summary of conclusions included in the report based on the investigation data collected and recommendations for future investigation, monitoring, remedial action or site closure.

11.12.3.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

11.12.3.4 Introduction

The introduction section shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the site usage and status shall be included in this section. A brief description of the purpose of the investigation, the type of site investigation conducted, and the type of results presented in the report also shall be provided in this section.

11.12.3.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of any subsurface features such as pipelines, underground tanks, utility lines, and other

subsurface structures shall be included in the background summary and labeled on the figure, as appropriate. In addition, this section shall include a brief summary of the possible sources of contamination, the history of releases or discharges of contamination, the known extent of contamination, and a general summary of the results of previous investigations including references to previous reports. The references to previous reports shall include page, table, and figure numbers for referenced information. A site plan, showing relevant investigation locations, and summary data tables shall be included in the Figures and Tables sections of the document, respectively.

11.12.3.6 Scope of Activities

A section on the scope of activities shall briefly describe all activities performed during the investigation event including background information research, implemented health and safety measures that affected or limited the completion of tasks, drilling, test pit or other excavation methods, well construction methods, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot tests, and IDW storage or disposal.

11.12.3.7 Field Investigation Results

A section shall provide a summary of the procedures used and the results of all field investigation activities conducted at the site including the dates that investigation activities were conducted, the type and purpose of field investigation activities performed, field screening measurements, logging and sampling results, pilot test results, construction details, and conditions observed. Field observations or conditions that altered the planned work or may have influenced the results of sampling, testing, and logging shall be reported in this section. The following sections shall be included.

11.12.3.8 Site Conditions

11.12.3.8.i Surface Conditions

A section on surface conditions shall provide a brief detailed description of current site topography, features and structures including a description of topographic drainages, man-made drainages, vegetation, erosional features, and basins. It shall also include a detailed description of current site usage and any current operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water runoff, or contaminant fate and transport shall be included in this section.

11.12.3.8.ii Subsurface Conditions

A section on subsurface conditions shall provide a brief, detailed description of the site conditions observed during the subsurface investigations, including relevant soil horizons, stratigraphy, presence of groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during the investigation and, as applicable, previous investigations shall be included in the Figures section of the work plan. A brief

description of the stratigraphic units that are encountered during the investigation shall be included in this subsection if no previous investigations have been conducted at the site.

11.12.3.9 Exploratory Drilling or Excavation Investigations

A section shall describe the locations, methods, and depths of subsurface explorations. The description shall include the types of equipment used, the logging procedures, the soil or rock classification system used to describe the observed materials, exploration equipment decontamination procedures, and conditions encountered that may have affected or limited the investigation.

A description of the site conditions observed during subsurface investigation activities shall be included in this section, including soil horizon and stratigraphic information. Site plans showing the locations of all borings and excavations shall be included in the Figures Section of the report. Boring and test pit logs for all exploratory borings and test pits shall be presented in an appendix or attachment to the report.

11.12.3.10 Exploratory and Monitoring Well Boring Geophysical Logging

A section shall describe the methods, dates of measurement, depth intervals measured, and the results of geophysical logging. The relative merits and limitations of each geophysical logging method employed shall be discussed, along with any field conditions or instrument malfunctions that occurred that may have affected the results of the geophysical logging.

11.12.3.11 Subsurface Conditions

A section on subsurface conditions shall describe known subsurface lithology and structures, based on observations made during the current and previous subsurface investigations, including interpretation of geophysical logs and as-built drawings of man-made structures. A description of any known locations of pipelines and utility lines and observed geologic structures shall also be included in this section. A site plan showing boring and excavation locations and the locations of the site's above- and below-ground structures shall be included in the Figures Section of the report. In addition, cross-sections shall be constructed, if appropriate, to provide additional visual presentation of site or regional subsurface conditions.

11.12.3.12 Monitoring Well Construction and Boring or Excavation Abandonment

A section shall describe the methods and details of monitoring well construction and the methods used to abandon or backfill exploratory borings and excavations. The description shall include the dates of well construction, boring abandonment, or excavation backfilling. In addition, well construction diagrams shall be included in an appendix or attachment with the associated boring logs for monitoring well borings. The Permittees may submit well abandonment reports as an appendix to the investigation report.

11.12.3.13 Groundwater Conditions

A section shall describe groundwater conditions observed beneath the subject site and relate local groundwater conditions to regional groundwater conditions. A description of the depths to water, aquifer thickness, and groundwater flow directions shall be included in this section for alluvial groundwater, shallow perched groundwater, intermediate perched groundwater, and regional groundwater, as appropriate to the investigation. Figures showing well locations, surrounding area, and groundwater elevations and flow directions for each hydrologic zone shall be included in the Figures Section of the report.

11.12.3.14 Surface Water Conditions

A section shall describe surface water conditions and include a description of surface water runoff, drainage, surface water sediment transport, and contaminant transport in surface water as suspended load and as a dissolved phase in surface water via natural and man-made drainages, if applicable. A description of contaminant fate and transport shall be included, if appropriate.

11.12.3.15 Surface Air and Subsurface Vapor Conditions

A section shall describe surface air and subsurface vapor monitoring and sampling methods used during the site investigation. It shall also describe observations made during the site investigation regarding subsurface flow pathways and the subsurface air-flow regime.

11.12.3.16 Materials Testing Results

A section shall discuss the materials testing results, such as core permeability testing, grain size analysis, or other materials testing results. Sample collection methods, locations, and depths shall also be included. Corresponding summary tables shall be included in the Tables Section of the report.

11.12.3.17 Pilot Testing Results

A section shall discuss the results of any pilot tests. Pilot tests are typically conducted after initial subsurface investigations are completed and the need for additional investigation or remediation has been evaluated. Pilot tests, including aquifer tests and remediation system pilot tests, shall be addressed through separate work plans and pilot test reports. The format for pilot test work plans and reports shall be approved by the Department prior to submittal.

11.12.3.18 Regulatory Criteria

A section shall set forth the cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site shall be included if site-specific levels have been established at separate Facility sites or units. A table summarizing the applicable cleanup standards or levels or inclusion of applicable cleanup standards or levels in the data tables shall be included as part of the document. The risk assessment, if conducted, shall be presented in a separate document or in an appendix to this report. If cleanup or screening levels calculated in the Department-approved risk evaluation are

employed, the risk evaluation document shall be referenced and shall include pertinent page numbers for referenced information.

11.12.3.19 Site Contamination

A section shall provide a description of sampling intervals and methods for detection of surface and subsurface contamination in soils, rock, sediments, groundwater, and surface water, and as vapor-phase contamination. Only factual information shall be included in this section. Interpretation of the data shall be reserved for the summary and conclusions sections of the report. Tables summarizing all sampling, testing, and screening results for detected contaminants shall be prepared in a format approved by the Department. The tables shall be presented in the Tables Section of the report.

11.12.3.19.i Soil, Rock, and Sediment Sampling

A section shall describe the sampling of soil, rock, and sediment. It shall include the dates, locations and methods of sample collection; sampling intervals; sample logging methods; screening sample selection methods; and laboratory sample selection methods including the collection depths for samples submitted for laboratory analyses. A site plan showing the sample locations shall be included in the Figures Section of the report.

11.12.3.19.ii Soil, Rock, and Sediment Sample Field Screening Results

A section shall describe the field screening methods used during the investigation and the field screening results. Field screening results also shall be presented in summary tables in the Tables Section of the document. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this section.

11.12.3.19.iii Soil, Rock, and Sediment Sampling Analytical Results

A section shall summarize the results of laboratory analysis for soil, rock, and sediment samples. It shall also describe the analytical methods used and provide a comparison of the analytical results to background levels, cleanup standards, or established cleanup levels for the site. The laboratory results also shall be presented in summary tables in the Tables Section of the document. Field conditions and sample collection methods that could potentially affect the analytical results shall be described in this section. If appropriate, soil analytical data shall be presented with sample locations on a site plan and included in the Figures Section of the report.

11.12.3.19.iv Groundwater Sampling

A section on groundwater sampling shall describe the dates, locations, depths, and methods of sample collection; methods for sample logging; and methods for screening and laboratory sample selection. A map showing all sites and surrounding area well locations shall be included in the Figures Section of the report.

11.12.3.19.v Groundwater General Chemistry

A section on the general groundwater chemistry shall describe the results of measurement of field purging parameters and field analytical measurements. Field parameter measurements and field analytical results also shall be presented in summary tables in the Tables Section of the document. The limitations of field measurement instrumentation and any conditions that may have influenced the results of field screening shall be discussed in this section. As determined by the Permittees and the Department, relevant water chemistry concentrations shall be presented as data tables or as iso-concentration contours on a map included in the Figures Section of the report.

11.12.3.19.vi Groundwater Chemical Analytical Results

A section shall summarize the results of groundwater chemical analyses. It shall describe the groundwater chemical analytical methods and analytical results. It shall also provide a comparison of the data to cleanup standards or established cleanup levels for the site. The rationale or purpose for altering or modifying the groundwater sampling program outlined in the site investigation work plan shall also be provided in this section. Field conditions shall be described in this section that may have affected the analytical results during sample collection. Tables summarizing the groundwater laboratory, field, and field sample QA/QC chemical analytical data; applicable cleanup levels; and modifications to the groundwater sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations, data tables, or as isoconcentration contours on a map included in the Figures Section of the report.

11.12.3.19.vii Surface Water Sampling

A section shall describe the surface water sampling and shall include the dates, times, locations, depths, and methods of sample collection. It shall also describe methods for sample logging, sample-screening methods, and laboratory sample selection methods. A map showing all surface-water sampling locations shall be included in the Figures Section of the report.

11.12.3.19.viii Surface Water General Chemistry

A section on the surface water general chemistry shall describe the results of measurement of field parameters and field analytical measurements. Field parameter measurements and field analytical results also shall be presented in summary tables in the Tables Section of the document. The limitations of field measurement instrumentation and any conditions that influenced the results of field screening shall be discussed in this Section. Relevant water chemistry concentrations shall be presented as data tables on a map included in the Figures Section of the report.

11.12.3.19.ix Surface Water Chemical Analytical Results

A section shall summarize the results of surface water chemical analyses. It shall describe the analytical methods and analytical results, and provide a comparison of the data to the cleanup standards or established background or cleanup levels for the site. The rationale or purpose for

altering or modifying the surface-water sampling program outlined in the site investigation work plan also shall be provided in this section. Field conditions that may have affected the analytical results during sample collection shall be described in this section. Tables summarizing the surface water laboratory, field, and analytical field sample QA/QC analytical data; applicable cleanup levels; and modifications to the surface-water sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations or as data tables on a map included in the Figures Section of the report.

11.12.3.19.x Air and Subsurface Vapor Sampling

A section shall describe the air and subsurface vapor sampling. It shall describe the dates, locations, depths or elevations above ground surface, methods of sample collection, methods for sample logging, and methods for laboratory sample selection. A map showing all air sampling locations shall be provided in the Figures Section of the report.

11.12.3.19.xi Air and Subsurface Vapor Field Screening Results

A section shall describe the air and subsurface vapor field screening results. It shall describe the field screening methods used for ambient air and subsurface vapors during the investigation. Field screening results shall also be presented in summary tables in the Tables Section of the report. The locations of ambient air and subsurface vapor screening sample collection shall be presented on a site plan included in the Figures Section of the report. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this Section.

11.12.3.19.xii Air and Subsurface Vapor Laboratory Analytical Results

A section shall describe the results of air and subsurface vapor laboratory analysis. It shall describe the air sampling laboratory analytical methods and analytical results, and provide a comparison of the data to emissions standards or established cleanup or emissions levels for the site. The rationale or purpose for altering or modifying the air monitoring or sampling program outlined in the site investigation work plan also shall be provided in this section. Field conditions that may have affected the analytical results during sample collection shall be described in this section. Tables summarizing the air sample laboratory, field, and analytical field sample QA/QC data; applicable cleanup levels or emissions standards; and modifications to the air sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations, data tables, or as iso-concentration contours on a map included in the Figures Section of the report.

11.12.3.20 Conclusions

A section shall provide a brief summary of the investigation activities and a discussion of the conclusions of the investigation conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup or screening levels, and to relevant historical investigation results and analytical data. Potential receptors, including groundwater, shall be identified and discussed. An explanation shall be provided with regard to data gaps. A risk

assessment may be included as an appendix to the investigation report; however, the risk assessment shall be presented in the Risk Assessment format described in Permit Section 11.12.5. References to the risk assessment shall be presented only in the summary and conclusions sections of the Investigation Report.

11.12.3.21 Recommendations

A section shall discuss the need for further investigation, corrective measures, risk assessment and monitoring, or recommendations for corrective action completed, based on the conclusions provided in the Conclusions section. It shall include explanations regarding additional sampling, monitoring, and site closure. A corresponding schedule for further action regarding the site shall also be provided. No action recommendations shall include the anticipated schedule for submittal of a petition for a permit modification.

11.12.3.22 Tables

A section shall provide the following summary tables as applicable. With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the tables shall include the current data, dates of data collection, analytical methods, detection limits, and significant data quality exceptions. The summary analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

1. tables summarizing regulatory criteria, background levels, and applicable cleanup levels (this information may be included in the analytical data tables instead of as separate tables);

2. tables summarizing field survey location data. Separate tables shall be prepared for well locations and individual medium sampling locations except where the locations are the same for more than 1 medium;

3. tables summarizing field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;

4. a table summarizing soil, rock, and/or sediment laboratory analytical data. It shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

5. a table summarizing the groundwater elevations and depths to groundwater. The table shall include the monitoring well depths and the screened intervals in each well;

6. a table summarizing the groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

7. a table summarizing the surface water laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

8. a table summarizing the air sample screening and laboratory analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

9. tables summarizing the pilot test data, if applicable, including units of measurement and types of instruments used to obtain measurements; and

10. a table summarizing any materials test data.

11.12.3.23 Figures

A section shall provide the following figures as applicable. All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps shall have a date.

1. a vicinity map showing topography and the general location of the subject site relative to surrounding features and properties;

2. a site plan that presents any pertinent site features and structures, underground utilities, well locations, and remediation system location(s) and details. Off-site well locations and other relevant features shall be included on the site plan. Additional site plans may be required to present the locations of relevant off-site well locations, structures and features;

3. figures showing boring or excavation locations and sampling locations;

4. figures presenting soil sample field screening and laboratory analytical data;

5. figures displaying the locations of all newly installed and existing wells and borings;

6. figures presenting monitoring well and piezometer locations, groundwater elevation data, and groundwater flow directions;

7. figures presenting groundwater laboratory analytical data, including any past data requested by the Department. The laboratory analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map;

8. figures presenting surface water sample locations and field measurement data including any past data requested by the Department;

9. figures presenting surface water laboratory analytical data including any past data requested by the Department. The laboratory analytical data corresponding to each sampling location may be presented in table form on the figure;

10. figures showing air sampling locations and presenting air quality. The field screening or laboratory analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map;

11. figures presenting geologic cross-sections based on outcrop and borehole data; and

12. figures presenting pilot test locations and data, where applicable, including site plans or graphic data presentation.

11.12.3.24 Appendices

Each investigation report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

11.12.3.24.i Field Methods

An appendix shall provide detailed descriptions of the methods used to acquire field measurements of each medium that was surveyed or tested during the investigation. This appendix shall include exploratory drilling or excavation methods, the methods and types of instruments used to obtain field screening, field analytical or field parameter measurements, instrument calibration procedures, sampling methods for each medium investigated, decontamination procedures, sample handling procedures, documentation procedures, and a description of field conditions that affected procedural or sample testing results. Methods of measuring and sampling during pilot tests shall be reported in this appendix, if applicable. Geophysical logging methods shall be discussed in a separate section of this appendix. Investigation derived waste (IDW) storage and disposal methods shall also be discussed in this appendix. Copies of IDW disposal documentation shall be provided in a separate appendix.

11.12.3.24.ii Boring/Test Pit Logs and Well Construction Diagrams

An appendix shall provide boring logs, test pit logs, or other excavation logs, and well construction details. In addition, a key to symbols and a soil or rock classification system shall be included in this appendix. Geophysical logs shall be provided in a separate section of this appendix.

11.12.3.24.iii Analytical Program

An appendix shall discuss the analytical methods, a summary of data quality objectives, and the data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the field and laboratory analytical data with regard to the investigation and the site status shall be included in this appendix along with references to the case narratives provided in the laboratory reports.

11.12.3.24.iv Analytical Reports

An appendix shall provide the contract laboratory final analytical data reports generated for the investigation. The reports shall include all chain-of-custody records and Level II QA/QC results

provided by the laboratory. The final laboratory reports and data tables shall be provided electronically in a format approved by the Department. Paper copies (or copies electronically scanned in PDF format) of all chain-of-custody records shall be provided with the reports.

11.12.3.24.v Other Appendices

Other appendices containing additional information shall be included as required by the Department or as otherwise appropriate.

11.12.4 Periodic monitoring Report

The Permittees shall use the following guidance for preparing periodic monitoring reports. The reports shall present the reporting of periodic groundwater, surface water, vapor, and remediation system monitoring at the Facility. The following sections provide a general outline for monitoring reports, and also provide the minimum requirements for reporting for specific Facility sites, areas, and regional monitoring. All data collected during each monitoring and sampling event in the reporting period shall be included in the reports. In general, interpretation of data shall be presented only in the background, conclusions, and recommendations sections of the reports. The other text sections of the reports shall be reserved for presentation of facts and data without interpretation or qualifications.

11.12.4.1 Title Page

The title page shall include the type of document; Facility name; area designation; SWMU or AOC name, site, watershed, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and LANS representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

11.12.4.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose, scope, and results of the monitoring conducted at the subject site during the reporting period. The area (e.g., Plume-front, Facility-wide) SWMU, AOC and site name, location, and/or area designation shall be included in the executive summary. In addition, this section shall include a brief summary of conclusions based on the monitoring data collected.

11.12.4.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

11.12.4.4 Introduction

The introduction section shall include the Facility name, area designation physical area and/or, unit location, and unit status as applicable (e.g. closed, corrective action). General information on the site usage and status shall be included in this section. A brief description of the purpose

of the monitoring, type of monitoring conducted, and the type of results presented in the report also shall be provided in this section.

11.12.4.5 Scope of Activities

A section on the scope of activities shall briefly describe all activities performed during the monitoring event or reporting period including field data collection, analytical testing, remediation system monitoring, if applicable, and purge/decontamination water storage and disposal.

11.12.4.6 Regulatory Criteria

A section on regulatory criteria shall provide information regarding applicable cleanup standards, risk-based screening levels and risk-based cleanup goals for the subject site. A separate table summarizing the applicable screening levels or standards or inclusion of the applicable cleanup standards or screening levels in the data tables can be substituted for this section. The appropriate cleanup or screening levels for each site shall be included, if site-specific levels have been established at separate sites. Risk-based evaluation procedures, if used to calculate cleanup or screening levels, must either be included as an attachment or referenced. The specific document and page numbers must be included for all referenced materials.

11.12.4.7 Monitoring Results

A section shall provide a summary of the results of monitoring conducted at the site. This section shall include the dates and times that monitoring was conducted, the measured depths to groundwater, directions of groundwater flow, field air and water quality measurements, contaminant surveys, static pressures, field measurements, and a comparison to previous monitoring results. Field observations or conditions that may influence the results of monitoring shall be reported in this section. Tables summarizing vapor-monitoring parameters, groundwater elevations, depths to groundwater measurements, and other field measurements can be substituted for this section. The tables shall include all information required in Permit Section 11.12.4.11.

11.12.4.8 Analytical Data Results

A section shall discuss the results of the chemical analyses. It shall provide the dates of sampling, the analytical methods, and the analytical results. It shall also provide a comparison of the data to previous results and to background levels, cleanup standards, or established cleanup levels for the site. The rationale or purpose for altering or modifying the monitoring and sampling program shall be provided in this section. A table summarizing the laboratory analytical data, QA/QC data, applicable cleanup levels, and modifications to the sampling program can be substituted for this section. The tables shall include all information required in Permit Section 11.12.4.11.

11.12.4.9 Remediation System Monitoring

A section shall discuss the remediation system monitoring. It shall summarize the remediation system's capabilities and performance. It shall also provide monitoring data, treatment system discharge sampling requirements, and system influent and effluent sample analytical results. The dates of operation, system failures, and modifications made to the remediation system during the reporting period shall also be included in this section. A summary table may be substituted for this section. The tables shall include all information required in Permit Section 11.12.4.11.

11.12.4.10 Summary

A summary section shall provide a discussion and conclusions of the monitoring conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup levels, and to relevant historical monitoring and laboratory analytical data. An explanation shall be provided with regard to data gaps. A discussion of remediation system performance, monitoring results, modifications, if applicable, and compliance with discharge requirements shall be provided in this section. Recommendations and explanations regarding future monitoring, remedial actions, or site closure, if applicable, shall also be included in this section.

11.12.4.11 Tables

A section shall provide the following summary tables for the media sampled. With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the tables shall include the current sampling and monitoring data plus data from the three previous monitoring events or, if data from less than three monitoring events is available, data acquired during previous investigations. Remediation system monitoring data also shall be presented. The dates of data collection shall be included in the tables. Summary tables may be substituted for portions of the text. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

1. a table summarizing the regulatory criteria (a Regulatory Criteria text section may be substituted for this table or the applicable cleanup levels may be included in the analytical data tables);

2. a table summarizing groundwater elevations and depths to groundwater data. The table shall include the monitoring well depths, the screened intervals in each well, and the dates and times of measurements;

3. a table summarizing field measurements of surface water quality data;

4. a table summarizing field measurements of vapor monitoring data (must include historical vapor monitoring data as described above);

5. a table summarizing field measurements of groundwater quality data (must include historical water quality data as described above);

6. a table summarizing vapor sample analytical data (must include historical vapor sample analytical data as described above);

7. a table summarizing surface water analytical data (must include historical surface water analytical data as described above);

8. a table summarizing groundwater analytical data (must include historical groundwater analytical data as described above); and

9. a table summarizing remediation system monitoring data, if applicable (must include historical remediation system monitoring data as described above).

11.12.4.12 Figures

The section shall include the following figures. All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date.

1. a vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;

2. a site plan that presents pertinent site features and structures, well and piezometer locations, and remediation system location(s) and features. Off-site well locations and pertinent features shall be included on the site plan, if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;

3. figures presenting the locations of piezometer, monitoring and other well locations, groundwater elevation data, and groundwater flow directions;

4. figures presenting groundwater analytical data for the current monitoring event. The analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure or as an iso-concentration map;

5. figures presenting surface water sampling locations and analytical data for the current monitoring period if applicable;

6. figures presenting vapor sampling locations and analytical data for the current monitoring event if applicable. The analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure or as an iso-concentration map; and

7. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable.

11.12.4.13 Appendices

Each monitoring report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

11.12.4.13.i Field Methods

An appendix shall include the methods used to acquire field measurements of groundwater elevations, vapor and water quality data, and vapor, surface water and groundwater samples. It shall include the methods and types of instruments used to measure depths to water, air or headspace parameters, flow measurements, and water quality parameters. In addition, decontamination, well purging techniques, well sampling techniques, and sample handling procedures shall be provided in this appendix. Methods of measuring and sampling remediation systems shall be reported in this appendix, if applicable. Purge and decontamination water storage and disposal methods shall also be presented in this appendix. Copies of purge and decontamination water disposal documentation shall be provided in a separate appendix, if applicable.

11.12.4.13.ii Analytical Program

An appendix shall discuss the analytical program. It shall include the analytical methods, a summary of data quality objectives, and data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the analytical data with regard to the monitoring event and the site status shall be included in this appendix along with references to case narratives provided in the laboratory reports.

11.12.4.13.iii Analytical Reports

An appendix shall provide the analytical reports and shall include the contract laboratory final chemical analytical data reports generated during this reporting period. The reports must include all chain-of-custody records and Level II QA/QC results provided by the laboratory. The laboratory final reports and data tables shall be provided electronically in a format approved by the Department. Paper copies (or electronically scanned in PDF format) of all chain-of-custody records shall be provided with the reports.

11.12.5 Risk Assessment Report

The Permittees shall prepare risk assessment reports for sites requiring corrective action at the Facility using the format listed below. This Permit Section (11.12.5) provides a general outline for risk assessments and also lists the minimum requirements for describing risk assessment elements. In general, interpretation of data shall be presented only in the Background, Conceptual Site Model, and Conclusions and Recommendations Sections of the reports. The other text sections of the Risk Assessment report shall be reserved for presentation of sampling results from all investigations, conceptual and mathematical elements of the risk assessment, and presentations of toxicity information and screening values used in the risk assessment. The general risk assessment outline, applicable to both human health and ecological risk assessments, is provided below.

11.12.5.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and LANS representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

11.12.5.2 Executive Summary (Abstract)

The executive summary or abstract section shall provide a brief summary of the purpose and scope of the risk assessment of the subject site. The executive summary shall also briefly summarize the conclusions of the risk assessment. The Facility, SWMU, AOC, and site names; location; and Area designation shall be included in the executive summary.

11.12.5.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the risk assessment. The corresponding page numbers for the titles of each unit of the report shall be included in the table of contents.

11.12.5.4 Introduction

The introduction section shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the current site usage and status shall be included in this section.

11.12.5.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features.

11.12.5.6 Site Description

A section shall describe current site topography, features and structures including topographic drainages, man-made drainages, erosional features, current site uses, and other data relevant to assessing risk at the site. Depth to groundwater and direction of groundwater flow shall be included in this section. The presence and location of surface water bodies such as any springs or wetlands shall be noted in this section. Photographs of the site may be incorporated into this section. Ecological features of the site shall be described here, including type and amount of vegetative cover, observed and expected wildlife receptors, and level of disturbance of the site. A topographical map of the site and vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features shall be included in the Figures Section of the document.

11.12.5.7 Sampling Results

A section shall discuss the results of the sampling at the site. It shall include a description of the history of releases of contaminants, the known and possible sources of contamination, and the vertical and lateral extent of contamination present in each medium. This section shall include summaries of sampling results of all investigations including site plans (included in the Figures Section of the report) showing locations of detected contaminants. This section shall reference pertinent figures, data summary tables, and references in previous reports. References to previous reports shall include page, table, and figure numbers for referenced information. Summaries of sampling data shall include for each constituent: the maximum value detected, the detection limit, the 95 percent upper confidence level (UCL) of the mean value detected (if applicable to the data set), and whether the 95 percent UCL of the mean was calculated based on a normal or lognormal distribution. Background values used for comparison to inorganic constituents at the site shall be presented here. The table of background values should appear in the Tables Section of the document and include actual values used as well as the origin of the values (e.g. Facility-wide, UCL, upper tolerance level (UTL)). This section shall also include a discussion of how "non-detect" sample results were handled in the averaging of data.

11.12.5.8 Conceptual Site Model

A section shall present the conceptual site model. It shall include information on the expected fate and transport of contaminants detected at the site. This section shall provide a list of all sources of contamination at the site. Sources that are no longer considered to be ongoing but represent the point of origination for contaminants transported to other locations shall be included. The discussion of fate and transport shall address potential migration of each contaminant in each medium, potential breakdown products and their migration, and anticipated pathways of exposure for human or ecological receptors. Diagrammatic representations of the conceptual site model shall appear in the Figures Section of the document.

For human health risk assessments, the conceptual site model shall include the current and reasonably foreseeable future land use and residential land use for all risk assessments. All values for exposure parameters and the source of those values shall be included in table format and presented in the Tables Section of the document.

Conceptual site models presented for ecological risk assessments shall identify assessment endpoints and measurement receptors for the site. The discussion of the model shall explain how the measurement receptors for the site are protective of the wildlife receptors identified by the Permittees in the Site Description Section (see Permit Section 7.5.5.a).

11.12.5.9 Risk Screening Levels

A section shall present the actual screening values used for each contaminant for comparison to all human health and ecological risk screening levels. The Department's (SSLs for residential and industrial soil shall be used to screen soil for human health using EPA's *Risk Assessment Guidance for Superfund (RAGS), Volume I, Part A, 1989* as updated. For those contaminants not appearing on the Department's SSL table, the EPA Region 6 soil screening value adjusted to meet the Department's risk goal of 10^{-5} for total risk for carcinogens shall be used to screen the

site for human health risks. Screening for ecological risk shall be conducted using U.S. EPA's ECO-SSLs, or derive a screening level using the methodology in the Department's "*Guidance for Assessing Ecological Risks Posed by Chemicals: Screening –Level Ecological Risk Assessment.*" If no valid toxicological studies exist for a particular receptor or contaminant, the contaminant/receptor combination shall be addressed using qualitative methods. If a Department-approved site-specific risk scenario is used for the human health risk assessment, this section shall include all toxicity information and exposure assessment equations used for the site-specific scenario as well as the sources for that information. Other regulatory levels applicable to screening the site, such as drinking water Maximum Contaminant Levels (MCLs), shall also be included in this section.

11.12.5.10 Risk Assessment Results

A section shall present all risk values, hazard quotients (HQ), and HIs for human health based on current and reasonably foreseeable future land use. Where the current or reasonably foreseeable future land use is not residential, risk values, HQs, and HIs for a residential land use scenario shall also be calculated and reported. The residential scenario shall be used for comparison purposes only, unless the land use becomes residential. This section shall also present the HQ and HI for each contaminant for each ecological receptor.

11.12.5.10.i Uncertainty analysis

A section shall include discussion of qualitative, semi-quantitative, and quantitative uncertainty in the risk assessment and estimate the potential impact of the various uncertainties.

11.12.5.11 Conclusions and Recommendations

A section shall include the interpretation of the results of the risk assessment and any recommendations for future disposition of the site. This section may include additional information and considerations that the Permittees believes are relevant to the analysis of the site.

11.12.5.12 Tables

A section shall provide the following summary tables, as appropriate. With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the summary tables shall include information on detection limits and significant data quality exceptions. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

1. a table presenting background values used for comparison to inorganic constituents at the site. The table shall include actual values used as well as the origin of the values (Facility-wide, UCL, UTL, or maximum);

2. a table summarizing sampling data shall include, for each constituent, all detected values above background, the maximum value detected, the 95 percent UCL of the mean value

detected (if applicable to the data set), and whether that 95 percent UCL of the mean was calculated based on a normal or lognormal distribution;

3. a table of all screening values used and the sources of those values.

4. a table presenting all risk values, HQs, and HIs under current and reasonably foreseeable future land use for human health;

5. if residential use is not a current or reasonably foreseeable future land use, a table presenting all risk values, HQs, and HIs under a residential land use scenario for human health shall be included for comparison purposes;

6. a table presenting the HQ and HI for each contaminant for each ecological receptor; and

7. a table presenting values for exposure parameters and the source of the values.

11.12.5.13 Figures

A section shall present the following figures for each site, as appropriate. With prior approval from the Department, the Permittees may combine one or more of the figures. All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers.

1. a vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;

2. for human health risk assessments, a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system location(s) and its details. Off-site well locations and other relevant features shall be included on the site plan if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;

3. for ecological risk assessments, a topographical map of the site and vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features; and

4. conceptual site model diagrams for both human health and ecological risk assessments.

11.12.5.14 Appendices

Each risk assessment report shall include appendices containing supporting data. Appendices may include the results of statistical analyses of data sets and comparisons of data, full sets of results of all sampling investigations at the site, or other data as appropriate.

11.12.6 Corrective Measures Evaluation Report

The Permittees shall prepare corrective measures evaluations for sites requiring corrective measures using the format listed below. This Permit Section (11.12.6) provides a general outline for corrective measures evaluations and also lists the minimum requirements for describing

corrective measures when preparing these documents. All investigation summaries, site condition descriptions, corrective action goals, corrective action options, remedial options selection criteria, and schedules shall be included in the corrective measures evaluations. In general, interpretation of historical investigation data and discussions of prior interim activities shall be presented only in the background sections of the corrective measures evaluations. At a minimum, detections of contaminants encountered during previous site investigations shall be presented in the corrective measures evaluations in table format with an accompanying site plan showing sample locations. The other text sections of the corrective measures evaluations shall be reserved for presentation of corrective action-related information regarding anticipated or potential site-specific corrective action options and methods relevant to the project. The general corrective measures evaluation outline is provided below.

11.12.6.1 Title Page

The title page shall include the type of document; Facility name; area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and LANS representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

11.12.6.2 Executive Summary (Abstract)

This executive summary or abstract shall provide a brief summary of the purpose and scope of the corrective measures evaluation to be conducted at the subject site. The executive summary or abstract shall also briefly summarize the conclusions of the evaluation. The SWMU, AOC, and site names, location, and Area designation shall be included in the executive summary.

11.12.6.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the corrective measures evaluation. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

11.12.6.4 Introduction

The Introduction Section shall include the Facility name, Area designation, site location, and site status (e.g. closed, corrective action). General information on the current site usage and status shall be included in this Section. A brief description of the purpose of the corrective measures evaluation and the corrective action objectives for the project also shall be provided in this Section.

11.12.6.5 Background

The Background Section shall describe the relevant background information. This Section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The

locations of any subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in this Section and labeled on the site plan, as appropriate.

This Section shall include contaminant and waste characteristics, a brief summary of the history of contaminant releases, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each medium. This Section shall include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. References to previous reports shall include page, table, and figure numbers for referenced information. Summary tables and site plans showing relevant investigation locations shall be referenced and included in the Tables and Figures Sections of the document, respectively.

11.12.6.6 Site Conditions

11.12.6.6.i Surface Conditions

A section on surface conditions shall describe current and historic site topography, features, and structures, including a description of topographic drainages, man-made drainages, vegetation, and erosional features. It shall also include a description of current uses of the site and any current operations at the site. This section shall also include a description of those features that could potentially influence corrective action option selection or implementation such as archeological sites, wetlands, or other features that may affect remedial activities. In addition, descriptions of features located in surrounding sites that may have an effect on the subject site regarding sediment transport, surface water runoff or contaminant transport shall be included in this section. A site plan displaying the locations of all pertinent surface features and structures shall be included in the Figures Section of the corrective measures evaluation.

11.12.6.6.ii Subsurface Conditions

A section on subsurface conditions shall describe the site conditions observed during previous subsurface investigations. It shall include relevant soil horizon and stratigraphic information, groundwater conditions, fracture data, and subsurface vapor information. A site plan displaying the locations of all borings and excavations advanced during previous investigations shall be included in the Figures Section of the corrective measures evaluation. A brief description of the stratigraphic units anticipated to be present beneath the site may be included in this section if stratigraphic information is not available from previous investigations conducted at the site.

11.12.6.7 Potential Receptors

11.12.6.7.i Sources

A section shall provide a list of all sources of contamination at the subject site where corrective measures are to be considered or required. Sources that are no longer considered to be releasing contaminants at the site, but may be the point of origination for contaminants transported to other locations, shall be included in this section.

11.12.6.7.ii Pathways

A section shall describe potential migration pathways that could result in either acute or chronic exposures to contaminants. It shall include such pathways as utility trenches, paleochannels, surface exposures, surface drainages, stratigraphic units, fractures, structures, and other features. The migration pathways for each contaminant and each relevant medium should be tied to the potential receptors for each pathway. A discussion of contaminant characteristics relating to fate and transport of contaminants through each pathway shall also be included in this section.

11.12.6.7.iii Receptors

A section shall provide a listing and description of all anticipated potential receptors that could possibly be affected by the contamination present at the site. Potential receptors shall include human and ecological receptors, groundwater, and other features such as pathways that could divert or accelerate the transport of contamination to human receptors, ecological receptors, and groundwater.

11.12.6.8 Regulatory Criteria

A section shall set forth the applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site shall be included, if site-specific levels have been established at separate sites or units. A table summarizing the applicable cleanup standards or levels, or inclusion of applicable cleanup standards or levels in the summary data tables shall be included in the Tables Section of the document. The risk assessment shall be presented in a separate document or in an appendix to this report. If cleanup or screening levels calculated in a risk evaluation are employed, the risk evaluation document shall be referenced including pertinent page numbers for referenced information.

11.12.6.9 Identification of Corrective Measures Options

A section shall identify and describe potential corrective measures for source, pathway, and receptor controls. Corrective measures options shall include the range of available options including, but not limited to, a no action alternative, institutional controls, engineering controls, in-situ and on-site remediation alternatives, complete removal, and any combination of alternatives that would potentially achieve cleanup goals.

11.12.6.10 Evaluation of Corrective Measures Options

A section shall provide an evaluation of the corrective measures options identified in Permit Section 11.12.6.9. The evaluation shall be based on the applicability, technical feasibility, effectiveness, implementability, impacts to human health and the environment, and cost of each option. A table summarizing the corrective measures alternatives and the criteria listed below shall be included in the Tables Section of the document. The general basis for evaluation of corrective measures options is defined below.

11.12.6.10.i Applicability

Applicability addresses the overall suitability for the corrective action option for containment or remediation of the contaminants in the subject medium for protection of human health and the environment.

11.12.6.10.ii Technical Practicability

Technical practicability describes the uncertainty in designing, constructing, and operating a specific remedial alternative. The description shall include an evaluation of historical applications of the remedial alternative including performance, reliability, and minimization of hazards.

11.12.6.10.iii Effectiveness

Effectiveness assesses the ability of the corrective measure to mitigate the measured or potential impact of contamination in a medium under the current and projected site conditions. The assessment also shall include the anticipated duration for the technology to attain regulatory compliance. In general, all corrective measures described above will have the ability to mitigate the impacts of contamination at the site, but not all remedial options will be equally effective at achieving the desired cleanup goals to the degree and within the same time frame as other options. Each remedy shall be evaluated for both short-term and long-term effectiveness.

11.12.6.10.iv Implementability

Implementability characterizes the degree of difficulty involved during the installation, construction, and operation of the corrective measure. Operation and maintenance of the alternative shall be addressed in this section.

11.12.6.10.v Human Health and Ecological Protectiveness

This category evaluates the short-term (remedy installation-related) and long-term (remedy operation-related) hazards to human health and the environment of implementing the corrective measure. The assessment shall include whether the technology will create a hazard or increase existing hazards and the possible methods of hazard reduction.

11.12.6.10.vi Cost

This section shall discuss the anticipated cost of implementing the corrective measure. The costs shall be divided into: 1) capital costs associated with construction, installation, pilot testing, evaluation, permitting, and reporting of the effectiveness of the alternative; and 2) continuing costs associated with operating, maintaining, monitoring, testing, and reporting on the use and effectiveness of the technology.

11.12.6.11 Selection of Preferred Corrective Measure

The Permittees shall propose the preferred corrective measure(s) at the site and provide a justification for the selection in this section. The proposal shall be based upon the ability of the remedial alternative to: 1) achieve cleanup objectives in a timely manner; 2) protect human and ecological receptors; 3) control or eliminate the sources of contamination; 4) control migration of released contaminants; and 5) manage remediation waste in accordance with State and Federal regulations. The justification shall include the supporting rationale for the remedy selection, based on the factors listed in Permit Section 11.12.6.10 and a discussion of short- and long-term objectives for the site. The benefits and possible hazards of each potential corrective measure alternative shall be included in this section.

11.12.6.12 Design Criteria to Meet Cleanup Objectives

The Permittees shall present descriptions of the preliminary design for the selected corrective measures in this section. The description shall include appropriate preliminary plans and specifications to effectively illustrate the technology and the anticipated implementation of the remedial option at the subject area. The preliminary design shall include a discussion of the design life of the alternative and provide engineering calculations for proposed remediation systems.

11.12.6.13 Schedule

A section shall set forth a proposed schedule for completion of remedy-related activities such as bench tests, pilot tests, construction, installation, remedial excavation, cap construction, installation of monitoring points, and other remedial actions. The anticipated duration of corrective action operations and the schedule for conducting monitoring and sampling activities shall also be presented. In addition, this section shall provide a schedule for submittal of reports and data to the Department, including a schedule for submitting all status reports and preliminary data.

11.12.6.14 Tables

A section shall present the following summary tables, as appropriate. With prior approval of the Department, the Permittees may combine one or more of the tables. Data presented in the summary tables shall include information on dates of sample collection, analytical methods, detection limits, and significant data quality exceptions. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

1. a table summarizing regulatory criteria, background, and/or the applicable cleanup standards;

2. a table summarizing historical field survey location data;

3. tables summarizing historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;

4. tables summarizing historical soil, rock, or sediment laboratory analytical data. The summary tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

5. a table summarizing historical groundwater elevation and depth to groundwater data. The table shall include the monitoring well depths and the screened intervals in each well;

6. tables summarizing historical groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

7. tables summarizing historical surface water laboratory analytical data if applicable. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

8. tables summarizing historical air sample screening and analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;

9. tables summarizing historical pilot or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements;

10. a table summarizing the corrective measures alternatives and evaluation criteria; and

11. a table presenting the schedule for installation, construction, implementation and reporting of selected corrective measures.

11.12.6.15 Figures

A section shall present the following figures for each site, as appropriate. All figures must include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date.

1. a vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;

2. a unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details. Off-site well locations and other relevant features shall be included on the site plan if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;

3. figures showing historical soil boring or excavation locations and sampling locations.

4. figures presenting historical soil sample field screening and laboratory analytical data, if appropriate;

5. figures showing all existing wells including vapor monitoring wells and piezometers. The figures shall present historical groundwater elevation data and indicate groundwater flow directions;

6. figures presenting historical groundwater laboratory analytical data including past data, if applicable. The analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure or as an iso-concentration map;

7. figures presenting historical surface water sample locations and analytical data including past data, if applicable. The laboratory analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure;

8. figures presenting historical air sampling locations and presenting air quality data. The field screening or laboratory analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure or as an iso-concentration map;

9. figures presenting historical pilot or other test locations and data, where applicable, including site plans or graphic data presentation;

10. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable;

11. figures presenting the locations of existing and proposed remediation systems;

12. figures presenting existing remedial system design and construction details; and

13. figures presenting preliminary design and construction details for preferred corrective measures.

11.12.6.16 Appendices

Each corrective measures evaluation shall include, as appropriate, as an appendix, the management plan for waste, including investigation derived waste, generated as a result of construction, installation, or operation of remedial systems or activities conducted. Each corrective measures evaluation shall include additional appendices presenting relevant additional data, such as pilot or other test or investigation data, remediation system design specifications, system performance data, or cost analyses as necessary.

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PART 12: TA-16 SPECIFIC PERMIT REQUIREMENTS

12.1 GENERAL OPERATING CONDITIONS

The Permittees shall maintain and operate the open-burn units at TA-16 as specified in Permit Part 6 (*Treatment by Open Burning*), Attachment I (*Open Burn Unit Management*), and this Permit Part.

The Permittees shall ensure that the open-burning of hazardous wastes at TA-16 occurs only in two areas, the TA-16-388 Flash Pad and the TA-16-399 Burn Tray as designated in Figure 12-1.

The Permittees shall ensure that burning operations at TA-16-388 and TA-16-399 do not run concurrently (40 CFR § 270.32(b)).

The Permittees shall ensure that the open burning of hazardous wastes at TA-16 is conducted using a non-continuous (batch) thermal treatment process (40 CFR § 270.32(b)).

The Permittees shall inspect annually and maintain as necessary the surface water run-on/run-off control features associated with TA-16-388 and TA-16-399, including all associated rock retention structures and the retaining wall (40 CFR §§ 264.601(b) and 270.32(b)). The Permittees shall document these inspections in the Facility Operating Record.

The Permittees shall conduct an annual soil sampling and analysis program in accordance with 40 CFR § 264.278 and § 264.602. Soil samples shall be collected annually at the open burn unit each July; the sampling and analysis report must be submitted in accordance with the date specified in Attachment N (*Compliance Schedule*). Sampling shall occur within 24 hours following the last treatment event for June of each year at the unit. If no treatment has been conducted since June of the preceding year, annual sampling may not be conducted for that annual period. The Department shall be notified, in writing, no later than July 1 of each year after the effective date of this Permit of the anticipated annual soil sampling date. If treatment has not been conducted since the previous June, the Permittees shall certify, in writing, that treatment was not conducted at the unit during the preceding year no later than July 1 of each year after the effective date of this Permit.

Four soil samples shall be collected from the zero to six inch depth and analyzed for total metals, explosives, and semi-volatile organic compounds. Sample locations shall be within 25 feet of the OB unit's concrete pad, along its north, south, east, and west sides. If sampling analysis results indicate hazardous constituents above residential risk soil screening levels, the Permittees shall follow the sampling and remediation requirements in Permit Sections 9.2.4.7 and 9.2.4.8.

12.2 TA-16-388 FLASH PAD

The Permittees may treat dry or wet bulk high explosives (HE) on the TA-16-388 Flash Pad.

The Permittees shall not treat more than 250 lbs bulk HE per event (with a maximum annual amount of 20,000 lbs) and no less than 100 lbs per event (with a maximum annual amount of 800 lbs) at the Flash Pad (40 CFR § 270.32(b)).

The Permittees may treat HE-contaminated waste on the TA-16-388 Flash Pad.

The Permittees shall not treat more than 1,000 lbs per event (with a maximum annual amount of 20,000 lbs) and no less than 50 lbs per event (with a maximum annual amount of 600 lbs) of HE-contaminated waste at the Flash Pad (40 CFR § 270.32(b)).

The Permittees shall not treat the following constituents at the Flash Pad:

1. acrolein;
2. benzene;
3. benz(a)pyrene;
4. chloroform;
5. total chromium;
6. crotonaldehyde;
7. 1,2-dichloroethane;
8. formaldehyde;
9. trichloroethylene;
10. furans; and
11. zinc

(40 CFR § 270.32(b)).

The Permittees shall ensure solvents or soils treated at the Flash Pad have a minimum of 10% HE (40 CFR § 270.32(b)).

The Permittees shall ensure that no fuel other than propane shall support open burning at the Flash Pad (40 CFR § 270.32(b)).

12.3 TA-16-399 BURN TRAY

The Permittees shall ensure that the TA-16-399 Burn Tray is used to treat only pure dry HE (40 CFR § 270.32(b)).

The Permittees shall not treat more than 1,000 lbs bulk HE per event (with a maximum annual amount of 20,000 lbs) and no less than 100 lbs per event (with a maximum annual amount of 800 lbs) at the Burn Tray (40 CFR § 270.32(b)).

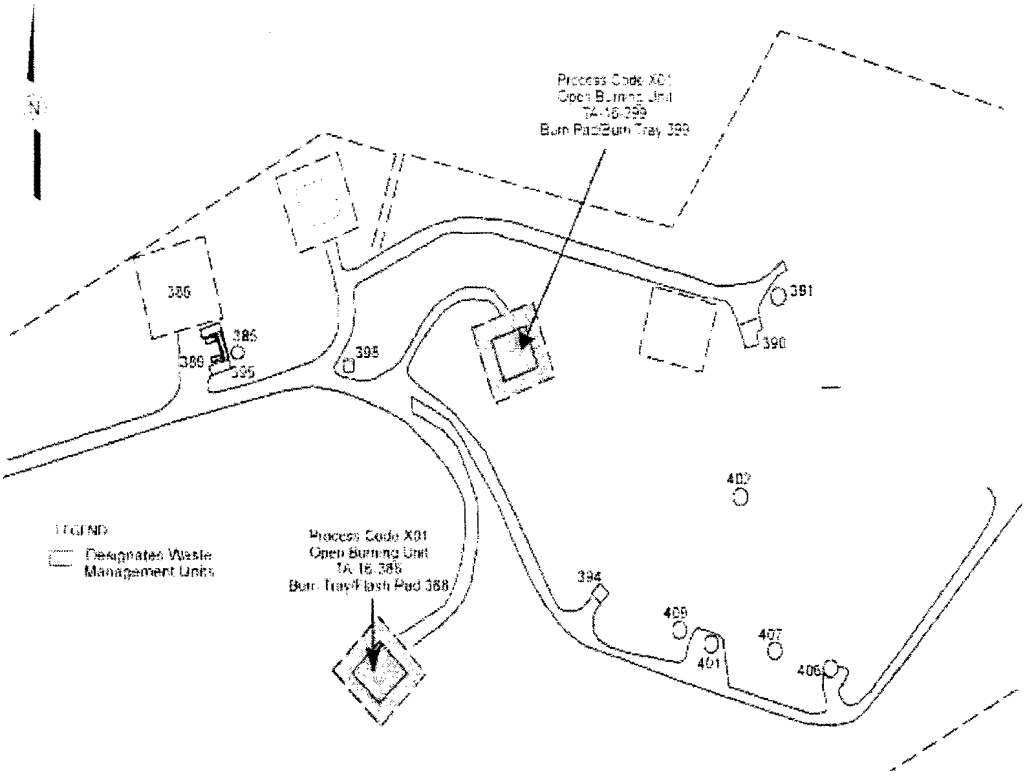

Figure 12-1

Technical Area (TA) 16 Burn Ground Facility Boundary

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PART 13: TA-50 SPECIFIC PERMIT REQUIREMENTS

13.1 GENERAL OPERATING CONDITIONS

The Permittees shall maintain and operate the container storage units at TA-50 as specified in Permit Part 3 (*Storage in Containers*), in Attachment G (*Container Management,* TA-50 Section, Subsection G.2), and this Permit Part.

The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at TA-50 occurs only in two areas: 1) an indoor storage area located in Building 69 (TA-50-69), Rooms 102 and 103; and 2) an outdoor storage area (TA-50-69, Outdoor) located south/southeast of Building 69, comprised of an asphalt pad and modular transportainer units.

The Permittees shall ensure that ignitable wastes will not be stored inside the glovebox located within the indoor CSU.

The Permittees shall annually inspect and when necessary maintain the drainage swales located south of the CSU between the CSU and the MDA C, and located on the west side of the CSU between Pecos Drive and the TA-50 fence line, to ensure that potential run-on is directed away from the CSUs (40 CFR § 264.175(c)(1)).

The Permittees are prohibited from storing hazardous or mixed waste containing free liquids at TA-50 CSUs.

The Permittees shall at all times maintain a fire access lane between the TA-50-69 Outdoor and Indoor CSUs (40 CFR § 270.32(b)).

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PART 14: TA-54 SPECIFIC PERMIT REQUIREMENTS

14.1 GENERAL OPERATING CONDITIONS

The Permittees shall maintain and operate the container storage units at TA-54 in accordance with Permit Part 3 (*Storage in Containers*), in accordance with Attachment G (*Container Management,* TA-54 Section), and in accordance with this Permit Part.

The Permittees shall ensure that long-term storage of hazardous waste in containers at TA-54 occurs only in the two CSUs at Area L, the nine CSUs at Area G, the two CSUs at TA-54 West, and as identified in Attachment O (*Hazardous Waste Management Units*).

14.2 AREA G

The Permittees shall ensure that within Area G, Domes 229, 231, and 232, all hazardous waste containers holding free liquids are stored on secondary containment pallets (40 CFR § 270.32(b)).

The Permittees shall plug and abandon the fire protection drain line system between Area G, Pad 9, Domes 229, 231, and 232 (40 CFR § 270.32(b)).

The Permittees are prohibited from storing hazardous wastes overnight between domes at Area G, Pad 9 (40 CFR § 270.32(b)).

The Permittees shall remove all fluids from the secondary containment system at Area G, Dome 224 and maintain the system in a dry state (40 CFR § 270.32(b)). The Permittees shall include a record of the containment system's evacuation in the Facility's Operating Record, including a complete chemical analysis of the system's fluid contents.

The Permittees shall remove all fluids from the secondary containment system at Area G, Dome 230 and maintain the system in a dry state (40 CFR § 270.32(b)). The Permittees shall include a record of the containment system evacuations in the Facility's Operating Record, including a complete chemical analysis of the system's contents.

The Permittees shall ensure that at Area G, all containers storing hazardous waste with free liquids are stored on secondary containment pallets, except inside the following structures; Domes 230, 224, Sheds 144, 145, 146, 177, 1027, 1028, 1029, 1041, and Building TA-54-412 (DVRS).

14.3 AREA L

The Permittees shall consider the Area L, Dome 215, exterior, double-walled, 10,000 gallon, holding tank and its ancillary piping as a portion of the Dome's secondary containment (40 CFR § 270.32(b)). The holding tank shall be inspected monthly and any detected fluids shall be removed immediately. The Permittees shall include a record of all holding tank inspections and

evacuations in the Facility's Operating Record, including a complete chemical analysis of the tank contents (40 CFR § 270.32(b)).

The Permittees shall ensure that within Area L, Domes 215 and 216, all hazardous waste containers holding free liquids are stored on secondary containment pallets.

The Permittees shall ensure that at Area L, all containers storing hazardous waste with free liquids are stored on secondary containment pallets, except when inside the following structures; Sheds 31, 68, 69, 70, and Buildings TA-54-32, TA-54-35, TA-54-36, TA-54-39 (Room 101 and South Containment Pad), and TA-54-58.

14.4 TA-54-WEST

The Permittees shall store hazardous waste at TA-54-West only within the boundary of the CSU as depicted in Figure 14-1.

The Permittees shall ensure that containers storing hazardous waste wastes with free liquids are stored on secondary containment pallets at TA-54-West .

The Permittees may store mixed TRU wastes in sealed NRC certified Type-B shipping containers at the TA-54-West Outdoor CSU without secondary containment and weather protection.

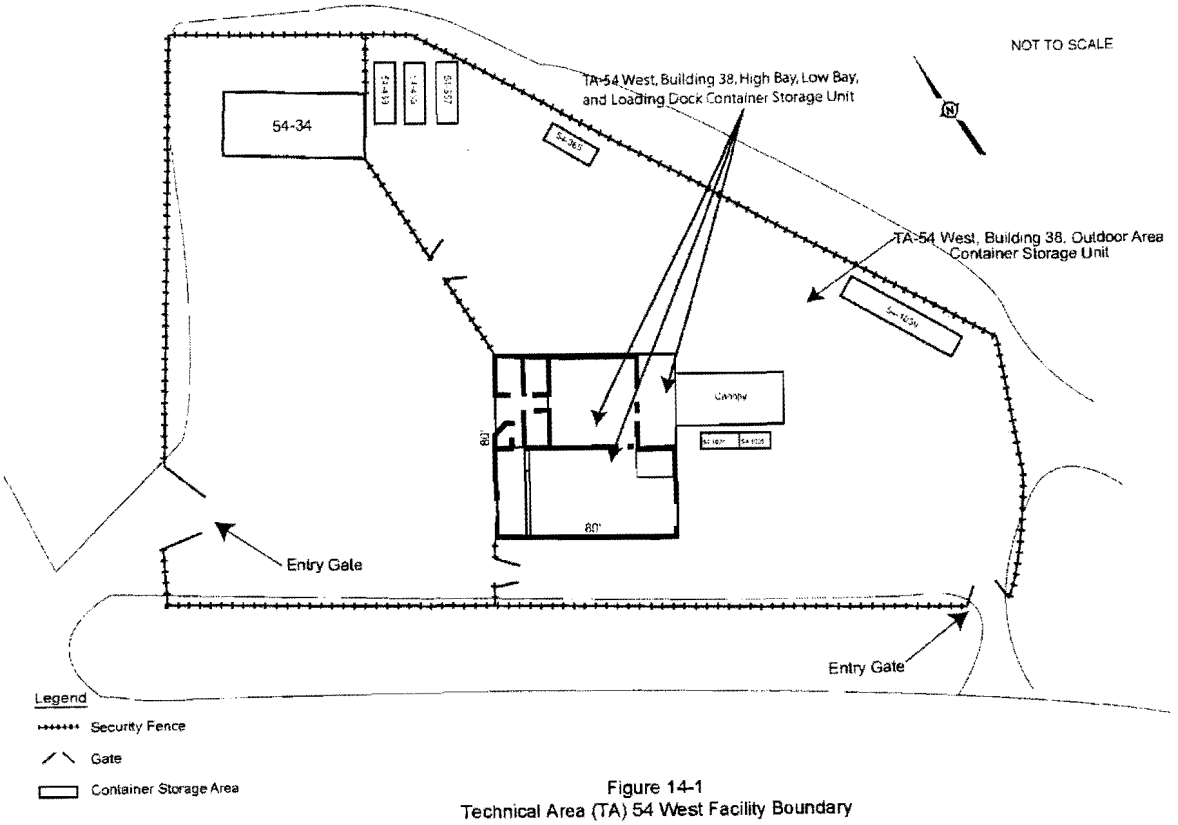

Figure 14-1
Technical Area (TA) 54 West Facility Boundary

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PART 15: TA-55 SPECIFIC PERMIT REQUIREMENTS

15.1 GENERAL OPERATING CONDITIONS

The Permittees shall maintain and operate the CSUs at TA-55 in accordance with Permit Part 3 (*Storage in Containers*), in accordance with Attachment G (*Container Management*, TA-55 Section), and in accordance with this Permit Part.

The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at TA-55 occurs only in the container storage units (CSUs) B45, B40, B05, K13, the vault located at TA-55-4, TA-55-185, and the outdoor container storage pad located northwest of TA-55-4. These units are also the permitted container storage units (CSUs) identified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*) with process code S01.

The Permittees shall ensure that long-term storage of hazardous or mixed waste in tanks at TA-55 occurs only in Room 401 at TA-55-4. This unit is also the permitted tank storage unit identified in Attachment O, (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*) with process code S02.

The Permittees shall maintain and operate the tank storage units at TA-55 in accordance with this Permit Part, in accordance with Permit Part 4 (*Storage in Tanks*), and in accordance with Attachment H (*Tank Management*).

The Permittees shall ensure that treatment by stabilization of hazardous or mixed waste at TA-55 occurs only in Room 401 at TA-55-4. This unit is also the permitted stabilization unit identified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*) with process code T04.

The Permittees shall maintain and operate the stabilization units at TA-55 in accordance with this Permit Part, in accordance with Permit Part 5 (*Treatment by Stabilization*), and in accordance with Attachment J (*Stabilization Unit Management*).

15.2 CONTAINER STORAGE UNIT

The Permittees shall only store hazardous or mixed wastes that do not contain free liquids at CSUs B05, B45, and TA-55-185.

The Permittees shall ensure that at TA-55, all containers storing hazardous or mixed waste with free liquids are stored on secondary containment pallets, except inside the following CSUs; B40, K13, and TA-55-4 Vault. Because the floors of CSUs B40, K13, and TA-55-4 Vault are considered a secondary containment system, and because these floors are not sloped sufficiently to drain, the Permittees shall ensure that all containers of hazardous or mixed waste in these CSUs are at all times elevated or otherwise protected from contact with potentially accumulated liquids (40 CFR § 270.32(b)).

The Permittees shall ensure that no more than two 55-gallon drums are stored on self-containment pallets at TA-55.

The Permittees shall ensure that ignitable or reactive wastes are not stored at CSUs B45, B05, TA-55-185, and the vault located at TA-55-4.

15.3 TANK STORAGE UNIT

The Permittees shall only store hazardous or mixed waste in the tank system in Structure TA-55-4, Room 401, which is comprised of three tank components and consists of a total of 16 tanks with a maximum storage capacity of 1,020 liters (approximately 266 gallons). The three tank components shall be referred to as: 1) the evaporator glovebox tank; 2) the cementation unit pencil tanks (total of five); and 3) the pencil tanks (total of ten).

The Permittees shall maintain and operate the tank system as specified in Permit Part 4 (*Storage in Tanks*) and in Attachment H (*Tank Management*), Section H.1.

The Permittees shall construct the pencil tank component of the tank system, its piping and ancillary equipment, and the foundation and tank support as specified at Attachment H, Section H.1.3.

The Permittees shall test and certify the pencil tank component of the tank system as specified in Attachment H, Section H.2.3.

The Permittees shall consider the walls and floor of Room 401 as the secondary containment system for the tank storage system.

The Permittees shall not store ignitable or reactive waste in the tank system at TA-55. The Permittees shall not commingle incompatible wastes in the tank system at TA-55.

The Permittees shall ensure that no hazardous or mixed wastes containing organic concentrations greater than or equal to 10 percent by weight are contained in or contacted by equipment associated with the tank system in Room 401. The Permittees shall maintain in the Facility Operating Record a sufficiently detailed record of wastes entering the system to demonstrate adherence to this permit condition.

15.4 STABILIZATION UNIT

The Permittees shall ensure that the cementation unit includes a pH column, a vacuum trap, two motor-driven mixers, four impellers, piping and a glovebox. The Permittees shall ensure that the cementation unit is located in Glovebox GB-454, Room 401, at Structure TA-55-4.

The Permittees shall ensure that the cementation unit is maintained and operated as specified in Permit Part 5 (*Treatment by Stabilization*) and in Attachment J (*Stabilization Unit Management*).

The Permittees shall consider the walls and floor of Room 401 as the secondary containment system for the cementation unit.

The Permittees shall not manage ignitable or reactive wastes in the cementation unit. The Permittees shall ensure that incompatible wastes are not combined within the cementation unit.

The Permittees shall ensure that no hazardous or mixed wastes containing organic concentrations greater than or equal to ten percent by weight are contained in or contacted by equipment associated with the cementation unit. The Permittees shall maintain in the Facility Operating Record a sufficiently detailed record of wastes entering the unit to demonstrate adherence to this permit condition.

The Permittees shall ensure that the cementation unit is operated in a manner that prevents releases to the atmosphere by, in part, maintaining negative pressure inside glovebox GB-454 with the vacuum connected to the TA-55-4 facility ventilation system. The Permittees shall ensure that if a power failure occurs all operations will cease inside the glovebox unit until power is restored.

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PART 16: TA-3 SPECIFIC PERMIT REQUIREMENTS

16.1 GENERAL OPERATING CONDITIONS

The Permittees shall maintain and operate the CSUs at TA-55 in accordance with Permit Part 3 (*Storage in Containers*), in accordance with Attachment G (*Container Management*), TA-3 Section, and in accordance with this Permit Part.

The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at TA-3 occurs only in the container storage units in Rooms 9010, 9020, and 9030 identified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*).

16.2 CONTAINER STORAGE UNIT

The Permittees shall ensure that at TA-3, all containers storing hazardous waste with free liquids are stored on secondary containment pallets. Because the floors of CSUs in Rooms 9010, 9020, and 9030 are not sloped sufficiently to drain, the Permittees shall ensure that all containers of hazardous waste in these CSUs are at all times elevated or otherwise protected from contact with potentially accumulated liquids.

The Permittees shall ensure that no more than two 55-gallon drums are stored on self-containment pallets at TA-3.

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ATTACHMENT A

GENERAL AND TA-SPECIFIC FACILITY DESCRIPTIONS

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
µg/L	microgram(s) per liter
AASHTO	American Association of State Highway and Transportation Officials
amsl	above mean sea level
cm/yr	centimeters per year
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
ft	feet/foot
GPP	Groundwater Protection Program
HE	high explosives
IC	ion chromatography
LANL	Los Alamos National Laboratory
LC/MS/MS	liquid chromatography/mass spectrometry/mass spectrometry
mg/L	milligrams per liter
m/s	meters per second
m/yr	meter(s) per year
NMED	New Mexico Environment Department
pCi/L	picocuries per liter
ppb	parts per billion
R&D	research and development
RLWTF	Radioactive Liquid Waste Treatment Facility
RRES	Risk Reduction and Environmental Stewardship Division
TA	technical area

ATTACHMENT A
FACILITY DESCRIPTION

The information provided in this Attachment is submitted in accordance with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised June 14, 2000 [6-14-00]. The following subject areas are addressed in this attachment or are referenced to technical area (TA)-specific permit applications, permit modification requests, or permit renewal applications:

- A general description of the Los Alamos National Laboratory (LANL) facility [20.4.1 NMAC § 270.14(b)(1)];
- Traffic patterns, volume, and control [20.4.1 NMAC § 270.14(b)(10)];
- Facility location information for compliance with the seismic standard and floodplain requirements [20.4.1 NMAC §§ 270.14(b)(11) and 270.14(b)(19)(ii), and 20.4.1 NMAC § 264.18(a) and (b)];
- Topographic map requirements [20.4.1 NMAC § 270.14(b)(19)];
- Groundwater [20.4.1 NMAC § 270.14(c) and 20.4.1 NMAC § 264.90(a)].

A.1 GENERAL DESCRIPTION [20.4.1 NMAC § 270.14(B)(1)]

LANL is located in Los Alamos County, an incorporated county, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The regional location of LANL is shown on Figure 1-1. LANL is divided into TAs, as shown on Permit Part 2, Figure 2-8. LANL, which occupies an area of 40 square miles, and the associated residential and commercial areas of Los Alamos County, which occupy an area of approximately 109 square miles, are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons. Ephemeral, interrupted, or intermittent streams lie at the bottoms of all the canyons. The mesa tops range in elevation from approximately 7,800 feet (ft) above mean sea level (amsl) at the flank of the Jemez Mountains, located to the west of Los Alamos, to about 6,200 ft amsl at their eastern extent, where they terminate above the Rio Grande.

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, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research;

nuclear safeguards; biomedicine; health and biotechnology; and industrial partnerships. LANL is owned by the U.S. Department of Energy (DOE) and is operated jointly by the DOE National Nuclear Security Administration and the University of California. The facility mailing address is P.O. Box 1663, Los Alamos, New Mexico, 87545.

LANL is an existing treatment and recovery operations, general facility operations, D&D projects, and ER activities. Mixed and storage facility. This General Part B Permit Renewal Application and other TA-specific permit applications, permit modification requests, or permit renewal applications are submitted for treatment and storage units that are current or proposed "active" operating units. LANL does not seek an operating permit for any disposal units.

Hazardous waste is generated at LANL primarily from research and development (R&D) activities, general facility operations, environmental restoration (ER) activities, and decontamination and decommissioning (D&D) projects. Mixed low-level waste is generated mainly from R&D activities, processing transuranic waste is generated primarily from R&D activities, processing and recovery operations, and D&D projects. High explosives (HE)-contaminated waste is generated mainly from R&D activities, ER activities, wastewater treatment processes, and building maintenance and modification activities. Brief descriptions of specific hazardous and mixed waste management units at LANL are presented in Attachment A of TA-specific permit applications, permit modification requests, or permit renewal applications. Waste generated from R&D activities, processing and recovery operations, and ER activities may be received from off-site facilities, as described in Supplement 1 (LANL, 2003a).

A.2 TRAFFIC PATTERNS [20.4.1 NMAC § 270.14(B)(10)]

The traffic pattern information presented below is general in nature. More detailed information is addressed in TA-specific permit applications, permit modification requests, or permit renewal applications.

A.2.1 General

The rugged topography of alternating mesas and canyons present at LANL limits traffic circulation to only a few major arterial roads. Approximately 85 miles of paved roads are present within LANL (Pan Am World Services Inc., 1986). The major roads are shown on Map 1 in the most recent version of the "Los Alamos National Laboratory General Part A Permit

Application," hereinafter referred to as the LANL General Part A. There are approximately 19 miles of highway, 22 miles of TA access roads, and 44 miles of roads in LANL's TAs.

The main access route to LANL is State Road 502; the majority of traffic to LANL approaches from the east on State Road 502 and East Jemez Road. Alternate access routes are available from the south and west on State Roads 4 and 501 (West Jemez Road).

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

Approximately 10,000 people are currently employed at LANL (including full-time, part-time, and casual LANL personnel and subcontractors). Roughly 4,000 people commute to LANL daily from communities outside Los Alamos County.

A.2.2 Waste Collection Areas

Hazardous and mixed waste is generated at TAs throughout LANL. Small quantities of waste are generally accumulated in containers at less-than-90-day storage areas or satellite accumulation areas and then packed in containers, such as drums, boxes, or crates, for transport to storage or treatment areas, as necessary. Bulk liquid waste is contained primarily in drums or tanks. Because hazardous and mixed waste may be generated throughout LANL, waste transport may occur on nearly all roads within LANL. Off-site wastes may be received at LANL on a limited basis.

A.2.3 Routes of Travel

Information addressing unit-specific travel routes is presented in Attachment A of TA-specific permit applications, permit modification requests, or permit renewal applications.

A.2.4 Traffic Volumes

According to a traffic study conducted in early 2003, the peak traffic periods are between 6:00 and 8:00 a.m. and 4:00 and 6:00 p.m. Monday through Thursday, and between 6:00 and 8:00 a.m. and 3:00 and 5:00 p.m. Friday (Digital Traffic Systems, 2003). The 2003 traffic study was conducted at 10 locations throughout Los Alamos County. The data collection locations are

shown on a figure in Supplement 2 (LANL, 2003a). A data summary and the data from the cited study are also presented in Supplement 2. Based on the study, the daily average number of vehicles is greatest on Monday through Friday near the intersection of Diamond Drive and Trinity Drive (Site 2 in the study), with 25,820 vehicles. The smallest daily average number of vehicles on Monday through Friday is 1,539 near the intersection of West Jemez Road and State Road 4.

Additional traffic volume information is provided in Attachment A of TA-specific permit applications, permit modification requests, or permit renewal applications.

A.2.5 Traffic Control Signals

Site-wide traffic flow at LANL is controlled by traffic lights, stop signs, and yield signs. Traffic lights are in place at all major intersections. Traffic signs are used at "T" intersections throughout LANL. Access to high security TAs is controlled by security guards or special access gates. Only personnel having appropriate security clearance and identification or escorted visitors are allowed access to the high security TAs. Vehicles and personnel entering these TAs are subject to periodic search by security personnel.

Unit-specific information addressing traffic control signals is presented in Attachment A of TA-specific permit applications, permit modification requests, or permit renewal applications.

A.2.6 Road Load-Bearing Capacity

Roads at LANL carrying the greatest traffic volumes include Diamond Drive, Pajarito Road, and East and West Jemez Roads. These roads are typically constructed with an 8-inch-thick base overlain with a 5-inch-thick asphaltic-concrete surface, and were designed and built in conformance with American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996). This specification is intended to accommodate truck loading capacities of 32,000 pounds per axle. Roads within TAs are generally two-lane roads with asphaltic-concrete surfaces. These roads are typically constructed with a 6-inch-thick base overlain with a 3-inch-thick asphaltic-concrete surface. These roads were also designed and constructed to meet AASHTO specification HS-20.

A.3 LOCATION INFORMATION

A.3.1 Seismic Standard [20.4.1 NMAC § 270.14(b)(11)]

LANL is an "existing" facility that met the requirements for interim status under Section 74-4-9 of the New Mexico Hazardous Waste Act and Section 3005(e) of the Resource Conservation and Recovery Act. The U.S. Environmental Protection Agency (EPA) specifically exempted "existing" facilities operating under interim status from the requirement under 20.4.1 NMAC § 270.14(b)(11) to submit a Part B permit application that demonstrates compliance with the seismic standards under 20.4.1 NMAC § 264.18(a) [see *46 FR 2802* and *46 FR 2813* (January 12, 1981)].

A.3.2 Floodplain Standard [20.4.1 NMAC §§ 270.14(b)(11)(iii through v) and 270.14(b)(19)(ii); 20.4.1 NMAC § 264.18(b)]

As required in "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515" (EPA, 1994), LANL mapped all 100-year floodplain boundaries within the LANL complex. A report was published documenting the floodplain mapping procedures (McLin, 1992). These maps were revised after the Cerro Grande Fire, and a new report was generated (McLin et al., 2001). The new maps and new report were provided to the New Mexico Environment Department (NMED) as Appendices B and C in the November 2001 Response to a Request for Supplemental Information (LANL, 2001). As shown on the new maps, no hazardous waste management units to be permitted are located within the 100-year floodplain at LANL. The new report is included as Supplement 3 (LANL, 2003a).

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC § 270.14(B)(19)]

Due to the size of LANL, several maps and figures are provided or referenced in LANL, 2003a to meet the requirements of 20.4.1 NMAC § 270.14(b)(19) [6-14-00]. All maps clearly show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps were provided as Appendix C of the "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application: General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM0890010515" (LANL, 2001).
- A map showing surface waters, including intermittent streams, and flow direction is included in the LANL General Part A.

- Surrounding land uses are requests, or permit renewal applications.
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E. shown on Map 1 in the LANL General Part A.
- Wind roses for LANL are shown on Figures A-3 and A-4 (LANL, 2003a).
- Access control features (e.g., fences, gates) are shown on a figure(s) in Permit Part 2.
- Buildings and structures are shown on maps in the LANL General Part A and on figures in TA-specific permit applications, permit modification requests, or permit renewal applications.
- The locations of the hazardous and/or mixed waste management units at LANL are shown on maps in the LANL General Part A and on figures in TA-specific permit applications, permit modification requests, or permit renewal applications.
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the LANL General Part A.
- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 (LANL, 2003a).
- A map showing the boundaries of LANL is provided as Map A-2 (LANL, 2003a).
- Drainage control features (e.g., run-on/runoff) are shown on a figure(s) in TA-specific permit applications, permit modification
- An equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on Figure 50-1 in the LANL General Part A.

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management units. As provided in 20.4.1 NMAC § 270.14(b)(19) [6-14-00], LANL has submitted the maps at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER [20.4.1 NMAC § 270.14(C) AND 20.4.1 NMAC § 264.90(A)]

The following information is provided to meet the requirements of 20.4.1 NMAC § 270.14(c) [6-14-00] for regulated units subject to corrective action. In the Los Alamos area, groundwater occurs in three modes: (1) water in shallow alluvium and underlying tuff in some of the larger canyons, (2) intermediate perched zone groundwater (a perched groundwater body above a less permeable layer and separated from the underlying aquifer by an unsaturated zone), and (3) the regional aquifer of the Los Alamos area.

A.5.1 Alluvial Groundwater Occurrence

Infiltration of surface water flow (caused by effluent discharges, spring discharge, or stormwater runoff) maintains shallow groundwater in the alluvium of some canyons. Alluvial groundwater is unconfined and is perched on underlying Bandelier Tuff, Cerros del Rio basalts, or Puye Formation. In wet canyon bottoms, infiltration of surface water maintains shallow groundwater in the alluvium. Wet canyons generally have large surface water flow, head in the Jemez Mountains, or receive effluent discharges. Groundwater levels are typically highest in the late spring due to snowmelt runoff and in mid-to-late summer due to thunderstorms. Groundwater levels and extent of saturation decrease during the winter and early summer when runoff is at a minimum. Dry canyons have little surface water flow. In these canyons, groundwater may occur seasonally in the alluvium. Dry canyons are generally those that head in the eastern portion of the Pajarito Plateau.

Alluvium that is as much as 100 ft thick has been deposited in the canyons of the Pajarito Plateau by intermittent and ephemeral stream flows. Alluvium in canyons that head in the Jemez Mountains is generally composed of sands, gravels, pebbles, cobbles, and boulders derived from the Tschicoma Formation and Bandelier Tuff on the flank of the mountains. Alluvium in canyons that head on the Pajarito Plateau is relatively fine-grained and consists of clays, silts, sands, and gravels derived from the Bandelier Tuff. In Mortandad Canyon east of Test Well 8, the alluvium has two distinct lithologic zones: the upper zone is a coarse-grained pebbly sand; the lower zone is a brown sandy silty clay, which rests uncomfortably on the Bandelier Tuff (Baltz et al., 1963, p. 31).

Ephemeral runoff in some canyons infiltrates the alluvium until downward movement is impeded by the less permeable underlying strata. The impeded downward movement results in a buildup of shallow alluvial groundwater. In some cases, relatively thin zones of shallow groundwater can also be contained in the weathered tuff or some other geologic unit immediately underlying the alluvium. The horizontal and vertical extent of the alluvial groundwater is limited by depletion via evapotranspiration and movement into the underlying rocks (Purtymun et al., 1977). The limited saturated thickness and extent of the alluvial groundwater within the Laboratory boundaries make it inadequate as a significant source of potable and industrial water supply to LANL .

A.5.1.1 Alluvial Groundwater Flux

Lateral flow of the alluvial groundwaters is down canyon and in an easterly direction. Purtymun (1974) used observed travel times through the alluvial groundwater of Mortandad Canyon of a pulse of tritium released from TA-50 to infer the large-scale permeability of the alluvium. Based on this study, the velocity of alluvial groundwater flow ranges from about 60 ft per day in the upper reach to about 7 ft per day in the lower reach of the canyon (Purtymun, 1974). Purtymun (1974) determined field-scale hydraulic conductivity values to several zones of different texture within the alluvium, which were identified during a study by Baltz et al. (1963). Chloride and tritium tracer measurements were used to estimate the hydraulic conductivities. The upper zone has a hydraulic conductivity of 1.6×10^{-3} meters per second (m/s) between MCO-5 and MCO-6. The lower zone has a hydraulic conductivity of 5.8×10^{-4} m/s between MCO-6 and MCO-7.5, and 8.8×10^{-5} m/s between MCO-7.5 and MCO-8.

A.5.1.2 Alluvial Groundwater Quality

Water quality of the alluvial groundwater reflects the composition of storm runoff, snowmelt, and effluent discharges, where present. In canyons affected by effluents, the alluvial groundwater and sediments contain the majority of adsorbing contaminants (such as plutonium). Mobile solutes (such as tritium, HE compounds, and anions) migrate with moving groundwater, and are present in recharge. Contaminated alluvial groundwater occurs in Acid/Pueblo, DP/Los Alamos, and Mortandad canyons, and in Cañon de Valle, and potentially in other canyons where full investigations have not yet been conducted. In Acid/Pueblo, DP/Los Alamos, and Mortandad canyons, the contamination resulted from discharges from radioactive liquid waste treatment facilities (and untreated discharges in Acid/Pueblo Canyon). The groundwater and sediments are contaminated with residual radionuclides, including cesium-137, strontium-90, plutonium isotopes, and americium-241. In Mortandad Canyon, samples collected from alluvial shallow groundwater monitoring wells (Wells MCO-3 through MCO-6) in Mortandad Canyon in December 1999 contained perchlorate concentrations ranging from 80 to 220 parts per billion (ppb). Other components of the discharges included fluoride and nitrate. Cañon de Valle contains residues from past discharges of HE wastewater.

A permeable reactive barrier was installed in Mortandad Canyon in 2002 to remove from alluvial aquifer water radionuclide and chemical contaminants resulting from legacy discharges to the canyon. Alluvial water that encounters the barrier is scrubbed of radionuclides (such as strontium-90, americium-241, and plutonium and uranium isotopes) as well as chemicals (such as perchlorate, nitrate, and heavy metals). To assess the effectiveness of the barrier, samples of water and materials inside the barrier's treatment box and water upstream and downstream of the barrier will be collected for analyses.

A.5.2 Intermediate Perched Groundwater Occurrence

The areas where intermediate perched zone groundwater has been encountered in wells are shown in Table A-1. Intermediate perched zones occur beneath major canyons, particularly in wet canyons that receive effluent discharges, have large surface water flow, or head in the Jemez Mountains. These intermediate perched zones occur in the Guaje Pumice Bed at the base of the Bandelier Tuff, the underlying Cerros del Rio basalts, and the Puye Formation. The location of intermediate perched zones is determined by presence of sufficient recharge, permeability variations of the rocks (reflecting lithologic variations), and geologic structure. Intermediate perched zones may be confined or unconfined. Intermediate perched zones beneath canyons do not generally extend laterally beneath the mesas.

Within drier mesas (generally in the eastern portion of the Laboratory), water can occur in the Bandelier Tuff under unsaturated conditions. Relatively little water (~1 millimeter/year) moves downward beneath the mesa tops under natural conditions due to low rainfall, high evaporation, and efficient water use by vegetation. Atmospheric evaporation extends within mesas, drying out the mesa interior and decreasing downward flow. Moisture content of the tuff varies with recharge rate and with texture of the lithologic units (Nylander et al., 2001). Generally, at depths of below 10 ft, the moisture content of the tuff varies from about 4 to 6% on the mesas. In the eastern portion of the Laboratory (e.g., in Los Alamos Canyon), perching layers are found within the interbedded Cerros del Rio Basalt and the Puye Formation sediments, where they underlie the more permeable Guaje Pumice Bed (Table A-1).

For wet mesas (generally along the western portion of the Laboratory), water occurs in the Bandelier Tuff primarily under unsaturated conditions. At the mesa top Well R-25 at TA-16, relatively low moisture contents in the Tshirege Member of the Bandelier Tuff range from 2% to 5%. The moisture content increases through the lower units of this member to about 21% in the

top of the Cerro Toledo interval. Moisture content in the upper portion of the Otowi Member is about 7%, and increases at depth to approximately 20%. Groundwater also occurs as transient zones of saturation and in perennial saturated ribbons of limited spatial extent, which feed springs on the mesa sides. The saturated zones are localized by fractures and by permeability changes related to lithologic variations within the Bandelier Tuff. Higher rainfall and increased welding and jointing of the tuff lead to greater recharge rates for wet mesas than observed in drier mesas. In addition to spring discharge at mesa sides, saturated and unsaturated flow through mesas result in recharge to the underlying intermediate perched zones or the regional aquifer. In the western portion of the Laboratory, groundwater occurs as a thick (300-ft) intermediate perched zone within the lower Bandelier Tuff and the Puye Formation, approximately 700 ft below the mesa top.

Mesa top recharge under disturbed surface conditions is higher than under natural conditions. Increased recharge occurs when the soil is compacted, when vegetation is disturbed, or when more water is added to the hydrologic system by features such as pavement or effluent discharge. Fractures within mesas could provide preferential pathways for contaminants, especially in regions of high infiltration and in rocks of low matrix permeability. Fracture flow is less likely to occur when the rock matrix is porous and permeable, because water is drawn out of the fractures.

Characterization over the past decade has significantly improved the understanding of the hydrogeologic setting at LANL, including intermediate perched zone groundwater. The vertical and lateral extent of the perched zones, the nature and extent of the perching units, and the potential for migration of perched groundwater to the regional aquifer continue to be investigated. Drilling of alluvial wells and regional aquifer wells that intersect intermediate perched groundwater has provided sufficient information thus far that indicates that neither alluvial nor perched saturated water exist to any significant vertical extent. From the data and information generated thus far, LANL believes that upon completion of the Hydrogeologic Workplan, anticipated in calendar year 2004, sufficient information will have been generated through well installation and modeling to create a technically-based conceptual model of the alluvial and perched water zones. Such information will help fulfill the objectives and purpose of site-wide characterization under the Hydrogeologic Workplan.

Upon completion of the Hydrogeologic Workplan, it is anticipated that additional hydrogeologic characterization will be performed as part of Investigation Work Plans for canyons and aggregate areas. Information obtained during these investigations will be used to continue improving the conceptual model of the alluvial and perched water zones.

A.5.2.1 Intermediate Perched Groundwater Flux

Lateral movement of intermediate perched groundwater may occur if the dip of the perching horizon and the canyon orientation do not coincide. Most recharge for west side perched intermediate groundwater originates as underflow of groundwater from the Jemez Mountains, with some contribution from recharge through mesas and canyon bottoms. Discharge from the intermediate perched zones occurs at springs or results in recharge to the underlying regional aquifer. Studies have shown that the intermediate perched zone groundwater in Pueblo Canyon is hydrologically connected to the stream in Pueblo Canyon (Abrahams and Purtymun, 1966). This perched zone water discharges at the base of the basalt at Basalt Spring, located on San Ildefonso Pueblo land east of LANL in lower Los Alamos Canyon. It has been estimated that the rate of movement of the perched groundwater in this vicinity is about 60 ft per day, or about 6 months from recharge to discharge (Purtymun, 1975).

The direction and flux of water through the unsaturated zone have been examined in two studies. Rogers and Gallaher (1995) tabulated Bandelier Tuff core hydraulic properties from several boreholes at LANL to estimate recharge rates beneath the Pajarito Plateau. Rogers et al. (1996) used hydraulic properties from seven boreholes that had sufficient data to evaluate movement of water in the vadose zone. The seven boreholes were from mesa top and canyon bottom locations, which represent two of the distinct hydrologic regimes on the Pajarito Plateau. Most head gradients determined for the boreholes were approximately unity, thus implying that flow is nearly steady state. One exception was found for boreholes at TA-54, Area G, where gradient reversals at depths of about 100 ft suggest that evaporative drying may be occurring.

Infiltration rates for liquid water at the seven locations were approximated by Rogers et al. (1996), who used vertical head gradients and unsaturated hydraulic conductivity estimates in their calculations. As such, the apparent fluxes beneath mesa top locations range from approximately 0.06 centimeters per year (cm/yr) beneath Area G to 245 cm/yr directly beneath the TA-53 surface impoundments when they were operational. It is believed that high precipitation or surface disturbances (e.g., man-made ponds) lead to higher fluxes beneath

some mesas. Beneath Cañada del Buey and Potrillo Canyon, two typically dry canyons, the apparent canyon-bottom infiltration rates range from 0.4 to 8.3 cm/yr. Beneath Mortandad Canyon, the canyon-bottom infiltration rates range from 1 to 10 cm/yr. More recent data from wet canyons have been interpreted to provide more comprehensive estimates. For Well R-15 in Mortandad Canyon, moisture profile measurements yield infiltration rate estimates on the order of 50 cm/yr. In Los Alamos Canyon, similar estimation techniques in canyon well LADP-3 were estimated to be consistent with infiltration rates of about 10 to 60 cm/yr. Such values are large enough that contaminants are predicted to travel through at least 100 meters of Bandelier Tuff during the time of Laboratory operations. This result is consistent with the observations of relatively deep penetration of contaminants such as perchlorate ion in R-15.

A.5.2.2 Intermediate Perched Groundwater Quality

Water quality within intermediate perched zones reflects that of the recharge water, including effluent discharges and native groundwater. Flow within intermediate perched zones could transport contaminants away from their surface source. Measurements of tritium in intermediate perched zone groundwater indicate that recharge to those depths has occurred during the last several decades. Observations made at four locations in Pueblo and Los Alamos canyons show that levels of tritium in the perched zone are high enough to be attributed to recharge of surface water contaminated by effluent or other releases from LANL operations. In a test well in Pueblo Canyon (TW-2A), tritium has been observed at concentrations between 2,000 and 3,000 picocuries per liter (pCi/L). Beginning in 1991, low-detection-limit tritium measurements have shown tritium levels of about 150 pCi/L in samples from a test well located in lower Pueblo Canyon near its confluence with Los Alamos Canyon (TW-1A), and in Basalt Spring, which is located in Los Alamos Canyon just downstream from its confluence with Pueblo Canyon. Measurements at these three locations are consistent with LANL's previous understanding that the intermediate perched zone groundwater in Pueblo Canyon has been affected by effluents discharged into the canyon. In the middle reach of Los Alamos Canyon, about one mile down gradient of TA-2, tritium was detected in the intermediate perched zone at well LADP-3 (Broxton and Eller, 1995). Perched groundwater was encountered at a depth of about 320 to 330 ft at this well, and water samples contained about 6,000 pCi/L of tritium.

In June 2001, characterization well MCOBT-4.4 was installed at the confluence of Mortandad and Ten Site canyons. Mortandad Canyon received effluent discharged from LANL's former wastewater treatment plant at TA-35 from 1951 to 1963 and from LANL's Radioactive Liquid

Waste Treatment Facility (RLWTF) at TA-50 from 1963 to present. Tritium, fluoride, nitrate plus nitrate (as N), and perchlorate were detected in the perched groundwater samples collected from MCOBT-4.4. The nitrate and perchlorate concentrations exceeded the EPA primary standard for nitrate (10 milligrams per liter [mg/L]) and the draft provisional risk-based level for perchlorate (1 microgram per liter [µg/L]). Additional characterization sampling is being conducted at this well to evaluate contaminant concentrations in the perched zone (Broxton et al., 2002a). Results to date show that perchlorate concentrations range from 140 to 180 µg/L (ppb) at depths of 492 to 524 ft (Longmire, 2003).

A.5.3 Regional Aquifer Groundwater Occurrence

The regional aquifer of the Los Alamos area is the only aquifer known to be capable of providing the Los Alamos County community and Laboratory water supply (Purtymun, 1984). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western parts of the Pajarito Plateau. The depth to the regional aquifer below the mesa tops (and adjacent canyons) ranges from about 600 ft at the eastern margin of the plateau (or near the surface at the Rio Grande) to about 1,200 ft along the western margin (or 900 ft below the deepest canyons). According to Purtymun (1984), the regional aquifer exhibits artesian conditions in the eastern part along the Rio Grande. Throughout the plateau, continuously recorded water level measurements collected in test wells since the Fall of 1992 indicate that the regional aquifer responds to barometric and earth tide effects in a manner typical of confined aquifers.

Twelve deep water-supply wells in three well fields currently produce water for LANL and the communities of Los Alamos and White Rock. The well fields include the off-site Guaje well field and the on-site Pajarito and Otowi well fields. The Guaje well field is located northeast of LANL and contains five production wells. The five production wells in the Pajarito well field are located in Sandia and Pajarito canyons and on mesa tops between these canyons. The Otowi well field is located in Los Alamos and Pueblo canyons, and consists of two production wells. Production of potable municipal water supplies from these three well fields from 1998 through 2001 ranged from approximately 1.32 billion gallons in 1999 to 1.51 billion gallons in 2000 (Koch and Rogers, 2003). Yields from individual production wells ranged from about 375 to 1,479 gallons per minute from 1998 through 2001 (Koch and Rogers, 2003). The long-term trends in water levels reflect a plateau-wide decline in regional aquifer water levels in response to municipal water

production. The average annual decline is gradual and has ranged from 0.7 to 2 ft per year for production wells (Koch and Rogers, 2003).

A.5.3.1 Regional Aquifer Groundwater Flux

The Rio Grande is the main discharge area for the regional aquifer. The largest component of recharge occurs as underflow of groundwater from the Sierra de los Valles, to the west of the Pajarito Plateau. Recharge also occurs by leakage from wet mesas, from alluvial groundwater in canyon bottoms on the Pajarito Plateau, and from intermediate perched groundwater. Local recharge on the Pajarito Plateau is important because it provides potential pathways for contaminants that originate from effluent discharges (Nylander et al., 2001).

Recharge due to infiltration and percolation of alluvial groundwater can be a source of recharge to underlying intermediate perched zones and to the regional aquifer, usually by unsaturated flow. Recharge from alluvial groundwater by unsaturated flow accounts for important volumes of recharge and relatively rapid rates of groundwater flow (reaching the regional aquifer in decades or less). In some cases, recharge might occur by saturated flow. Faults, fractures, joints, surge beds, and higher permeability geologic units that underlie saturated alluvium (such as the Guaje Pumice Bed, Cerro Toledo Interval, Cerros del Rio basalts, and Puye Formation) could provide pathways for downward movement of water and contaminants. Moisture content of the Bandelier Tuff below wet canyons is approximately 6% to saturation. In Mortandad Canyon, a wet canyon due to effluent discharges, the moisture content in the Otowi Member is about 20% at Well R-15. Moisture content in the underlying Cerros del Rio Basalt ranges from 0.5 to 14.6% (LANL, 2000a). Additional information on Los Alamos groundwater and vadose zone characteristics will be published in groundwater annual status reports, drill hole or characterization well completion reports, and other technical reports.

Isotope and age-dating measurements have been made in an effort to better understand the nature of recharge to the regional aquifer. Samples from test wells and water-supply wells that penetrate the regional aquifer were analyzed for carbon-14 and low-level tritium to allow tentative estimates of the age of the water in the regional aquifer at various locations. The interpretation of the carbon-14 data indicates that the minimum age of water in the regional aquifer varies. Under the western portion of the plateau, the minimum age is about 1,000 years. As the water moves eastward, the age increases. Near the Rio Grande, the age of water is about 30,000 years (Rogers et al., 1996). It is important to recognize that, because the samples

were collected from water drawn from screened intervals of 600 to 3,100 ft, these ages are composite water ages. Nonetheless, these ages are consistent with easterly flow, with younger water recharging at the plateau's western boundary and flowing towards the east.

Groundwater samples from the regional aquifer near Los Alamos appear to show the presence of some recent (within the last 40 years) recharge. Samples from five locations detected tritium in several measurements by extremely low-detection-limit analytical methods (Environmental Protection Group, 1995, 1994). These locations include TW-1 in Pueblo Canyon near the confluence with Los Alamos Canyon, TW-3 in Los Alamos Canyon, old observation and water-supply wells LA-1A and LA-2 in Los Alamos Canyon near its confluence with the Rio Grande, TW-8 in Mortandad Canyon, and in wells and springs at San Ildefonso Pueblo (Environmental Protection Group, 1995; Blake et al., 1995). The tritium levels measured range from less than a percent to less than a hundredth of a percent of current drinking water standards. In addition, these levels are less than the levels that could be detected by EPA-specified analytical methods normally used to determine compliance with drinking water regulations. Additionally, samples from water-supply well Otowi-1 collected during 2000 detected perchlorate (see Section A.5.3.2) that documents recent recharge to the regional aquifer.

The regional hydraulic gradient is generally to the east, with a slight southerly component in some areas. As shown in Table A-2, the gradient is fairly steep in the western portion of the plateau within the Puye Formation, less steep in the central portions, then steepening again to the east as the groundwater approaches the Rio Grande. Locally, gradients may depart from these larger scale estimates; uncertainty due to local variations at scales less than R-well spacing is probably larger than uncertainty due to measurement error. Permeability data (provided in Table A-3) show that considerable variation in permeability is present in the aquifer. Assuming average aquifer properties measured in wells in the central portion of the plateau, LANL estimates a typical groundwater velocity to be 33 meters per year [m/yr] (see Table A-4). This is in good agreement with previous estimates (Purtymun, 1995). Any such estimate has inherent uncertainties due to the difficulty in estimating the effective porosity of the medium. By choosing a value on the low end of the range typically assumed for sedimentary rocks, it is thought that the groundwater velocity estimate is a maximum bound.

A.5.3.2 Regional Aquifer Groundwater Quality

Continued testing of water-supply wells, test wells, and springs in 2001 confirm the overall quality of the regional aquifer (LANL, 2002). Trace levels of tritium are present in the regional aquifer in a few areas where past liquid waste discharges occurred, notably beneath Los Alamos, Pueblo, and Mortandad canyons. The highest tritium level found in a regional aquifer test well (Test Well-1), near water-supply well Otowi-1, was about 1/50 of the drinking water standard of 20,000 pCi/L (LANL, 2002). Tritium continued to be found in water-supply well Otowi-1, located in Pueblo Canyon, in 2001 at a level that is 1/500 the drinking water standard. Except for above-background tritium in water-supply well Otowi-1, no other radionuclides other than naturally-occurring uranium were found in Los Alamos County, San Ildefonso Pueblo, or Santa Fe water-supply wells (LANL, 2002). Nitrate concentration in Test Well-1 remained elevated; however, in 2001, the concentration was only about half the drinking water standard of 10 mg/L, and nitrate was higher than background in water-supply well Otowi 1 (LANL, 2002).

The EPA named perchlorate as a contaminant of concern after studies linked the chemical to thyroid disorders and other potential health problems. Perchlorate is a non-radioactive chemical compound used in a variety of industrial processes. At LANL, perchlorate is a byproduct of the perchloric acid used in nuclear chemistry research. Low-level concentrations (2 to 3 ppb) of perchlorate were detected in late June 2000 in water samples collected from the Otowi-1 water-supply well located in lower Pueblo Canyon (LANL, 2000b). Independent analytical laboratories corroborated LANL's analytical results, and in four separate samples collected between June 21, 2000, and July 6, 2000, perchlorate concentrations in the Otowi-1 well ranged from 2 to 3.5 ppb. In 2001, perchlorate was detected in samples collected from the Otowi-1 well at concentrations of 1.7 and 5.85 µg/L (ppb); these concentrations were dependant on analytical method (LANL, 2002). Ion chromatography (IC) and liquid chromatography/mass spectrometry/mass spectrometry (LC/MS/MS) were used to analyze samples collected from Otowi-1. These two methods have different detection limits; the LC/MS/MS method has a lower detection limit than the IC method.

EPA has not yet established a drinking water standard for perchlorate, but has recommended safe drinking water levels ranging from 4 to 18 ppb. The State of California, in response to EPA studies, lowered its perchlorate standard from 18 to 4 ppb. An action level or regulatory standards have not been established by the State of New Mexico. In 1998, the EPA added perchlorate to the Safe Drinking Water Act's Contaminant Candidate List for consideration for

possible regulation; however, a finalized toxicity assessment and technical guidance development must be completed before a federal drinking water regulation for perchlorate would be promulgated.

LANL began testing for perchlorate in December 1997 after the California Department of Health Services identified perchlorate as a contaminant of concern. A possible source for the contamination could be legacy waste that was discharged into Acid Canyon from LANL's TA-45 treatment plant, which operated from 1943 to 1964. The plant was decommissioned in 1966 and 1967. Prior to the June 2000 detection, perchlorate had not been detected in any water-supply wells. Since 1997, LANL has submitted samples to external laboratories that utilize the most current industry-recognized minimum detection limits for perchlorate. Since 1999, LANL has sampled and analyzed (internally) four drinking water wells and several shallow and intermediate groundwater monitoring wells using the minimum detection limit of 4 ppb. Historical industry detection limits prior to 1997 were 100 ppb.

LANL personnel have successfully demonstrated the effectiveness of a new ion-exchange system installed in March 2002 at the TA-50 RLWTF, which discharges treated effluent to Mortandad Canyon. Since the installation of this special ion-exchange resin system, perchlorate concentrations in the discharged effluent have been reduced to below the EPA's approved testing method detection limit of 4 ppb. Between January 2000 and April 2001, before the new ion-exchange system was installed, monthly composite samples of effluent discharged from the RLWTF showed concentrations that ranged between 3 and 950 ppb. The modifications to the treatment operations have significantly decreased perchlorate concentrations in water discharged from the treatment facility.

Regulated units (i.e., surface impoundments, waste piles, land treatment units, and landfills, as provided by 20.4.1 NMAC § 264.90(a)(2) [6-14-00]) will meet the requirements specified in 20.4.1 NMAC §§ 260.90-100 [6-14-00], as appropriate. Currently, the regulated units at LANL include the Area G landfills (Pit 29 and Shaft 124), the Area H landfill (Shaft 9), and the Area L landfill (Shafts 1, 13-17, and 19-34 and Impoundments B and D). Areas G, H, and L are located at TA-54. Interim status groundwater monitoring data for the regulated units at LANL were not obtained as part of a groundwater monitoring program, as required by 20.4.1 NMAC §270.14(c)(1), because LANL had submitted groundwater monitoring waiver demonstrations, in accordance with 20.4.1 NMAC § 265.90(c). These waiver requests were subsequently denied,

and NMED requested that LANL develop the Hydrogeologic Workplan, which would address the requirements of 20.4.1 NMAC §§ 264.91 through 264.100 for regulated units and 20.4.1 NMAC § 264.101 for solid waste management units that have been determined to have had a release. The Hydrogeologic Workplan is being used to characterize the site-wide hydrogeologic setting at the facility. The data collected will help in the identification of the regional aquifer and any hydraulically-interconnected aquifers beneath the facility property, including groundwater flow direction and rate, and the basis for such identification, as required by 20.4.1 NMAC § 270.14(c)(2). It will also be used to establish a technical basis for siting potential future monitoring wells. The groundwater wells constructed pursuant to the Hydrogeologic Workplan may be used to monitor groundwater, and, if necessary, the well characterization and groundwater monitoring data collected will be used as inputs to determine points of compliance, as required by 20.4.1 NMAC § 264.95, as well as potential future locations of groundwater monitoring wells.

As required in 20.4.1 NMAC § 270.14(c)(3), topographic maps of the hazardous waste management areas at TA-54 are included in the LANL General Part A and in the "Los Alamos National Laboratory Technical Area 54 Permit Renewal Application," Revision 3.0 (LANL, 2003). These maps also show the property boundary (if allowed by map scale) and the locations of R wells installed at the time the maps were generated. The "point of compliance," as defined under 20.4.1 NMAC § 264.95, and the groundwater flow direction and rate will be added to these maps in General Part A revisions, as appropriate, when this information is developed and refined, respectively. There is currently no known groundwater contamination from the regulated units at TA-54; therefore, a description of any plume of contamination that has entered the groundwater, as required by 20.4.1 NMAC § 270.14(c)(4), is not provided herein. LANL is currently developing a facility-wide groundwater monitoring plan which will, among other topics, discuss relevant and appropriate groundwater monitoring provisions for LANL's regulated units and solid waste management units, as required by 20.4.1 NMAC § 270.14(c)(5) through (8).

A.5.4 Groundwater Characterization

To date, numerous characterization wells have been drilled, as required by the Hydrogeologic Workplan (LANL, 1998). The installed wells include Wells R-5, R-7, R-8, R-9, and R-9i (Los Alamos/Pueblo Canyon), R-12 (Sandia Canyon), R-13 and R-15 (Mortandad Canyon), R- 14 (Ten Site Canyon), R-16 (Overlook Park in White Rock), R-19 (mesa top above Threemile and

Potrillo canyons), R-21 and R-22 (on Mesita del Buey between Pajarito Canyon and Cañada del Buey), R-20, R-23, and R-32 (Pajarito Canyon), R-25 (south rim of Cañon de Valle), and R-31 (Ancho Canyon). The following provides brief descriptions of each of the characterization wells. Additional information will continue to be provided to the NMED Hazardous Waste Bureau via well summary reports, well completion reports, monitoring reports, and other technical reports.

- Well R-5 is located in lower Pueblo Canyon between the Los Alamos County Sewage Treatment Plant and water-supply well Otowi-1. Drilling activities started in April 2001, and well installation was completed in May 2001. The total depth of Well R-5 is 902 ft. The regional aquifer was reached at a depth of 685 ft. The well was completed with four screened intervals at depths of 326-331 ft, 373-389 ft, 677-720 ft, and 859-864 ft. Based on the analytical results from screening samples collected from the borehole during drilling, it appears that contamination from Laboratory discharges is not present in the regional aquifer at this well site. Additional information for Well R-5 is presented in the "Characterization Well R-5 Completion Report" (Risk Reduction and Environmental Stewardship Division [RRES] Groundwater Protection Program [GPP], 2003a).

- Well R-7 is located in upper Los Alamos Canyon. Drilling activities began in February 2000, and well construction and development were completed in February 2001. The well was drilled to a total depth of 1,097 ft. The regional aquifer was reached at a depth of 903 ft. The R-7 well was completed with three screened intervals: two associated with perched saturation at depths of 363-379 ft and 730-746 ft; and one straddling the regional water table at 895-937 ft. No contaminants above background were detected in samples collected from the borehole during drilling. Additional information for Well R-7 is published in the "Characterization Well R-7 Completion Report" (Stone et al., 2002).

- Well R-8 is located in Los Alamos Canyon, downstream of the confluence with DP Canyon. Drilling activities began in September 2001, and well construction and development were completed in February 2002. The R-8 well was drilled to a total depth of 1,022 ft. The regional aquifer was reached at a depth of 709 ft. The well was completed with two screened intervals at depths of 705-756 ft and 821-828 ft. Based on the analytical results from screening samples collected from the borehole during drilling, tritium is present at a slightly elevated level above background. Additional information

for Well R-8 is presented in the "Characterization Well R-8 Completion Report" (RRES GPP, 2003b).

- Well R-9 is located in Los Alamos Canyon at the eastern boundary of LANL. During the drilling of the well to a total depth of 771 ft, five perched water zones were encountered. The regional aquifer was reached at a depth of 688 ft. Tritium levels were highest (347 pCi/L) in the uppermost perched zone and lowest (14 pCi/L) in the regional aquifer. These levels are far below the levels of health concern (20,000 pCi/L), but do indicate the movement of some water from the land surface to the groundwater zones within the past 40 or so years. Additional information for Well R-9 is published in the "Characterization Well R-9 Completion Report" (Broxton et al., 2001a).

- Well R-9i was completed in March 2000 near the eastern LANL boundary in Los Alamos Canyon to a depth of 322 ft with two screened intervals in the upper saturated zones identified in Well R-9. Additional information for Well R-9i is published in the "Characterization Well R-9i Completion Report" (Broxton et al., 2001b).

- Well R-12 is located in Sandia Canyon at the eastern boundary of LANL. This well was drilled to a total depth of 886 ft. An intermediate-depth perched groundwater zone was encountered at a depth of 424 ft, and the regional aquifer was reached at a depth of 805 ft. The perched groundwater at the 424-ft depth was found to contain nitrate, ammonia, chloride, and tritium (208.1 pCi/L). The presence of some recent recharge water is indicated at this regional aquifer location by tritium levels of 46.9 pCi/L; nitrogen isotopes present indicate a sewage influence. Additional information for Well R-12 is published in the "Characterization Well R-12 Completion Report" (Broxton et al., 2001c).

- Well R-13 is located in Mortandad Canyon. Drilling activities began in August 2001, and well construction, development, and site completion were finished in February 2002. The borehole was drilled to a total depth of 1,133 ft, and the well was installed to a total depth of 1,029.4 ft. No perched water was encountered; the regional aquifer was reached at a depth of 834 ft. The well was completed with one screened interval in the regional aquifer at a depth of 958-1,019 ft. Based on the analytical results from water samples collected from the borehole during drilling, it appears that contamination from Laboratory discharges is not present in the regional aquifer at this well site. Additional

information is presented in the "Characterization Well R-13 Completion Report" (RRES GPP, 2003c).

- Well R-14 is located in Ten Site Canyon, east of the former radioactive liquid waste treatment and septic facilities at TA-35. Preparation and drilling activities began in May 2002, and well construction, development, and site completion were finished in February 2003. The well was drilled to a total depth of 1,327 ft. No perched water zones were encountered; the regional aquifer was reached at a depth of 1,182 ft. The well was completed with two screened intervals in the regional aquifer at depths of 1,201-1,233 ft and 1,286-1,293 ft. Two water samples were collected from the screened intervals in the regional aquifer during well development activities. Based on the analytical results for these samples, it appears that contamination from Laboratory discharges is not present in the regional aquifer at this well site. Additional information is presented in the "Characterization Well R-14 Completion Report" (RRES GPP, 2003d).

- Well R-15 is located in Mortandad Canyon about 1.5 miles east of the RLWTF at TA-50. Both hollow stem auger and air rotary/casing advance methods were used in drilling this well. A definable intermediate perched zone was encountered at a depth of 646 ft, and the regional aquifer was reached at a depth of 964 ft. The total depth of Well R-15 is 1,107 ft. The deep perched zone contained tritium at concentrations of 3,770 ± 850 pCi/L; these levels indicate infiltration of Laboratory-derived contaminants at this location, but the levels are well below federal drinking water standards. The tritium concentration in the regional aquifer at Well R-15 is less than detection. A perchlorate concentration of 12 ppb was detected in the perched water zone at Well R-15 in December 1999 (LANL, 2000c). Additional information for Well R-15 is published in the "Characterization Well R-15 Completion Report" (Longmire et al., 2001a).

- Well R-16 is located just south of Cañada del Buey near Overlook Park in White Rock, and immediately upstream from the sanitary sewage treatment plant. Preparation and drilling activities began in July 2002, and well construction and development were completed in December 2002. The well was drilled to a total depth of 1,287 ft, and the zone of regional groundwater saturation was encountered at a depth of 642 ft. The well was completed with four screened intervals at depths of 641-649 ft, 863-871 ft, 1,015-1,022 ft, and 1,237-1,245 ft. Three water samples were collected after well

development, one each from the lower three screened intervals. Based on analytical results for these three samples, contamination from Laboratory discharges does not appear to be present in the regional aquifer at this well site. Additional information is presented in the "Characterization Well R-16 Completion Report (RRES GPP, 2003e).

- Well R-19 was completed near TA-36 on the mesa above Threemile and Potrillo canyons to a depth of 1,902 ft with seven screens: two in the perched zone; and five in the regional aquifer. Additional information for Well R-19 is published in the "Characterization Well R-19 Completion Report" (Broxton et al., 2001d).

- Well R-20 is located in Pajarito Canyon, just east of TA-18 on the south side of Pajarito Road. Preparation and drilling activities began in July 2002, and well construction, development, and site completion activities were finished in March 2003. The borehole was drilled to a total depth of 1,365 ft. No perched zones were encountered during drilling, and the regional aquifer was reached at a depth of 873 ft. The well was completed with three screened intervals in the regional aquifer at depths of 905-912 ft, 1,147-1,155 ft, and 1,329-1,336 ft. Two regional aquifer water samples were collected from the developed well. Although strontium-90 was detected near the minimum detection activity level, the absence of tritium suggests that the waters have not been impacted by Laboratory releases. Additional information is presented in the "Characterization Well R-20 Completion Report" (RRES GPP, 2003f).

- Well R-21 is located in Cañada del Buey north of TA-54. This well was installed between October 2002 and February 2003. It was advanced to a depth of 995 ft. No perched water zones were encountered during borehole advancement, and the static water level of the regional aquifer was determined to be at a depth of approximately 804 ft. Based on the analytical results for screening samples collected from the single well screen, which extends from 889 ft to 907 ft below ground surface, potential contaminants of concern were not detected. Additional information for this well is published in the "Characterization Well R-21 Completion Report" (Kleinfelder, Inc., 2003).

- Well R-22 was drilled on Mesita del Buey east of TA-54, Area G, to a depth of 1,489 ft. Drilling activities began in August 2000, and well construction and development were completed in November 2000. The regional aquifer was reached at a depth of 883 ft; no

perched intermediate groundwater was encountered in Well R-22. The well was completed with five screened intervals in the regional zone of saturation at depths of 872-914 ft, 947-989 ft, 1,272-1,279 ft, 1,378-1,385 ft, and 1,447-1,452 ft. Samples collected from the borehole during drilling contained tritium at concentrations above background. Additional information for Well R-22 is published in the "Characterization Well R-22 Completion Report" (Ball et al., 2002).

- Well R-23 is located in Pajarito Canyon, just west of the intersection of State Road 4 and Pajarito Road and on the south side of Pajarito Road. Preparation and drilling activities began in July 2002, and well construction, development, and site completion activities were finished in March 2003. The borehole was drilled to a total depth of 935 ft. A possible perched zone was encountered at a depth of 470 ft, and the regional aquifer was reached at a depth of 829 ft. The well was completed with one screened interval in the regional aquifer at a depth of 816-873 ft. Based on the analytical screening results of the regional groundwater samples collected, contamination from Laboratory discharges does not appear to be present in the regional aquifer at this well site. Additional information is presented in the "Characterization Well R-23 Completion Report" (RRES GPP, 2003g).

- Well R-25 is located on a mesa top at TA-16 along the south rim of Cañon de Valle near the western boundary of LANL. The total depth of Well R-25 is 1,942 ft, and the regional aquifer was reached at a depth of 1,286 ft. Well R-25 was completed with nine screened intervals: three in the upper zone of saturation; one in the intervening alternating wet/dry zone; and five in the regional zone of saturation. Contaminants detected in borehole samples included HE compounds and their associated degradation products. Subsequently, quarterly sampling has detected solvent compounds. Additional information for Well R-25 is published in the "Characterization Well R-25 Completion Report" (Broxton et al., 2002b).

- Well R-31 is located at TA-39 in the north fork of Ancho Canyon near the southern boundary of LANL. This well was drilled to a total depth of 1,103 ft. The regional zone of saturation was encountered between 521 and 537 ft; no intermediate perched zones were encountered in this well. Additional information for Well R-31 is published in the "Characterization Well R-31 Completion Report" (Vaniman et al., 2002).

- Well R-32 is located in Pajarito Canyon, within TA-36 and south of TA-54, on the north side of Pajarito Road. Preparation and drilling activities began in July 2002, and well construction, development, and site completion activities were finished in March 2003. This well was drilled to a total depth of 1,008 ft. Perched groundwater was encountered in the alluvium at a depth of 22 ft. No other perched zones were identified. The regional aquifer was reached at a composite depth of 783 ft. The well was completed with three screened intervals in the regional aquifer at depths of 867-875 ft, 932-935 ft, and 973-981 ft. Based on analytical results for water samples collected at each screened interval, contamination from Laboratory discharges does not appear to be present in the regional aquifer at this well site. Additional information is presented in the "Characterization Well R-32 Completion Report" (RRES GPP, 2003h).

The following provides brief descriptions of wells that were installed for further investigation of contaminants in groundwater:

- CdV-R-15-3 was completed at TA-15 on the mesa above Cañon de Valle in June 2000 with six screened intervals: three in the upper perched zone and three in the regional zone of saturation. The three perched zone screens are dry. Additional information for Well CdV-R-15-3 is published in the "Well CdV-R-15-3 Completion Report" (Kopp et al., 2002).

- MCOBT-4.4 in Mortandad Canyon was drilled to a total depth of 767 ft in June 2001. The borehole was plugged up to a depth of 725 ft and a single completion well was installed.

- MCOBT-8.5 in Mortandad Canyon was drilled to a total depth of 740 ft in June 2001. The borehole was plugged up to a depth of 670 ft in order to install a well in Cerros del Rio basalt. However, after several days of monitoring, the borehole did not yield water and MCOBT-8.5 was plugged back to the surface.

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits will be addressed in TA-specific permit applications, permit modification requests, or permit renewal applications.

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Table A-1

Occurrences of Intermediate-Depth Perched Groundwater

Well	Perched Water Level Depth (ft)	Unit Containing Perched Saturation	Data Source
Pueblo Canyon			
TW-2A	120	Puye Formation	Purtymun, 1995
O-1	183	Puye Formation	Purtymun, 1995
TW-1A	180	Cerros del Rio Basalt	Purtymun, 1995
R-5	375	Cerros del Rio Basalt	Longmire, 2001b
Los Alamos Canyon			
H-19	(20-ft interval)	Guaje Pumice Bed	LANL, 1995
R-7	378	Guaje Pumice Bed/Puye Formation	Longmire, 2001b
LAO(A)	295	Guaje Pumice Bed	LANL, 1995
LADP-3	325	Guaje Pumice Bed	LANL, 1995
O-4	253	Puye Formation	Purtymun, 1995
R-9	137	Cerros del Rio Basalt	Broxton et al., 2000
R-9	264	Cerros del Rio Basalt	Broxton et al., 2000
R-9	524	Cerros del Rio Basalt	Broxton et al., 2000
Sandia Canyon			
R-12	424	Cerros del Rio Basalt	Broxton et al., 2000
PM-1	450	Cerros del Rio Basalt	Purtymun, 1995
Mortandad Canyon			
MCM-51	55	Tsankawi/Cerro Toledo	LANL, 1997
MCM-5.9	105	Tsankawi/Cerro Toledo	LANL, 1997
R-15	646	Cerros del Rio Basalt	Longmire et al., 2000
Pajarito Canyon			
SHB-4	145	Cerro Toledo interval	LANL, 1998
R-19	909	Puye Formation	Longmire, 2001b
54-1016	592	Cerros del Rio basalt	LANL, 1998
Cañon de Valle			
R-25	747	Otowi Member	Nylander et al., 2001
Ancho Canyon			
R-31	440	Cerros del Rio basalt	Marin, 2000

Table A-2

Estimated West-East Hydraulic Gradients

Pair of Wells				West-East Distance (m)	Gradient (m/m)
Upgradient Well	**Water level (m)**	Downgradient Well	Water level (m)		
R25	1836	CDV15-3	1833	2189	-0.02884
CDV15-3	1833	R19	1795	4710	-0.02149
DT-10	1805	R22	1747	5195	-0.01121
R15	1785	R12	1738	3684	-0.01283

Table A-3

Permeability Data for Rocks in the Regional Aquifer

Stratigraphic Unit	Well	Permeability (log m^2)	Hydraulic Conductivity (ft/day)	Hydraulic Conductivity (m/yr)
Tsf	O-1	-12.64	0.63	70.11
	LA-6	-12.36	1.22	135.76
	LA-5	-12.84	0.4	44.51
	LA-4	-12.56	0.44	48.96
	LA-3	-12.8	0.44	48.96
	LA-2	-12.77	0.47	52.30
	LA-1B	-12.35	1.25	139.10
	G-4	-12.26	1.51	168.03
	G-3	-12.59	0.71	79.01
	G-2	-12.36	1.22	135.76
	G-1A	-12.36	1.22	135.76
	G-1	-12.47	0.94	104.60
Tsfuv	DT-9	-11.23	16.35	1819.44
	O-4	-11.84	4.02	447.35
	PM-4	-11.94	3.22	358.32
Tpf	TW-8	-11.92	3.35	372.79
	R-15	-12.14	2.01	223.67
	R-15	-11.92	3.32	369.45
	R-19	-11.2	17.5	1947.41
	R-19	-11.15	19.6	2181.10
	CDV-R-15	-13.05	0.25	27.82
	CDV-R-15	-13.44	0.1	11.13
	R-9a	-15.22	.002	0.18
	R-12a	-17.8	4.E-6	.0005
	R-12a	-15.01	.003	0.30
Tpt	TW-3	-11.24	16.08	1789.39
	TW-2	-10.93	32.39	3604.38
	TW-1	-12.71	0.54	60.09

Stratigraphic Unit	Well	Permeability (log m^2)	Hydraulic Conductivity (ft/day)	**Hydraulic Conductivity (m/yr)**
Tb	PM-5	-12.59	0.71	79.01
	G-5	-12.38	1.17	130.20
	DT-10	-11.27	14.87	
	R-31	-12.41	1.07	119.07
	R-31	-12.82	0.42	46.74
	R-31	-11.88	3.62	402.84
	R-31	-14.49	0.01	1.11
	R-31	-14.6	0.01	1.11
	R-9i	-10.87	37.07	4125.17
	R-9i	-12.55	0.78	86.80
	R-9[a]	-14.9	.003	0.30
	R-12[a]	-18.4	1.1E-6	.00012
Tt	TW-4	-12.04	2.55	283.77
Average[b]		-12.30	1.38	153.25

a Derived from core measurements

b Excluding core measurements

Table A-4

Groundwater Velocity Estimate

Gradient **(m/m)**	Hydraulic Conductivity (m/yr)	Porosity	Calculated Velocity (m/yr)
.019[a]	176 m/yr[b]	0.1[c]	33

a Average of gradients shown in Table A-2

b Geometric average of data shown in Table A-3, excluding LA well field (due to its lower permeability)

c At low end of range typically reported for sedimentary rocks (0.1 – 0.3)

TA-3

ATTACHMENT A

FACILITY DESCRIPTION

TA-3

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TA-3

LIST OF ABBREVIATIONS/ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
CMR	Chemistry and Metallurgy Research
CSU	container storage unit
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4
TA	technical area

TA-3
ATTACHMENT A
FACILITY DESCRIPTION

The information provided in this Attachment Section conforms to the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) [1-1-97]. The following subject areas are addressed in this Attachment:

- A general description of Technical Area (TA) 3, Building 29 (TA-3-29), Chemistry and Metallurgy Research (CMR) Building at Los Alamos National Laboratory (LANL) [20 NMAC 4.1, Subpart IX, 270.14(b)(1)];
- Site-specific traffic patterns, volume, and control [20 NMAC 4.1, Subpart IX, 270.14(b)(10)];
- Site-specific location information for compliance with seismic and floodplain standard requirements [20 NMAC 4.1, Subpart IX, 270.14(b)(11), and 20 NMAC 4.1, Subpart V, 264.18(a) and (b)];
- Site-specific topographic map requirements [20 NMAC 4.1, Subpart IX, 270.14(b)(19)];
- Site-specific groundwater monitoring and protection information [20 NMAC 4.1, Subpart IX, 270.14(c), and 20 NMAC 4.1, Subpart V, 264.90(a)].

A LANL-wide facility description addressing additional regulatory requirements is provided in this Attachment's General Section.

A.1 TA-3-29 GENERAL DESCRIPTION [20 NMAC 4.1, SUBPART IX, 270.14(B)(1)]

TA-3 is located in the northern portion of LANL (Figure A-1 of LANL, 1999) on South Mesa between Los Alamos Canyon on the north and Two Mile Canyon on the south. Sandia and Mortandad Canyons head on the east margin of TA-3, forming steep cliffs at the top of the canyon walls. The elevation at TA-3 ranges from 7,100 to 7,500 feet above mean sea level. TA-3-29, the CMR Building, was established in 1952 as a research facility at TA-3. It is a three-story structure containing offices, laboratories, and one container storage unit (CSU). The TA-3-29 CSU is located in the southwest corner of the CMR Building (Figure A-2 of LANL, 1999) in the basement of Wing 9; it consists of three storage locations within Rooms 9010, 9020, and 9030 as shown on Figure A-3 of LANL, 1999. Descriptions of these storage locations are provided in Section 2.0 and Attachment G (LANL, 1999).

A.2 TRAFFIC PATTERNS [20 NMAC 4.1, SUBPART IX, 270.14(B)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in Appendix A of the LANL General Part B (LANL, 1998a).

A.2.1 Routes of Travel

TA-3-29 is located on Diamond Drive. The primary traffic routes that may be used to transport hazardous and mixed waste to or from the TA-3-29 CSU include Pajarito Road, Pecos Drive, DP Road, Trinity Drive (State Road 502), Mesita del Buey Road, and Diamond Drive; a lesser-used traffic route may include West Jemez Road (State Road 501) (Figure A-4 of LANL, 1999).

A.2.2 Traffic Volumes

According to a 1997 traffic study, the peak traffic periods in the vicinity of TA-3-29 are between 7:30 and 8:30 a.m., 12:15 and 1:15 p.m., and 4:30 and 5:30 p.m. (Los Alamos County, 1997). The traffic study was conducted at the intersection of Diamond Drive and Trinity Drive, just north of the TA-3-29 area. Maps and data from the cited study are included in Supplement 4 of the LANL General Part B (LANL, 1998a). The Diamond Drive and Trinity Drive intersection had a volume of 3,152 vehicles from 7:30 to 8:30 in the morning; 3,223 vehicles from 12:15 to 1:15 in the afternoon; and 2,815 vehicles from 4:30 to 5:30 in the afternoon, according to the study.

Maps and data from a traffic count conducted at the same intersection in April 1998 are also included in Supplement 4 of the LANL General Part B (Los Alamos County, 1998). The peak traffic periods for the 1998 study are between 7:15 and 8:15 a.m., 12:30 and 1:30 p.m., and 5:00 and 6:00 p.m. The traffic volume from 7:15 to 8:15 in the morning was 2,373 vehicles. Between 12:30 and 1:30 in the afternoon the volume was 2,588 vehicles. From 5:00 to 6:00 in the afternoon, the volume was 2,648 vehicles. The count is lower because Los Alamos High School was on spring break during this traffic study.

A.2.3 Traffic Control Signals

Traffic flow in the vicinity of TA-3-29 at LANL is controlled by traffic lights, stop signs, and yield signs. Traffic lights are in place at major intersections, including the intersections of Diamond Drive and Eniwetok Drive at the northeast boundary of TA-3-29, and Diamond Drive and Sigma Drive at the southeast boundary of TA-3-29. Traffic signs are used at "T" intersections throughout LANL, including the intersection of Pajarito Road and Diamond Drive south of TA-3-29.

Traffic control signals in the vicinity of TA-3-29 include stop signs, posted speed limits, and other traffic and pedestrian control signs. The locations of existing signs in the vicinity of TA-3-29 are shown on Figure A-5 (LANL, 1999).

A.2.4 Road Surfacing and Load Bearing Capacity

Roads in the vicinity of TA-3-29 are generally four-lane roads with asphaltic concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch-thick base overlain with a 3-inch-thick asphaltic concrete surface. These roads were designed and constructed to meet the American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996).

A.3 LOCATION INFORMATION

A.3.1 Seismic Standard [20 NMAC 4.1, Subpart IX, 270.14(b)(11)(i and ii) and 20 NMAC 4.1, Subpart V, 264.18(a)]

The hazardous and mixed waste management unit at TA-3-29 is exempt from the seismic standards in 20 NMAC 4.1, Subpart IX, 270.14(b)(11), and 20 NMAC 4.1, Subpart V, 264.18(a) [1-1-97], because this unit existed prior to January 25, 1985, and July 25, 1990, when the State of New Mexico received hazardous and mixed waste authorization, respectively.

A.3.2 Floodplain Standard [20 NMAC 4.1, Subpart IX, 270.14(b)(11)(iii) and 270.14(b)(19)(ii); 20 NMAC 4.1, Subpart V, 264.18(b)]

In accordance with 20 NMAC 4.1, Subpart IX, 270.14(b)(11)(iii) [1-1-97], it has been determined that the CSU addressed in this permit application is not located within the 100-year floodplain boundary. LANL has mapped all 100-year floodplain boundaries within the LANL complex, as required in "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515" (EPA, 1994). A report demonstrating that TA-3 is not within the 100-year floodplain has been published documenting the floodplain mapping procedures (McLin, 1992). This report is included as Supplement 5 of the LANL General Part B (LANL, 1998a).

A.4 TOPOGRAPHIC MAPS [20 NMAC 4.1, SUBPART IX, 270.14(B)(19)]

Topographic maps and figures are provided in LANL, 1999 to meet the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(19) [1-1-97]. The maps include the map scale, the date of

preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- A LANL-wide 100-year floodplain map is provided on page 36 of the report included as Supplement 5 of the LANL General Part B (LANL, 1998a).
- A map showing surface waters, including intermittent streams, near TA-3-29 is included as Figure A-6 (LANL, 1999).
- Surrounding land uses are shown on Figure A-1 (LANL, 1999).
- Wind roses for TA-6, the location of the closest wind observation tower to TA-3, are shown on Figures A-7 and A-8 (LANL, 1999).
- A map showing the legal boundaries of LANL (including TA-3) is provided as Map 1 in the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998b), hereinafter referred to as the LANL General Part A.
- Access control features at TA-3-29 (e.g. fences, gates) are shown on Figure 2-1.
- A map showing supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near TA-3-29 is included as Figure A-6 (LANL, 1999).
- The locations of buildings, hazardous and or mixed waste management units and structures, and loading and unloading areas at TA-3-29 are shown on Figure A-6 (LANL, 1999).
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the LANL General Part A (LANL, 1998b).
- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B (LANL, 1998a).
- Digital elevation model drainage features are shown on Figure A-10 (LANL, 1999).
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B (LANL, 1998a).
- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on a map in the LANL General Part A (LANL, 1998b).

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management unit. As provided in 20 NMAC 4.1, Subpart IX, 270.14(b)(19) [1-1-97], LANL has submitted the maps to the New Mexico Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20 NMAC 4.1, SUBPART IX, 270.14(C) AND 20 NMAC 4.1,SUBPART V, 264.90(A)]

Groundwater monitoring information is provided in Appendix A of the LANL General Part B (LANL, 1998a).

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following;

- Permits by Rule
- Emergency Permits
- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test or Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste

Currently, none of these permit types are relevant for operations at TA-3-29.

A.7 REFERENCES

AASHTO, 1996, "Standard Specifications for Highway Bridges," 16th Edition, American Association of State Highway and Transportation Officials.

EPA, 1994, "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515."

LANL, 1999, "Los Alamos National Laboratory Technical Area 3, Building 29, Chemistry and Metallurgy and Research Building, Part B Permit Application," Revision 0.0 (Project No. 774830.21), Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998a, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Los Alamos County, 1998, "Traffic Counts," Los Alamos County Public Works Department, Traffic Engineering Group.

Los Alamos County, 1997, "Traffic Counts," Los Alamos County Public Works Department, Traffic Engineering Group.

McLin, 1992, "Determination of 100-Year Floodplain Elevations at Los Alamos National Laboratory," LA-12195-MS, Los Alamos National Laboratory, Los Alamos, New Mexico.

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FACILITY DESCRIPTION

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AASHTO	American Association of State Highway and Transportation Officials
HE	high explosives
LANL	Los Alamos National Laboratory
OB	open burning
TA	technical area

TA-16
ATTACHMENT A
FACILITY DESCRIPTION

The information in this Attachment conforms to the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised June 14, 2000 [6-14-00]. The following subject areas are addressed in this Attachment Section:

- A general description of Technical Area (TA) 16 at Los Alamos National Laboratory (LANL) [20.4.1 NMAC § 270.14(b)(1)];
- Site-specific traffic patterns, volume, and control [20.4.1 NMAC § 270.14(b)(10)];
- Site-specific location information for compliance with the seismic and floodplain standard requirements [20.4.1 NMAC § 270.14(b)(11), and 20.4.1 NMAC § 264.18(a) and (b)];
- Site-specific topographic map requirements [20.4.1 NMAC § 270.14(b)(19)];
- Site-specific groundwater monitoring and protection information [20.4.1 NMAC § 270.14(c), and 20.4.1 NMAC § 264.90(a)].

A LANL-wide facility description addressing additional regulatory requirements is provided in this Attachment's General Section.

A.1 TA-16 GENERAL DESCRIPTION [20.4.1 NMAC § 270.14(B)(1)]

TA-16 is located in the southwestern portion of LANL (Figure A-1 of LANL, 2003). It is situated on a broad mesa that is bounded on the north by Cañon de Valle, on the south by State Road 4 and Bandelier National Monument, and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevation ranges from approximately 7,700 feet at the west end of the TA to approximately 6,800 feet at the lower east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops.

The open burning (OB) units at TA-16 are shown on Figures A-2 and A-3 (LANL, 2003). The TA-16 OB units include the TA-16-388 Flash Pad and the TA-16-399 HE Burn Tray. The TA-16-388 Flash Pad is where high explosives (HE) contamination is removed from excess equipment or scrap, HE-contaminated liquids and dry HE are burned, and wet HE is dried and burned. The TA-16-399 HE Burn Tray is used for the destruction of solid HE material. Descriptions of these two units are provided in Section 2.0 and Attachment G (LANL, 2003).

A.2 TRAFFIC PATTERNS [20.4.1 NMAC § 270.14(B)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in Appendix A of the LANL General Part B.

A.2.1 Routes of Travel

The primary traffic routes that may be used to transport hazardous waste to or from the OB units at TA-16 include Pajarito Road, Trinity Drive (State Road 502), Diamond Drive, West Jemez Road (State Road 501), Anchor Ranch Road, K-Site Road, State Road 4, and East Jemez Road (see Map 1 in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application" [hereinafter referred to as the LANL General Part A] and Figure A-4 of LANL, 2003).

A.2.2 Traffic Volumes

Due to the nature of operations at TA-16 and because the TA is in a secured area, the traffic volume in the area of the Burn Ground is kept to an absolute minimum to conduct safe treatment operations. Vehicle types are generally cars, light- and medium-duty trucks, vans, tank trucks, dump trucks, and sometimes forklifts and cranes. At the TA-16 Burn Ground, vehicles may be parked next to the Control Building (TA-16-389), driven on the TA-16 Burn Ground roads, or parked adjacent to the OB units.

A.2.3 Traffic Control Signals

Traffic control signals within TA-16 include stop signs, posted speed limits, and other traffic and pedestrian control signs. The locations of existing signs in the vicinity of the TA-16 Burn Ground are shown on Figure A-4 (LANL, 2003).

A.2.4 Road Surfacing and Load-Bearing Capacity

Roads within TA-16 are generally two-lane roads with asphaltic-concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch-thick base overlain with a 3-inch-thick asphaltic-concrete surface. These roads were designed and constructed to meet the American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996).

A.3 LOCATION INFORMATION [20.4.1 NMAC § 270.14(B)(11)]

A.3.1 Seismic Standard [20.4.1 NMAC § 270.14(b)(11)(i and ii) and 20.4.1 NMAC § 264.18(a)]

The OB units at the TA-16 Burn Ground are exempt from the seismic standards in 20.4.1 NMAC § 270.14(b)(11), and 20.4.1 NMAC § 264.18(a) [6-14-00], because they existed prior to November 19, 1980, the effective date of regulation for hazardous waste.

A.3.2 Floodplain Standard [20.4.1 NMAC §§ 270.14(b)(11)(iii through v) and 270.14(b)(19)(ii); 20.4.1 NMAC § 264.18(b)]

The OB units at TA-16 are located on top of a broad mesa. In accordance with 20.4.1 NMAC § 270.14(b)(11)(iii through v) [6-14-00], these hazardous waste management units are not located within the 100-year floodplain boundary. Additional floodplain information is provided in Appendix A of the LANL General Part B.

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC § 270.14(B)(19)]

Topographic maps and figures are provided in LANL, 2003 or referenced to meet the requirements of 20.4.1 NMAC § 270.14(b)(19) [6-14-00]. The maps include the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps were provided as Appendix C of the "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM0890010515" (LANL, 2001).
- A map showing surface waters, including intermittent streams, near the OB units at TA-16 is included as Figure A-5 (LANL, 2003).
- Surrounding land uses are shown on Map 1 in the LANL General Part A.
- Wind roses for TA-6 and TA-49, the locations of the closest wind observation towers to TA-16, are shown on Figures A-6 and A-7 (LANL, 2003).
- A map showing the legal boundaries of LANL (including TA-16) is provided as Map A-2 in the LANL General Part B.
- Access control features for TA-16 (e.g. fences, gates) are shown on Figure A-8 (LANL, 2003).
- The locations of buildings, hazardous waste management units and structures, and loading and unloading areas at TA-16 are shown on Figure A-5 (LANL, 2003).
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included as Map 2 in the LANL General Part A

- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B.
- Drainage control features at the TA-16 Burn Ground are shown on Figure A-9 of LANL, 2003.
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B.
- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on Figure 50-1 in the LANL General Part A.

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management units. As provided in 20.4.1 NMAC § 270.14(b)(19) [6-14-00], LANL has submitted the maps to the New Mexico Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20.4.1 NMAC § 270.14(C) AND 20.4.1 NMAC § 264.90(A)]

Groundwater monitoring information is provided in Appendix A of the LANL General Part B.

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following:

- Permits by Rule
- Emergency Permits
- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test or Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste

Currently, none of these permit types are relevant for the operations at TA-16.

A.7 REFERENCES

AASHTO, 1996, "Standard Specifications for Highway Bridges," 16th Edition, American Association of State Highway and Transportation Officials.

LANL, 2003, "Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Application," Revision 4.0, June 2003, LA-UR-03-3903, Los Alamos National Laboratory, Los Alamos, New Mexico

LANL, 2001, "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0, Los Alamos National Laboratory, EPA ID No. NM0890010515," LA-UR-01-6054, Los Alamos National Laboratory, Los Alamos, New Mexico.

TA-50

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FACILITY DESCRIPTION

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TABLE NO.	TITLE
A-1	Waste Management Unit Status at Technical Area 50

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
cm	centimeters
cm/hr	centimeters per hour
CSU	container storage unit
DOE	U.S. Department of Energy
ft	feet/foot
in.	inch(es)
km	kilometer
LANL	Los Alamos National Laboratory
RCRA	Resource Conservation and Recovery Act
TA	Technical Area
WCRRF	Waste Characterization, Reduction, and Repackaging Facility (TA-50-69)

TA-50
ATTACHMENT A
FACILITY DESCRIPTION

The information in this Attachment Section conforms with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised June 14, 2000 [6-14-00]. The following subject areas are addressed:

- A general description of Technical Area (TA) 50 at Los Alamos National Laboratory (LANL) (20.4.1 NMAC, Subpart IX, 270.14(b)(1) [6-14-00])
- Site-specific traffic patterns, volume, and control (20.4.1 NMAC, Subpart IX, 270.14(b)(10) [6-14-00])
- Site-specific location information for compliance with seismic and floodplain standard requirements (20.4.1 NMAC, Subpart IX, 270.14(b)(11), and 20.4.1 NMAC, Subpart V, 264.18(a) and (b) [6-14-00])
- Site-specific topographic map requirements (20.4.1 NMAC, Subpart IX, 270.14(b)(19) [6-14-00])
- Site-specific groundwater monitoring and protection information (20.4.1 NMAC, Subpart IX, 270.14(c) and 20.4.1 NMAC, Subpart V, 264.90(a) [6-14-00])

A LANL-wide facility description addressing additional regulatory requirements is provided in this Attachment's General Section.

A.1 TA-50 GENERAL DESCRIPTION [20.4.1 NMAC, SUBPART IX, 270.14(B)(1)]

TA-50 is located at the northeast corner of the intersection of Pajarito Drive and Pecos Road, on the finger mesa bounded by Mortandad Canyon to the north and Two-Mile Canyon to the south. Mesa-top elevations at TA-50 range from approximately 7,250 to 7,280 feet (ft) above mean sea level. Figure A-1 (LANL, 2002) depicts the TA-50 location within the LANL site boundary, and its location relative to other TAs. Figure A-2 (LANL, 2002) depicts facilities, structures, and hazardous and mixed waste units within the TA-50 boundary. Nearby facilities are described in Section A.1.4 of this attachment. The nearest point of unrestricted public access to TA-50 outside the LANL site boundary is the Royal Crest Trailer Park 1,500 meters (3,770 ft) north of TA-50. The residential areas of Los Alamos and White Rock are within a 17-kilometer (km) (10-mile) radius of TA-50 and together have a population of approximately 18,200.

The waste management units addressed in this Attachment Section include two container storage units located at TA-50-69. Other waste management units have been identified in

previous Part A or Part B permit applications. These hazardous and/or mixed waste management units are identified in Table A-1.

Table A-1

Waste Management Unit Status at Technical Area 50

Waste Management Unit	Unit Type	Current Status
TA-50-1, Room 59	CSU	Closed [a]
TA-50-37, Rooms 115, 117 and 118	CSU	Closed [a]
TA-50-69, Indoor Area	CSU	Requesting Permit Renewal [b]
TA-50-69, Outdoor Area	CSU	Requesting Permit Renewal [b]
TA-50-114	CSU	Closed [aa]
TA-50-1, Rooms 35, 36, and 38/38A	CSU	Administratively Removed [c]
Solidification/Cementation Unit	Treatment	Administratively Removed [c]
Controlled Air Incinerator	Treatment	Closed [d]
Batch Waste Treatment Unit	Treatment	Closed [e]
TA-50-137	CSU	Administratively Removed [c]
TA-50-138	CSU	Administratively Removed [c]
TA-50-139/Storage Pads	CSU	Administratively Removed [c]
TA-50-140/Storage Pads	CSU	Administratively Removed [c]

[a] Closure certification verification letter dated 11/15/04.

[aa] Withdrawal of the RAMROD permit modification request was approved in April 1998.

[b] Detailed descriptions provided in Attachment G of this permit renewal application.

[c] Waste management units that were proposed but never constructed and/or where waste was never stored, treated, or disposed.

[d] "Los Alamos National Laboratory controlled-Air Incinerator RCRA Closure Certification Report," Benchmark Environmental Corporation, Albuquerque, New Mexico, 1998.

[e] "Closure Certification Report TA-50 Batch Waste Treatment Unit," IT Corporation, Albuquerque, New Mexico, 1994.

CSU = container storage unit

Waste management units addresses in this Attachment Section include two container storage units (CSU) located in the southwest quadrant of TA-50 and identified as the TA-50-69, Indoor CSU and the TA-50-69, Outdoor CSU. Detailed descriptions of these CSUs are provided in Attachment G of this permit renewal application.

A.1.1 Meteorology and Hydrology

The climate and surface winds are described in the LANL General Part B.

A.1.2 Wells and Surface Waters [20.4.1 NMAC, Subpart IX, 270.14(b)(19)(iii) and (ix)]

The only hydrological characteristic specific to operations conducted at TA-50 is surface runoff in the small drainage off the mesa for brief periods during spring snowmelt and intense summer thunderstorms. Surface grading and other storm water controls prevent accumulation of storm water and snowmelt (Appendix A, LANL General Part B). Summer storms on the Pajarito Plateau can generate high discharge rates and may reach a maximum discharge in less than two hours. High discharge rates can transport suspended and bed sediments down the canyons. Snow, however, melts slowly in the spring and runs off over a period of several weeks to several months at a low discharge rate. Stream flow is ephemeral in Cañada del Buey to the north and Pajarito Canyon to the south of Mesita del Buey, occurring primarily during snowmelt or thunderstorms. Situated on top of the mesa, TA-50 is not affected by stream flooding or runoff.

A.1.3 Surrounding Land Use [20.4.1 NMAC, Subpart IX, 270.14(b)(19)(iv)]

No industrial facilities, except for those within LANL, are near TA-50. The following buildings or facilities are located within the TA-50 boundary:

- Radioactive Liquid Waste Treatment Facility, TA-50-1
- TA-50-37
- Engineering Sciences and Applications Division, TA-50-54
- WCRRF, TA-50-69
- Portable office trailer, TA-50-84
- Portable office trailer, TA-50-196
- U.S. West relay facility, TA-50-184
- Material Disposal Area-C Landfill (inactive)

As depicted on Figure A-1 (LANL, 2002), the TAs that border TA-50 include: TA-35, TA-40, TA-55, TA-63, and TA-66. TA-35, located northeast of TA-50, includes facilities that conduct nuclear safeguards research and development. TA-40, which is south and west of TA-50, is used in developing special detonators for the initiation of high-explosive systems. The facilities at TA-55, west of TA-50, conduct plutonium processing and metallurgy research. TA-66, southeast of TA-50, includes the Advanced Technology Assessment Center. The types of activities conducted, the separation distances, and administrative controls ensure that these nearby TAs do not affect the safety of operations conducted at TA-50.

A.2 TRAFFIC PATTERNS [20.4.1 NMAC, SUBPART IX, 270.14(B)(10)]

General traffic pattern information, traffic volume, and traffic control signals for the LANL-wide facility are provided in Appendix A of the LANL General Part B (LANL, 1998a).

A.2.1 Routes of Travel

The primary traffic routes that may be used to transport hazardous and mixed waste to and from TA-50 include Pajarito Road, Pecos Drive, and Mesita del Buey Road as shown on Figure A-3 (LANL, 2002). Lesser-used traffic routes include Diamond Drive and West Jemez Road (State Road 501). Containers received at TA-50, are also moved minimal distances on road surfaces within the TA.

A.2.2 Traffic Volumes and Control

The only local access road to TA-50 is Pajarito Road. Approximately 8,000 automobiles traverse Pajarito Road daily as stated in "Environmental Surveillance at Los Alamos During 1990" (LANL, 1992). The U.S. Department of Energy controls all of the area within the Laboratory site boundary and has the authority to completely restrict access. LANL routinely closes Pajarito Road for activities such as the transport of hazardous waste to and from TA-50.

During normal business hours, the traffic pattern consists of personal and government-owned passenger vehicles entering the area through the open western gate, going to a parking area, and parking. After normal business hours, access through this western gate is by badge-reader only. Throughout normal business hours, the eastern gate may remain open to receive deliveries. After normal business hours, this eastern gate is padlocked. Throughout the workday, the average flow of traffic is approximately 160 vehicles per day. Authorized government vehicles only are permitted on the road leading around the southern end of TA-50-1 and in the area to the southeast of TA-50-1. Figure 2-3 (Permit Part 2) depicts the gates and area discussed.

A.2.3 Traffic Control Signals

Traffic control signals within TA-50 include stop signs, posted speed limits, and other traffic and pedestrian control signs. The locations of existing signs at TA-50 are shown on Figure A-4 (LANL, 2002).

A.3 LOCATION INFORMATION [20.4.1 NMAC, SUBPART IX, 270.14(B)(11)]

A.3.1 Geology

Geologic aspects (Longmire et. al., 1996) of interest at TA-50 include the following:

- Detailed stratigraphy of the upper units of the Bandelier Tuff, including contacts between units that may form barriers to migration or create paths to divert liquid or vapor movement.
- Joints in the Bandelier Tuff that may provide paths for liquid and vapor movement.
- Mineralogy of the geologic strata that may be important in the retardation of contaminant movement.
- Faulting that may provide zones of fracturing along which contaminant transport may be enhanced.
- Surface erosion that could potentially transport contaminants.

A.3.1.1 Seismology [20.4.1 NMAC, Subpart IX, 270.14(b)(11)(i) and (ii), and 20.4.1 NMAC, Subpart V, 264.18(a)]

TA-50 is located in Los Alamos, New Mexico; therefore, pursuant to 20.4.1 NMAC, Subpart IX, 270.14(b)(11)(i) [6-14-00], the seismic standard of 20.4.1 NMAC, Subpart V, 264.18(a) [6-14-00], is applicable.

A geologic field investigation, which consisted of exploratory trenching, was conducted within 3,000 ft of TA-50 during the fall of 1992 and summer of 1993. Based on trench stratigraphy, no evidence of Holocene faulting was observed (Woodward-Clyde Federal Services, 1995). Therefore, TA-50 is in compliance with the seismic standards of 20.4.1 NMAC, Subpart IX, 270.14(b)(11)(i) and (ii), and 20.4.1 NMAC, Subpart V, 264.18(a) [6-14-00]. Figure A-5 (LANL, 2002) details regional surface faulting.

A.3.1.2 Stratigraphy

TA-50 is located in the central part of the Pajarito Plateau. A simplified stratigraphy of the TA-50 site, as well as estimated thickness of rock units, is shown on Figure A-6 (LANL, 2002).

A.3.1.3 Soils

The soils on Mesita del Buey were derived from Bandelier Tuff bedrock and formed under a semiarid climate. Soils on the mesa top are mainly thin, well-drained, sandy loams. The subsoil is a reddish-brown clay, gravelly clay, or clay loam with depth to tuff bedrock about 20 to 50

centimeters (cm) (8 to 20 inches [in.]). These soils are classified in the Unified Soil Classification System as sandy loam, sandy loam-sandy clay, loam, clay loam-loam, and clay loam.

TA-50 is a Hackroy-Rock outcrop complex and Carjo loam. The Hackroy-Rock outcrop complex consists primarily of rock outcrop and Hackroy soils. The Hackroy soils typically range from a brown, sandy loam in the top 8 cm to reddish-brown clay from 8 to 30 cm in depth. Permeability rates range from 5 to 15 centimeters per hour (cm/hr) in the top layers down to 0.15 to 0.50 cm/hr in the lower layers. The shrink-swell potential is low. Available water-holding capacity is 0.11 to 0.21 cm per cm (cm/cm), and the soil pH is 6.6 to 7.8. The Carjo soils typically range from a grayish-brown loam in the top 10 cm to a brown clay loam from 10 to 30 cm in depth. Permeability rates range from 1.5 to 5 cm/hr in the top layer, down to 0.15 to 5 cm/hr in the lower layers. The shrink-swell potential is low to moderate. Available water-holding capacity is 0.14 to 0.21 cm/cm, and the soil pH is 6.3 to 7.8 (Nyhan et al., 1978).

The slopes between TA-50 mesa top and canyon bottoms consist of steep rock outcrops and patches of shallow, undeveloped colluvial soils. The south-facing canyon walls of Pajarito Canyon are steep and have little or no soil material or vegetation, whereas the north-facing walls of Canada del Buey have areas of thin dark-colored soils. Native vegetation at TA-50 is mainly brome grass, false tarragon, blue grama, wormwood, Colorado piñon, and one-seed juniper.

A.3.1.4 Erosional Processes

Erosion of material on Mesita del Buey occurs primarily by shallow runoff on the relatively flat pans of the mesa, by deeper runoff in channels, and by rock fall and colluvial transport on the canyon walls. Wind erosion of disturbed soils also occurs. Mesita del Buey cliff-forming units are eroded primarily by lateral cliff retreat and not vertical erosion.

A.3.2 Floodplain Standard [20.4.1 NMAC, Subpart IX, 270.14(b)(11)(iii), 270.14(b)(19)(ii), and 20.4.1 NMAC, Subpart V, 264.18(b)]

The CSUs addressed in the TA-50 Part B are not located within the 100-year floodplain boundary. In accordance with 20.4.1 NMAC, Subpart IX, 270.14(b)(11)(iii) [6-14-00], additional floodplain information is provided in Appendix A of the LANL General Part B.

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC, SUBPART IX, 270.14(B)(19)]

Topographic maps and figures are provided in LANL, 2002 or referenced to meet the requirements of 20.4.1 NMAC, Subpart IX, and 270.14(b) (19) [6-14-00]. All maps clearly show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps are provided as Appendix C of the "Response to Request for Supplemental Information: Technical Adequacy Review, Resource Conservation and RCRA Permit Application; General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM 0890010515," (LANL, 2001).
- A map showing surface waters, including intermittent streams, near TA-50 is included as Figure A-7 (LANL, 2002).
- Surrounding land uses are shown on Figure A-1 (LANL, 2002).
- Wind roses for TA-6, the TA directly to the west of TA-50, are shown on Figures A-8 and A-9 (LANL, 2002).
- A map showing the legal boundaries of LANL (including TA-50) is provided as Map 1 in the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998b), hereinafter referred to as the LANL General Part A.
- Access control features at TA-50 (e.g., fences, gates) are shown on Figure 2.3.
- A map showing supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near TA-50 is included as Figure A-7 (LANL, 2002).
- The locations of buildings, hazardous and/or mixed waste management units, and loading and unloading areas at TA-50 are shown on Figure A-7 (LANL, 2002).
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the LANL General Part A (LANL, 1998b).
- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B (LANL, 1998a).
- Drainage control features (e.g., run-on/runoff) are shown on Figure A-11 (LANL, 2002).
- Natural surface drainages are shown on a topographic map included herein as Figure A-7 (LANL, 2002).
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B (LANL, 1998a).
- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on a map in the LANL General Part A (LANL, 1998b).

Contour lines on the topographic map are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management units at TA-50. As provided in 20.4.1 NMAC, Subpart IX, 270.14(b)(19) [6-14-00], LANL has submitted the maps to the New Mexico

Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20.4.1 NMAC, SUBPART IX, 270.14(C) AND 20.4.1 NMAC, SUBPART V, 264.90(A)]

Groundwater monitoring and protection requirements specified in 20.4.1 NMAC, Subpart IX, 270.14(c) and 20.4.1 NMAC, Subpart V, 264.90(a) [6-14-00], apply only to owners and operators of surface impoundments, waste piles, land treatment units, and landfills. This document addresses CSUs, which are not regulated units subject to 20.4.1 NMAC, Subpart IX, 270.14(c) [6-14-00].

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following:

- Permits by Rule
- Emergency Permits
- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test of Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste

Currently, none of these permit types are relevant for operations at TA-50.

A.7 REFERENCES

LANL, 2002, "Los Alamos National Laboratory Technical Area 50 Part B Permit Renewal Application," Revision 3.0, August 2002, LA-UR-02-4739, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2001, "Response to Request for Supplemental Information; Technical Adequacy Review, RCRA Permit Application; General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0, Los Alamos National Laboratory, EPA ID No. NM0890010515," Los Alamos National Laboratory, Los Alamos, New Mexico.

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Woodward-Clyde Federal Services, 1995, "Seismic Hazards Evaluation of the Los Alamos National Laboratory," Los Alamos, New Mexico.

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FACILITY DESCRIPTION

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AASHTO	American Association of State Highway and Transportation Officials
CSU	container storage unit
JCI	Johnson Controls World Services, Inc.
LANL	Los Alamos National Laboratory
MLLW	mixed low-level waste
MTRUW	mixed transuranic waste
TA	technical area

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ATTACHMENT A
FACILITY DESCRIPTION

The information in this Attachment Section conforms with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised June 14, 2000 [6-14-00]. The following subject areas are addressed in this Section:

- A general description of Technical Area (TA) 54 at Los Alamos National Laboratory (LANL) [20.4.1 NMAC § 270.14(b)(1)];
- Site-specific traffic patterns, volume, and control [20.4.1 NMAC § 270.14(b)(10)];
- Site-specific location information for compliance with the seismic and floodplain standard requirements [20.4.1 NMAC § 270.14(b)(11), and 20.4.1 NMAC § 264.18(a) and (b)];
- Site-specific topographic map requirements [20.4.1 NMAC § 270.14(b)(19)];
- Site-specific groundwater monitoring and protection information [20.4.1 NMAC § 270.14(c), and 20.4.1 NMAC § 264.90(a)].

A LANL-wide facility description addressing additional regulatory requirements is provided in this Attachment's General Section.

A.1 TA-54 GENERAL DESCRIPTION [20.4.1 NMAC § 270.14(B)(1)]

TA-54 is located in the east-central portion of LANL (Figure A-1 of LANL, 2003) on Mesita del Buey, an east-west-trending finger mesa bounded by Cañada del Buey to the north and by Pajarito Canyon to the south. Mesa-top elevations at TA-54 range from approximately 6,400 to 6,650 feet above mean sea level. TA-54 consists of several waste management areas, including Area L, Area G, and TA-54 West, and supporting offices.

The TA-54 hazardous and mixed waste management units addressed in this Attachment Section are located at Area L, Area G, and TA-54 West (Figure A-2 of LANL, 2003).

At Area L, there are two container storage units (CSU) for storage of hazardous waste and/or mixed low-level waste (MLLW). They include the aboveground CSU within the fence and the Storage Shafts CSU (Shafts 36 and 37).

At Area G, there are nine CSUs for storage of hazardous waste, MLLW, and mixed transuranic waste (MTRUW). They include the following:

- Storage Domes 229, 230, 231, and 232, and Pad 9;
- TA-54-412, Storage Dome 226, and Pad 1;
- Storage Dome 48 and Pad 3;
- Pad 10 (former Pads 2 and 4) and the transuranic waste characterization facilities;
- Storage Domes 49 and 224; Storage Sheds 144, 145, 146, 177, 1027, 1028, 1030, and 1041; and Pads 5, 8, and 7;
- Storage Domes 153 and 283, and Pad 6;
- Storage Shed 8;
- TA-54-33, and;
- Storage Dome 375 and Pad 11.

At TA-54 West, there are two CSUs for storage of MLLW and MTRUW in solid form. They include the Indoor CSU and the Outdoor CSU at TA-54-38.

Descriptions of the Area L, Area G, and TA-54 West CSUs are provided in Section 2.0 and Attachment G (LANL, 2003). The locations of these CSUs are shown on Figures 2-1, 2-3, and 2-14 in Section 2.0 (LANL, 2003).

A.2 TRAFFIC PATTERNS [20.4.1 NMAC § 270.14(B)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in this Attachment's General Section.

A.2.1 Routes of Travel

The primary traffic routes used to transport hazardous and mixed waste to TA-54 include Pajarito Road, Diamond Drive, and West Jemez Road (State Road 501) (see Map 1 in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application" [hereinafter referred to as the LANL General Part A]). Within TA-54, waste is transported along Mesita del Buey Road to TA-54 West, Area L, or Area G (Figure A-2 of LANL, 2003).

A.2.2 Traffic Volumes

Traffic volumes on Mesita del Buey Road are generally light to moderate. A traffic study was conducted in 1993 at the intersection of Pajarito Road and Rex Drive, which immediately joins Mesita del Buey Road. Based on this study, the Pajarito Road and Rex Drive intersection had a

volume of 380 vehicles turning off of Pajarito Road between 6:30 and 9:00 in the morning (Johnson Controls World Services, Inc. [JCI], 1993). Vehicle types are generally cars, light- and medium-duty trucks, and vans. Flatbed trucks or trailers also use Mesita del Buey Road to transport waste containers.

A.2.3 Traffic Control Signals

Traffic control signals within TA-54 include stop signs, posted speed limits, caution lights, and other traffic and pedestrian control signs. The locations of existing signs at TA-54 are shown on Figure A-3 (LANL, 2003).

A.2.4 Road Surfacing and Load-Bearing Capacity

Roads within TA-54 are generally two-lane roads with asphaltic-concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch-thick base overlain with a 3-inch-thick asphaltic-concrete surface. These roads were designed and constructed to meet the American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996). In TA-54, Area G, road surfaces consist of asphaltic-concrete, graded gravel, and/or dirt.

A.3 LOCATION INFORMATION [20.4.1 NMAC § 270.14(B)(11)]

A.3.1 Seismic Standard [20.4.1 NMAC § 270.14(b)(11)(i and ii) and 20.4.1 NMAC § 264.18(a)]

The hazardous and mixed waste management units at TA-54, Areas L and G, are exempt from the seismic standards in 20.4.1 NMAC § 270.14(b)(11), and 20.4.1 NMAC § 264.18(a) [6-14-00], because these units or the interim status storage capacity existed prior to January 25, 1985, and July 25, 1990, when the State of New Mexico received hazardous and mixed waste authorization, respectively. The mixed waste management units at TA-54 West are exempt from the seismic standards in 20.4.1 NMAC § 270.14(b)(11), and 20.4.1 NMAC § 264.18(a) [6-14-00], because this unit existed prior to July 25, 1990 when the State of New Mexico received mixed waste authorization. Consistent with the criteria provided in 20.4.1 NMAC § 270.14(b)(11)(i), and 20.4.1 NMAC § 264.18(a) [6-14-00], the waste management units at TA-54 existed prior to the effective date of regulations or were approved under interim status; thus, the seismic standards are not applicable.

A.3.2 Floodplain Standard [20.4.1 NMAC §§ 270.14(b)(11)(iii through v) and 270.14(b)(19)(ii); 20.4.1 NMAC § 264.18(b)]

The hazardous and mixed waste management units at TA-54 are located on a mesa top, Mesita del Buey. In accordance with 20.4.1 NMAC § 270.14(b)(11)(iii through v) [6-14-00], the hazardous and mixed waste management units at TA-54 are not located within the 100-year floodplain boundary. Additional floodplain information is provided in Appendix A of the LANL General Part B.

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC § 270.14(B)(19)]

Topographic maps and figures are provided in LANL, 2003 or referenced to meet the requirements of 20.4.1 NMAC § 270.14(b)(19) [6-14-00]. The maps clearly show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps were provided as Appendix C of the "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM0890010515" (LANL, 2001).
- Maps showing surface waters, including intermittent streams, near TA-54 are included as Figures 2-1, 2-3, and 2-14 in Section 2.0 (LANL, 2003).
- Surrounding land uses are shown on Map 1 in the LANL General Part A.
- Wind roses for TA-54 are shown on Figures A-4 and A-5 (LANL, 2003).
- A map showing the legal boundaries of LANL (including TA-54) is provided as Map A-2 in the LANL General Part B.
- Access control features at TA-54 (e.g., fences, gates) are shown on Figures 2-1, 2-3, and 2-14 (LANL, 2003).
- The locations of buildings, hazardous and/or mixed waste management units and structures, and loading and unloading areas at TA-54 are shown on Figures 2-1, 2-3, and 2-14 (LANL, 2003).
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the LANL General Part A.
- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B.
- Drainage control features (e.g., run-on/runoff, drainage barriers) are shown on Figures 2-1, 2-3, and 2-14 (LANL, 2003).
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B.

- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on Figure 50-1 in the LANL General Part A.

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management units. As provided in 20.4.1 NMAC § 270.14(b)(19) [6-14-00], LANL has submitted the maps to the New Mexico Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20.4.1 NMAC § 270.14(C) AND 20.4.1 NMAC § 264.90(A)]

Groundwater monitoring information is provided in Appendix A of the LANL General Part B.

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following;

- Permits by Rule
- Emergency Permits
- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test or Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste.

Currently, none of these permit types are relevant for operations at TA-54.

A.7 REFERENCES

AASHTO, 1996, "Standard Specifications for Highway Bridges," 16th Edition, American Association of State Highway and Transportation Officials.

JCI, 1993, "Conceptual Study Report for Entrances to TA-54 at Pajarito Road and Rex Drive, at New Intersection Between TA-51 and TA-54 West, and at TA-54, Area G, Dirt Road Connecting Pajarito Road to Waste Site on Top of Mesa," JCI 93-128, Johnson Controls World Services, Inc., Design Department, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 54 Part B Permit Renewal Application," Revision 3.0, June 2003, LA-UR-03-3579, Los Alamos National Laboratory, Los Alamos, New Mexico

LANL, 2001, "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application: General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM0890010515," LA-UR-01-6054, Los Alamos National Laboratory, Los Alamos, New Mexico.

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FACILITY DESCRIPTION

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AASHTO	American Association of State Highway and Transportation Officials
ft	feet/foot
in.	inch(es)
LANL	Los Alamos National Laboratory
TA	Technical Area

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ATTACHMENT A
FACILITY DESCRIPTION

The information in this Attachment Section conforms with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised June 14, 2000 [6-14-00]. The following subject areas are addressed:

- A general description of Technical Area (TA) 55 at Los Alamos National Laboratory (LANL) [20.4.1 NMAC §270.14(b)(1)];
- Site-specific traffic patterns, volume, and control [20.4.1 NMAC §270.14(b)(10)];
- Site-specific location information for compliance with the seismic standard and floodplain requirements [20.4.1 NMAC §270.14(b)(11) and 20.4.1 NMAC §264.18(a) and (b)];
- Site-specific topographic map requirements [20.4.1 NMAC §270.14(b)(19)]; and
- Site-specific groundwater monitoring and protection information [20.4.1 NMAC §270.14(c) and 20.4.1 NMAC §264.90(a)].

A LANL-wide facility description addressing additional regulatory requirements is provided in this Attachment's General Section.

A.1 TA-55 GENERAL DESCRIPTION [20.4.1 NMAC §270.14(B)(1)]

TA-55 is located in the north central portion of LANL (Figure A-1 of LANL, 2003) on a mesa between a branch of Mortandad Canyon on the north and Two Mile Canyon on the south. Mesa-top elevations at TA-55 range from approximately 7,100 to 7,300 feet (ft) above mean sea level. The locations of the waste management units at TA-55 are shown on Figure A-2 (LANL, 2003).

TA-55 began operating in 1978 and is the location of research and development activities, including a plutonium-processing facility. The waste management units at TA-55 include seven container storage units, a storage tank system, and a cementation unit. Detailed descriptions of the waste management units at TA-55 are provided in Attachments G, H, and I (LANL, 2003), respectively.

A.2 TRAFFIC PATTERNS [20.4.1 NMAC §270.14(B)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in Appendix A of the LANL General Part B.

A.2.1 Routes of Travel

Hazardous and/or mixed waste stored and treated at TA-55 is generated at TA-3 and TA-55. Hazardous and/or mixed waste is occasionally transported from TA-55 to other areas at LANL (e.g., TA-54). The primary traffic routes that may be used to transport hazardous and mixed waste to and from TA-55 include Diamond Drive, Pajarito Road, and Pecos Drive as shown on Figure A-3 of LANL, 2003.

A.2.2 Traffic Volumes

The buildings at TA-55 are located northwest of the intersection of Pajarito Road and Pecos Drive, as shown on Figure A-4 of LANL, 2003. According to a traffic study conducted by Johnson Controls World Services, Inc. (JCI) (JCI, 1999), Pajarito Road has an average daily traffic volume of 12,000 vehicles. This includes vehicles traveling both northwest and southeast. Pecos Drive has an average daily traffic volume of 5,000 vehicles per day. This includes vehicles traveling both north and south. These values are based on a 24-hour period. Vehicle types include cars, light- and medium-duty trucks, and vans.

A.2.3 Traffic Control Signals

Traffic control signals surrounding and within TA-55 include stop signs, posted speed limits, a traffic light, and other traffic and pedestrian control signs. The locations of existing traffic control signals at TA-55 are shown on Figure A-4 of LANL, 2003.

A.2.4 Road Load-Bearing Capacity

Roads within TA-55 are generally two lane roads with asphaltic-concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch (in.)-thick base with a 3-in.-thick asphaltic-concrete surface. These roads were designed and constructed to meet the American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996).

A.3 LOCATION INFORMATION [20.4.1 NMAC §270.14(B)(11)]

A.3.1 Seismic Standard [20.4.1 NMAC §270.14(b)(11)(i - ii) and 20.4.1 NMAC §264.18(a)]

General seismic information for the LANL-wide facility is provided in Appendix A of the LANL General Part B. TA-55 is in compliance with the seismic standards of 20.4.1 NMAC §270.14(b)(11) and 20.4.1 NMAC §264.18(a) [6-14-00]. A geologic field investigation, which consisted of exploratory trenching, was conducted within 3,000 ft of TA-55-4 and TA-55-185

during the fall of 1992 and summer of 1993. Based on trench stratigraphy, no evidence of Holocene faulting was observed (Woodward-Clyde Federal Services, 1995).

A.3.2 Floodplain Standard [20.4.1 NMAC §270.14(b)(11)(iii - v) and 270.14(b)(19)(ii); 20.4.1 NMAC §264.18(b)]

The hazardous and mixed waste management units at TA-55 are located on a mesa top. In accordance with 20.4.1 NMAC §270.14(b)(11)(iii) [6-14-00], the hazardous and mixed waste management units addressed in this permit application are not located within the 100-year floodplain boundary. Additional floodplain information is provided in Appendix A of the LANL General Part B.

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC §270.14(B)(19)]

Topographic maps and figures are provided in LANL, 2003 or referenced to meet the requirements of 20.4.1 NMAC §270.14(b)(19) [6-14-00]. All maps clearly show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps are provided as Appendix C of the "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A," April 1998, Revision 0.0; and "Los Alamos National Laboratory General Part B," October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM 0890010515" (LANL, 2001).
- A map showing surface waters, including intermittent streams, near TA-55 is included as Figure A-5 (LANL, 2003).
- Surrounding land uses are shown on Figure A-1 of LANL, 2003.
- Wind roses for TA-6, the TA directly west of TA-55, are shown on Figures A-6 and A-7 (LANL, 2003).
- A map showing the boundaries of LANL (including TA-55) is provided as Figure A-2 in the LANL General Part B.
- Access control features at TA-55 (e.g., fences, gates) are shown on Figure 2-7 (Permit Part 2).
- A map showing supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near TA-55 is included as Figure A-5 (LANL, 2003).
- The locations of buildings, hazardous and/or mixed waste management units, and loading and unloading areas at TA-55 are shown on Figure A-5 (LANL, 2003).
- A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application," herein after referred to as the LANL General Part A.

- Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B.
- Drainage control features (e.g., run-on/runoff) are shown on Figure A-9 (LANL, 2003).
- Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B.
- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on Figure 50-1 in the LANL General Part A.

Contour lines on the topographic map (Figure A-5 of LANL, 2003) are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management units at TA-55. As provided in 20.4.1 NMAC §270.14(b)(19) [6-14-00], LANL has submitted the maps to the New Mexico Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20.4.1 NMAC, SUBPART IX, 270.14(C) AND 20.4.1 NMAC, SUBPART V, 264.90(A)]

Groundwater monitoring information is provided in Appendix A of the LANL General Part B.

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following:

- Permits by Rule
- Emergency Permits
- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test or Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste

Currently, none of these permit types are in effect for operations at TA-55.

A.7 REFERENCES

AASHTO, 1996 and all approved updates, "Standard Specifications for Highway Bridges," 16th Edition, American Association of State Highway and Transportation Officials.

JCI, 1999, Telecon from John Bradley, Johnson Controls World Services, Inc. to Jessica Moseley, IT Corporation, on February 10, 1999, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 55 Part B Permit Renewal Application," Revision 2.0, September 2003, LA-UR-03-6303, Los Alamos National Laboratory, Los Alamos, New Mexico

LANL, 2001, "Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A," April 1998, Revision 0.0; "Los Alamos National Laboratory General Part B," October 1998, Revision 1.0, Los Alamos National Laboratory, EPA ID No. NM0890010515," Los Alamos National Laboratory, Los Alamos, New Mexico.

Woodward-Clyde Federal Services, 1995, "Evaluation of the Potential for Surface Faulting at TA-63," prepared for Los Alamos National Laboratory, Los Alamos, New Mexico.

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ATTACHMENT A

GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CAM	continuous air monitor
CAS	Central Alarm Station
cm	centimeters
cm/hr	centimeters per hour
CSU	container storage unit
FMCS	facility motor/control system
ft	feet/foot
HEPA	high-efficiency particulate air
LACFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
MSDS	Material Safety Data Sheets
PA	public address
S-10	Hazardous Materials Response Group
TA	technical area

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ATACHMENT A
GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES

This Attachment Section provides an overview of current facility operations and waste management practices for the hazardous and mixed waste management units at Los Alamos National Laboratory (LANL) Technical Area (TA) 55.

A.1 SECURITY AND ACCESS CONTROL [20.4.1 NMAC §270.14(b)(4) and §270.14(b)(19)(viii) and 20.4.1 NMAC §264.14]

Security at TA-55 is maintained with both manmade and natural barriers. These barriers prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock into TA-55, and thus satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §264.14, revised June 14, 2000 [6-14-00]. Two 12-foot (ft) high chain-link security fences with razor wire at the top surround the entire perimeter of TA-55, as shown on Figure 2-7 (Permit Part 2).

Three entry gates allow access to TA-55. One entry gate is located at the main entrance to TA-55 on the southeast side of the facility, one entry gate is located on the road to TA-48 at the northwest end of TA-55, and one entry gate is located at the northeast corner of TA-55 (for access to TA-55, Building 28 [TA-55-28] only). An entry station is located adjacent to the entry gate at the main entrance to the facility. The entry station is manned 24 hours a day by security personnel. Unescorted access to TA-55 is granted only to persons possessing appropriate security clearance and meeting specific training requirements.

TA-55 is patrolled by security personnel during both operational and non-operational hours to ensure that the gates are locked and that unauthorized entry has not occurred. The entire length of both security fences is also inspected several times each day by on-site security personnel. In accordance with 20.4.1 NMAC §270.14(b)(19)(viii) [6-14-00], the locations of the security fences, entry gates, and entry stations are shown on Figure 2-7 (Permit Part 2). In addition to the fence and entry gates, cliffs and canyons surrounding TA-55 provide natural barriers to discourage unauthorized entry.

Warning signs are posted on the perimeter fences at approximately 40 to 110-ft intervals and can be seen from any approach to TA-55. Warning signs are also posted at each access to the

waste management units in sufficient numbers to be seen from any approach. The legends on the signs are bilingual (i.e., English and Spanish) and indicate "No Trespassing by Order of the United States Department of Energy." The signs are legible from a distance of 25 ft. The only exceptions are in confined areas where space is limited. Signs for confined areas may be reduced in size, but are legible to personnel who require access to these areas.

A.2 PREPAREDNESS AND PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C]

The following sections present how operations at TA-55 comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. Additional information on the communication and alarm equipment available at LANL is presented in Appendix E of the most recent version of the "Los Alamos National Laboratory General Part B Permit Application," hereinafter referred to as the LANL General Part B. A list of the emergency equipment available for use at the hazardous and mixed waste management units at TA-55 is provided in Tables D-1 through D-4 of Attachment D (*Contingency Plan*) and in Table E-2 of the LANL General Part B. A videotape explaining the alarms and evacuation procedures at TA-55 must be viewed by new visitors prior to entering TA-55.

A.2.1 Required Equipment [20.4.1 NMAC §264.32]

Buildings at TA-55 are equipped with multiple audible and visual safety-alarm systems to alert personnel in the event of an emergency and to evacuate the area. These alarm systems are located both inside and outside buildings at TA-55 and are monitored and controlled by the facility monitor/control system (FMCS). The FMCS is in operation 24 hours a day and is located in the Operations Center at TA-55-4 with access through TA-55-3. Specific FMCS alarm systems at TA-55 are discussed below.

A TA-55 computer system monitors the smoke and heat sensors, fire-alarm pull boxes, and drop box push-button alarms located throughout TA-55. Fire-alarm pull boxes and/or drop box push-button alarms are located in the vicinity of the waste management units addressed in this permit application. Fire-alarm pull boxes may be used by personnel to activate a local fire alarm when a fire or other emergency is discovered. Fire-alarm pull boxes are located in TA-55-4, Room 401, and throughout the basement in the vicinity of the container storage units (CSU), storage tank system, and cementation unit. A fire-alarm pull box is readily available at TA-55-185 and on the outer west side of TA-55-4 (for personnel working at the container storage pad).

Once manually activated, an alarm (a steady high-pitched tone) sounds in the TA-55-4 Operations Center and at the Los Alamos County Fire Department (LACFD). Automatic thermal alarms are also located in active gloveboxes at TA-55-4.

Buildings at TA-55 are equipped with fire-suppression alarm systems and/or smoke detectors. The fire-suppression alarms are activated when water flow is detected in the sprinkler pipes of the fire-suppression system. The smoke detectors, once activated, also sound an alarm. Both types of alarms are area-specific and sound only in the affected area. Red lights are mounted both inside and outside of rooms and at strategic locations throughout TA-55. Upon activation of the fire-alarm system, the alarm sounds and the red lights flash to alert personnel of emergency conditions. All fire-alarm pull boxes, heat and smoke detection systems, and automatic fire-suppression systems at TA-55 are connected to the LACFD through LANL's Central Alarm Station (CAS).

A general evacuation alarm (a loud mid-range pulsating tone) is activated by gamma sensors on the ceilings of rooms on the first floor of TA-55-4 and in other areas of the basement. This evacuation alarm sounds throughout TA-55 and serves to alert personnel to evacuate. It may also be activated by the TA-55-4 Operations Center for other emergencies requiring evacuation.

Continuous air monitors (CAM) are located at various locations throughout TA-55. CAMs will be used as additional leak detection for the waste management units addressed in this permit application by detecting any airborne alpha contamination that would be present if a spill or leak of mixed waste were to occur.

TA-55-4 is also equipped with a ventilation alarm system designed to monitor air pressure and ambient air for personnel working in areas where hazardous or mixed waste is managed. The ventilation system creates zones within TA-55-4 which are at a lower pressure than the outside air. Air flows from the zones of highest pressure to the zones of lowest pressure (highest potential contamination areas). The airflow through the different zones is carefully balanced and controlled to provide the greatest protection to personnel as well as to the environment. If negative air pressure exceeds designated limits, a ventilation alarm (a slow, repeating chime sound) is activated.

In addition to the alarms described above, the public address (PA) system may also be used to announce an evacuation at TA-55. The PA system can be heard throughout TA-55 and is activated by the TA-55-4 Operations Center.

TA-55 is equipped with both local paging and conventional telephones to provide adequate communication and to summon external emergency assistance, if necessary. Local paging telephones and speakers and/or conventional telephones are located at or near the hazardous and mixed waste management units addressed in this permit application. Local paging telephones are used to page on-site personnel within the local paging area and may be used in the event of an emergency to communicate the location and nature of hazardous conditions to personnel in the area. The general evacuation alarm system at TA-55 is interrupted when the TA-55 PA system is activated through the TA-55-4 Operations Center. Personnel working at any of the waste management units at TA-55 may also use conventional telephones to call the Operations Center to summon emergency assistance from the Hazardous Materials Response Group (S-10), local police and fire departments, and state emergency response teams, if necessary.

Fire control equipment is readily available for the waste management units addressed in this permit application. Depending on the size of the fire and the fuel source, portable fire extinguishers may be used by on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. All buildings at TA-55 are equipped with heat and smoke detection systems and/or automatic, heat-activated fire-suppression systems to aid in the timely response in the event of fires in these buildings.

Fire hydrants are located on the north, south, and west sides of TA-55-4. Water is supplied to the fire hydrants by a municipal water system which provides adequate volume and pressure (i.e., greater than 1,000 gallons per minute and 90 pounds per square inch static pressure) to multiple water hoses in the event of a fire. The LACFD will supply all water hoses needed in the event of a fire at TA-55.

Spill control at TA-55-4, Room 401, and the Vault is provided by recessed floors. Self-containment pallets or cabinets provide spill control at the B40 and K13 CSUs. Additional spill control equipment is available, as needed, from S-10.

Decontamination equipment is available at TA-55 for personnel working at any of the waste management units included in this permit application. The equipment includes portable eyewash stations and safety showers. Eyewash stations and safety showers are located in Room 401 and throughout the basement of TA-55-4. Eyewash stations are also located on the Container Storage Pad and outside on the south side of TA-55-4 near TA-55-185. TA-55-185 will be equipped with an eyewash station prior to wastes being managed there. Safety showers are readily available in the following locations: TA-55-4, Room 401; in the basement of TA-55-4; on the Container Storage Pad; and outside on the south side of TA-55-4. TA-55-185 will be equipped with a portable safety shower prior to wastes being managed there. Additional decontamination equipment may be provided by S-10 personnel. Material Safety Data Sheets (MSDS) provide useful exposure information and are available in Room 401 and in the basement of TA-55-4. MSDSs will also be located in TA-55-185 prior to wastes being managed there.

A.2.2 Testing and Maintenance of Equipment [20.4.1 NMAC §264.33]

All TA-55 communications and alarm systems, fire protection, and decontamination equipment are inspected, tested, and/or maintained as provided in Attachment D of this document. The frequency of inspection is adequate to ensure proper operation in the event of an emergency. Repair and replacement of emergency equipment are performed as required.

A.2.3 Access to Communications or Alarm Systems [20.4.1 NMAC §264.34]

Whenever waste is being handled at any of the TA-55 waste management units addressed in this permit application, all personnel involved have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another individual. In the event of an emergency, communication equipment at TA-55 allows personnel to contact the TA-55-4 Operations Center, the operating group management, S-10, and/or the CAS operator. In addition to communications and alarm systems, TA-55 personnel may carry pagers so that they can be contacted by TA-55 and other LANL emergency support personnel at all times.

A.2.4 Aisle Space Requirements [20.4.1 NMAC §264.35]

Waste containers in the TA-55 CSUs are arranged in rows with a minimum aisle space of 24 inches. Storage configuration within a row depends upon the type of container, its size, and its weight restrictions. Fifty-five-gallon drums and standard waste boxes are arranged in rows and

may be stacked to a maximum of ten ft high. The 85-gallon drums are not stacked. Large waste boxes may also be stacked to a maximum of two high, unless size and weight restrictions prohibit stacking due to safety concerns.

A.2.5 Support Agreements with Outside Agencies [20.4.1 NMAC §264.37(a)]

LANL maintains support agreements with outside agencies for emergency response assistance. Information regarding these support agreements is provided in Section 2.1.2.4 of the LANL General Part B.

A.3 HAZARDS PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C; 20.4.1 NMAC §270.14(B)(8)]

A description of the preventive procedures, structures, and equipment at TA-55 is presented below. This information is provided in accordance with the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C, and 20.4.1 NMAC §270.14(b)(8) [6-14-00]. Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards, undue exposure of personnel to hazardous and mixed waste, and releases to the environment.

A.3.1 Preventing Hazards in Unloading [20.4.1 NMAC §270.14(b)(8)(i)]

Flatbed trucks, trailers, forklifts, or other appropriate vehicles may be used to transport waste containers to and from the waste management units at TA-55. Forklift operators may use a boom, if necessary, to improve handling capabilities. Small containers may be handled manually or with a dolly. The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while moving containers.

A.3.2 Preventing Run-On/Runoff [20.4.1 NMAC §270.14(b)(8)(ii)]

Runoff from the waste management units at TA-55 to other areas of the facility or to the environment is and will be prevented. Secondary containment is provided at each waste management unit included in this permit application where potential liquid-bearing containers are stored. Self-containment systems will be utilized at each CSU, as needed, and will be sufficient to contain at least 10 percent of the volume of potential liquid-bearing containers or the volume of the largest container, whichever is greater, pursuant to the requirements of 20.4.1 NMAC §264.175(b)(3) [6-14-00]. TA-55-4, Room 401 serves as secondary containment for the storage tank system and the cementation unit. The storage tank system and the cementation unit will have adequate secondary containment as required in 20.4.1 NMAC §264.193 [6-14-00]. Runoff control of liquids resulting from fire-suppression activities and from leaks or spills will be

accomplished by using a vacuum truck, a portable pump, a high-efficiency particulate air (HEPA) vacuum, and/or sorbents, depending on the volume and location of accumulated liquid. Accumulated liquids will be removed as soon as possible.

Run-on (e.g., sheet flooding) to any of the TA-55 waste management units addressed in this permit application is and will be prevented. With the exception of the Container Storage Pad, all of the CSUs are located indoors. The container storage pad is sloped, is elevated 2 to 4 inches above ground level, and has a culvert located beneath the pad running from the northwest side to the southeast corner to provide drainage and direct potential run-on away from the pad. In addition, containers stored on the pad are covered. Pursuant to the requirements of 20.4.1 NMAC §270.14(b)(19)(xi) [6-14-00], contours and surface drainage around the Container Storage Pad, TA-55-4, and TA-55-185 are shown on Figure A-9 in Attachment A (LANL, 2003). These features will prevent run-on to the waste management units at TA-55.

A.3.3 Preventing Water Supply Contamination [20.4.1 NMAC §270.14(b)(8)(iii)]

The waste management units at TA-55 are located, designed, constructed, operated, and maintained in a manner that will ensure the prevention of water supply contamination. Each unit is either located inside a building or provided with secondary containment. In the event of a release, the materials in question will be removed as quickly as possible and packaged in an appropriate container. Given these conditions, there is little or no potential for deposition or migration of waste constituents into the groundwater or other water supplies as a result of waste-handling operations at TA-55. In addition, the depth to groundwater at TA-55 is approximately 1,200 ft (LANL, 1998) and the average annual precipitation in the Los Alamos area (including both rain and water equivalent or frozen precipitation) is 48 centimeters (cm). The evaporation of freestanding water exceeds the annual precipitation. Permeability rates for soils at TA-55 range from 1.5 to 5.0 cm per hour (cm/hr) in the top layers to 0.15 to 5.0 cm/hr in the lower layers. Available water-holding capacity ranges from 0.14 to 0.21 percent (Nyhan et al., 1978). Collectively, the depth to the regional aquifer and the annual moisture deficit significantly limit the potential for contaminants to migrate to the groundwater in the unlikely event that contaminants reach the ground surface surrounding TA-55. In addition, all water supply lines are under pressure and are equipped with backflow prevention devices. Pursuant to the requirements of 20.4.1 NMAC §270.14(b)(8)(iii) [6-14-00], no impact to water supplies is expected.

A.3.4 Mitigating Effects of Power Outages [20.4.1 NMAC §270.14(b)(8)(iv)]

Electrical power is supplied to operate ventilation systems, the PA system, various instruments, and other electrical equipment at TA-55. In the event of a power failure, portable generators are available from the Facility and Waste Operations Division support office and at TA-55-3. These generators may be used as temporary power sources at any of the waste management units within TA-55. Evacuation alarms located throughout TA-55 are equipped with a battery back up and will continue to operate for eight hours during a power failure. Operations at any of the waste management units would be discontinued temporarily if electrical power was not restored quickly or if container-handling equipment failed. Neither a power nor an equipment failure would affect containment at any of the waste management units at TA-55.

A.3.5 Preventing Undue Exposure [20.4.1 NMAC §270.14(b)(8)(v)]

To prevent undue exposure of personnel to hazardous or mixed waste, personal protective equipment appropriate for the waste being handled is worn by all on-site personnel at TA-55 involved in waste management activities at any of the waste management units. Workers involved in waste handling at TA-55 are required to wear protective work uniforms and steel-toed/composite-toed shoes, as appropriate. Hard hats and gloves may also be worn while equipment is being operated and when containers are being loaded or unloaded.

A.3.6 Preventing Releases to the Atmosphere [20.4.1 NMAC §270.14(b)(8)(vi)]

Releases to the atmosphere are not anticipated from any of the TA-55 waste management units addressed in this permit application. Containers are kept closed during handling and storage except when, upon inspection, it is determined that containers need to be overpacked or the contents repackaged in new containers or when it is necessary to add or remove waste. Inspections are conducted to ensure the integrity of all stored containers. The cementation unit, located in TA-55-4, Room 401, is operated within a vacuum-pressured glovebox equipped with HEPA filters. This system prevents the release of any airborne contaminants from TA-55. The ventilation alarm system and/or other air monitoring equipment are located in the vicinity of the waste management units located in TA-55-4. In the event of an unexpected release, all personnel working within or near the area would be notified immediately to evacuate.

A.4 RECORDKEEPING REQUIREMENTS

Recordkeeping requirements applicable to the TA-55 CSUs, the storage tank system, and the cementation unit consist of the biennial report, unmanifested waste report, and additional reports. These reports are discussed in Section 2.6 of the LANL General Part B.

A.5 REFERENCES

LANL, 1998, "Hydrogeologic Workplan," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 55 Part B Permit Renewal Application," Revision 2.0, September 2003, LA-UR-03-6303, Los Alamos National Laboratory, Los Alamos, New Mexico

Nyhan, J.W., L.W. Hacker, T.E. Calhoun, and D.L. Young, 1978, "Soil Survey of Los Alamos County, New Mexico," LA-G779-MS, Los Alamos National Laboratory, Los Alamos, New Mexico.

ATTACHMENT B

PART A APPLICATION

Form Approved, OMB No. 2050-0034 Expires XX/XX/02
GSA No. 0248-EPA-OT

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

For EPA Regional Use Only

Date Received
Month Day Year

EPA

United States Environmental Protection Agency
Washington, DC 20460

Hazardous Waste Permit Application Part A

(Read the Instructions before starting)

I. Facility's EPA ID Number ***(Mark 'X' in the appropriate box)***

☐ **A. First Part A Submission**

[X] **B. Part A Amendment #** April 2005, Revision 5.0

C. Facility's EPA ID Number: NM0890010515

D. Secondary ID Number ***(if applicable)***:

II. Name of Facility: LOS ALAMOS NATIONAL LABORATORY

III. Facility Location ***(Physical address not P.O. Box or Route Number)***

A. Street:

Street ***(Continued)***:

City or Town: LOS ALAMOS
State: NM
Zip Code: 87545-

County Code *(If known)*: 028
County Name: LOS ALAMOS

B. Land Type (Enter code): F

C. Geographic Location
LATITUDE (Degrees, minutes, & seconds): 35 49 051
LONGITUDE (Degrees, minutes & seconds): 106 14 015

D. Facility Existence Date
Month Day Year: 01 01 1943

IV. Facility Mailing Address

Street or P.O. Box: PO BOX 1663

City or Town: LOS ALAMOS
State: NM
Zip Code: 87545-

V. Facility Contact ***(Person to be contacted regarding waste activities at facility)***

Name ***(Last)***: WILMOT
(First): EDWIN L

Job Title: MANAGER
Phone Number ***(Area Code and Number)***: 505-667-5105

VI. Facility Contact Address ***(See Instructions)***

A. Contact Address
Location Mailing Other: X

B. Street or P.O. Box: 528 35TH STREET

City or Town: LOS ALAMOS
State: NM
Zip Code: 87544-

X. Other Environmental Permits		
A. Permit Type	**B. Permit Number**	**C. Description**
National Pollutant Discharge Elimination System (NPDES):		
NPDES Construction General Permit:		Construction Project Title
N	NMR15D094	Cerro Grande Fire Recovery
N	NMR15D095	DARHT
N	NMR15D096	Deactivation & Decommission
N	NMR15D097	DX Strategic Plan
N	NMR15DW48	Environmental Restoration Construction
N	NMR15D099	Land Transfer Project
N	NMR15D098	NMSSUP
N	NMR15EE93	NMSSUP Phase II
N	NMR15DQ51	Pajarito Road Access Control
N	NMR15EE95	PM-IP Office Trailers
N	NMR15EA34	Power Grid Infrastructure Upgrade
N	NMR15EA41	Red Net Infrastructure Expansion
N	NMR15EJ48	Security Perimeter Project
N	NMR15D103	TA-16 Weapons Engineer Campus
N	NMR15DP87	TA-16 West Jemez Road Upgrade
N	NMR15D093	TA-3 Construction
N	NMR15E222	TA-50 RLWTF Upgrade Construction
N	NMR15DF77	TA-53 Lead Storage Yard Base Course
N	NMR15D101	TA-54 Construction Activities
N	NMR15D100	TA-55 Construction
N	NMR15EE34	TA-60 Roads & Grounds Relocation
N	NMR15DL41	TA-63 FWO-DO Project
N	NMR15EO62	TA-69 Water Line Replacement
N	NMR15D224	TA33 Construction Activities
Industrial Point Source Permit:		
N	NM0028355	Industrial point source discharges
NPDES Storm Water Multi-Sector General Permit (MSGP) for Industrial Activities:		
N	NMR05A734	University of California
N	NMR05A735	Department of Energy
Dredge and Fill Permits with the U.S. Army Corps of Engineers:		
F	Action No: 2005-00609	Security Perimeter Road Project
F	Action No. 2006-00068	Stream Gaging Station Construction Project
F	Action No. 2006-00060	Stream Gaging Station Maintenance Project
Resource Conservation and Recovery Act (RCRA):		
R	NM0890010515-1	RCRA Hazardous Waste Facility Operating Permit
Groundwater Discharge Plans (GDP):		
E	DP-857	GWDP, TA-46, SWWS Plant
E	DP-1132	GWD, TA-50, Radioactive Liquid Waste Treatment Facility (New Mexico Environment Department [NMED] approval pending)
Air Quality Permits:		
E	P100	Air Quality Operating Permit (20.2.70 NMAC) LANL Air Emissions
E	2195	Air Quality (20.2.72 NMAC) Portable Rock Crusher
E	2195B	Air Quality (20.2.72 NMAC) TA-3 Steam Plant – Flue Gas Recirculation
E	2195F	Air Quality (20.2.72 NMAC) TA-33 Generator
E	GCP3-2195G	Air Quality (20.2.72 NMAC) TA-60 Asphalt Plant
E	2195H	Air Quality (20.2.72 NMAC) Data disintegrator
E		Air Quality (National Emission Standards for Hazardous Air Pollutants)

	#634-M-2 #632 #1081-M-1	Beryllium Machining: TA-3-141 TA-35-213 TA-55-4
E	2195N	Air Quality (20.2.72 NMAC) Chemistry and Metallurgy Research Replacement Facility
Septic Tank Permits:		
E	LA-05	TA-9-109, Abandoned
E	LA-06	TA-9-110, Holding Tank
E	LA-07	TA-11-20, Holding Tank
E	LA-08	TA-69-9, Holding Tank
E	LA-12	TA-69-10, Holding Tank
E	LA-13	TA-11-43, Holding Tank
E	LA-15	TA-15-51, Abandoned
E	LA-16	TA-15-61, Seepage Pit
E	LA-17	TA-15-62, Holding Tank
E	LA-21	TA-15-205, Leach Field
E	LA-23	TA-15-284, Drainline
E	LA-24	TA-16-371, Holding Tank
E	LA-25	TA-16-381, Holding Tank
E	LA-27	TA-18-39, Leach Field
E	LA-32	TA-33-31, Seepage Pit
E	LA-33	TA-33-33, Holding Tank
E	LA-35	TA-33-93, Abandoned
E	LA-36	TA-33-121, Abandoned
E	LA-38	TA-16-175, Filter Trench, tank replaced with new tanks 1194 & 1195
E	LA-39	TA-16-178, Leach Field
E	LA-40	TA-40-25, Leach Field
E	LA-44	TA-39-104, Settling Tank, replaced with TA-33-161
E	LA-45	TA-40-24, Holding Tank
E	LA-49	TA-49-118, Evapotranspiration Bed
E	LA-50	TA-49-119, Evapotranspiration Bed
E	LA-59	TA-52-99, Seepage Pit
E	ES990364	TA-16-819, Holding Tank
E	SF880258	TA-66-3, Holding Tank
E	SF890024	TA-39-132, Leach Field
E	SF890025	TA-72-18, Holding Tank
E	SF890031	TA-16-1153, Abandoned
E	SF89032R	TA-33-179, Leach Field
E	SF94002R	TA-8-126, Holding Tank
E	SF980011	TA-54-351/352, Holding Tank
E	SF980449	TA-54-406/407, Holding Tanks (2)
E	SF890589	TA-15-569, Holding Tank
E	ES030243	TA-36-78, Leach Field
E	Unknown	TA-49-172, Unknown
E	Unknown	TA-49-173, Unknown
E	ES030243	TA-36-249, Holding Tank

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved, OMB No. 2050-0034 Expires XX/XX/02
GSA No. 0248-EPA-OT

EPA ID Number *(Enter from page 1)*: NM089001051 5

Secondary ID Number *(Enter from page 1)*:

VII. Operator Information *(See Instructions)*

A. Name of Operator: LOS ALAMOS NATIONAL SECURITY, LLC

Street or P.O. Box: 4200 WEST JEMEZ ROAD, SUITE 200B

City or Town: LOS ALAMOS

State: NM

Zip Code: 87544-

Phone Number *(Area Code and Number)*: 505-663-5340

B. Operator Type: P

C. Change of Operator Indicator: Yes [ ] No [X]

Date Changed Month 06 Day 01 Year 2006

VIII. Facility Owner *(See Instructions)*

A. Name of Facility's Legal Owner: US DEPARTMENT OF ENERGY

Street or P.O. Box: 528 35TH STREET

City or Town: LOS ALAMOS

State: NM

Zip Code: 87544-

Phone Number *(Area Code and Number)*: 505-667-5105

B. Owner Type: F

C. Change of Owner Indicator: Yes [ ] No [X]

Date Changed Month Day Year

IX. NAICS Codes *(in order of significance; start in left box)*

First	92811	**Third**	562211
(Description) National Security		*(Description)* Haz Waste Treatment and Disposal	
Second	54171	**Fourth**	562212
(Description) R&D in the Phys., Eng., & Life Sci.		*(Description)* Solid Waste Landfill	

X. Other Environmental Permits *(See instructions)*

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
		See attached.

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XI. Nature of Business (*Provide a brief description*)

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, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine; health and biotechnology; and industrial partnerships.

XII. Process Codes and Design Capacities

A. **PROCESS CODE** - *Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in item XIII.*

B. **PROCESS DESIGN CAPACITY** - *for each code entered in column A, enter the capacity of the process.*
1. **AMOUNT** – *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*
2. **UNIT OF MEASURE** – *For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.*

C. **PROCESS TOTAL NUMBER OF UNITS** - *Enter the total number of units used in the corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Application	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Storage	Any Unit of Measure Listed Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Disposal	Any Unit Measure Listed Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T03	Incinerator	Short Tons Per Hour Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per \Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, Or Refining Furnace	
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	Gallons Per Day; Liters Per Day, Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day, Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour, Gallons Per Hour; Liters Per Hour; or Million Btu Per Hour
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day, Metric Tons Per Hour, or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G	Short Tons Per Hour	D	Cubic Yards	Y
Gallons Per Hour	E	Metric Tons Per Hour	W	Cubic Meters	C
Gallons Per Day	U	Short Tons Per Day	N	Acres	B
Liters	L	Metric Tons Per Day	S	Acre-feet	A
Liters Per Hour	H	Pounds Per Hour	J	Hectares	Q
Liters Per Day	V	Kilograms Per Hour	R	Hectare-meter	F
		Million Btu Per Hour	X	Btu Per Hour	I

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes

A. EPA HAZARDOUS WASTE NUMBER - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C. UNIT OF MEASURE - *For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	*CODE*	*METRIC UNIT OF MEASURE*	*CODE*
POUNDS	*P*	*KILOGRAMS*	*K*
TONS	*T*	*METRIC TONS*	*M*

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: for each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of Item XIV-D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in item XIV-E.*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in the space provided on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be sued to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		*A. EPA HAZARD WASTE NO. (Enter code)*				*B. ESTIMATED ANNUAL QUANTITY OF WASTE*	*C. UNIT OF MEASURE (Enter code)*	*D. PROCESS*									
								(1) PROCESS CODES (Enter)									*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
X	*1*	*K*	*0*	*5*	*4*	*900*	*p*	*T*	*0*	*3*	*D*	*8*	*0*				
X	*2*	*D*	*0*	*0*	*2*	*400*	*P*	*T*	*0*	*3*	*D*	*8*	*0*				
X	*3*	*D*	*0*	*0*	*1*	*100*	*P*	*T*	*0*	*3*	*D*	*8*	*0*				
X	*4*	*D*	*0*	*0*	*2*												Included With Above

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N M 0 8 9 0 0 1 0 5 1 5	

XV. Map

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (See instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XVIII. Certification(s)

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

Owner Signature	Date Signed
Name and Official Title (Type or print) **Edwin L. Wilmot, DOE/LASO Manager**	
Owner Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature	Date Signed
Name and Official Title (Type or print) **Edwin L. Wilmot, DOE/LASO Manager**	
Operator Signature	Date Signed
Name and Official Title (Type or print) **Michael R. Anastasio, President, LANS, LLC, and LANL Director Designate**	

XIX. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (Refer to instructions for more information)

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Form Approved, OMB No. 2050-0034 Expires XX/XX/02
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GSA No. 0248-EPA-OT

EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 3								
	1	S	0	1	18,500	G	001	
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
1	0							

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) In item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4				In-situ Vitrification
	1							
	2							
	3							
	4							

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities ***(Continued)***

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 14								
	1	X	0	1	50/20	See Line 2	002	
	2				Units near TA-14-23 used for open burning/open detonation of explosive hazardous waste. Maximum amount treated by open burning is 50 pounds per burn; maximum amount treated by open detonation is 20 pounds per detonation.			
	3				.			
	4				.			
	5				.			
	6				.			
	7				.			
	8				.			
	9				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes ***(Follow instructions from item XII for D99, S99, T04 and X99 process codes)***

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1				.			
	2				.			
	3				.			
	4				.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X 1	S 0 2	533.778	G	001	
Technical Area 16					
1	X 0 1	1,000 100/40,000	See Line 2	002	
2		Pounds per burn Gallons per burn/pounds per burn			
3					
4					
5					
6					
7					
8					
9					
10					

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X 1	T 0 4	.			In-situ Vitrification
1		.			
2		.			
3		.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 36								
	1	X	0	1	2,000	See Line 2	001	
	2				Unit near TA-36-8 used for open detonation of explosive hazardous waste. Maximum amount treated is 2,000 pounds per detonation.			
	3				.			
	4				.			
	5				.			
	6				.			
	7				.			
	8				.			
	9				.			
1	0				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1				.			
	2				.			
	3				.			
	4				.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 39								
	1	X	0	1	2,000	See Line 2	002	
	2				Units near TA-39-6 and TA-39-57 used for open detonation of explosive hazardous waste. Maximum amount treated at each unit is 1,000 pounds per detonation.			
	3				.			
	4				.			
	5				.			
	6				.			
	7				.			
	8				.			
	9				.			
1	0				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1				.			
	2				.			
	3				.			
	4				.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X 1	S 0 2	533.778	G	001	
Technical Area 50					
1	S 0 1	31,500	G	002	
2					
3					
4					
5		.			
6		.			
7		.			
8		.			
9		.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X 1	T 0 4	.			In-situ Vitrification
1		.			
2		.			
3		.			
4		.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities ***(Continued)***

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 54, Area L								
	1	S	0	1	408,480	G	002	
	2	S	0	2	3,320	See lines 5 and 6	002	
	3	T	0	1		See lines 5 and 6		
	4	D	8	0	1200	See line 7	001	
	5				The open-top steel tanks were used for both treatment and storage (Line 2, S02) and (Line 3, T01).			
	6				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is gallons.			
	7				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is cubic yards.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes ***(Follow instructions from item XII for D99, S99, T04 and X99 process codes)***

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			*In-situ Vitrification*
	1	S	9	9	600	See Line 2	001	Shaft Storage
	2				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is gallons.			
	3				.			
	4				.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 54, Area G								
	1	S	0	1	3,664,150	G	008	
	2	S	0	1	4,950	See Line 4	001	
	3	D	8	0	14	See Line 5	001	
	4				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is gallons.			
	5				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is cubic yards.			
	5				.			
	6				.			
	7				.			
	8				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in Item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seg w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1				.			
	2				.			
	3				.			
	4				.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X 1	S 0 2	533.778	G	001	
Technical Area 54 West					
1	S 0 1	11,660	G	002	
2		.			
3		.			
4		.			
5		.			
6		.			
7		.			
8		.			
9		.			
10		.			
11		.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X 1	T 0 4	.			In-situ Vitrification
1		.			
2		.			
3		.			
4		.			

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EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 54, Material Disposal Area H								
	1	D	8	0	63	See Line 2	001	
	2				To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03]. Permitted status is not requested. The unit of measure for capacity is cubic yards.			
	3				.			
	4				.			
	5				.			
	6				.			
	7				.			
	8				.			
	9				.			
1	0				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1				.			
	2				.			
	3				.			
	4				.			

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

EPA ID Number (*Enter from page 1*)	Secondary ID Number (*Enter from page 1*)
N M 0 8 9 0 0 1 0 5 1 5	

XII. Process Codes and Design Capacities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	533.778	G	001	
Technical Area 55								
	1	S	0	1	178,500	G	006	
	2	S	0	2	137	G	001	
	3							
	4							
	5							
	6				.			
	7				.			
	8				.			
	9				.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, tanking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) In Item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4	.			In-situ Vitrification
	1	T	0	4	150	G	001	Solidification
	2				.			
	3				.			
	4				.			

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EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
			Technical Area 3				
1	D001	7,000	P	S01			
2	D002	21,000	P	S01			
3	D003	2,500	P	S01			
4	D004	3,000	P	S01			
5	D005	3,000	P	S01			
6	D006	2,500	P	S01			
7	D007	7,000	P	S01			
8	D008	27,000	P	S01			
9	D009	4,000	P	S01			
10	D010	2,500	P	S01			
11	D011	3,000	P	S01			
12	D012	1,000	P	S01			
13	D018	1,500	P	S01			
14	D019	2,000	P	S01			
15	D021	2,000	P	S01			
16	D022	2,000	P	S01			
17	D023	2,000	P	S01			
18	D024	2,000	P	S01			
19	D025	2,000	P	S01			
20	D026	2,000	P	S01			
21	D027	1,500	P	S01			
22	D028	2,000	P	S01			
23	D029	1,000	P	S01			
24	D030	1,500	P	S01			
25	D032	1,500	P	S01			
26	D033	1,500	P	S01			
27	D034	1,500	P	S01			
28	D035	3,500	P	S01			
29	D036	1,500	P	S01			
30	D037	1,000	P	S01			
31	D038	1,500	P	S01			
32	D039	2,500	P	S01			
33	D040	2,500	P	S01			
34	D042	1,500	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

N M 0 8 9 0 0 1 0 5 1 5

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
			Technical Area 3				
35	D043	1,500	P	S01			
36	F001	21,000	P	S01			
37	F002	21,000	P	S01			
38	F003	21,000	P	S01			
39	F004	2,500	P	S01			
40	F005	21,000	P	S01			
41	F006	500	P	S01			
42	F007	500	P	S01			
43	F009	500	P	S01			
44	P003	1,000	P	S01			
45	P012	1,000	P	S01			
46	P015	1,000	P	S01			
47	P029	1,000	P	S01			
48	P030	1,000	P	S01			
49	P031	1,000	P	S01			
50	P038	1,000	P	S01			
51	P056	1,000	P	S01			
52	P063	1,000	P	S01			
53	P068	1,000	P	S01			
54	P073	1,000	P	S01			
55	P076	1,000	P	S01			
56	P078	1,000	P	S01			
57	P095	1,000	P	S01			
58	P096	1,000	P	S01			
59	P098	1,000	P	S01			
60	P099	500	P	S01			
61	P106	1,000	P	S01			
62	P113	1,000	P	S01			
63	P120	1,000	P	S01			
64	U001	1,000	P	S01			
65	U002	1,000	P	S01			
66	U003	1,000	P	S01			
67	U012	1,000	P	S01			
68	U019	1,000	P	S01			
69	U022	1,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 3							
70	U029	1,000	P	S01			
71	U031	1,000	P	S01			
72	U037	1,000	P	S01			
73	U044	1,000	P	S01			
74	U045	1,000	P	S01			
75	U052	1,000	P	S01			
76	U056	1,000	P	S01			
77	U057	1,000	P	S01			
78	U075	1,000	P	S01			
79	U077	1,000	P	S01			
80	U080	1,000	P	S01			
81	U108	1,000	P	S01			
82	U103	500	P	S01			
83	U112	1,000	P	S01			
84	U115	1,000	P	S01			
85	U117	1,000	P	S01			
86	U121	1,000	P	S01			
87	U122	1,000	P	S01			
88	U123	1,000	P	S01			
89	U131	1,000	P	S01			
90	U133	1,000	P	S01			
91	U134	1,000	P	S01			
92	U135	1,000	P	S01			
93	U140	1,000	P	S01			
94	U144	1,000	P	S01			
95	U151	1,000	P	S01			
96	U154	1,000	P	S01			
97	U159	1,000	P	S01			
98	U160	1,000	P	S01			
99	U161	1,000	P	S01			
100	U165	1,000	P	S01			
101	U169	1,000	P	S01			
102	U188	1,000	P	S01			
103	U190	1,000	P	S01			
104	U196	1,000	P	S01			
105	U204	1,000	P	S01			
106	U210	1,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (Enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D[1])*
			Technical Area 3				
107	U211	1,000	P	S01			
108	U213	1,000	P	S01			
109	U216	1,000	P	S01			
110	U218	1,000	P	S01			
111	U219	1,000	P	S01			
112	U220	1,000	P	S01			
113	U225	500	P	S01			
114	U226	1,000	P	S01			
115	U227	500	P	S01			
116	U228	1,000	P	S01			
117	U239	500	P	S01			
118	U246	500	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 14							
1	D001	2,000	P	X01			
2	D003						Included With Above.
3	D005						Included With Above.
4	D006						Included With Above.
5	D007						Included With Above.
6	D008						Included With Above.
7	D009						Included With Above.
8	D011						Included With Above.
9	D018						Included With Above.
10	D022						Included With Above.
11	D028						Included With Above.
12	D029						Included With Above.
13	D030						Included With Above.
14	D035						Included With Above.
15	D036						Included With Above.
16	D038						Included With Above.
17	D040						Included With Above.
18	F001						Included With Above.
19	F002						Included With Above.
20	F003						Included With Above.
21	F004						Included With Above.
22	F005						Included With Above.

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 16							
1	D001	250,000	P	X01			
2	D002						Included With Above.
3	D003						Included With Above.
4	D005						Included With Above.
5	D006						Included With Above.
6	D007						Included With Above.
7	D008						Included With Above.
8	D009						Included With Above.
9	D011						Included With Above.
10	D018						Included With Above.
11	D022						Included With Above.
12	D028						Included With Above.
13	D029						Included With Above.
14	D030						Included With Above.
15	D035						Included With Above.
16	D036						Included With Above.
17	D038						Included With Above.
18	D040						Included With Above.
19	F001						Included With Above.
20	F002						Included With Above.
21	F003						Included With Above.
22	F004						Included With Above.
23	F005						Included With Above.
24	K044						Included With Above.
25	K045						Included With Above.
26	U019						Included With Above.
27	U022						Included With Above.
28	U044						Included With Above.
29	U112						Included With Above.
30	U154						Included With Above.
31	U159						Included With Above.

EPA I.D. Number *(Enter from Page 1)*												Secondary ID Number *(Enter from Page 1)*											
N	M	0	8	9	0	0	1	0	5	1	5												

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter Code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 16							
32	U169						Included With Above.
33	U196						Included With Above.
34	U220						Included With Above.
35	U239						Included With Above.
							Included With Above.

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter Code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 16, Material Disposal Area P [a]							
1	D001	TBD		D80			
2	D003	TBD		D80			
3	D005	TBD		D80			
4	D006	TBD		D80			
5	D008	TBD		D80			
6	D030	TBD		D80			

a Unit is undergoing closure in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03], requirements. Permitted status is not requested.

EPA I.D. Number *(Enter from Page 1)*												Secondary ID Number *(Enter from Page 1)*
N	M	0	8	9	0	0	1	0	5	1	5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter Code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 36							
1	D001	15,000	P	X01			
2	D003						Included With Above.
3	D005						Included With Above.
4	D006						Included With Above.
5	D007						Included With Above.
6	D008						Included With Above.
7	D009						Included With Above.
8	D011						Included With Above.
9	D018						Included With Above.
10	D022						Included With Above.
11	D028						Included With Above.
12	D029						Included With Above.
13	D030						Included With Above.
14	D035						Included With Above.
15	D036						Included With Above.
16	D038						Included With Above.
17	D040						Included With Above.
18	F001						Included With Above.
19	F002						Included With Above.
20	F003						Included With Above.
21	F004						Included With Above.
22	F005						Included With Above.

EPA I.D. Number *(Enter from Page 1)*												Secondary ID Number *(Enter from Page 1)*											
N	M	0	8	9	0	0	1	0	5	1	5												

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 39							
1	D001	15,000	P	X01			
2	D003						Included With Above.
3	D005						Included With Above.
4	D006						Included With Above.
5	D007						Included With Above.
6	D008						Included With Above.
7	D009						Included With Above.
8	D011						Included With Above.
9	D018						Included With Above.
10	D022						Included With Above.
11	D028						Included With Above.
12	D029						Included With Above.
13	D030						Included With Above.
14	D035						Included With Above.
15	D036						Included With Above.
16	D038						Included With Above.
17	D040						Included With Above.
18	F001						Included With Above.
19	F002						Included With Above.
20	F003						Included With Above.
21	F004						Included With Above.
22	F005						Included With Above.

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
1	D001	69,696	P	S01			
2	D002	52,734	P	S01			
3	D003	3,444	P	S01			
4	D004	7,531	P	S01			
5	D005	7,740	P	S01			
6	D006	535,451	P	S01			
7	D007	567,226	P	S01			
8	D008	1,405,439	P	S01			
9	D009	75,666	P	S01			
10	D010	8,922	P	S01			
11	D011	31,255	P	S01			
12	D016	44	P	S01			
13	D017	66	P	S01			
14	D018	5,535	P	S01			
15	D019	4261	P	S01			
16	D020	100	P	S01			
17	D021	1,918	P	S01			
18	D022	4,354	P	S01			
19	D023	100	P	S01			
20	D024	100	P	S01			
21	D025	100	P	S01			
22	D026	518	P	S01			
23	D027	972	P	S01			
24	D028	216,183	P	S01			
25	D029	215,184	P	S01			
26	D030	5,491	P	S01			
27	D031	293	P	S01			
28	D032	3135	P	S01			
29	D033	2,222	P	S01			
30	D034	1,228	P	S01			
31	D035	1,792	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

N M 0 8 9 0 0 1 0 5 1 5

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
32	D036	549	P	S01			
33	D037	761	P	S01			
34	D038	1,594	P	S01			
35	D039	1,675	P	S01			
36	D040	3,942	P	S01			
37	D041	293	P	S01			
38	D042	1182	P	S01			
39	D043	655	P	S01			
40	F001	442,263	P	S01			
41	F002	147,347	P	S01			
42	F003	50,980	P	S01			
43	F004	2,817	P	S01			
44	F005	334,821	P	S01			
45	F006	100	P	S01			
46	F007	100	P	S01			
47	F008	100	P	S01			
48	F009	165	P	S01			
49	F027	165	P	S01			
50	F028	100	P	S01			
51	K044	100	P	S01			
52	K045	100	P	S01			
53	K047	100	P	S01			
54	P001	100	P	S01			
55	P002	100	P	S01			
56	P003	293	P	S01			
57	P004	100	P	S01			
58	P005	100	P	S01			
59	P006	143	P	S01			
60	P007	100	P	S01			
61	P008	100	P	S01			
62	P009	100	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

N M 0 8 9 0 0 1 0 5 1 5

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
63	P010	100	P	S01			
64	P011	143	P	S01			
65	P012	293	P	S01			
66	P013	100	P	S01			
67	P014	100	P	S01			
68	P015	293	P	S01			
69	P016	100	P	S01			
70	P017	100	P	S01			
71	P018	100	P	S01			
72	P020	100	P	S01			
73	P021	100	P	S01			
74	P022	100	P	S01			
75	P023	100	P	S01			
76	P024	100	P	S01			
77	P026	100	P	S01			
78	P027	100	P	S01			
79	P028	100	P	S01			
80	P029	293	P	S01			
81	P030	485	P	S01			
82	P031	485	P	S01			
83	P033	143	P	S01			
84	P034	100	P	S01			
85	P036	100	P	S01			
86	P037	100	P	S01			
87	P038	227	P	S01			
88	P039	100	P	S01			
89	P040	100	P	S01			
90	P041	100	P	S01			
91	P042	100	P	S01			
92	P043	143	P	S01			
93	P044	100	P	S01			

EPA I.D. Number *(Enter from Page 1)* N M 0 8 9 0 0 1 0 5 1 5

Secondary ID Number *(Enter from Page 1)*

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
94	P045	100	P	S01			
95	P046	100	P	S01			
96	P047	100	P	S01			
97	P048	143	P	S01			
98	P049	100	P	S01			
99	P050	100	P	S01			
100	P051	100	P	S01			
101	P054	100	P	S01			
102	P056	2,674	P	S01			
103	P057	100	P	S01			
104	P058	100	P	S01			
105	P059	100	P	S01			
106	P060	100	P	S01			
107	P062	100	P	S01			
108	P063	293	P	S01			
109	P064	100	P	S01			
110	P065	100	P	S01			
111	P066	100	P	S01			
112	P067	100	P	S01			
113	P068	293	P	S01			
114	P069	100	P	S01			
115	P070	100	P	S01			
116	P071	100	P	S01			
117	P072	100	P	S01			
118	P073	293	P	S01			
119	P074	100	P	S01			
120	P075	100	P	S01			
121	P076	403	P	S01			
122	P077	100	P	S01			
123	P078	425	P	S01			
124	P081	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
125	P082	100	P	S01			
126	P084	100	P	S01			
127	P085	100	P	S01			
128	P087	100	P	S01			
129	P088	100	P	S01			
130	P089	100	P	S01			
131	P092	143	P	S01			
132	P093	100	P	S01			
133	P094	100	P	S01			
134	P095	293	P	S01			
135	P096	293	P	S01			
136	P097	100	P	S01			
137	P098	293	P	S01			
138	P099	100	P	S01			
139	P101	100	P	S01			
140	P102	100	P	S01			
141	P103	100	P	S01			
142	P104	143	P	S01			
143	P105	143	P	S01			
144	P106	293	P	S01			
145	P108	100	P	S01			
146	P109	100	P	S01			
147	P110	100	P	S01			
148	P111	100	P	S01			
149	P112	143	P	S01			
150	P113	293	P	S01			
151	P114	100	P	S01			
152	P115	100	P	S01			
153	P116	100	P	S01			
154	P118	100	P	S01			
155	P119	143	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
156	P120	293	P	S01			
157	P121	100	P	S01			
158	P122	100	P	S01			
159	P123	100	P	S01			
160	U001	293	P	S01			
161	U002	954	P	S01			
162	U003	485	P	S01			
163	U004	100	P	S01			
164	U005	100	P	S01			
165	U006	100	P	S01			
166	U007	143	P	S01			
167	U008	143	P	S01			
168	U009	143	P	S01			
169	U010	100	P	S01			
170	U011	100	P	S01			
171	U012	293	P	S01			
172	U014	100	P	S01			
173	U015	100	P	S01			
174	U016	100	P	S01			
175	U017	100	P	S01			
176	U018	143	P	S01			
177	U019	470	P	S01			
178	U020	100	P	S01			
179	U021	100	P	S01			
180	U022	293	P	S01			
181	U023	100	P	S01			
182	U024	100	P	S01			
183	U025	100	P	S01			
184	U026	100	P	S01			
185	U027	100	P	S01			
186	U028	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
187	U029	293	P	S01			
188	U030	100	P	S01			
189	U031	293	P	S01			
190	U032	100	P	S01			
191	U033	143	P	S01			
192	U034	100	P	S01			
193	U035	100	P	S01			
194	U036	100	P	S01			
195	U037	143	P	S01			
196	U038	100	P	S01			
197	U039	100	P	S01			
198	U041	143	P	S01			
199	U042	100	P	S01			
200	U043	100	P	S01			
201	U044	293	P	S01			
202	U045	293	P	S01			
203	U046	100	P	S01			
204	U047	100	P	S01			
205	U048	100	P	S01			
206	U049	100	P	S01			
207	U050	100	P	S01			
208	U051	100	P	S01			
209	U052	293	P	S01			
210	U053	100	P	S01			
211	U055	143	P	S01			
212	U056	293	P	S01			
213	U057	293	P	S01			
214	U058	100	P	S01			
215	U059	100	P	S01			
216	U060	100	P	S01			
217	U061	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
218	U062	100	P	S01			
219	U063	100	P	S01			
220	U064	100	P	S01			
221	U066	100	P	S01			
222	U067	143	P	S01			
223	U068	143	P	S01			
224	U069	100	P	S01			
225	U070	165	P	S01			
226	U071	100	P	S01			
227	U072	100	P	S01			
228	U073	100	P	S01			
229	U074	100	P	S01			
230	U075	381	P	S01			
231	U076	100	P	S01			
232	U077	293	P	S01			
233	U078	100	P	S01			
234	U079	100	P	S01			
235	U080	4,129	P	S01			
236	U081	100	P	S01			
237	U082	100	P	S01			
238	U083	100	P	S01			
239	U084	100	P	S01			
240	U085	143	P	S01			
241	U086	100	P	S01			
242	U087	100	P	S01			
243	U088	100	P	S01			
244	U089	100	P	S01			
245	U090	100	P	S01			
246	U091	518	P	S01			
247	U092	143	P	S01			
248	U093	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
249	U094	100	P	S01			
250	U095	100	P	S01			
251	U096	100	P	S01			
252	U097	100	P	S01			
253	U098	100	P	S01			
254	U099	100	P	S01			
255	U101	100	P	S01			
256	U102	100	P	S01			
257	U103	143	P	S01			
258	U105	100	P	S01			
259	U106	100	P	S01			
260	U107	100	P	S01			
261	U108	293	P	S01			
262	U109	143	P	S01			
263	U110	100	P	S01			
264	U111	100	P	S01			
265	U112	293	P	S01			
266	U113	100	P	S01			
267	U114	100	P	S01			
268	U115	293	P	S01			
269	U116	100	P	S01			
270	U117	293	P	S01			
271	U118	100	P	S01			
272	U119	100	P	S01			
273	U120	100	P	S01			
274	U121	293	P	S01			
275	U122	778	P	S01			
276	U123	293	P	S01			
277	U124	143	P	S01			
278	U125	100	P	S01			
279	U126	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
280	U127	100	P	S01			
281	U128	100	P	S01			
282	U129	100	P	S01			
283	U130	100	P	S01			
284	U131	293	P	S01			
285	U132	100	P	S01			
286	U133	293	P	S01			
287	U134	667	P	S01			
288	U135	447	P	S01			
289	U136	143	P	S01			
290	U137	100	P	S01			
291	U138	100	P	S01			
292	U140	293	P	S01			
293	U141	100	P	S01			
294	U142	100	P	S01			
295	U143	100	P	S01			
296	U144	293	P	S01			
297	U145	293	P	S01			
298	U146	100	P	S01			
299	U147	100	P	S01			
300	U148	100	P	S01			
301	U149	100	P	S01			
302	U150	100	P	S01			
303	U151	884	P	S01			
304	U152	100	P	S01			
305	U153	143	P	S01			
306	U154	359	P	S01			
307	U155	100	P	S01			
308	U156	100	P	S01			
309	U157	100	P	S01			
310	U158	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
311	U159	315	P	S01			
312	U160	293	P	S01			
313	U161	470	P	S01			
314	U162	143	P	S01			
315	U163	143	P	S01			
316	U164	100	P	S01			
317	U165	293	P	S01			
318	U166	100	P	S01			
319	U167	143	P	S01			
320	U168	143	P	S01			
321	U169	293	P	S01			
322	U170	143	P	S01			
323	U171	100	P	S01			
324	U172	100	P	S01			
325	U173	100	P	S01			
326	U174	100	P	S01			
327	U176	100	P	S01			
328	U177	100	P	S01			
329	U178	100	P	S01			
330	U179	100	P	S01			
331	U180	100	P	S01			
332	U181	100	P	S01			
333	U182	100	P	S01			
334	U183	100	P	S01			
335	U184	100	P	S01			
336	U185	100	P	S01			
337	U186	100	P	S01			
338	U187	100	P	S01			
339	U188	293	P	S01			
340	U189	100	P	S01			
341	U190	293	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
342	U191	100	P	S01			
343	U192	100	P	S01			
344	U193	100	P	S01			
345	U194	100	P	S01			
346	U196	293	P	S01			
347	U197	100	P	S01			
348	U200	100	P	S01			
349	U201	100	P	S01			
350	U202	100	P	S01			
351	U203	100	P	S01			
352	U204	293	P	S01			
353	U205	100	P	S01			
354	U206	100	P	S01			
355	U207	100	P	S01			
356	U208	100	P	S01			
357	U209	100	P	S01			
358	U210	513	P	S01			
359	U211	359	P	S01			
360	U213	293	P	S01			
361	U214	100	P	S01			
362	U215	100	P	S01			
363	U216	293	P	S01			
364	U217	100	P	S01			
365	U218	293	P	S01			
366	U219	293	P	S01			
367	U220	491	P	S01			
368	U221	100	P	S01			
369	U222	100	P	S01			
370	U223	143	P	S01			
371	U225	293	P	S01			
372	U226	6,594	P	S01			

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N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D[1])
Technical Area 50							
373	U227	293	P	S01			
374	U228	1,219	P	S01			
375	U234	100	P	S01			
376	U235	100	P	S01			
377	U236	100	P	S01			
378	U237	100	P	S01			
379	U238	100	P	S01			
380	U239	646	P	S01			
381	U240	143	P	S01			
382	U243	100	P	S01			
383	U244	100	P	S01			
384	U246	231	P	S01			
385	U247	100	P	S01			
386	U248	100	P	S01			
387	U249	100	P	S01			
388	U353	100	P	S01			
389	U359	100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
1	D001	220,000	P	S01			
2	D002	365,000	P	S01			
3	D003	100,000	P	S01			
4	D004	25,000	P	S01			
5	D005	80,000	P	S01	S02	T01	
6	D006	65,000	P	S01			
7	D007	75,000	P	S01			
8	D008	800,000	P	S01			
9	D009	65,000	P	S01			
10	D010	30,000	P	S01			
11	D011	40,000	P	S01			
12	D012	12,000	P	S01			
13	D013	4,000	P	S01			
14	D014	4,000	P	S01			
15	D015	7,000	P	S01			
16	D016	4,000	P	S01			
17	D017	4,000	P	S01			
18	D018	20,000	P	S01			
19	D019	20,000	P	S01			
20	D020	30,000	P	S01			
21	D021	10,000	P	S01			
22	D022	23,000	P	S01			
23	D023	4,000	P	S01			
24	D024	4,000	P	S01			
25	D025	4,000	P	S01			
26	D026	4,000	P	S01			
27	D027	12,000	P	S01			
28	D028	30,000	P	S01			
29	D029	7,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes			
				(1) PROCESS CODES *(Enter code)*			(2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
30	D030	20,000	P	S01			
31	D031	12,000	P	S01			
32	D032	19,000	P	S01			
33	D033	19,000	P	S01			
34	D034	19,000	P	S01			
35	D035	20,000	P	S01			
36	D036	9,000	P	S01			
37	D037	7,000	P	S01			
38	D038	4,000	P	S01			
39	D039	10,000	P	S01			
40	D040	15,000	P	S01			
41	D041	7,000	P	S01			
42	D042	12,000	P	S01			
43	D043	15,000	P	S01			
44	F001	660,000	P	S01			
45	F002	350,000	P	S01			
46	F003	250,000	P	S01			
47	F004	30,000	P	S01			
48	F005	250,000	P	S01			
49	F006	7,000	P	S01			
50	F007	28,000	P	S01			
51	F008	7,000	P	S01			
52	F009	8,000	P	S01			
53	F010	4,000	P	SO1			
54	F011	4,000	P	S01			
55	F012	4,000	P	S01			
56	F027	4,000	P	S01			
57	F028	4,000	P	S01			
58	F039	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
59	K044	22,000	P	S01			
60	K045	4,000	P	S01			
61	K046	4,000	P	S01			
62	K047	4,000	P	S01			
63	K084	500	P	S01			
64	K101	500	P	S01			
65	K102	500	P	S01			
66	P001	4,000	P	S01			
67	P002	4,000	P	S01			
68	P003	4,000	P	S01			
69	P004	4,000	P	S01			
70	P005	4,000	P	S01			
71	P006	4,000	P	S01			
72	P007	4,000	P	S01			
73	P008	4,000	P	S01			
74	P009	4,000	P	S01			
75	P010	4,000	P	S01			
76	P011	4,000	P	S01			
77	P012	4,000	P	S01			
78	P013	4,000	P	S01			
79	P014	4,000	P	S01			
80	P015	4,000	P	S01			
81	P016	4,000	P	S01			
82	P017	4,000	P	S01			
83	P018	4,000	P	S01			
84	P020	4,000	P	S01			
85	P021	4,000	P	S01			
86	P022	4,000	P	S01			
87	P023	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
88	P024	4,000	P	S01			
89	P026	4,000	P	S01			
90	P027	4,000	P	S01			
91	P028	4,000	P	S01			
92	P029	4,000	P	S01			
93	P030	4,000	P	S01			
94	P031	4,000	P	S01			
95	P033	4,000	P	S01			
96	P034	4,000	P	S01			
97	P036	4,000	P	S01			
98	P037	4,000	P	S01			
99	P038	4,000	P	S01			
100	P039	4,000	P	S01			
101	P040	4,000	P	S01			
102	P041	4,000	P	S01			
103	P042	4,000	P	S01			
104	P043	4,000	P	S01			
105	P044	4,000	P	S01			
106	P045	4,000	P	S01			
107	P046	4,000	P	S01			
108	P047	4,000	P	S01			
109	P048	4,000	P	S01			
110	P049	4,000	P	S01			
111	P050	4,000	P	S01			
112	P051	4,000	P	S01			
113	P054	4,000	P	S01			
114	P056	4,000	P	S01			
115	P057	4,000	P	S01			
116	P058	4,000	P	S01			
117	P059	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
118	P060	4,000	P	S01			
119	P062	4,000	P	S01			
120	P063	4,000	P	S01			
121	P064	4,000	P	S01			
122	P065	4,000	P	S01			
123	P066	4,000	P	S01			
124	P067	4,000	P	S01			
125	P068	4,000	P	S01			
126	P069	4,000	P	S01			
127	P070	4,000	P	S01			
128	P071	4,000	P	S01			
129	P072	4,000	P	S01			
130	P073	4,000	P	S01			
131	P074	4,000	P	S01			
132	P075	4,000	P	S01			
133	P076	4,000	P	S01			
134	P077	4,000	P	S01			
135	P078	4,000	P	S01			
136	P081	4,000	P	S01			
137	P082	4,000	P	S01			
138	P084	4,000	P	S01			
139	P085	4,000	P	S01			
140	P087	4,000	P	S01			
141	P088	4,000	P	S01			
142	P089	4,000	P	S01			
143	P092	4,000	P	S01			
144	P093	4,000	P	S01			
145	P094	4,000	P	S01			
146	P095	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
147	P096	4,000	P	S01			
148	P097	4,000	P	S01			
149	P098	4,000	P	S01			
150	P099	4,000	P	S01			
151	P101	4,000	P	S01			
152	P102	4,000	P	S01			
153	P103	4,000	P	S01			
154	P104	4,000	P	S01			
155	P105	4,000	P	S01			
156	P106	4,000	P	S01			
157	P108	4,000	P	S01			
158	P109	4,000	P	S01			
159	P110	4,000	P	S01			
160	P111	4,000	P	S01			
161	P112	4,000	P	S01			
162	P113	4,000	P	S01			
163	P114	4,000	P	S01			
164	P115	4,000	P	S01			
165	P116	4,000	P	S01			
166	P118	4,000	P	S01			
167	P119	4,000	P	S01			
168	P120	4,000	P	S01			
169	P121	4,000	P	S01			
170	P122	4,000	P	S01			
171	P123	4,000	P	S01			
172	P127	4,000	P	S01			
173	P128	4,000	P	S01			
174	P185	4,000	P	S01			
175	P188	4,000	P	S01			
176	P189	4,000	P	S01			
177	P190	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
178	P191	4,000	P	S01			
179	P192	4,000	P	S01			
180	P194	4,000	P	S01			
181	P196	4,000	P	S01			
182	P197	4,000	P	S01			
183	P198	4,000	P	S01			
184	P199	4,000	P	S01			
185	P201	4,000	P	S01			
186	P202	4,000	P	S01			
187	P203	4,000	P	S01			
188	P204	4,000	P	S01			
189	P205	4,000	P	S01			
190	U001	4,000	P	S01			
191	U002	7,000	P	S01			
192	U003	4,000	P	S01			
193	U004	4,000	P	S01			
194	U005	4,000	P	S01			
195	U006	4,000	P	S01			
196	U007	4,000	P	S01			
197	U008	4,000	P	S01			
198	U009	4,000	P	S01			
199	U010	4,000	P	S01			
200	U011	4,000	P	S01			
201	U012	4,000	P	S01			
202	U014	4,000	P	S01			
203	U015	4,000	P	S01			
204	U016	4,000	P	S01			
205	U017	4,000	P	S01			
206	U018	4,000	P	S01			
207	U019	4,000	P	S01			
208	U020	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
209	U021	4,000	P	S01			
210	U022	4,000	P	S01			
211	U023	4,000	P	S01			
212	U024	4,000	P	S01			
213	U025	4,000	P	S01			
214	U026	4,000	P	S01			
215	U027	4,000	P	S01			
216	U028	4,000	P	S01			
217	U029	4,000	P	S01			
218	U030	4,000	P	S01			
219	U031	4,000	P	S01			
220	U032	4,000	P	S01			
221	U033	4,000	P	S01			
222	U034	4,000	P	S01			
223	U035	4,000	P	S01			
224	U036	4,000	P	S01			
225	U037	4,000	P	S01			
226	U038	4,000	P	S01			
227	U039	4,000	P	S01			
228	U041	4,000	P	S01			
229	U042	4,000	P	S01			
230	U043	4,000	P	S01			
231	U044	4,000	P	S01			
232	U045	4,000	P	S01			
233	U046	4,000	P	S01			
234	U047	4,000	P	S01			
235	U048	4,000	P	S01			
236	U049	4,000	P	S01			
237	U050	4,000	P	S01			
238	U051	4,000	P	S01			
239	U052	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
240	U053	4,000	P	S01			
241	U055	4,000	P	S01			
242	U056	4,000	P	S01			
243	U057	4,000	P	S01			
244	U058	4,000	P	S01			
245	U059	4,000	P	S01			
246	U060	4,000	P	S01			
247	U061	4,000	P	S01			
248	U062	4,000	P	S01			
249	U063	4,000	P	S01			
250	U064	4,000	P	S01			
251	U066	4,000	P	S01			
252	U067	4,000	P	S01			
253	U068	4,000	P	S01			
254	U069	4,000	P	S01			
255	U070	4,000	P	S01			
256	U071	4,000	P	S01			
257	U072	4,000	P	S01			
258	U073	4,000	P	S01			
259	U074	4,000	P	S01			
260	U075	4,000	P	S01			
261	U076	4,000	P	S01			
262	U077	4,000	P	S01			
263	U078	4,000	P	S01			
264	U079	4,000	P	S01			
265	U080	7,000	P	S01			
266	U081	4,000	P	S01			
267	U082	4,000	P	S01			
268	U083	4,000	P	S01			
269	U084	4,000	P	S01			
270	U085	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
			Technical Area 54, Area L				
271	U086	4,000	P	S01			
272	U087	4,000	P	S01			
273	U088	4,000	P	S01			
274	U089	4,000	P	S01			
275	U090	4,000	P	S01			
276	U091	4,000	P	S01			
277	U092	4,000	P	S01			
278	U093	4,000	P	S01			
279	U094	4,000	P	S01			
280	U095	4,000	P	S01			
281	U096	4,000	P	S01			
282	U097	4,000	P	S01			
283	U098	4,000	P	S01			
284	U099	4,000	P	S01			
285	U101	2,000	P	S01			
286	U102	2,000	P	S01			
287	U103	4,000	P	S01			
288	U105	4,000	P	S01			
289	U106	4,000	P	S01			
290	U107	4,000	P	S01			
291	U108	4,000	P	S01			
292	U109	4,000	P	S01			
293	U110	4,000	P	S01			
294	U111	4,000	P	S01			
295	U112	4,000	P	S01			
296	U113	4,000	P	S01			
297	U114	4,000	P	S01			
298	U115	4,000	P	S01			
299	U116	4,000	P	S01			
300	U117	4,000	P	S01			
301	U118	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
302	U119	4,000	P	S01			
303	U120	4,000	P	S01			
304	U121	4,000	P	S01			
305	U122	7,000	P	S01			
306	U123	4,000	P	S01			
307	U124	4,000	P	S01			
308	U125	4,000	P	S01			
309	U126	4,000	P	S01			
310	U127	4,000	P	S01			
311	U128	4,000	P	S01			
312	U129	4,000	P	S01			
313	U130	4,000	P	S01			
314	U131	4,000	P	S01			
315	U132	4,000	P	S01			
316	U133	4,000	P	S01			
317	U134	12,000	P	S01			
318	U135	4,000	P	S01			
319	U136	4,000	P	S01			
320	U137	4,000	P	S01			
321	U138	4,000	P	S01			
322	U140	4,000	P	S01			
323	U141	4,000	P	S01			
324	U142	4,000	P	S01			
325	U143	4,000	P	S01			
326	U144	4,000	P	S01			
327	U145	4,000	P	S01			
328	U146	4,000	P	S01			
329	U147	4,000	P	S01			
330	U148	4,000	P	S01			
331	U149	4,000	P	S01			
332	U150	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
333	U151	7,000	P	S01			
334	U152	4,000	P	S01			
335	U153	4,000	P	S01			
336	U154	4,000	P	S01			
337	U155	4,000	P	S01			
338	U156	4,000	P	S01			
339	U157	4,000	P	S01			
340	U158	4,000	P	S01			
341	U159	4,000	P	S01			
342	U160	4,000	P	S01			
343	U161	4,000	P	S01			
344	U162	4,000	P	S01			
345	U163	4,000	P	S01			
346	U164	4,000	P	S01			
347	U165	4,000	P	S01			
348	U166	4,000	P	S01			
349	U167	4,000	P	S01			
350	U168	4,000	P	S01			
351	U169	4,000	P	S01			
352	U170	4,000	P	S01			
353	U171	4,000	P	S01			
354	U172	4,000	P	S01			
355	U173	4,000	P	S01			
356	U174	4,000	P	S01			
357	U176	4,000	P	S01			
358	U177	4,000	P	S01			
359	U178	4,000	P	S01			
360	U179	4,000	P	S01			
361	U180	4,000	P	S01			
362	U181	4,000	P	S01			
363	U182	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
364	U183	4,000	P	S01			
365	U184	4,000	P	S01			
366	U185	4,000	P	S01			
367	U186	4,000	P	S01			
368	U187	4,000	P	S01			
369	U188	4,000	P	S01			
370	U189	4,000	P	S01			
371	U190	4,000	P	S01			
372	U191	4,000	P	S01			
373	U192	4,000	P	S01			
374	U193	4,000	P	S01			
375	U194	4,000	P	S01			
376	U196	4,000	P	S01			
377	U197	4,000	P	S01			
378	U200	4,000	P	S01			
379	U201	4,000	P	S01			
380	U202	4,000	P	S01			
381	U203	4,000	P	S01			
382	U204	4,000	P	S01			
383	U205	4,000	P	S01			
384	U206	4,000	P	S01			
385	U207	4,000	P	S01			
386	U208	4,000	P	S01			
387	U209	4,000	P	S01			
388	U210	4,000	P	S01			
389	U211	4,000	P	S01			
390	U213	4,000	P	S01			
391	U214	4,000	P	S01			
392	U215	4,000	P	S01			
393	U216	4,000	P	S01			
394	U217	4,000	P	S01			

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N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
395	U218	4,000	P	S01			
396	U219	4,000	P	S01			
397	U220	7,000	P	S01			
398	U221	4,000	P	S01			
399	U222	4,000	P	S01			
400	U223	4,000	P	S01			
401	U225	4,000	P	S01			
402	U226	7,000	P	S01			
403	U227	4,000	P	S01			
404	U228	7,000	P	S01			
405	U234	4,000	P	S01			
406	U235	4,000	P	S01			
407	U236	4,000	P	S01			
408	U237	4,000	P	S01			
409	U238	4,000	P	S01			
410	U239	7,000	P	S01			
411	U240	4,000	P	S01			
412	U243	4,000	P	S01			
413	U244	4,000	P	S01			
414	U246	4,000	P	S01			
415	U247	4,000	P	S01			
416	U248	4,000	P	S01			
417	U249	4,000	P	S01			
418	U271	4,000	P	S01			
419	U278	4,000	P	S01			
420	U279	4,000	P	S01			
421	U280	4,000	P	S01			
422	U328	4,000	P	S01			
423	U353	4,000	P	S01			
424	U359	4,000	P	S01			
425	U364	4,000	P	S01			

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N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes			
				(1) PROCESS CODES *(Enter code)*			(2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 54, Area L							
426	U367	4,000	P	S01			
427	U372	4,000	P	S01			
428	U373	4,000	P	S01			
429	U387	4,000	P	S01			
430	U389	4,000	P	S01			
431	U394	4,000	P	S01			
432	U395	4,000	P	S01			
433	U404	4,000	P	S01			
434	U409	4,000	P	S01			
435	U410	4,000	P	S01			
436	U411	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Material Disposal Area L (Impoundments B and D/Shafts 1, 13-17, and 19-34) [a, b]							
1	D001	82,000	P	D80			
2	D002	17,200	P	D80			
3	D003	750	P	D80			
4	D004	1,700	P	D80			
5	D006	650	P	D80			
6	D007	1,000	P	D80			
7	D008	1,250	P	D80			
8	D009	2,200	P	D80			
9	D011	100	P	D80			
10	D016	600	P	D80			
11	F002	1,400	P	D80			
12	P015	4,000	P	D80			
13	P087	15	P	D80			
14	U002	5,000	P	D80			
15	U019	200	P	D80			
16	U069	500	P	D80			
17	U080	2,000	P	D80			
18	U122	550	P	D80			
19	U151	35	P	D80			
20	U154	550	P	D80			
21	U159	300	P	D80			
22	U161	500	P	D80			
23	U165	140	P	D80			
24	U220	620	P	D80			
25	U226	10,000	P	D80			
26	U228	4,400	P	D80			
27	U239	345	P	D80			

a Based on historical data from LANL Solid Waste Operations.

b To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03], requirements. Permitted status is not requested.

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
1	D001	330,000	P	S01			
2	D002	395,000	P	S01			
3	D003	185,000	P	S01			
4	D004	2,525,000	P	S01			
5	D005	82,000	P	S01			
6	D006	515,000	P	S01			
7	D007	3,775,000	P	S01			
8	D008	5,400,000	P	S01			
9	D009	100,000	P	S01			
10	D010	45,000	P	S01			
11	D011	2,540,000	P	S01			
12	D012	18,000	P	S01			
13	D013	4,000	P	S01			
14	D014	4,000	P	S01			
15	D015	7,000	P	S01			
16	D016	4,000	P	S01			
17	D017	4,000	P	S01			
18	D018	30,000	P	S01			
19	D019	25,000	P	S01			
20	D020	30,000	P	S01			
21	D021	15,000	P	S01			
22	D022	33,000	P	S01			
23	D023	4,000	P	S01			
24	D024	4,000	P	S01			
25	D025	4,000	P	S01			
26	D026	4,000	P	S01			
27	D027	22,000	P	S01			
28	D028	40,000	P	S01			
29	D029	7,000	P	S01			
30	D030	30,000	P	S01			
31	D031	22,000	P	S01			
32	D032	29,000	P	S01			
33	D033	29,000	P	S01			
34	D034	29,000	P	S01			
35	D035	30,000	P	S01			
36	D036	19,000	P	S01			
37	D037	7,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
38	D038	14,000	P	S01			
39	D039	20,000	P	S01			
40	D040	25,000	P	S01			
41	D041	17,000	P	S01			
42	D042	22,000	P	S01			
43	D043	25,000	P	S01			
44	F001	6,410,000	P	S01			
45	F002	3,450,000	P	S01			
46	F003	2,850,000	P	S01			
47	F004	35,000	P	S01			
48	F005	3,250,000	P	S01			
49	F006	7,000	P	S01			
50	F007	18,000	P	S01			
51	F008	7,000	P	S01			
52	F009	8,000	P	S01			
53	F010	4,000	P	S01			
54	F011	4,000	P	S01			
55	F012	4,000	P	S01			
56	F019	4,000	P	S01			
57	F020	4,000	P	S01			
58	F021	4,000	P	S01			
59	F022	4,000	P	S01			
60	F023	4,000	P	S01			
61	F024	4,000	P	S01			
62	F025	4,000	P	S01			
63	F026	4,000	P	S01			
64	F027	4,000	P	S01			
65	F028	4,000	P	S01			
66	F032	4,000	P	S01			
67	F034	4,000	P	S01			
68	F035	4,000	P	S01			
69	F037	4,000	P	S01			
70	F038	4,000	P	S01			
71	F039	4,000	P	S01			
72	K044	22,000	P	S01			
73	K045	4,000	P	S01			
74	K046	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*: N M 0 8 9 0 0 1 0 5 1 5

Secondary ID Number *(Enter from Page 1)*:

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
75	K047	4,000	P	S01			
76	K084	500	P	S01			
77	K101	500	P	S01			
78	K102	500	P	S01			
79	P001	4,000	P	S01			
80	P002	4,000	P	S01			
81	P003	4,100	P	S01			
82	P004	4,000	P	S01			
83	P005	4,000	P	S01			
84	P006	4,000	P	S01			
85	P007	4,000	P	S01			
86	P008	4,000	P	S01			
87	P009	4,000	P	S01			
88	P010	4,000	P	S01			
89	P011	4,000	P	S01			
90	P012	4,100	P	S01			
91	P013	4,000	P	S01			
92	P014	4,000	P	S01			
93	P015	4,100	P	S01			
94	P016	4,000	P	S01			
95	P017	4,000	P	S01			
96	P018	4,000	P	S01			
97	P020	4,000	P	S01			
98	P021	4,000	P	S01			
99	P022	4,000	P	S01			
100	P023	4,000	P	S01			
101	P024	4,000	P	S01			
102	P026	4,000	P	S01			
103	P027	4,000	P	S01			
104	P028	4,000	P	S01			
105	P029	4,100	P	S01			
106	P030	4,100	P	S01			
107	P031	4,100	P	S01			
108	P033	4,000	P	S01			
109	P034	4,000	P	S01			
110	P036	4,000	P	S01			
111	P037	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
112	P038	4,100	P	S01			
113	P039	4,000	P	S01			
114	P040	4,000	P	S01			
115	P041	4,000	P	S01			
116	P042	4,000	P	S01			
117	P043	4,000	P	S01			
118	P044	4,000	P	S01			
119	P045	4,000	P	S01			
120	P046	4,000	P	S01			
121	P047	4,000	P	S01			
122	P048	4,000	P	S01			
123	P049	4,000	P	S01			
124	P050	4,000	P	S01			
125	P051	4,000	P	S01			
126	P054	4,000	P	S01			
127	P056	4,100	P	S01			
128	P057	4,000	P	S01			
129	P058	4,000	P	S01			
130	P059	4,000	P	S01			
131	P060	4,000	P	S01			
132	P062	4,000	P	S01			
133	P063	4,100	P	S01			
134	P064	4,000	P	S01			
135	P065	4,000	P	S01			
136	P066	4,000	P	S01			
137	P067	4,000	P	S01			
138	P068	4,100	P	S01			
139	P069	4,000	P	S01			
140	P070	4,000	P	S01			
141	P071	4,000	P	S01			
142	P072	4,000	P	S01			
143	P073	4,100	P	S01			
144	P074	4,000	P	S01			
145	P075	4,000	P	S01			
146	P076	4,100	P	S01			
147	P077	4,000	P	S01			
148	P078	4,100	P	S01			
149	P081	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
150	P082	4,000	P	S01			
151	P084	4,000	P	S01			
152	P085	4,000	P	S01			
153	P087	4,000	P	S01			
154	P088	4,000	P	S01			
155	P089	4,000	P	S01			
156	P092	4,000	P	S01			
157	P093	4,000	P	S01			
158	P094	4,000	P	S01			
159	P095	4,100	P	S01			
160	P096	4,100	P	S01			
161	P097	4,000	P	S01			
162	P098	4,100	P	S01			
163	P099	4,000	P	S01			
164	P101	4,000	P	S01			
165	P102	4,000	P	S01			
166	P103	4,000	P	S01			
167	P104	4,000	P	S01			
168	P105	4,000	P	S01			
169	P106	4,100	P	S01			
170	P108	4,000	P	S01			
171	P109	4,000	P	S01			
172	P110	4,000	P	S01			
173	P111	4,000	P	S01			
174	P112	4,000	P	S01			
175	P113	4,100	P	S01			
176	P114	4,000	P	S01			
177	P115	4,000	P	S01			
178	P116	4,000	P	S01			
179	P118	4,000	P	S01			
180	P119	4,000	P	S01			
181	P120	4,100	P	S01			
182	P121	4,000	P	S01			
183	P122	4,000	P	S01			
184	P123	4,000	P	S01			
185	P127	4,000	P	S01			
186	P128	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
187	P185	4,000	P	S01			
188	P188	4,000	P	S01			
189	P189	4,000	P	S01			
190	P190	4,000	P	S01			
191	P191	4,000	P	S01			
192	P192	4,000	P	S01			
193	P194	4,000	P	S01			
194	P196	4,000	P	S01			
195	P197	4,000	P	S01			
196	P198	4,000	P	S01			
197	P199	4,000	P	S01			
198	P201	4,000	P	S01			
199	P202	4,000	P	S01			
200	P203	4,000	P	S01			
201	P204	4,000	P	S01			
202	P205	4,000	P	S01			
203	U001	4,100	P	S01			
204	U002	7,100	P	S01			
205	U003	4,100	P	S01			
206	U004	4,000	P	S01			
207	U005	4,000	P	S01			
208	U006	4,000	P	S01			
209	U007	4,000	P	S01			
210	U008	4,000	P	S01			
211	U009	4,000	P	S01			
212	U010	4,000	P	S01			
213	U011	4,000	P	S01			
214	U012	4,100	P	S01			
215	U014	4,000	P	S01			
216	U015	4,000	P	S01			
217	U016	4,000	P	S01			
218	U017	4,000	P	S01			
219	U018	4,000	P	S01			
220	U019	4,100	P	S01			
221	U020	4,000	P	S01			
222	U021	4,000	P	S01			
223	U022	4,100	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
224	U023	4,000	P	S01			
225	U024	4,000	P	S01			
226	U025	4,000	P	S01			
227	U026	4,000	P	S01			
228	U027	4,000	P	S01			
229	U028	4,000	P	S01			
230	U029	4,100	P	S01			
231	U030	4,000	P	S01			
232	U031	4,100	P	S01			
233	U032	4,000	P	S01			
234	U033	4,000	P	S01			
235	U034	4,000	P	S01			
236	U035	4,000	P	S01			
237	U036	4,000	P	S01			
238	U037	4,100	P	S01			
239	U038	4,000	P	S01			
240	U039	4,000	P	S01			
241	U041	4,000	P	S01			
242	U042	4,000	P	S01			
243	U043	4,000	P	S01			
244	U044	4,100	P	S01			
245	U045	4,100	P	S01			
246	U046	4,000	P	S01			
247	U047	4,000	P	S01			
248	U048	4,000	P	S01			
249	U049	4,000	P	S01			
250	U050	4,000	P	S01			
251	U051	4,000	P	S01			
252	U052	4,100	P	S01			
253	U053	4,000	P	S01			
254	U055	4,000	P	S01			
255	U056	4,100	P	S01			
256	U057	4,100	P	S01			
257	U058	4,000	P	S01			
258	U059	4,000	P	S01			
259	U060	4,000	P	S01			
260	U061	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
261	U062	4,000	P	S01			
262	U063	4,000	P	S01			
263	U064	4,000	P	S01			
264	U066	4,000	P	S01			
265	U067	4,000	P	S01			
266	U068	4,000	P	S01			
267	U069	4,000	P	S01			
268	U070	4,000	P	S01			
269	U071	4,000	P	S01			
270	U072	4,000	P	S01			
271	U073	4,000	P	S01			
272	U074	4,000	P	S01			
273	U075	4,100	P	S01			
274	U076	4,000	P	S01			
275	U077	4,100	P	S01			
276	U078	4,000	P	S01			
277	U079	4,000	P	S01			
278	U080	12,000	P	S01			
279	U081	4,000	P	S01			
280	U082	4,000	P	S01			
281	U083	4,000	P	S01			
282	U084	4,000	P	S01			
283	U085	4,000	P	S01			
284	U086	4,000	P	S01			
285	U087	4,000	P	S01			
286	U088	4,000	P	S01			
287	U089	4,000	P	S01			
288	U090	4,000	P	S01			
289	U091	4,000	P	S01			
290	U092	4,000	P	S01			
291	U093	4,000	P	S01			
292	U094	4,000	P	S01			
293	U095	4,000	P	S01			
294	U096	4,000	P	S01			
295	U097	4,000	P	S01			
296	U098	4,000	P	S01			
297	U099	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
298	U101	4,000	P	S01			
299	U102	4,000	P	S01			
300	U103	4,000	P	S01			
301	U105	4,000	P	S01			
302	U106	4,000	P	S01			
303	U107	4,000	P	S01			
304	U108	4,100	P	S01			
305	U109	4,000	P	S01			
306	U110	4,000	P	S01			
307	U111	4,000	P	S01			
308	U112	4,100	P	S01			
309	U113	4,000	P	S01			
310	U114	4,000	P	S01			
311	U115	4,100	P	S01			
312	U116	4,000	P	S01			
313	U117	4,100	P	S01			
314	U118	4,000	P	S01			
315	U119	4,000	P	S01			
316	U120	4,000	P	S01			
317	U121	4,100	P	S01			
318	U122	7,100	P	S01			
319	U123	4,100	P	S01			
320	U124	4,000	P	S01			
321	U125	4,000	P	S01			
322	U126	4,000	P	S01			
323	U127	4,000	P	S01			
324	U128	4,000	P	S01			
325	U129	4,000	P	S01			
326	U130	4,000	P	S01			
327	U131	4,100	P	S01			
328	U132	4,000	P	S01			
329	U133	4,100	P	S01			
330	U134	12,100	P	S01			
331	U135	4,100	P	S01			
332	U136	4,000	P	S01			
333	U137	4,000	P	S01			
334	U138	4,000	P	S01			
335	U140	4,100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
336	U141	4,000	P	S01			
337	U142	4,000	P	S01			
338	U143	4,000	P	S01			
339	U144	4,100	P	S01			
340	U145	4,000	P	S01			
341	U146	4,000	P	S01			
342	U147	4,000	P	S01			
343	U148	4,000	P	S01			
344	U149	4,000	P	S01			
345	U150	4,000	P	S01			
346	U151	7,100	P	S01			
347	U152	4,000	P	S01			
348	U153	4,000	P	S01			
349	U154	4,100	P	S01			
350	U155	4,000	P	S01			
351	U156	4,000	P	S01			
352	U157	4,000	P	S01			
353	U158	4,000	P	S01			
354	U159	4,100	P	S01			
355	U160	4,100	P	S01			
356	U161	4,100	P	S01			
357	U162	4,000	P	S01			
358	U163	4,000	P	S01			
359	U164	4,000	P	S01			
360	U165	4,100	P	S01			
361	U166	4,000	P	S01			
362	U167	4,000	P	S01			
363	U168	4,000	P	S01			
364	U169	4,100	P	S01			
365	U170	4,000	P	S01			
366	U171	4,000	P	S01			
367	U172	4,000	P	S01			
368	U173	4,000	P	S01			
369	U174	4,000	P	S01			
370	U176	4,000	P	S01			
371	U177	4,000	P	S01			
372	U178	4,000	P	S01			
373	U179	4,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
374	U180	4,000	P	S01			
375	U181	4,000	P	S01			
376	U182	4,000	P	S01			
377	U183	4,000	P	S01			
378	U184	4,000	P	S01			
379	U185	4,000	P	S01			
380	U186	4,000	P	S01			
381	U187	4,000	P	S01			
382	U188	4,100	P	S01			
383	U189	4,000	P	S01			
384	U190	4,100	P	S01			
385	U191	4,000	P	S01			
386	U192	4,000	P	S01			
387	U193	4,000	P	S01			
388	U194	4,000	P	S01			
389	U196	4,100	P	S01			
390	U197	4,000	P	S01			
391	U200	4,000	P	S01			
392	U201	4,000	P	S01			
393	U202	4,000	P	S01			
394	U203	4,000	P	S01			
395	U204	4,100	P	S01			
396	U205	4,000	P	S01			
397	U206	4,000	P	S01			
398	U207	4,000	P	S01			
399	U208	4,000	P	S01			
400	U209	4,000	P	S01			
401	U210	4,100	P	S01			
402	U211	4,100	P	S01			
403	U213	4,100	P	S01			
404	U214	4,000	P	S01			
405	U215	4,000	P	S01			
406	U216	4,100	P	S01			
407	U217	4,000	P	S01			
408	U218	4,100	P	S01			
409	U219	4,100	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
410	U220	7,100	P	S01			
411	U221	4,000	P	S01			
412	U222	4,000	P	S01			
413	U223	4,000	P	S01			
414	U225	4,100	P	S01			
415	U226	7,100	P	S01			
416	U227	4,100	P	S01			
417	U228	7,100	P	S01			
418	U234	4,000	P	S01			
419	U235	4,000	P	S01			
420	U236	4,000	P	S01			
421	U237	4,000	P	S01			
422	U238	4,000	P	S01			
423	U239	7,100	P	S01			
424	U240	4,000	P	S01			
425	U243	4,000	P	S01			
426	U244	4,000	P	S01			
427	U246	4,100	P	S01			
428	U247	4,000	P	S01			
429	U248	4,000	P	S01			
430	U249	4,000	P	S01			
431	U271	4,000	P	S01			
432	U278	4,000	P	S01			
433	U279	4,000	P	S01			
434	U280	4,000	P	S01			
435	U328	4,000	P	S01			
436	U353	4,000	P	S01			
437	U359	4,000	P	S01			
438	U364	4,000	P	S01			
439	U367	4,000	P	S01			
440	U372	4,000	P	S01			
441	U373	4,000	P	S01			
442	U387	4,000	P	S01			
443	U389	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
Technical Area 54, Area G							
444	U394	4,000	P	S01			
445	U395	4,000	P	S01			
446	U404	4,000	P	S01			
447	U409	4,000	P	S01			
448	U410	4,000	P	S01			
449	U411	4,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity Of Waste*	*C. Unit of Measure (Enter code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 54, Material Disposal Area G (Shaft 124 and Pit 29) [a, b]							
1	D004	850	P	D80			
2	D005	2100	P	D80			
3	D006	4250	P	D80			
4	D007	4450	P	D80			
5	D008	507,100	P	D80			
6	D009	850	P	D80			
7	D010	15	P	D80			
8	D011	530	P	D80			

a Based on total estimated hazardous chemical inventory from the TA-54 RFI Report, Los Alamos National Laboratory, Los Alamos New Mexico, March 2000.

b To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03], requirement. Permitted status is not requested.

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
1	D001	18,563	P	S01			
2	D002	9,612	P	S01			
3	D003	882	P	S01			
4	D004	6,173	P	S01			
5	D005	5,644	P	S01			
6	D006	906,805	P	S01			
7	D007	946,136	P	S01			
8	D008	2,147,302	P	S01			
9	D009	65,433	P	S01			
10	D010	6,790	P	S01			
11	D011	7,584	P	S01			
12	D012	9,000	P	S01			
13	D013	2,000	P	S01			
14	D014	2,000	P	S01			
15	D015	3,500	P	S01			
16	D016	2,000	P	S01			
17	D017	2,000	P	S01			
18	D018	353	P	S01			
19	D019	7055	P	S01			
20	D020	15,000	P	S01			
21	D021	1,220	P	S01			
22	D022	1,676	P	S01			
23	D023	2,000	P	S01			
24	D024	2,000	P	S01			
25	D025	2,000	P	S01			
26	D026	2,000	P	S01			
27	D027	1,014	P	S01			
28	D028	289,600	P	S01			
29	D029	288,144	P	S01			
30	D030	6,525	P	S01			
31	D031	88	P	S01			
32	D032	4,145	P	S01			
33	D033	2,778	P	S01			
34	D034	1,455	P	S01			
35	D035	132	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
36	D036	441	P	S01			
37	D037	705	P	S01			
38	D038	88	P	S01			
39	D039	1,940	P	S01			
40	D040	4,365	P	S01			
41	D041	88	P	S01			
42	D042	1,411	P	S01			
43	D043	529	P	S01			
44	F001	556,402	P	S01			
45	F002	72,003	P	S01			
46	F003	34,464	P	S01			
47	F004	2,160	P	S01			
48	F005	324,211	P	S01			
49	F006	3,500	P	S01			
50	F007	9,000	P	S01			
51	F008	3,500	P	S01			
52	F009	2,000	P	S01			
53	F010	2,000	P	S01			
54	F011	2,000	P	S01			
55	F012	2,000	P	S01			
56	F019	2,000	P	S01			
57	F020	2,000	P	S01			
58	F021	2,000	P	S01			
59	F022	2,000	P	S01			
60	F023	2,000	P	S01			
61	F024	2,000	P	S01			
62	F025	2,000	P	S01			
63	F026	2,000	P	S01			
64	F027	2,000	P	S01			
65	F028	2,000	P	S01			
66	F032	2,000	P	S01			
67	F034	2,000	P	S01			
68	F035	2,000	P	S01			
69	F037	2,000	P	S01			
70	F038	2,000	P	S01			
71	F039	2,000	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
72	K044	11,000	P	S01			
73	K045	2,000	P	S01			
74	K046	2,000	P	S01			
75	K047	2,000	P	S01			
76	K084	250	P	S01			
77	K101	250	P	S01			
78	K102	250	P	S01			
79	P001	44	P	S01			
80	P002	44	P	S01			
81	P003	44	P	S01			
82	P004	44	P	S01			
83	P005	44	P	S01			
84	P006	44	P	S01			
85	P007	44	P	S01			
86	P008	44	P	S01			
87	P009	44	P	S01			
88	P010	44	P	S01			
89	P011	44	P	S01			
90	P012	44	P	S01			
91	P013	44	P	S01			
92	P014	44	P	S01			
93	P015	44	P	S01			
94	P016	44	P	S01			
95	P017	44	P	S01			
96	P018	44	P	S01			
97	P020	44	P	S01			
98	P021	44	P	S01			
99	P022	44	P	S01			
100	P023	44	P	S01			
101	P024	44	P	S01			
102	P026	44	P	S01			
103	P027	44	P	S01			
104	P028	44	P	S01			
105	P029	44	P	S01			
106	P030	44	P	S01			
107	P031	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
108	P033	44	P	S01			
109	P034	44	P	S01			
110	P036	44	P	S01			
111	P037	44	P	S01			
112	P038	44	P	S01			
113	P039	44	P	S01			
114	P040	44	P	S01			
115	P041	44	P	S01			
116	P042	44	P	S01			
117	P043	44	P	S01			
118	P044	44	P	S01			
119	P045	44	P	S01			
120	P046	44	P	S01			
121	P047	44	P	S01			
122	P048	44	P	S01			
123	P049	44	P	S01			
124	P050	44	P	S01			
125	P051	44	P	S01			
126	P054	44	P	S01			
127	P056	353	P	S01			
128	P057	44	P	S01			
129	P058	44	P	S01			
130	P059	44	P	S01			
131	P060	44	P	S01			
132	P062	44	P	S01			
133	P063	44	P	S01			
134	P064	44	P	S01			
135	P065	44	P	S01			
136	P066	44	P	S01			
137	P067	44	P	S01			
138	P068	44	P	S01			
139	P069	44	P	S01			
140	P070	44	P	S01			
141	P071	44	P	S01			
142	P072	44	P	S01			
143	P073	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
144	P074	44	P	S01			
145	P075	44	P	S01			
146	P076	44	P	S01			
147	P077	44	P	S01			
148	P078	44	P	S01			
149	P081	44	P	S01			
150	P082	44	P	S01			
151	P084	44	P	S01			
152	P085	44	P	S01			
153	P087	44	P	S01			
154	P088	44	P	S01			
155	P089	44	P	S01			
156	P092	44	P	S01			
157	P093	44	P	S01			
158	P094	44	P	S01			
159	P095	44	P	S01			
160	P096	44	P	S01			
161	P097	44	P	S01			
162	P098	44	P	S01			
163	P099	44	P	S01			
164	P101	44	P	S01			
165	P102	44	P	S01			
166	P103	44	P	S01			
167	P104	44	P	S01			
168	P105	44	P	S01			
169	P106	44	P	S01			
170	P108	44	P	S01			
171	P109	44	P	S01			
172	P110	44	P	S01			
173	P111	44	P	S01			
174	P112	44	P	S01			
175	P113	44	P	S01			
176	P114	44	P	S01			
177	P115	44	P	S01			
178	P116	44	P	S01			
179	P118	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
180	P119	44	P	S01			
181	P120	44	P	S01			
182	P121	44	P	S01			
183	P122	44	P	S01			
184	P123	44	P	S01			
185	P127	44	P	S01			
186	P128	44	P	S01			
187	P185	44	P	S01			
188	P188	44	P	S01			
189	P189	44	P	S01			
190	P190	44	P	S01			
191	P191	44	P	S01			
192	P192	44	P	S01			
193	P194	44	P	S01			
194	P196	44	P	S01			
195	P197	44	P	S01			
196	P198	44	P	S01			
197	P199	44	P	S01			
198	P201	44	P	S01			
199	P202	44	P	S01			
200	P203	44	P	S01			
201	P204	44	P	S01			
202	P205	44	P	S01			
203	U001	44	P	S01			
204	U002	44	P	S01			
205	U003	44	P	S01			
206	U004	44	P	S01			
207	U005	44	P	S01			
208	U006	44	P	S01			
209	U007	44	P	S01			
210	U008	44	P	S01			
211	U009	44	P	S01			
212	U010	44	P	S01			
213	U011	44	P	S01			
214	U012	44	P	S01			
215	U014	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
216	U015	44	P	S01			
217	U016	44	P	S01			
218	U017	44	P	S01			
219	U018	44	P	S01			
220	U019	44	P	S01			
221	U020	44	P	S01			
222	U021	44	P	S01			
223	U022	44	P	S01			
224	U023	44	P	S01			
225	U024	44	P	S01			
226	U025	44	P	S01			
227	U026	44	P	S01			
228	U027	44	P	S01			
229	U028	44	P	S01			
230	U029	44	P	S01			
231	U030	44	P	S01			
232	U031	44	P	S01			
233	U032	44	P	S01			
234	U033	44	P	S01			
235	U034	44	P	S01			
236	U035	44	P	S01			
237	U036	44	P	S01			
238	U037	44	P	S01			
239	U038	44	P	S01			
240	U039	44	P	S01			
241	U041	44	P	S01			
242	U042	44	P	S01			
243	U043	44	P	S01			
244	U044	44	P	S01			
245	U045	44	P	S01			
246	U046	44	P	S01			
247	U047	44	P	S01			
248	U048	44	P	S01			
249	U049	44	P	S01			
250	U050	44	P	S01			
251	U051	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
252	U052	44	P	S01			
253	U053	44	P	S01			
254	U055	44	P	S01			
255	U056	44	P	S01			
256	U057	44	P	S01			
257	U058	44	P	S01			
258	U059	44	P	S01			
259	U060	44	P	S01			
260	U061	44	P	S01			
261	U062	44	P	S01			
262	U063	44	P	S01			
263	U064	44	P	S01			
264	U066	44	P	S01			
265	U067	44	P	S01			
266	U068	44	P	S01			
267	U069	44	P	S01			
268	U070	44	P	S01			
269	U071	44	P	S01			
270	U072	44	P	S01			
271	U073	44	P	S01			
272	U074	44	P	S01			
273	U075	44	P	S01			
274	U076	44	P	S01			
275	U077	44	P	S01			
276	U078	44	P	S01			
277	U079	44	P	S01			
278	U080	132	P	S01			
279	U081	44	P	S01			
280	U082	44	P	S01			
281	U083	44	P	S01			
282	U084	44	P	S01			
283	U085	44	P	S01			
284	U086	44	P	S01			
285	U087	44	P	S01			
286	U088	44	P	S01			
287	U089	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
288	U090	44	P	S01			
289	U091	44	P	S01			
290	U092	44	P	S01			
291	U093	44	P	S01			
292	U094	44	P	S01			
293	U095	44	P	S01			
294	U096	44	P	S01			
295	U097	44	P	S01			
296	U098	44	P	S01			
297	U099	44	P	S01			
298	U101	44	P	S01			
299	U102	44	P	S01			
300	U103	44	P	S01			
301	U105	44	P	S01			
302	U106	44	P	S01			
303	U107	44	P	S01			
304	U108	44	P	S01			
305	U109	44	P	S01			
306	U110	44	P	S01			
307	U111	44	P	S01			
308	U112	44	P	S01			
309	U113	44	P	S01			
310	U114	44	P	S01			
311	U115	44	P	S01			
312	U116	44	P	S01			
313	U117	44	P	S01			
314	U118	44	P	S01			
315	U119	44	P	S01			
316	U120	44	P	S01			
317	U121	44	P	S01			
318	U122	44	P	S01			
319	U123	44	P	S01			
320	U124	44	P	S01			
321	U125	44	P	S01			
322	U126	44	P	S01			
323	U127	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
324	U128	44	P	S01			
325	U129	44	P	S01			
326	U130	44	P	S01			
327	U131	44	P	S01			
328	U132	44	P	S01			
329	U133	44	P	S01			
330	U134	44	P	S01			
331	U135	44	P	S01			
332	U136	44	P	S01			
333	U137	44	P	S01			
334	U138	44	P	S01			
335	U140	44	P	S01			
336	U141	44	P	S01			
337	U142	44	P	S01			
338	U143	44	P	S01			
339	U144	44	P	S01			
340	U145	44	P	S01			
341	U146	44	P	S01			
342	U147	44	P	S01			
343	U148	44	P	S01			
344	U149	44	P	S01			
345	U150	44	P	S01			
346	U151	265	P	S01			
347	U152	44	P	S01			
348	U153	44	P	S01			
349	U154	88	P	S01			
350	U155	44	P	S01			
351	U156	44	P	S01			
352	U157	44	P	S01			
353	U158	44	P	S01			
354	U159	132	P	S01			
355	U160	44	P	S01			
356	U161	44	P	S01			
357	U162	44	P	S01			
358	U163	44	P	S01			
359	U164	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES (1) PROCESS CODES (Enter code)			D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
360	U165	44	P	S01			
361	U166	44	P	S01			
362	U167	44	P	S01			
363	U168	44	P	S01			
364	U169	44	P	S01			
365	U170	44	P	S01			
366	U171	44	P	S01			
367	U172	44	P	S01			
368	U173	44	P	S01			
369	U174	44	P	S01			
370	U176	44	P	S01			
371	U177	44	P	S01			
372	U178	44	P	S01			
373	U179	44	P	S01			
374	U180	44	P	S01			
375	U181	44	P	S01			
376	U182	44	P	S01			
377	U183	44	P	S01			
378	U184	44	P	S01			
379	U185	44	P	S01			
380	U186	44	P	S01			
381	U187	44	P	S01			
382	U188	44	P	S01			
383	U189	44	P	S01			
384	U190	44	P	S01			
385	U191	44	P	S01			
386	U192	44	P	S01			
387	U193	44	P	S01			
388	U194	44	P	S01			
389	U196	44	P	S01			
390	U197	44	P	S01			
391	U200	44	P	S01			
392	U201	44	P	S01			
393	U202	44	P	S01			
394	U203	44	P	S01			
395	U204	44	P	S01			

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
396	U205	44	P	S01			
397	U206	44	P	S01			
398	U207	44	P	S01			
399	U208	44	P	S01			
400	U209	44	P	S01			
401	U210	44	P	S01			
402	U211	44	P	S01			
403	U213	44	P	S01			
404	U214	44	P	S01			
405	U215	44	P	S01			
406	U216	44	P	S01			
407	U217	44	P	S01			
408	U218	44	P	S01			
409	U219	44	P	S01			
410	U220	44	P	S01			
411	U221	44	P	S01			
412	U222	44	P	S01			
413	U223	44	P	S01			
414	U225	44	P	S01			
415	U226	1,146	P	S01			
416	U227	44	P	S01			
417	U228	88	P	S01			
418	U234	44	P	S01			
419	U235	44	P	S01			
420	U236	44	P	S01			
421	U237	44	P	S01			
422	U238	44	P	S01			
423	U239	88	P	S01			
424	U240	44	P	S01			
425	U243	44	P	S01			
426	U244	44	P	S01			
427	U246	44	P	S01			
428	U247	44	P	S01			
429	U248	44	P	S01			
430	U249	44	P	S01			
431	U271	44	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity Of Waste	C. Unit of Measure (Enter Code)	D. PROCESSES			
				(1) PROCESS CODES (Enter code)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
			TA-54 West				
432	U278	44	P	S01			
433	U279	44	P	S01			
434	U280	44	P	S01			
435	U328	44	P	S01			
436	U353	44	P	S01			
437	U359	44	P	S01			
438	U364	44	P	S01			
439	U367	44	P	S01			
440	U372	44	P	S01			
441	U373	44	P	S01			
442	U387	44	P	S01			
443	U389	44	P	S01			
444	U394	44	P	S01			
445	U395	44	P	S01			
446	U404	44	P	S01			
447	U409	44	P	S01			
448	U410	44	P	S01			
449	U411	44	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	*A. EPA Hazardous Waste No. (enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter Code)*	*D. PROCESSES*			
				(1) PROCESS CODES (Enter code)			*(2) PROCESS DESCRIPTION (If a code is not entered in D(1))*
Technical Area 54, Material Disposal Area H (Shaft 9) [a]							
1	D003	TBD	P	D80			
2							
3							
4							
5							
6							
7							
8							

a To be closed in accordance with New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart VI [10-01-03], requirements. Permitted status is not requested.

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 55							
1	D001	75,000	P	S01			
2	D002	150,000	P	S01	S02	T04	
3	D003	42,000	P	S01			
4	D004	5,000	P	S01	S02	T04	
5	D005	11,000	P	S01	S02	T04	
6	D006	400,500	P	S01	S02	T04	
7	D007	605,000	P	S01	S02	T04	
8	D008	900,000	P	S01	S02	T04	
9	D009	26,000	P	S01	S02	T04	
10	D010	2,500	P	S01	S02	T04	
11	D011	11,000	P	S01	S02	T04	
12	D012	1000	P	S01		T04	
13	D018	4,500	P	S01		T04	
14	D019	4,500	P	S01		T04	
15	D021	4,500	P	S01		T04	
16	D022	1,500	P	S01		T04	
17	D027	1,500	P	S01		T04	
18	D028	2,500	P	S01		T04	
19	D030	1,500	P	S01		T04	
20	D032	1,500	P	S01		T04	
21	D033	1,500	P	S01		T04	
22	D034	1,500	P	S01		T04	
23	D035	12,000	P	S01		T04	
24	D036	1,500	P	S01		T04	
25	D037	1,500	P	S01		T04	
26	D038	1,500	P	S01		T04	
27	D039	11,000	P	S01		T04	
28	D040	11,000	P	S01		T04	
29	D042	1,500	P	S01		T04	
30	D043	1,500	P	S01		T04	
31	F001	110,000	P	S01			
32	F002	110,000	P	S01			
33	F003	110,000	P	S01			
34	F005	110,000	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 55							
35	F006	500	P	S01			
36	F007	500	P	S01			
37	F009	500	P	S01			
38	P003	1,500	P	S01			
39	P012	1,500	P	S01			
40	P015	6,000	P	S01			
41	P029	1,500	P	S01			
42	P030	1,500	P	S01			
43	P031	1,500	P	S01			
44	P038	1,500	P	S01			
45	P056	3,000	P	S01			
46	P063	1,500	P	S01			
47	P068	1,500	P	S01			
48	P073	1,500	P	S01			
49	P076	1,500	P	S01			
50	P078	1,500	P	S01			
51	P095	1,500	P	S01			
52	P096	1,500	P	S01			
53	P098	1,500	P	S01			
54	P099	500	P	S01			
55	P106	1,500	P	S01			
56	P113	1,500	P	S01			
57	P120	1,500	P	S01			
58	U001	3,000	P	S01			
59	U002	1,500	P	S01			
60	U003	1,500	P	S01			
61	U012	1,500	P	S01			
62	U019	3,000	P	S01			
63	U022	1,500	P	S01			
64	U029	1,500	P	S01			
65	U031	1,500	P	S01			
66	U037	1,500	P	S01			
67	U044	1,500	P	S01			
68	U045	1,500	P	S01			
69	U052	1,500	P	S01			

EPA I.D. Number *(Enter from Page 1)* | Secondary ID Number *(Enter from Page 1)*

N M 0 8 9 0 0 1 0 5 1 5

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes (1) PROCESS CODES *(Enter code)*			D. Processes (2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 55							
70	U056	1,500	P	S01			
71	U057	1,500	P	S01			
72	U075	1,500	P	S01			
73	U077	1,500	P	S01			
74	U080	6,000	P	S01			
75	U103	500	P	S01			
76	U108	1,500	P	S01			
77	U112	1,500	P	S01			
78	U115	1,500	P	S01			
79	U117	1,500	P	S01			
80	U121	1,500	P	S01			
81	U122	1,500	P	S01			
82	U123	1,500	P	S01			
83	U131	1,500	P	S01			
84	U133	1,500	P	S01			
85	U134	6,000	P	S01			
86	U135	1,500	P	S01			
87	U140	1,500	P	S01			
88	U144	1,500	P	S01			
89	U151	6,000	P	S01			
90	U154	6,000	P	S01			
91	U159	6,000	P	S01			
92	U160	1,500	P	S01			
93	U161	1,500	P	S01			
94	U165	1,500	P	S01			
95	U169	1,500	P	S01			
96	U188	1,500	P	S01			
97	U190	1,500	P	S01			
98	U196	1,500	P	S01			
99	U204	1,500	P	S01			
100	U210	6,000	P	S01			
101	U211	6,000	P	S01			
102	U213	1,500	P	S01			
103	U216	1,500	P	S01			

EPA I.D. Number *(Enter from Page 1)*	Secondary ID Number *(Enter from Page 1)*
N M 0 8 9 0 0 1 0 5 1 5	

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(Enter code)*	D. Processes			
				(1) PROCESS CODES *(Enter code)*			(2) PROCESS DESCRIPTION *(If a code is not entered in D[1])*
Technical Area 55							
104	U218	1,500	P	S01			
105	U219	1,500	P	S01			
106	U220	6,000	P	S01			
107	U225	1,500	P	S01			
108	U226	6,000	P	S01			
109	U227	1,500	P	S01			
110	U228	1,500	P	S01			
111	U239	1,500	P	S01			
112	U246	1,500	P	S01			

ATTACHMENT C

WASTE ANALYSIS PLAN

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AK	acceptable knowledge
ALARA	as low as reasonably achievable
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
FFCO	Federal Facilities Compliance Order
FR	*Federal Register*
FWO-SWO	Facilities and Waste Operations-Solid Waste Operations Group
HE	high explosives
HEPA	high-efficiency particulate air
LANL	Los Alamos National Laboratory
LDR	land disposal restrictions
LIG	Laboratory Implementation Guidance
LIR	Laboratory Implementation Requirement
MLLW	mixed low-level waste(s)
MTRUW	mixed transuranic waste(s)
NCR	non-conformance report
NMED	New Mexico Environment Department
OB	open burning
OD	open detonation
ppmw	parts per million by weight
QA	quality assurance

QAPjP	"Los Alamos National Laboratory Transuranic Waste Quality Assurance Project Plan"
QC	quality control
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RTL	regulatory threshold limit
RTR	real-time radiography
SOP	standard operating procedure
SVOC	semivolatile organic compound
STP	Site Treatment Plan
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
TSDF	treatment, storage, and disposal facility
UHC	underlying hazardous constituents
VOC	volatile organic compound
WAC	waste acceptance criteria
WAP	waste analysis plan
WCSF	Waste Characterization Strategy Form
WIPP	Waste Isolation Pilot Plant
WIPP WAC	"Waste Acceptance Criteria for the Waste Isolation Pilot Plant"
WMC	Waste Matrix Code(s)

ATTACHMENT C
WASTE ANALYSIS PLAN

This Waste Analysis Plan (WAP) presents information on and describes the sampling and characterization procedures used to determine the chemical and physical nature of hazardous waste, the hazardous component of mixed low-level waste (MLLW), the hazardous component of mixed transuranic waste (MTRUW), and high explosives (HE) and HE-contaminated waste stored and treated at Los Alamos National Laboratory (LANL). It meets the requirements set forth in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 264.13, revised June 14, 2000 [6-14-00]. The waste analysis information contained in this WAP is used for characterization of wastes managed in containers and tanks, and to support treatment by open burning (OB), open detonation (OD), and cementation processes. Additional waste analysis regulatory requirements are specified in 20.4.1 NMAC § 270.14(b), and 20.4.1 NMAC § 268.7 [6-14-00]. Additional waste analysis permit requirements are specified at Permit Section 2.4. 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 C.1 Facility Description: Includes a general description of LANL; general descriptions of the waste streams stored and treated and the activities that generate waste.

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

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

Section C.5 Special Procedural Requirements: Includes a discussion of the 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 C.6 References.

Table C-1 summarizes applicable regulatory requirements and the corresponding location where the requirement is addressed in this appendix.

Throughout this document, generator waste characterization is described as the preliminary source of information at LANL determining the identification and subsequent management of the waste. The information presented in this Attachment is intended to discuss how the waste characterization data are reviewed and used by LANL waste management units and organizations in compliance with the 20.4.1 NMAC, Subpart V, Part 264, and 20.4.1 NMAC, Subpart VIII, Part 268, regulatory requirements.

C.1 FACILITY DESCRIPTION [20.4.1 NMAC § 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. A detailed description of the LANL facility is included in Appendix A of this General Part B Permit Renewal Application.

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, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine, health, and biotechnology; and industrial partnerships. LANL is owned by the U.S. Department of Energy (DOE) and is operated jointly by DOE and Los Alamos National Security, LLS.

C.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 restoration (ER) activities. Wastes generated from these types of processes and activities may also be received from off-site facilities, as described in Supplement 1 of the General Part B Permit Renewal Application (LANL, 2003). Tables C-2 through C-7 present information on hazardous wastes, MLLW, MTRUW, HE wastes, and HE-contaminated wastes

potentially generated at LANL. Wastes generated at off-site facilities that may be received at LANL are described in Table C-8. These tables include brief waste descriptions, waste-generating process or activity, the characterization basis for waste designation, potential EPA Hazardous Waste Number(s), the hazardous constituent(s) listed in Appendix VIII of 20.4.1 NMAC, Subpart V, and/or the characteristic(s) defined at 20.4.1 NMAC, Subpart V, Part 264, Subpart C, that make the waste hazardous, and the regulatory limits, as appropriate. These tables are provided for information purposes only.

C.1.2 Stored Waste

Hazardous waste, MLLW, and MTRUW are stored at various container storage units throughout LANL. The following sections contain general descriptions of these wastes and the processes that generate them.

C.1.2.1 Hazardous Waste

The criteria for establishing a waste as a hazardous waste are provided in 20.4.1 NMAC, Subpart II [6-14-00]. A waste is considered hazardous if it meets the definition of a solid waste described in 20.4.1 NMAC § 261.2 [6-14-00]; is not exempted from regulation as a hazardous waste under 20.4.1 NMAC § 261.4 [6-14-00]; and exhibits any of the characteristics of hazardous waste identified in 20.4.1 NMAC, Subpart II, Part 261, Subpart C, or is listed in 20.4.1 NMAC, 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, contaminated non-corrosive aqueous and non-aqueous solutions and sludges, mercury wastes, used batteries and battery fluids, unused off-specification commercial chemical products, gas cylinder waste, ER soils and sludges, ER aqueous liquids, and ER debris. Hazardous waste streams may be of uniform physical composition (i.e., homogeneous) or of dissimilar/diverse composition (i.e., heterogeneous). Homogeneous waste is defined as waste that contains only one material or substance or waste that has its components mixed so that consistent samples can be drawn throughout. Homogeneous waste streams can be either solids or liquids. Heterogeneous waste is defined as waste that contains multiple components that are separate because of density or specific gravity, are located in different places within the mixture, or are discrete and different

articles. Heterogeneous wastes (e.g., debris) do not lend themselves to representative sampling and analysis. Descriptions of these routinely handled hazardous waste streams and their waste-generating processes are provided below and summarized in Table C-2.

Spent Solvents

This waste stream consists of 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 chemistry research, cleaning, and degreasing.

Contaminated Solid Wastes

Contaminated solid wastes (i.e., wastes of a solid physical form) include mixtures of rags, spill cleanup materials, Kimwipes™, 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, chemistry research, D&D projects, metal finishing operations, and general maintenance operations.

Paint and Related Wastes

Paint and paint-related wastes consist of excess paint, paint strippers/thinners, and sludges of paints and thinners. Possible contaminants include heavy metals used as paint pigments and solvents contained in thinners and lacquers. Waste-generating activities include painting and finishing operations and general facility maintenance.

Photographic and Photocopier Wastes

Photographic wastes include spent or excess film developers, fixer solutions, and bleach solutions that may be contaminated with heavy metals. Photocopier wastes include kerosene-based toners and dispersants. This waste stream is generated from photographic film processing and photocopier operations.

Corrosive Liquid Wastes

These wastes consist of acidic or alkaline solutions that may contain organics, inorganics, metals, oils, and other contaminants. Waste-generating activities include analytical chemistry research, electro-etching, and electro-polishing.

Solid Metals and Metallic Compounds

This waste stream consists of 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 Non-corrosive Aqueous and Non-aqueous Solutions and Sludges

This waste stream consists of non-corrosive aqueous and non-aqueous solutions and sludges that are contaminated with hazardous wastes or hazardous residues. Waste-generating activities include vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research.

Mercury Wastes

Mercury wastes include free elemental mercury, mercuric compounds, articles and instruments containing mercury, fluorescent light fixtures, and gels containing mercuric compounds. Waste-generating activities include lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance.

Used Batteries and Battery Fluids

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

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 also includes 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, which may contain regulated hazardous metals, organic compounds, or exhibit the hazardous characteristics of ignitability, corrosivity, and reactivity.

ER Soils and Sludges

This 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 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 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.

C.1.2.2 Mixed Low-Level Waste

Low-level waste is defined in DOE Order 435.1, "Radioactive Waste Management" (DOE, 1999), as "Radioactive waste that is not classified as high-level waste, spent nuclear fuel, transuranic waste, by-product material [as defined in Section 11(e)(2) of the *Atomic Energy Act,* as amended], or naturally occurring radioactive material". MLLW is any waste that has both a hazardous waste component and a low-level waste component, as defined above. For MLLW, this WAP addresses only the hazardous component.

MLLW is generated at LANL primarily from R&D activities, processing and recovery operations, D&D projects, and ER activities. MLLW streams may be homogeneous or heterogeneous, as defined in Section C.1.2.1. Descriptions of the MLLW and their waste-generating processes are provided below and summarized in Table C-3. 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).

Soils with Heavy Metals

Soil waste contaminated with heavy metals is generated during D&D and ER activities at various locations throughout LANL. This waste consists of soils contaminated with varying concentrations of lead or other heavy metals.

Environmental Restoration Soils

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

Inorganic Solid Oxidizers

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 D&D of research laboratories and R&D.

Lead Waste

Lead waste consists of contaminated and activated lead shielding used as radiation shielding, inseparable lead, lead blankets, and lead requiring sorting. It is generated primarily from radioisotope experiments and other reactor, accelerator, laser, and x-ray activities. The lead may be in the form of sheets, pigs, bricks, shot, shavings, slag, dross, and other shapes. Radioactive contamination on the surface of the lead may be removable and the lead can then be recycled or reused.

Noncombustible Debris

Noncombustible debris consists of discarded hazardous and contaminated scrap metals that are generated by maintenance, D&D of research laboratories or equipment, R&D, and ER 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.

Combustible Debris

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

Organic-Contaminated Noncombustible Solids

This waste stream includes absorbed oils, laboratory trash, and discarded equipment. Absorbed oil waste is comprised of drums containing vermiculite or other inorganic sorbents used to absorb oil from spills and routine maintenance operations. Some of the oil originates from vacuum pumps and may be contaminated by mercury, lead, or cadmium.

Laboratory trash consists of noncombustible solid materials with residual solvent contamination. The laboratory debris includes reagent bottles, broken glassware, and disposable lab ware. Large quantities of chemicals are not placed in this trash; however, residual liquids or powders may have remained on some of the discarded material.

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

Organic-Contaminated Combustible Solids

This waste stream consists of waste similar to combustible debris waste, 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, vacuum pumps with residual mercury, activated or contaminated

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

Unused Solid Reagent Chemical Wastes

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

Spent Solvents and Contaminated Solvent Mixtures

This waste stream is comprised of spent solvents and spent solvent mixtures that contain organic or inorganic compounds, heavy metals, oils, and/or 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 contain organics, inorganics, metals, oils, and/or other contaminants. Waste-generating activities include radiochemistry research, plutonium processing, and analytical chemistry.

Aqueous and Non-aqueous Liquids Contaminated with Heavy Metals and/or Organics

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

Oil Wastes

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

Unused Liquid Reagent Chemical Wastes

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

Gas Cylinder Waste

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

C.1.2.3 Mixed Transuranic Waste

Transuranic (TRU) waste is defined in DOE Order 435.1, "Radioactive Waste Management" (DOE, 1999), as follows: "Radioactive waste containing more than 100 nanocuries (3700 becquerels) per gram of waste, with half-lives greater than 20 years." Transuranic isotopes are those with atomic numbers greater than 92. MTRUW contains both a hazardous waste component and a TRU waste component. For MTRUW, this WAP addresses only the hazardous component. The system of MTRUW stream descriptions presented below is consistent with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit. This information may be superseded by any changes to the "Waste Acceptance Criteria for the Waste Isolation Pilot Plant" (WIPP WAC).

MTRUW is generated at LANL primarily from R&D activities, processing and recovery operations, and D&D projects. Limited quantities of MTRUW from off-site facilities will be accepted at LANL for additional characterization and management. MTRUW streams at LANL include four broad categories that can be described by a Summary Category Group, which is further subdivided into Waste Matrix Codes. Summary Category Groups are used to define waste characterization groupings for the "Federal Facility Compliance Order (Los Alamos National Laboratory)" (New Mexico Environment Department [NMED], 1995) requirements and are based on the physical and chemical forms of the waste. Complete descriptions of the Summary Category Groups are available in "DOE Waste Treatability Groups Guidance" (DOE, 1995). The Summary Category Groups that are applicable to the MTRUW stored and, in some cases, treated at LANL are listed below.

- *Summary Category Group S3000, Homogeneous Solids*: defined as solid waste materials, excluding soil/gravel, that do not meet the EPA LDR criteria for classification as debris.
- *Summary Category Group S4000, Soil/Gravel*: defined as solid waste materials that are at least 50 percent by volume soil/gravel.
- *Summary Category Group 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 natural geologic material. Particle sizes smaller than 2.36 inches in size may be

considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.

- *Summary Category Group L1000, Aqueous Liquids/Slurries*: defined as aqueous liquids and slurries that meet the EPA LDR criteria for wastewaters (i.e., <1 percent total suspended solids).

Summary Category Groups are applied to MTRUW streams as a general categorization scheme to distinguish between waste types. More specific waste identification systems (i.e., Waste Matrix Codes [WMC] and LANL TRU Waste Stream ID numbers) are used for supplementary purposes as part of waste management operations at LANL. The WMCs that are applicable to the solid MTRUW stored at LANL are:

- *WMC S3100, Inorganic Homogeneous Solid Waste*: includes mixed inorganic homogeneous waste (cemented inorganics, organics on vermiculite, non-cemented, salts, and cemented organics).
- *WMC S5300, Organic Debris Waste*: consists of mixed combustible debris waste (plastic, cellulosics, and rubber).
- *WMC S5400, Heterogeneous Debris Waste*: includes mixed heterogeneous debris waste (varying amounts of combustible and noncombustible debris, with a small amount of homogeneous waste present).

Solid MTRUW is assigned a WMC and is further identified with a LANL TRU Waste Stream ID number. Using the WMC, waste streams are further delineated based on the following prioritized criteria: waste-generating process (to the degree to which waste has been segregated by process); Summary Category Group (i.e., homogeneous or debris waste); waste matrix; and hazardous chemical content (i.e., organics and/or inorganics). The following are general MTRUW stream descriptions:

- Homogeneous Inorganic, Cemented: includes solidified aqueous or homogeneous inorganic solids, solidified inorganic process solids, leached process residues, evaporator bottoms/salts, and/or cement paste.
- Homogeneous Inorganic, Cemented Organics: major portion of the waste is cement (i.e., inorganic) containing a minor portion of cemented solidified organic process solids.
- Homogeneous Inorganic, Non-cemented: includes solid (non-cemented) inorganic waste, ash, dewatered aqueous sludge, and/or chemical treatment sludge.
- Homogeneous Inorganic, Salts: includes pyrochemical, nitrate, and/or chloride salts; hydroxide cake; and/or other salt waste.
- Homogeneous Inorganic, Vermiculite: includes vermiculite-absorbed hydrocarbon oil, vermiculite-absorbed silicon-based liquid, and solidified (non-cemented) organic waste.
- Soil: includes all radioactive-contaminated soil.

- Combustible debris: includes greater than 50% by volume combustible decontamination waste, cellulosics, plastics, rubber, laboratory trash, building debris, hot cell waste, and/or other combustibles.
- Heterogeneous debris: includes greater than 50% by volume noncombustible waste, metal scrap, glass, metal waste, metal crucibles and dies, precious metals, filter media and residue, beryllium-contaminated debris, ion-exchange resins, irradiation sources, firing point sources, leaded rubber, graphite waste, high-efficiency particulate air (HEPA) filter waste, skull and oxide, slag and porcelain, and/or other noncombustible waste.

The WMCs correspond to other historical and current waste identification systems used at LANL. Table C-4 lists the MTRUW streams stored at LANL by their Summary Category Group, WMC, and general matrix description, and provides a cross-reference between past and present waste identification systems.

LANL TRU Waste Stream ID numbers are applied to the MTRUW streams described above. LANL TRU Waste Stream ID numbers are assigned the prefix "LA-", followed by a unique identifier that further delineates the waste stream. The following paragraphs provide examples of the delineated waste streams for the MTRUW stored and, in some cases, treated at LANL. MTRUW information is summarized in Table C-5.

LA-TA-55-19: Mixed Combustible Debris Waste

This waste stream consists of mixed combustible debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The debris waste includes paper, rags, plastic, rubber, wood-based HEPA filters, and other plastic-based and cellulose-based items.

LA-TA-55-30: Mixed Heterogeneous Debris Waste

This waste stream consists of mixed heterogeneous debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste includes plutonium-contaminated noncombustible and combustible debris waste.

LA-MIN01-CIN: Mixed Inorganic Homogeneous Waste, Cemented Inorganics

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, facility and equipment operations and maintenance, and liquid waste treatment operations. The waste includes cemented sludge, solidified aqueous waste, and solidified inorganic process solids.

LA-MIN02-V: Mixed Inorganic Homogeneous Waste, Organics on Vermiculite

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste is comprised of organic liquids (oils and solvents) adsorbed on vermiculite.

LA-MIN03-NC: Mixed Inorganic Homogeneous Waste, Non-cemented

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and liquid waste treatment operations. It consists of vacuum filter cake solid waste.

LA-MIN04-S: Mixed Inorganic Homogeneous Waste, Salts

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. It is comprised of non-cemented inorganic process solids (salts).

LA-MIN05-COR: Mixed Inorganic Homogeneous Waste, Cemented Organics

This waste stream consists of mixed inorganic homogeneous solidified (cemented) organic process solids and emulsified solvents and oils generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance.

LA-MHD02-238: Mixed Heterogeneous Debris Waste, Pu-238

This waste stream consists of mixed heterogeneous debris waste generated by Pu-238 processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance. The waste includes Pu-238 contaminated noncombustible and combustible debris waste.

LA-MIN06-C238: Mixed Inorganic Homogeneous Waste, Cemented Inorganics, Pu-238

This waste stream consists of mixed inorganic homogeneous waste comprised of solidified (cemented) inorganic process solids. This waste stream is generated by Pu-238 processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance.

LA-MHD03-DD: Mixed Heterogeneous Debris Waste, D&D

This waste stream consists of mixed heterogeneous debris waste generated from facility and equipment D&D, including associated sectioning, size reduction, and packaging operations. The waste is comprised of plutonium-contaminated noncombustible and combustible debris waste.

LA-MHD05-ITRI: Mixed Heterogeneous Debris Waste, ITRI

This waste stream consists of mixed heterogeneous debris generated between 1975 and 1984 by the Inhalation Toxicology Research Institute, which is currently operated by Lovelace at the Kirtland Air Force Base, New Mexico. The waste is comprised of laboratory waste that may contain rags, tools, and biological waste contaminated with Pu-239.

LA-MHD07-SNL: Mixed Heterogeneous Debris Waste, Sandia National Laboratory

This waste stream consists of mixed heterogeneous debris waste generated by Sandia National Laboratories. This waste stream may contain lead (D008).

LA-MHD04-RH: Mixed Heterogeneous Debris Waste, Remote-Handled

This waste stream consists of mixed remote-handled heterogeneous debris waste generated by hot cell operations. This waste is comprised of combustible and noncombustible waste.

Sandia National Laboratories/New Mexico - Generated Waste

MTRUW 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 C-8).

C.1.3 Treated Wastes

MTRUW, HE waste, and HE-contaminated waste are treated at various waste management units throughout LANL. MTRUW is treated by cementation to stabilize the waste for storage and to meet the WIPP WAC. The HE waste and HE-contaminated waste are treated by OB or OD to remove its reactive characteristic.

C.1.3.1 Treated Mixed TRU Wastes

MTRUW that require treatment are generated primarily from R&D and processing and recovery operations. Treatment of MTRUW at LANL may consist of immobilization/solidification by

cementation to form a noncorrosive solid matrix. Additional specific information on the cementation treatment process is provided in Section C.3.2.3 of this WAP.

C.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 or volumes 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 that 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 20.4.1 NMAC § 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 HE-processing operations, such as machining and pressing; R&D activities, including pilot-scale HE production; D&D; and ER activities. Table C-6 provides a summary of available information on HE waste and HE-contaminated waste treated by OB. These waste streams include homogeneous and heterogeneous wastes as defined in Section C.1.2.1 and are described in the following paragraphs.

HE-Contaminated Water

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; ER, R&D, and D&D activities; drilling activities; and maintenance activities.

HE-Contaminated Solvent Waste

This waste stream consists of HE-contaminated solvents. It is generated primarily by laboratory analysis; R&D, ER, and D&D activities; HE production; spills; and the dissolving of HE and polymers.

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-processing operations and ER and D&D activities.

Solid and Scrap HE

This waste stream consists of off-specification or obsolete HE. It is generated primarily from HE processing; testing operations; disposition of weapons; and from ER, R&D, and D&D activities.

HE-Contaminated Commercial Chemical Products

HE-contaminated commercial chemical products may be generated at various technical areas (TA) throughout LANL that manage HE. This waste generally consists of spilled commercial chemical products contaminated with HE.

Wet HE

This waste stream consists of wet HE-machining chips, ER and D&D wastes, sludges, spent activated carbon, filters, and filter solids that result primarily from the filtration of HE wastewater; ER, R&D, and D&D activities; and HE processing.

HE-Contaminated Solid Waste

This waste stream may include HE-contaminated rags, paper, glassware, tools, and other waste. These wastes may also be contaminated with solvents or oil. This waste stream is generated primarily from HE-processing activities; laboratory use; and ER, D&D, R&D, and drilling activities.

HE-Contaminated Equipment

This waste stream consists of HE-contaminated equipment, which includes discarded, noncombustible equipment and material from HE-processing areas; D&D, R&D, and ER activities; and laboratory use. This waste stream is typically recycled after treatment.

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.

C.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 C.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 C-7 provides a summary of available information on HE waste and HE-contaminated waste that is treated by OD. These waste streams include homogeneous and heterogeneous wastes and are described briefly below.

HE-Contaminated Solid Waste

This waste stream may include HE-contaminated rags, paper, glassware, tools, and other waste. These wastes may also be contaminated with solvents or oil. This waste stream is generated primarily from HE-processing activities; laboratory use; and ER, D&D, R&D, and drilling activities.

Solid and Scrap HE

This waste stream consists of off-specification or obsolete HE. It is generated primarily from HE processing; testing operations; disposition of weapons; and from ER, R&D, and D&D activities.

C.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 O (*Hazardous Waste Management Units*). Detailed information on the waste management units is provided in the TA-specific permit applications, permit modification requests, or permit renewal documents.

C.2 WASTE ANALYSIS PARAMETERS [20.4.1 NMAC § 264.13(a)(1)]

Detailed chemical and physical characterization will be performed on hazardous wastes, the hazardous component of MLLW, the hazardous component of MTRUW, HE wastes, and HE-contaminated wastes for management purposes, as required by 20.4.1 NMAC § 264.13. Waste analysis parameters will be selected to ensure that the waste characterization documentation will contain the information necessary to properly manage the waste in accordance with Resource Conservation and Recovery Act (RCRA) general facility standards in 20.4.1 NMAC, Subpart V, Part 264, and LDR requirements in 20.4.1 NMAC, Subpart VIII, Part 268.

C.2.1 Proposed Analytical Parameters and Methods [20.4.1 NMAC § 264.13(b)(1), and 20.4.1 NMAC § 270.14(b)(2)]

Analytical parameters and characterization methods that will be used for hazardous wastes, MLLW, MTRUW, and HE and HE-contaminated wastes generated at LANL are summarized in Tables C-9 through C-12. The parameters listed below will be used, as necessary, to determine the RCRA regulatory status of the wastes listed in Section C.1.

- Acceptable Knowledge (AK)
- 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)
- Additional MTRUW characterization sampling methods
  - Headspace gas sampling to determine the presence of VOCs in container headspace
  - Physical waste form characterization through real-time radiography (RTR) and/or visual examination to verify the absence of prohibited items (e.g., liquids and sealed >4 liter containers)
- Flash point characterization
- pH characterization
- Reactivity characterization
- Additional characterization data

C.2.2 Criteria and Rationale for Parameter Selection [20.4.1 NMAC § 264.13(b)(1)]

Parameter selection for waste characterization is based on the physical form of the waste (e.g., debris) and on knowledge of the process generating the waste. To determine whether a solid waste is hazardous, LANL uses AK (which includes process knowledge), supplemented by sampling and analysis, if necessary, as described in Sections C.3.1.1 and C.3.1.2. The analytical parameters selected to confirm knowledge-based waste characterization for hazardous waste, MLLW, and MTRUW, and the rationale for the selected parameters are identified in Tables C-9, C-10, and C-11, respectively. MTRUW characterization incorporates characterization procedures from the WIPP permit (NMED, 2003) requirements, which are based on knowledge of raw materials and physical/chemical processes of waste-generating activities and by verification methods. Additional characterization procedures will be implemented as needed to meet the requirements of the WIPP permit or other LANL waste permit conditions. 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 is identified in Table C-12.

Appendix III of 20.4.1 NMAC, Subpart 200, Part 261, provides references which list approved analytical methods used to determine the concentrations of hazardous constituents in the liquid and solid fractions and extracts of waste samples. All the methods are fully described in the most recent version of *SW-846*. These and other approved methods approved by the Department will be used, as necessary, to determine whether a waste stream is hazardous. Samples will not be analyzed for all listed hazardous constituents, only those that are most likely to be present based on the source of the waste stream and all constituents the laboratory analytical method is capable of measuring.

Detailed instructions for conducting Toxicity Characteristic Leaching Procedure (TCLP) waste analysis are found in the most recent version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" *(SW-846)* and are incorporated by reference into 20.4.1 NMAC, Subpart 200, Part 261, Appendices II and III. Also listed in the most recent version of *SW-846* is the appropriate analytical method for each hazardous constituent required to determine if the waste contains a contaminant in excess of the maximum contaminant concentration regulated under 20.4.1 NMAC, Subpart 200, Part 261. TCLP is a method for leaching hazardous constituents from the solid portion of the waste and is used only if the solids constitute more than 0.5% of the waste by weight. The laboratory can also forego extraction if: 1) total analysis of the waste shows the concentrations of the analytes are so low, an extract of the waste could not contain analytes at concentrations above the regulatory limits; or 2) analysis of any liquid portion of the waste contains such high concentrations of hazardous constituents that, even accounting for dilution, the entire sample would be hazardous.

Many RCRA hazardous wastes are restricted from land disposal under the Hazardous and Solid Waste Amendments unless they are treated first to substantially diminish their toxicity and reduce the likelihood that hazardous constituents will migrate from the disposal site. As required in 20.4.1 NMAC, Subpart 800, Part 268, each waste shipment must be accompanied by a notification stating whether the restricted waste meets specific LDR treatment standards promulgated for hazardous constituents, or is otherwise exempt. In most cases, the notification can be completed after laboratory analysis of the waste. If an LDR notification is based solely on knowledge of the waste, the supporting documentation will be kept on record, in accordance with 20.4.1 NMAC § 268.7.

C.3 CHARACTERIZATION PROCEDURES [20.4.1 NMAC §§ 264.13(a)(1) and 264.13(b)(2), and 20.4.1 NMAC § 270.14(b)(2)]

Throughout LANL, it is required that characterization of wastes be considered before a waste-generating process will begin. The preliminary characterization of waste begins prior to actual generation (at the point of concept and design of a process or system), which in turn allows the generator to determine whether AK, sampling and analysis, or a combination of the two will be required prior to actual waste characterization for transport to the TA-54 storage facility.

The approach to characterization of hazardous wastes, MLLW, MTRUW, HE wastes, and HE-contaminated wastes is based on the chemical, physical, and radiological nature of the waste stream. Characterization procedures require that information for the waste stream be provided on a unique waste characterization document, generally referred to as a waste profile form, accompanied by sampling and analysis data or AK documentation. These documents are collectively referred to as the waste characterization documentation. The waste characterization documentation is submitted to Facilities and Waste Operations-Solid Waste Operations (FWO-SWO) personnel for review, classification, and approval prior to acceptance at TA-54. This characterization is accomplished by using AK and/or sampling and analysis, which are described in the following sections.

Trained personnel review the waste characterization documentation for adequacy and waste acceptance criteria (WAC) acceptability. Training for use of waste characterization documentation is included in a facility waste documentation course. This training provides step-by-step instructions on how to complete forms for characterizing wastes. If the documentation is incomplete or does not contain sufficient information to adequately characterize or classify the waste, the documentation is returned to the generator for additional information. Examples of further documentation that may be requested include more detailed process knowledge and description or additional/new analytical data to meet WAC requirements for the off-site treatment, storage, or disposal facility (TSDF).

Waste characterization documentation allows determination of compliance with the information requirements of Permit Section 2.4.1, including the determination of waste classification and assignment of EPA Hazardous Waste Numbers; preparation of LDR documentation; and proper management of the waste. Once the waste characterization documentation is reviewed, classified, and approved, the generator is notified and paperwork is prepared for shipping. The shipping documentation is submitted to FWO-SWO personnel and reviewed against the waste

characterization documentation and Department of Transportation regulations. If approved by FWO-SWO personnel, the waste shipment is scheduled for transport to the appropriate TSDF. If the shipping documentation is inadequate or does not correspond with the characterization documentation, the shipping documentation is returned to the generator for corrections.

Upon receipt and prior to accepting the waste containers for storage at TA-54, waste shipments are inspected to ensure that the shipping documentation and the waste characterization documentation have the proper approvals in addition to ensuring that compliance with the WAC and all federal and state regulations are met. At TA-54, both the waste characterization documentation and the shipping documentation become part of the operating record upon receipt of the waste. These records will be made available within a reasonable timeframe to the NMED, upon request.

Subsequent transport of waste streams whose waste characterization has been previously approved by FWO-SWO personnel shall be accompanied by a certification statement from the waste generator that the waste has not changed significantly so as not to be accurately represented by the previously approved waste characterization information.

Reevaluation of initial characterization information is performed to verify the accuracy of the initial waste characterization, to ensure 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. Waste streams are reevaluated annually to verify that they have not changed. This annual reevaluation will be accomplished through review and recertification of applicable waste characterization documentation, and the documented reevaluation will be maintained in the facility operating record. Any information that indicates a change in the process that generates the waste and/or affects the waste will require the waste to be recharacterized. Furthermore, one-percent of wastes whose characterization is based solely on acceptable knowledge have that characterization verified annually utilizing quantifiable laboratory analysis to ensure its accuracy in accordance with Section C.3.1.3.

C.3.1 Hazardous and Mixed Low-Level Waste Characterization

Characterization procedures for hazardous waste and MLLW are selected based on the physical nature of the waste stream (e.g., homogeneous or heterogeneous waste). Homogeneous solid waste will be characterized for the presence of hazardous components of the waste (i.e., VOCs, SVOCs, and metals) on the basis of AK and, if necessary, sampling and analysis.

Heterogeneous solid waste is typically characterized on the basis of AK for the following reasons: (1) the physical, chemical, and/or radiological nature of the waste makes it difficult to obtain representative samples; (2) the lack of appropriate sampling methodology; and (3) for MLLW, safety concerns associated with unnecessary exposure to the radioactive component of the waste (i.e., as low as reasonably achievable [ALARA] concerns). In the event AK is used to characterize the waste, characterization documents are reviewed with the help of subject matter experts, when necessary, to achieve the most comprehensive characterization available before waste is approved for transport to TA-54.

Chemicals of an unknown nature are handled on a case-by-case basis. The individual waste is initially characterized by knowledge of the operations and activities that were performed in the specific area in which the waste was generated. This information, if available, is used to restrict the choices of initial waste analysis to a smaller population of chemicals and is not the sole basis of waste characterization. In the event that RCRA hazardous wastes are present in the initial waste analysis, more definitive AK is obtained, including, as appropriate, further analysis for sufficient and complete waste characterization prior to waste acceptance at TA-54.

For purposes of managing unknown wastes, a small volume is defined at LANL as one liquid gallon (approximately four liters) or less. The rationale for the small volume designation is that this is the minimum quantity of sample needed to test if the waste is hazardous. At and below this limit, the sample may be 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 management.

Volumes greater than one gallon (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 determination of the proper EPA Hazardous Waste Number(s) and LDR status. Characterization methods used are provided in Tables C-9 and C-10.

Information regarding the presence of free liquids in containers of hazardous waste and MLLW is obtained through generator waste-characterization knowledge, visual examinations, and/or the Paint Filter Liquids Test.

HE waste and HE-contaminated waste at LANL are treated by OB to remove the characteristic of reactivity. 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." 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 and/or field screening or laboratory analysis. Wastes that contain concentrated HE are characterized by process knowledge, as described in Section C.3.1.1.1. 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, may be used.
- If heterogeneous waste contains visible HE, it is considered reactive.
- If heterogeneous waste came into direct contact with HE and all of the surfaces cannot be tested or visually examined (e.g., debris or equipment), it is assumed that there is a reactive amount of HE associated with it.
- HE concentrations may be directly measured in homogeneous materials (e.g., soil or water). This is usually done using the appropriate analytical method from the most recent version of *SW-846* Method 8300 series. 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 C-13.

OB completely removes the reactive characteristic from HE-contaminated wastes. These wastes, however, may also exhibit RCRA toxicity characteristics or contain listed wastes. In some cases, OB is 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 the TCLP. Sampling and analysis for ash generated by OB are summarized in Table C-14.

C.3.1.1. Acceptable Knowledge [20.4.1 NMAC §§ 264.13(a)(2) and 264.13(b)(5), and 20.4.1 NMAC § 270.14(b)(2)]

The physical, chemical, and radiological nature of some waste forms (e.g., heterogeneous) makes 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 material (i.e., ALARA concerns) or explosive material.

Acceptable knowledge is a method used to characterize the waste streams utilizing process knowledge and additional waste analysis data. According to EPA guidance, *acceptable knowledge* is broadly defined to include process knowledge, additional characterization data, and/or facility records of analysis (EPA, 1994A). Consistent with the 1994 guidance, EPA defined "acceptable knowledge" as it applies to TRU waste destined for WIPP as "any information about the process used to generate the waste, material inputs to the process, and the time period during which the waste was generated . . ." [Code of Federal Regulations, Title 40 (40 CFR), § 194.254(c)(3)]. EPA recognizes AK as an "integral part" of the system for controls for waste characterization of certain types of DOE waste (see *67 FR 51930, 51942* [August 9, 2002]).

Process knowledge is described in 20.4.1 NMAC § 264.13(a)(2) [6-14-00], as data developed under 20.4.1 NMAC, Subpart II, Part 261, and existing published or documented data on a specific hazardous waste or hazardous waste generated from similar processes. EPA described *process knowledge* as knowledge of waste characteristics derived from information generated contemporaneously with the waste on the materials or processes used to generate the waste. This information may include administrative, procurement, and quality control documentation associated with the generating process, or past sampling or analytical data. Usually, the major elements of process knowledge include information about the process used to generate the waste, material inputs to the process, and the time period during which the waste was generated (see *67 FR 51934*).

Additional characterization data includes data obtained from chemical or physical analysis or review that is not subject to RCRA protocols, such as the most recent version of *SW-846* and other approved methods, or through testing of similar or surrogate waste streams. These data can be 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).

For characterization, the following examples from EPA guidance (EPA, 1994A) are appropriate for the use of AK:

- Hazardous components in wastes from specific processes are well documented, such as with F-listed and K-listed wastes.
- Wastes are discarded unused commercial chemical products, reagents, or chemicals of known physical and chemical properties.
- Health and safety risks to personnel would not justify sampling and analysis (e.g., radioactive mixed waste).
- Physical nature of the waste does not lend itself to taking a laboratory sample.

Waste characterization documentation based solely on AK is reviewed by appropriate personnel, with the aid of subject matter experts if necessary, to determine if one or more of the above criteria have been met. The criteria must be documented, available for review to ensure that a valid and accurate RCRA hazardous waste characterization can be made before acceptance at TA-54, and listed and summarized on a waste profile form. While AK documentation will be maintained at the generator's location in paper form for at least three years, and in an electronic form at the Facility until closure of the associated permitted unit, it must be in a format so that waste management personnel and/or subject matter experts can obtain copies or review the documentation. The latter would be the case with classified or sensitive AK documentation that cannot be sent to TA-54 due to security requirements. A traceable identifier (i.e., process or AK document number or alphanumeric designation) is assigned by the generator on the waste characterization documentation, and must be referenced in such a way that generators can access the information for as long as required by RCRA regulation and this Permit.

C.3.1.1.1 Process Knowledge

For characterization, 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 components 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 obtain, assemble, and prepare the process knowledge documentation for each waste stream. There are many sources of applicable documentation at LANL that are acceptable to substantiate process knowledge for a specific waste stream. Examples of documentation that are acceptable include, but are not limited to, 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 chemical composition 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.

C.3.1.1.2 Additional Characterization Data

Additional characterization data used for AK include information for the waste stream provided by the generator. These data may be qualitative in nature, not subject to an approved quality control program, or performed on a similar waste stream. 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.

C.3.1.2 Sampling and Analysis [20.4.1 NMAC §§ 264.13(a)(3), 264.13(b)(2), (3), and (4), and 20.4.1 NMAC § 270.14(b)(2)]

This section discusses proposed sampling and analytical procedures and frequency of sampling applicable to hazardous waste and the hazardous component of MLLW. The approach described for characterizing these waste types is based on the radiological, physical, chemical, and hazardous properties of the waste. If necessary for waste characterization purposes, chemical data will be obtained, as needed, through solid and liquid waste sampling techniques.

For waste streams that can be representatively sampled (i.e., homogeneous), sampling and analysis is performed when a waste lacks sufficient process information to adequately characterize the waste based on AK. 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 certain technical performance criteria and to be consistent with regulatory guidelines. Personnel involved in sampling and analysis comply with LANL-specific protocol consistent with the most recent version of *SW-846* (EPA, 1986) and/or other Department approved methods.

Many analytical laboratories provide sample containers and specify required minimum volumes for individual waste types or physical states. The most important determinants of sampling method and volume are the physical state of the waste (liquid, solid, sludge), the waste container (drum, tank), accessibility, waste variability, and safety concerns. Detailed sampling recommendations and guidance are provided in the most recent version of *SW-846*, Chapter 9. For solids, 500 grams in a glass container is usually adequate. Liquid sample volumes vary from one liter to approximately eight liters, depending on the number of analysis parameters and solids content. Sample jars for samples to be analyzed for VOCs must be completely filled to minimize volatilization of contaminants from the liquid into the headspace.

Sampling is performed with a device appropriate for the waste being sampled. Sampling devices include, but are not limited to, weighted bottles, bailers, or composite liquid waste samplers for sampling liquids in drums, pits, or tanks. Augers, triers, scoops, shovels, and similar types of devices are useful for sampling solid wastes in containers or other locations.

The aim of the sampling method is to obtain a sample or samples representative of the waste stream. Sampling personnel must use an understanding of the waste-generating and -handling processes to ensure samples are representative. Some wastes separate into distinct layers with time, and representative samples must include aliquots from each layer. In some cases, it may be important to use a statistical or random sampling scheme that provides for the collection of representative samples.

A number of criteria must be considered in determining how many samples are required, how locations are selected, and how frequently sampling should be repeated. If a highly uniform waste stream is generated from a single process location, one sample collected annually is sufficient. However, if a single waste stream is a mixture of materials generated in several locations under varying conditions through time, more samples will be required, and composite sampling may be appropriate. At a minimum, the sampling must be repeated if the waste-generating process changes in a way that might alter the EPA Hazardous Waste Number(s) and LDR status of the waste, or if inspection of the waste reveals it has changed.

Appendix I of 20.4.1 NMAC, Subpart 200, Part 261, lists specific guidance documents that detail sampling protocols for different waste types. Waste samples collected in accordance with these protocols are considered representative by EPA. The protocols include standards developed by

the American Society for Testing and Materials (ASTM) and portions of the most recent version of *SW-846*.

C.3.1.2.1 Solid Waste Analysis [20.4.1 NMAC § 264.13(b)(3)]

If necessary for waste characterization purposes, solid homogeneous waste streams are sampled and analyzed for total metal content, VOCs, and SVOCs. The sampling protocol for solid hazardous waste and MLLW is based on sampling methods approved by EPA for solid waste and soil sampling in the most recent version of *SW-846*, as well as other Department approved methods. These methods are designed to ensure that representative waste samples are collected consistently and transferred to the responsible laboratory in a manner that maintains sample integrity.

If necessary for waste characterization purposes, homogeneous waste streams will be sampled and analyzed for the toxicity characteristic (TC) contaminants listed in 20.4.1 NMAC § 261.24 [6-14-00]. Analysis for total concentration of TC contaminants will be performed on samples in a screening step, as described in Section 1.2 of Method 1311 (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.

C.3.1.2.2 Liquid Waste Analysis

Liquid wastes generated at LANL consist of aqueous solutions, slurries, and organic liquids. If necessary for waste characterization purposes, these wastes will 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, is characterized by filtering the waste, measuring total contaminant concentrations in the resulting filtrate, and comparing these concentrations to the TC regulatory levels in 20.4.1 NMAC § 261.24 [6-14-00].

Wastes that contain both a liquid and a solid phase are 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 C.3.1.2.1. The following formula (EPA, 1994b) will be used to calculate the maximum theoretical leachate concentrations for the combined phases:

$$\frac{[A \times B] + [C \times D]}{B + [20 \text{ liters/kilogram} \times D]} = M$$

Where,

A = concentration of the analyte in the liquid portion of the sample (milligrams/liter)
B = volume of the liquid portion of the sample (liter)
C = concentration of the analyte in the solid portion of the sample (milligrams/kilogram)
D = weight of the solid portion of the sample (kilogram)
M = maximum theoretical leachate concentration (milligrams/liter).

C.3.1.2.3 Sample Handling, Preservation, and Storage

Table C-15 presents requirements specified in the most recent version of *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. In the event the specified criteria are not met, another sample will be collected and submitted for analysis.

C.3.1.2.4 Analytical Laboratory Selection and Analytical Methods [20.4.1 NMAC § 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 C-16 and C-17 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
- Analytes of interest
- Required detection limits (e.g., regulatory thresholds including the LDR Universal Treatment Standards)
- 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 C-16 and C-17. Qualified analytical laboratories at LANL and/or approved subcontractor laboratories that meet the above criteria will be used for the required analyses.

C.3.1.3 Verification Frequencies [20.4.1 NMAC §§ 264.13(a)(3) and 264.13(b)(4)]

Verification frequencies vary by the types of waste received at each LANL treatment or storage facility. As the primary storage and shipping facility at LANL, TA-54 manages the widest variety of waste streams. A limited number of HE waste streams, primarily debris, are managed at the OB units.

The waste verification process at TA-54 applies to waste received at that facility and designated for storage and/or off-site treatment and/or disposal. Personnel involved in verification activities are trained and qualified for the activities they perform. A complete listing of waste verification processes are identified at Permit Part 2, Section 2.4.7.

LANL will annually verify the waste characterization of one percent of hazardous wastes characterized solely utilizing acceptable knowledge (40 CFR §264.13(b)(4)). Such waste characterization verification shall be performed by quantitative chemical analysis appropriate for the waste as specified in this *Waste Analysis Plan* (Attachment C). The one percent of wastes whose characterization is to be verified shall be determined in relation to the total number of waste streams managed at TA-54 in the previous calendar year. To count waste streams within a year, each waste material generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents, and is distinguishable from other waste material by EPA Hazardous Waste Numbers and Land Disposal Restriction status, shall be counted. The waste streams whose waste characterization is to be verified shall be chosen without bias and the selection procedure shall be documented in the operating record. Waste streams not required to undergo this annual verification and not to be counted toward the total number of waste streams managed in the previous year include mixed wastes, hazardous

debris, and hazardous wastes that are hazardous only because they are listed at 40 CFR Part 261, Subpart D.

Once the waste stream has been designated for verification, waste verification personnel are notified of its pending arrival at TA-54. Waste streams needing verification are sampled in accordance with approved EPA and ASTM protocols.

If the characterization for the waste stream is found to be inconsistent with the documentation, a non-conformance report (NCR) is issued. The NCR program is used both to trigger further verification of waste and as enforceable criteria for the TA-54 waste verification program. Depending on the severity of the discrepancy, the waste generator or waste-generating facility may be subject to increased verification review under the program, and the waste may not be accepted for management at TA-54.

The verification program for wastes treated at the OB units is different because debris and HE are the predominant types of waste treated and because there are a limited number of waste streams. Due to the difficulty in analyzing debris, information on the waste-generating process becomes the primary source of information. Verification for debris occurs in two stages. The debris is first visually inspected before treatment to ensure that the received waste matches the description on the waste characterization documentation. Then, any residues separated from the debris before or after treatment are analyzed each time a new waste stream is treated. If analysis of the residues finds constituents not identified on the waste characterization documentation for the incoming waste, treatment facility personnel contact the waste generator and conduct a thorough review of the process generating the waste. Based on the review, the generator may be requested to modify the waste characterization documentation. Solid and scrap HE and wet HE are not usually sampled because the formulations are closely controlled and well known, and HE waste is dangerous to transport off site for analysis. In addition to the transportation considerations, HE is by definition "energetic" and may react adversely to dissolution with acids, extraction with solvents, and sample size reduction techniques used in standard laboratory analytical procedures.

For other HE waste streams, initial chemical analysis by the generator is required. Analysis is also required if the waste-generating process changes. Additional analytical testing from generators may be requested based upon the following criteria:

The complexity of the waste-generating process,

Constituents identified during testing of residues were not included on original waste characterization documentation,

Incomplete or suspect documentation, and/or

Past performance of the waste generators.

The frequency of sampling OB/OD treatment residues is, at a minimum, each time a new waste stream is treated. Treatment residues may be sampled more frequently, considering the above criteria. LANL will maintain in the operating record a list of waste streams previously treated so as to be able to identify new waste streams.

For wastes managed at the TA-55 hazardous and mixed waste management units, the waste may be verified through the TA-54 waste verification process. Wastes treated by cementation at TA-55 are subject to institutional controls, which assure that the waste composition is constant. Because this waste-generating process does not change, subsequent review through the TA-54 waste verification process is sufficient.

C.3.2 Mixed Transuranic Waste Characterization

Characterization of the hazardous component of MTRUW stored and treated at LANL and destined for disposal at WIPP is performed in accordance with the procedures described in the WIPP Hazardous Waste Facility Permit. The following summarizes these requirements, as presented in the "Los Alamos National Laboratory Transuranic Waste Quality Assurance Project Plan" (QAPjP) (LANL, 2003). MTRUW not destined for WIPP is characterized as described in Section C.3.2.2 of this WAP. All MTRUW will undergo characterization to determine its prohibition status with regard to the land disposal restrictions of 40 CFR Part 268.

Initial characterization of both homogeneous and heterogeneous MTRUW is based primarily on AK. Additional characterization to meet WIPP certification procedures will be implemented at appropriate LANL or other facilities to meet requirements of the WIPP WAP permit conditions.

Pursuant to WIPP certification and WIPP WAP requirements, further characterization of homogeneous waste will 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 or other facilities using AK, headspace gas sampling, RTR, and visual examination. MTRUW not destined for WIPP but stored at LANL is characterized using the routine procedures used for hazardous waste and MLLW, as discussed in Section C.3.2.2.

The MTRUW streams described in Section C.1.2.3 are categorized by Summary Category Groups based on the physical and chemical form of the waste. Homogeneous waste streams in the solid process residue (Summary Category Group S3000), soil/gravel (Summary Category Group S4000), or aqueous liquids/slurries (Summary Category Group L1000) categories may contain RCRA-regulated VOCs, SVOCs, and metals and will be characterized using AK and/or sampling and analysis. Debris waste streams (Summary Category Group 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 components using AK based on examination of the original materials and operations from which the waste was generated, followed by RTR, visual examination, and headspace gas sampling.

MTRUW stored at Area G without secondary containment must contain no free liquids.

The QAPjP referenced above addresses MTRUW characterization procedures to be utilized after the waste is stored at LANL. These procedures were developed primarily to meet the 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. Because the QAPjP and other WIPP permit-derived documents addressing MTRUW characterization 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.

LANL has prepared a records inventory and disposition schedule for all waste characterization data and related QA/QC records for MTRUW to be shipped to WIPP. These documents will be

maintained in the Facility operating record until the Department has approved the closure certification statements for the applicable permitted storage unit in Area G.

C.3.2.1 LANL TRU Waste Certification Plan

The LANL TRU Waste Certification Plan (LANL, 2002) incorporates the certification requirements of the "Waste Acceptance Criteria for the Waste Isolation Pilot Plant" (WIPP WAC) (DOE, 2002a or most recent version) for MTRUW that will be sent to that site. It establishes the programmatic framework and requirements within which waste generators 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 AK information are evaluated. Once this documentation has been prepared, it is subject to review and approval by certification program personnel. Waste generators also participate in external audits, as required by the QAPjP and the LANL TRU Waste Certification Plan, to verify the characterization and certification process. If the requirements of the WIPP WAC and the "TRUPACT-II Authorized Methods for Payload Control" (DOE, 2002b) are met, the waste will be certified and transported to WIPP.

C.3.2.1.1 Acceptable Knowledge

AK characterization procedures for MTRUW stored at LANL prior to certification for WIPP acceptance are the same as those described in Section C.3.1.1. The QAPjP (LANL, 2003) describes how LANL ensures compliance with the WIPP requirements associated with the compilation, confirmation, and administrative controls of AK information. LANL-specific procedures consistent with the WIPP WAP are used to implement AK as part of the LANL TRU waste certification program for WIPP to ensure the AK information is compiled in an auditable record, the facility and MTRUW management operations are described and correlated to specific waste stream information, prohibited wastes are identified and segregated, discrepancies in AK are resolved, and the appropriate EPA Hazardous Waste Numbers are assigned.

C.3.2.1.2 Real-Time Radiography [20.4.1 NMAC § 264.13(b)(2), and 20.4.1 NMAC § 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 prohibited items and that the physical form requirements of the

WIPP WAC are met. At the same time, RTR will verify the waste classification (i.e., Summary Category Group) and waste form determined using AK. All MTRUW containers will be analyzed by RTR, and the results for each waste container will be documented. An RTR data form will be used to document the types and quantities of material types observed in each container.

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 permit.

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 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 MTRUW are based on Attachment B1, "Waste Characterization Sampling Methods," Section B1-3, "Radiography" (NMED, 2003).

C.3.2.1.3 Visual Examination [20.4.1 NMAC § 264.13(b)(2), and 20.4.1 NMAC §270.14(b)(2)]

The contents of select MTRUW containers will be visually examined to confirm RTR results, or visual examination may be used in lieu of RTR. Visual examination will also verify aspects of AK amenable to visual confirmation. For example, the visual examination will verify the physical characteristics of a waste and the associated Summary Category Group (i.e., Summary Category Group 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 AK 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 MTRUW are based on Attachment B1, "Waste Characterization Sampling Methods," Section B1-3b(3), "Visual Examination" (NMED, 2003).

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 containers by selecting a number of containers 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 permit, Attachment B2, "Statistical Methods Used in Sampling and Analysis," Section B2-1, "Approach for Statistically Selecting Waste Containers for Visual Examination" (NMED, 2003). The following table is an example of how the number of MTRUW 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 permit.

Number of Waste Containers Requiring Visual Examination:

Annual Number of Waste Containers Undergoing Characterization	Number of Waste Containers Requiring Visual Examination					
50	22	22	22	22	29	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

LANL uses the miscertification rate observed at LANL in the previous year to determine the appropriate number of containers for visual examination.

C.3.2.1.4 Headspace Gas Sampling [20.4.1 NMAC §§ 264.13(b)(2) and (3), and 20.4.1 NMAC § 270.14(b)(2)]

Headspace gas sampling and analysis is a qualitative screening technique used to confirm the presence of certain regulated hazardous constituents. This method of characterization includes sampling and analysis of headspace gas from the container headspace. In order to meet the characterization requirements in the WIPP permit, the headspace of all containers in storage will be sampled and analyzed as the containers are characterized for shipment to WIPP. 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 QAPjP QA objectives through analysis of field QC samples and adherence to QC practices. Sampling and analysis methods for the determination of VOCs in the headspace of MTRUW containers must meet the requirements in the WIPP WAP.

C.3.2.1.5 Solid Waste Sampling and Analysis

The following describes the methods for collecting samples of MTRUW classified as homogeneous solids or soils. Sampling protocol is based on requirements in the WIPP WAP. These sampling methods are similar to those approved by EPA for solid waste and soil sampling in the most recent version of *SW-846*; in "Standard Practice for Thin-Walled Tube Sampling of

Soils" (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 MTRUW classified as homogeneous solids or soils is packaged as a monolith in waste containers or in smaller containers within the outermost waste container. For waste containers 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 are analyzed are listed in Table C-18.

To accomplish sampling of these wastes, the techniques described below have been developed for sample collection. The methods used to collect samples from the monolithic waste containers or smaller containers must be such that the samples are representative of the waste from which they are taken. For containers of monolithic 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 container.

Sample Core Collection

Coring tools must be used to collect cores of homogeneous solids or soils from waste 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 will be used in lieu of a rotational coring tool. Requirements for coring tools are presented in the WIPP WAP.

Statistical Approach for Selection of Homogeneous Waste Containers

A statistical approach will be used to select homogeneous waste containers 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 AK and, thus, represent populations that contain similar waste. The specific method for calculating the number of drums for sampling is found in the WIPP permit. 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.

C.3.2.2 Non-WIPP Mixed TRU Waste Characterization

MTRUW may be generated, re-characterized, or accepted at LANL that is not currently destined for characterization and shipment to WIPP and subject to the WIPP certification requirements. Examples of this type of waste stream are MTRUW that is not generated by defense programs and items that are not compliant with the WIPP WAC.

Characterization procedures for these types of wastes will consist of the same procedures as those described for hazardous waste and MLLW in Section C.3.1 of this plan. These wastes will be characterized using AK and/or sampling and analysis on the same basis as discussed in Section C.3. AK for these wastes can also include additional AK verification procedures for MTRUW, as discussed in Section C.3.2.1, depending on the waste type.

C.3.2.3 Characterization Procedures for Treatment of Mixed TRU Wastes

This section presents waste analysis information specific to treatment in the cementation unit at TA-55. It addresses only the hazardous component of mixed waste treated in the cementation unit.

The cementation unit is a Subpart X miscellaneous unit pursuant to 20.4.1 NMAC, Subpart 500, Part 264, Subpart X [6-14-00], and is used to treat liquid and solid mixed wastes by stabilization in cement to form a noncorrosive solid matrix. The cementation unit is located in Glovebox GB-454 along the west wall of TA-55, Building 4 (TA-55-4), in Room 401, and consists of a pH adjustment column, vacuum trap, two motor-driven mixers, four impellers, associated support structures, a glovebox, and piping.

The cementation unit treats homogeneous liquid and solid mixed waste generated primarily from R&D and processing and recovery operations at TA-55 and at the Chemistry and Metallurgy Research Building at TA-3. The liquid wastes (Summary Category Group L1000) generally consist of evaporator bottoms solutions and laboratory solutions that may exhibit the hazardous characteristics of corrosivity and toxicity for metals (including arsenic, barium, cadmium, chromium, lead, mercury, and silver), as defined in 20.4.1 NMAC §§ 261.22 and 261.24 [6-14-00], respectively. The homogeneous solid process wastes (Summary Category Group S3000) generally consist of process residue from the evaporator, process leached solids, filter cake, and other miscellaneous solids. This waste stream typically exhibits the hazardous characteristics of toxic metals. These waste streams will be mixed with cement in 55-gallon drums and allowed to cure into a noncorrosive solid matrix. Table C-19 provides a description of the waste streams

associated with the cementation unit and identifies their potentially applicable EPA Hazardous Waste Numbers. The resulting cemented waste is identified by Summary Category Group S3000 and typically carries the Waste Matrix Code S3100. A general description of the Summary Category Groups and WMCs is provided in Section C.1.2.3.

C.3.2.3.1 Characterization Procedures for Waste to Be Treated by Cementation

Chemical and physical characterization is performed prior to treatment of MTRUW, in accordance with 20.4.1 NMAC § 264.13 [6-14-00]. Documented AK, as described in Section C.3.1.1, is used to determine whether the waste stream is regulated as a hazardous waste. Process knowledge and/or chemical analytical data will be utilized to adequately characterize the MTRUW prior to cementation. If process information is not sufficient, the wastes to be treated by cementation may be periodically sampled and analyzed for pH and for TC metals listed in 20.4.1 NMAC § 261.24 [6-14-00] to establish a baseline, as appropriate. Based on documented AK, these wastes do not contain VOCs or SVOCs. Parameters and analytical methods for specific hazardous constituents are presented in Table C-18.

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 MTRUW at TA-55 will comply with the LANL-specific protocol consistent with the most recent version of *SW-846*. For purposes of collecting a representative sample of MTRUW, 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. Specific information relative to sampling, parameters, and analytical methods is outlined in Tables C-11 and C-18. Reevaluation frequency is addressed in Section C.3.

C.3.2.3.2 Characterization Procedures for Waste Treated by Cementation

The treated cemented waste will be shipped to WIPP for disposal. Therefore, the treated waste will be characterized in accordance with the LANL QAPjP (LANL, 2003), which incorporates the characterization requirements of the WIPP WAP for waste to be shipped to WIPP. QAPjP characterization procedures for the treated wastes also meet the RCRA waste analysis requirements of 20.4.1 NMAC § 264.13(a) [6-14-00].

C.3.2.4 Sample Handling, Preservation, and Storage

Table C-15 presents the most recent *SW-846* requirements regarding sample containers, preservation techniques, and holding times associated with sample collection. Sampling personnel adhere to these requirements to ensure that sampling and analysis meet quality objectives for data.

C.3.2.5 Analytical Laboratory Selection and Analytical Methods

Analytical laboratory selection and methods for the purpose of certifying MTRUW for transportation to WIPP must be certified to the requirements of the WIPP WAP. For wastes to be stored at LANL, analytical laboratories at LANL and/or approved subcontractor laboratories will perform the detailed qualitative and quantitative chemical analyses specified in Table C-18 of this WAP. These laboratories must have:

- The capability of handling TRU waste
- A documented comprehensive QA/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 MTRUW 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).

Collectively, these factors contributed to the selection of the analytical methods specified in Table C-18. Qualified analytical laboratories at LANL and/or approved subcontractor laboratories that meet the above criteria will be used for the required analytes.

C.3.3 Remediation Waste Characterization

Remediation waste is defined in 20.4.1 NMAC § 260.10 as all solid and hazardous waste, and all media and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purposes of implementing corrective action requirements. At LANL, ER Project remediation wastes are generated from a wide variety

of activities, including, but not limited to, site investigations, corrective actions (e.g., interim actions, interim measures, voluntary corrective actions, voluntary corrective measures, and corrective measures study/corrective measures implementation), drilling projects, closures, and D&D activities. These remediation wastes consist primarily of contaminated soil and structural debris. Investigation-derived waste, a subset of remediation wastes, may include small amounts of samples, personal protective equipment, contaminated sampling supplies, plastic, environmental media (e.g., drill cuttings and/or core material, well development and purge waters), and decontamination fluids.

The Laboratory's ER Project has developed two standard operating procedures (SOP) to fully address characterization of remediation waste, which form the basis for the information provided in this WAP. The SOPs are subject to change and the following discussion is provided for information purposes only. The SOPs are "Management of Environmental Restoration Project Waste," ER-SOP-01.06 (LANL, 2001a), which describes the process for managing ER Project waste generated during corrective action, and "Waste Characterization," ER-SOP-01.10 (LANL, 2001b), which describes the development of a strategy for characterizing wastes generated during specific corrective action-related activities implemented by the ER Project. These SOPs provide specific, mandatory, and uniform procedures for managing and characterizing remediation waste and incorporate, by reference, the most current version of Laboratory Implementation Requirements (LIR) and Laboratory Implementation Guidance (LIG) associated with waste management.

ER-SOP-01.06 provides definitions and references for all types and categories of waste, corresponding waste documentation, waste management personnel, and applicable ER Project policies. The SOP describes training requirements for any ER Project personnel managing waste, and references ER-SOP-01.10 for the completion of a Waste Characterization Strategy Form (WCSF).

ER-SOP-01.10 identifies the steps involved in waste identification and characterization as delineated by Laboratory requirements, and provides instructions for completing a WCSF. A WCSF must be completed by ER Project personnel and subsequently reviewed and approved by appropriate personnel prior ER Project waste generation. The WCSF process for ER Project remediation waste is used in conjunction with current LIRs and LIGs associated with waste characterization and management, and with the Laboratory's current WAC document.

Completion of a WCSF includes the following steps:

- Identify potential wastes to be generated by the proposed activity through reviewing historical site information, including previously developed ER Project data and reports regarding the project site.
- Determine whether the existing data and/or documentation for the waste stream fulfill the criteria for AK specified in LIG 404-00-02, "Acceptable Knowledge Guidance."
- If the existing data do not fulfill the AK criteria specified in the LIG, develop a waste analysis suite and select test methods appropriate to identify and quantify potential contaminants. If the existing data are partially useful, develop a sampling and analysis strategy that will complete the characterization for the waste stream. If the existing data provide no useful information, develop a sampling and analysis strategy that will identify and quantify all potential constituents of concern in the waste stream.
- Identify preliminary classifications of wastes to be generated. Classifications include, but are not limited to, radioactive (including low-level and mixed low-level), RCRA solid or hazardous, polychlorinated biphenyl, and special. Wastes may be combinations of these classifications.
- List the anticipated amount of waste, by classification, to be generated as part of the ER Project activity.
- List packaging requirements.

The WCSF for a specific ER Project site or activity is amended when a new waste type or classification not previously identified on the form is to be generated or there are changes in planned field activities. Once approved, the amendment becomes part of the original WCSF. The WCSF, with instructions on its completion, is included in ER-SOP-01.10.

The information provided in a WCSF is used to aid the classification of waste generated by an ER Project activity. Waste characterization documentation is prepared for each type of waste generated and is used to document the actual characterization of a specific waste stream described in the WCSF.

Remediation waste will be characterized to fully comply with all Hazardous Waste Permit waste characterization requirements.

C.4 OFF-SITE WASTE ACCEPTANCE PROCEDURES [20.4.1 NMAC §§ 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 20.4.1 NMAC §§ 264.13(a)(3)(ii), 264.13(a)(4), 264.13(b)(5), and 264.13(c) [6-14-00]. Table 2-2 of the General Part B Permit Renewal Application (LANL,

2003) lists off-site waste-generating facilities that may send waste to LANL. Specific descriptions of the waste streams to be received by LANL from these facilities and the appropriate waste characterization documentation and acceptance procedures are included in Supplement 1 of this General Part B Permit Renewal Application. 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 will be used to examine the waste and its documentation, if the information provided by the generator is insufficient to meet LANL WAC.

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 LANL, 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, the Department will be notified of the discrepancy within five days, and the waste will be returned to the off-site generator within 90 days, unless the generator provides an acceptable resolution to the discrepancy within 90 days after receipt of the waste.

If TA-54 accepts hazardous waste from an off-site facility, each shipment is inspected and analyzed as necessary to determine that it matches the waste identified on the waste manifest. These requirements are reiterated under LDR.

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

C.5 SPECIAL PROCEDURAL REQUIREMENTS [20.4.1 NMAC § 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.

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

Pursuant to 20.4.1 NMAC § 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 as described in Section C.3, they are labeled appropriately, and the waste types are physically segregated within each container storage unit. Wastes are segregated and stored, as appropriate, 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.

C.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 20.4.1 NMAC § 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 or OD. LANL relies on SOPs, hazard control plans, and other formal 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 or 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.

The cementation unit will not treat ignitable, reactive, or incompatible mixed waste.

C.5.3 Procedures to Ensure Compliance with LDR Requirements [20.4.1 §§ 268.7(a) and 268.7(b)(3), (4), and (5)]

The LDRs contained in 20.4.1 NMAC, Subpart 800, Part 268, identify hazardous wastes restricted from land disposal; define those circumstances under which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage, or disposal unit; specify treatment standards; and describe testing, tracking, and recordkeeping requirements for

generators and TSDFs. This section describes the approach used by LANL treatment and storage facilities to comply with LDR requirements.

The characterization documentation for all waste streams to be treated or stored on-site is reviewed as described in Section C.3. The documentation is evaluated:

- To ensure that appropriate EPA Hazardous Waste Numbers and UHCs exceeding treatment standards are identified and that the wastes are accompanied by generator notifications/certifications, if required by 20.4.1 NMAC § 268.7(a).
- To determine whether the waste is exempt or excluded, already meets the treatment standards, or must be treated on site, off site, or both to meet all treatment standards.
- To identify the appropriate TSDF to which the waste will next be sent.

LANL maintains the waste characterization data and other records, as specified in Section C.3.

If waste is to be treated on site to meet the LDR requirements, the treatment unit must comply with the testing and reporting requirements of 20.4.1 NMAC § 268.7(b). LANL will identify and document ahead of treatment all waste whose treatment goal it is to meet the LDR requirements. After treating the waste, the treated waste/residue is evaluated to determine whether all treatment standards have been met. The treatment standards are defined in 20.4.1 NMAC §§ 268.40, 268.45, 268.48, or 268.49, depending on the type of waste treated. Residues from wastes with concentration-based treatment standards are analyzed by the appropriate methods described in Section C.3.1.2 to assure that the waste meets applicable treatment standards. For wastes or contaminated soil with treatment standards expressed by the waste extract, the TCLP procedures described in Sections C.3.1.2.1 or C.3.1.2.2 will be used.

The treatment facility prepares the certifications appropriate to excluded debris treated to 20.4.1 NMAC § 268.45 alternative standards, soil treated to 20.4.1 NMAC § 268.49 standards, characteristic wastes for which all characteristics have been treated and all Universal Treatment Standards have been met, characteristic wastes for which all characteristics have been treated but not all treatment standards are achieved, and/or other special certifications required for materials such as soil. New waste characterization documentation, incorporating the treatment facility paperwork requirements of 20.4.1 NMAC § 268.7(b) or the generator paperwork requirements of 20.4.1 NMAC § 268.7(a) if the residue is considered a newly-generated waste or is being shipped to another TSDF, is prepared for the treated waste/residue, as appropriate.

The certifications/notifications and waste characterization documentation are used to determine where the waste will be sent for further treatment, storage, or disposal. The appropriate 20.4.1 NMAC § 268.7(a) notifications are prepared before sending any waste subject to LDR to an off-site TSDF. Most receiving facilities have their own WAC requirements, specifying how the LDR information will be submitted. The receiving facilities usually require that analytical data be provided before the waste is shipped to ensure the waste meets their WAC. Waste may be sent to TA-54 or other LANL storage units after treatment or directly off-site from the treatment facility.

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 20.4.1 NMAC §268.7(b), as discussed above.

As a permitted storage facility, LANL must comply with the 20.4.1 NMAC, Subpart VIII, Part 268, Subpart E, prohibitions on storage. Generally, wastes subject to LDR can be stored no longer than one year. However, the LDRs provide relief from the storage prohibition for wastes that have received a variance or waiver from treatment or have no practical disposal alternative. Other rulemaking may also exempt waste from LDR. The 1992 Federal Facility Compliance Act (Pub.L. 102-386, 106 Stat. 1505) exempts LANL's mixed waste from the storage prohibitions under 20.4.1 NMAC, Subpart VIII, Part 268, so long as LANL is in compliance with a state-issued order and Site Treatment Plan (STP). NMED issued LANL an FFCO and approved an STP setting forth schedules for LDR compliance. While LANL is in compliance with its FFCO and STP the storage prohibition under 20.4.1 NMAC, Subpart VIII, Part 268 does not apply to mixed waste covered by the FFCO. However, to determine the applicability of the storage prohibition and because LANL must comply with the 20.4.1 NMAC, Subpart VIII, § 268.3 prohibitions on dilution, LANL will characterize all hazardous wastes, including mixed waste covered by the FFCO, to determine its prohibition status with regard to the land disposal restrictions of 40 CFR Part 268.

C.5.4 Procedures to Ensure Compliance with Subpart CC Requirements [40 CFR § 264.1082]
LANL waste streams described in this document may be subject to 40 CFR, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on applicability criteria specified in 40 CFR § 264.1080. For wastes that are not eligible for exemption under 40 CFR §264.1080(b), LANL will address the applicable Subpart CC characterization requirements. LANL requires that Subpart CC requirements be evaluated as

part of the waste characterization process. Generator information is used to determine whether the concentration of VOCs in a waste stream at the point of generation is less than 500 parts per million by weight (ppmw), or is equal to or greater than 500 ppmw. The generator documents this determination for that waste stream. AK or process knowledge will 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 C-16, C-17, and C-18.

The characterization documentation for VOCs will be reviewed prior to acceptance of the waste at TA-54, as discussed in Section C.3. If process knowledge is insufficient, sampling and analysis of the waste will be required, in accordance with 20.4.1 NMAC §§ 265.1084(a)(2) through 265.1084(a)(4). Any hazardous waste that is newly-generated through the treatment or re-characterization of mixed waste will be characterized for the volatile organic content.

C.6 REFERENCES

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NMED, 2003, Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit, NM 4890139088, November 26, 1999, as revised.

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

Table C-1

Regulatory References and

Corresponding Waste Analysis Plan Location

Regulatory Citation(s)	Description of Requirement	Location in the Application Waste Analysis Plan
§264.13	General waste analysis	Throughout document
§264.13(a)(1)	A detailed chemical and physical analysis of a representative sample of the waste prior to treatment, storage, or disposal of the waste	B.2, B.3
§264.13(a)(2)	Analysis may include data developed under Part 261 and existing published or documented data on the hazardous waste or on hazardous waste generated from similar processes	B.3.1, B.3.2, B.3.3
§264.13(a)(3)	Analysis must be repeated as necessary to ensure that it is accurate and up to date	B.3.1, B.3.2, B.3.3
§264.13(a)(3)(i)	Analysis repeated when owner/operator has reason to believe that the process or operation generating the hazardous wastes, or nonhazardous wastes if applicable under § 264.113(d), has changed	B.3.1, B.3.2, B.3.3
§264.13(a)(3)(ii)	For off-site facilities, analysis repeated when the results of the inspection required in § 264.13(a)(4) indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper	B.4
§264.13(a)(4)	Owner/operator of an off-site facility must inspect and, if necessary, analyze each hazardous waste received to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper	B.4
§264.13(b)	Development and implementation of waste analysis plan	Entire document
§264.13(b)(1)	Parameters for which each hazardous waste, or non-hazardous waste if applicable under § 264.113(d), will be analyzed and the rationale for selection of the parameters	B.2, Tables B-9, B-10, B-11, and B-12
§264.13(b)(2)	Test methods which will be used for the proposed parameters	B.3, Tables B-13, B-14, B-16, B-17, and B-18
§264.13(b)(3)	Sampling method which will be used to obtain a representative sample of the waste to be analyzed	B.3
§264.13(b)(3)(i)	Sampling methods described in Appendix I of Part 261	B.3.1, B.3.2, B.3.3
§264.13(b)(3)(ii)	An equivalent sampling method	B.3.1, B.3.2, B.3.3
§264.13(b)(4)	Frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date	B.3.1, B.3.2, B.3.3

Table C-1 (Continued)

Regulatory Citation(s)	Description of Requirement	Location in the Waste Analysis Plan
§264.13(b)(5)	For off-site facilities, the waste analyses that hazardous waste generators have agreed to supply	B.4
§264.13(b)(6)	Where applicable, the methods to meet additional waste analysis requirements for specific waste management methods as specified in § 264.17 (ignitable, reactive, or incompatible), § 264.314 (bulk and containerized liquids), § 264.341 (waste analysis for incinerators), § 264.1034(d) (Subpart AA), § 264.1063(d) (Subpart BB), § 264.1083 (Subpart CC), and § 268.7 (Land Disposal Restrictions)	B.5
§264.13(b)(7)	The procedures and schedules for surface impoundments exempted from land disposal restrictions under § 268.4(a)	NA
§264.13(b)(7)(i)	Sampling of impoundment contents	NA
§264.13(b)(7)(ii)	Analysis of test data	NA
§264.13(b)(7)(iii)	Annual removal of residues which are not delisted under § 260.22 or which exhibit a characteristic of hazardous waste and either:	NA
§264.13(b)(7)(iii)(A)	Do not meet applicable treatment standards of Part 268, Subpart D; or	NA
§264.13(b)(7)(iii)(B)	Where no treatment standards have been established;	NA
§264.13(b)(7)(iii)(B)(1)	Such residues are prohibited from land disposal under § 268.32 or the Resource Conservation and Recovery Act § 3004(d); or	NA
§264.13(b)(7)(iii)(B)(2)	Such residues are prohibited from land disposal under § 268.33(f)	NA
§264.13(b)(8)	For owner/operator seeking an exemption to the air emission standards of Subpart CC in accordance with § 264.1082	B.5.4
§264.13(b)(8)(i)	If direct measurement is used for the waste determination, the procedures and schedules for waste sampling and analysis and the results of the analysis of test data to verify the exemption	B.5.4
§264.13(b)(8)(ii)	If knowledge of the waste is used for the waste determination, any information prepared by the facility owner/operator or by the generator of the hazardous waste if the waste is received from off-site, that is used as the basis for knowledge of the waste	B.5.4
§264.13(c)	For off-site facilities, the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper	B.4

Table C-1 (Continued)

Regulatory Citation(s)	Description of Requirement	Location in the Waste Analysis Plan
§264.13(c)(1)	The procedures to determine the identity of each movement of waste managed at the facility	B.4
§264.13(c)(2)	The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling	B.4
§264.13(c)(3)	The procedures for an off-site landfill receiving containerized hazardous wastes to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container	NA

[a] NA = not applicable

Table C-2

Descriptions of Hazardous Waste Stored at LANL

Waste Description [a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Spent Solvents	Research and development (R&D) activities; laser research; organic and inorganic chemistry research (e.g., solvent extractions, liquid chromatography solvents, polymer synthesis, and distillations); cleaning; and degreasing operations	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]	Acetone, Acetonitrile, Antimony, Benzene, Cadmium, Cyanides (Total), 1,2-Dichloroethane, 1,4-Dioxane, Ethyl ether, Methanol, Methylene chloride, Toluene, Trichloroethylene, Triethylamine
			D002	Corrosivity	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	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D026	Cresol	200.0[h]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D032	Hexachlorobenzene	0.13	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
			U213	Tetrahydrofuran	NA[e]	

Table C-2 (continued)

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Contaminated Solid Wastes	Machining operations, chemistry research, decontamination and decommissioning projects, metal finishing operations, HE wastewater filtration, and general maintenance operations	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]	Barium, Beryllium, Cadmium, Carbon disulfide, Chloroform, Chromium (Total), Ethel ether, Lead, Mercury-all others, Methanol, Methyl ethyl ketone, Methylene chloride, Nickel, Phenol, p,p'-DDT, Selenium, Silver, Thallium, Trichloroethylene
			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	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D023	o-Cresol	200.0[h]	
			D024	m-Cresol	200.0[h]	
			D025	p-Cresol	200.0[h]	
			D026	Cresol	200.0[h]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D031	Heptachlor (and its epoxide)	0.008	
			D032	Hexachlorobenzene	0.13	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0[f]	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogented solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
			K045	Spent carbon	NA[e]	

Table C-2 (continued)

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Paint and Related Wastes	Painting and finishing operations, and general facility maintenance	Acceptable Knowledge[d] Sampling and Analysis	D001 D005 D006 D007 D008 D009 D011 D036 F003 F005	Ignitability Barium Cadmium Chromium Lead Mercury Silver Nitrobenzene Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] 100.0 1.0 5.0 5.0 0.2 5.0 2.0 NA[e] NA[e]	Lead, Methyl ethyl ketone
Photographic and Photocopier Wastes	Photographic film processing and photocopier operations	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D006 D007 D008 D011	Ignitability Corrosivity Cadmium Chromium Lead Silver	NA[e] NA[e] 1.0 5.0 5.0 5.0	Silver
Corrosive Liquid Wastes	Analytical chemistry research, electro-etching, and electro-polishing	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D038 F002 F003 F005 P023	Ignitability Corrosivity Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform Pyridine Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Chloroacetaldehyde	NA[e] NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 5.0 NA[e] NA[e] NA[e] NA[e]	Acetone, Arsenic, Barium, Cadmium, Chromium (Total), Cyanides (Total), 2,4-Dinitrophenol, Fluoride, Isobutyl alcohol, Lead, Mercury-all others, Methanol, Nickel, o-Nitrophenol, Selenium, Silver, Sulfide, Thallium, Triethylamine, Zinc

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	Arsenic, Lead, Nickel, Silver
Waste Description[a]	**Waste-Generating Process[a]**	**Basis for Characterization[a]**	**Potential EPA[b] Hazardous Waste Numbers**	**Potential Hazardous Waste Constituents and/or Characteristics**	**Regulatory Limits[c] (milligrams per liter)**	**Potential Underlying Hazardous Constituents**
Contaminated Non-corrosive Aqueous and Non-aqueous Solutions and Sludges	Vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D023 D024 D025 D026 D027 D028 D029 D030 D032 D033 D034 D035 D036 D037 D038 D039 D040 D041	Ignitability Corrosivity Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform o-Cresol m-Cresol p-Cresol Cresol 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethylene 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Methyl ethyl ketone Nitrobenzene Pentrachlorophenol Pyridine Tetrachloroethylene Trichloroethylene 2,4,5-Trichlorophenol	NA[e] NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0[h] 200.0[h] 200.0[h] 200.0[h] 7.5 0.5 0.7 0.13[f] 0.13[f] 0.5 3.0 200.0 2.0 100.0 5.0 0.7 0.5 400.0	Acetone, Acetonitrile, Antimony, Arsenic, Barium, Benzene, Cadmium, Carbon tetrachloride, Chromium (Total), Chrysene, p-Cresol, m-Dichlorobenzene, 1,2-Dichloroethane, 4,6-Dinitro-o-cresol, 1,4-Dioxane, Fluorene, Indeno(1,2,3-c,d) pyrene, Lead, Mercury-all others, Methanol, Methyl ethyl ketone, Methylene chloride, Naphthalene, p-Nitrophenol, Pyridine, Selenium, Silver, Tetrachloroethylene, Toluene, Trichloroethylene, 2,4,6-Trichlorophenol, Zinc

			D042 D043 F001 F002 F003 F004 F005	2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	2.0 0.2 NA[e] NA[e] NA[e] NA[e] NA[e]	
Waste Description[a]	**Waste-Generating Process[a]**	**Basis for Characterization[a]**	**Potential EPA[b] Hazardous Waste Numbers**	**Potential Hazardous Waste Constituents and/or Characteristics**	**Regulatory Limits[c] (milligrams per liter)**	**Potential Underlying Hazardous Constituents**
Mercury Wastes	Lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance	Acceptable Knowledge[d] Sampling and Analysis	D003 D008 D009 D011 U151	Reactivity Lead Mercury Silver Mercury	NA[e] 5.0 0.2 5.0 NA[e]	Barium, Chromium (Total), Mercury-all others, Thallium, Zinc
Used Batteries and Battery Fluids	Equipment maintenance	Acceptable Knowledge[d]	D002 D003 D006 D007 D008 D009 D011 D038	Corrosivity Reactivity Cadmium Chromium Lead Mercury Silver Pyridine	NA[e] NA[e] 1.0 5.0 5.0 0.2 5.0 5.0[f]	Cadmium, Lead, Pyridine, Silver
Unused/Off-specification Commercial Chemical Products	R&D, spill residues, and general facility operations	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 through D043 All P- and U-listed EPA Hazardous Waste Numbers[g]	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] -[c] NA[e]	Acetonitrile, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Nickel, Selenium, Silver, Toluene

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
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]	
Environmental Restoration (ER) Soils and Sludges	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closures	Acceptable Knowledge[d] Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D030 D032 D033 D034 D036 D039 D040 D042 F001 F002 F003 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Tetrachloroethylene Trichloroethylene 2,4,6-Trichlorophenol Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 0.13[f] 0.13[f] 0.5 3.0 2.0 0.7 0.5 2.0 NA[e] NA[e] NA[e] NA[e]	Barium, Cadmium, Lead

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
ER Aqueous Liquids	Decontamination of remedial equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated storm water 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	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
ER Debris	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closures	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Barium, Lead
			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	
ER Debris (continued)			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

a Denotes information from the Los Alamos National Laboratory waste characterization documentation 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 (20.4.1 NMAC), Subpart II, Part 261, Subpart C [6-14-00].

d Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 Not 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 (20.4.1 NMAC, 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 General Part A Permit Application," Revision 3.0, 2002, Los Alamos National Laboratory, Los Alamos, New Mexico.

h If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table C-3

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 Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes						
Soils with Heavy Metals	Decontamination and decommissioning (D&D) and Environmental Restoration (ER) activities	Acceptable Knowledge[d] and Preliminary Analysis[e]	D004 D005 D006 D007 D008 D009 D010 D011	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0	Arsenic, Barium, Chromium (Total), Mercury-all others, Selenium, Vanadium, Zinc
Environmental Restoration Soils	Remediation of release sites and D&D activities	Acceptable Knowledge[d] Sampling and Analysis	D005 D006 D007 D008 D009 D028 D029 F001 F002 F004 F005	Barium Cadmium Chromium Lead Mercury 1,2-Dichloroethane 1,1-Dichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	100.0 1.0 5.0 5.0 0.2 0.5 0.7 NA[e] NA[e] NA[e] NA[e]	Chromium (Total), Lead
Inorganic Solid Oxidizers	D&D of research laboratories and research and development (R&D)	Acceptable Knowledge[d]	D001 D003 D005	Ignitability Reactivity Barium	NA[e] NA[e] 100.0	
Lead Waste	Radioisotope experiments and other reactor, accelerator, laser, and x-ray activities	Acceptable Knowledge[d]	D002 D003 D007 D008 D009	Corrosivity Reactivity Chromium Lead Mercury	NA[e] NA[e] 5.0 5.0 0.2	Lead
Noncombustible Debris	Maintenance, D&D, R&D, and ER activities	Acceptable Knowledge[d]	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Spent halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 NA[e] NA[e]	Arsenic, Cadmium, Chromium (Total), Lead, Mercury-all others

Table C-3 (continued)

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes (Continued)						
Combustible Debris	Maintenance, R&D, D&D, and ER activities	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Lead, Mercury-all others, Nickel, Zinc
			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	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
Organic-Contaminated Noncombustible Solids	Vacuum pump maintenance, R&D, D&D, and ER activities	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Methoxychlor, Methyl ethyl ketone
			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	
			D027	1,4-Dichlorobenzene	7.5	
			D030	2,4-Dinitrotoluene	0.13[f]	
			D032	Hexachlorobenzene	0.13[f]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0[f]	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

Table C-3 (continued)

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes (Continued)						
Organic-Contaminated Combustible Solids	Maintenance, D&D, and ER activities	Acceptable Knowledge[d]	D001 D003 D007 D008 D009 D030 D035 F001 F002 F003 F005	Ignitability Reactivity Chromium Lead Mercury 2,4-Dinitrotoluene Methyl ethyl ketone Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 5.0 0.2 0.13[f] 200.0 NA[e] NA[e] NA[e] NA[e]	
Water-Reactive Wastes	Cleanup of HE firing-site debris, machining and disassembly of test components	Acceptable Knowledge[d]	D001 D003 D005 F002	Ignitability Reactivity Barium Spent halogenated solvents	NA[e] NA[e] 100.0 NA[e]	
Mercury Wastes	Cleanup operations	Acceptable Knowledge[d]	D005 D007 D008 D009 F001	Barium Chromium Lead Mercury Spent halogenated solvents	100.0 5.0 5.0 0.2 NA[e]	Mercury-all others
Unused Solid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge[d]	D001 D002 D003 All P- and U-listed EPA Hazardous Waste Numbers[h]	Ignitability Corrosivity Reactivity Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] NA[e]	

Table C-3 (continued)

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes						
Spent Solvents and Contaminated Solvent Mixtures	Maintenance, cleaning, and degreasing activities: R&D; processing operations, such as extraction, bench-scale experimental inorganic chemistry, environmental analysis, radiochemistry	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Tribromomethane (Bromoform)
			D002	Corrosivity	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	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D030	2,4-Dinitrotoluene	0.13[f]	
			D032	Hexachlorobenzene	0.13[f]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D036	Nitrobenzene	2.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
Liquid Wastes (Continued)						
Corrosive Liquid Wastes	Radiochemistry research, plutonium-processing operations, and analytical chemistry	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Arsenic, Barium, Bromodichloromethane, Chromium (Total), Lead, Nickel, Silver
			D002	Corrosivity	NA[e]	
			D004	Arsenic	5.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D036	Nitrobenzene	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

Aqueous and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	ER activities, metal-polishing operations, and radiochemistry research	Acceptable Knowledge[d] Sampling and Analysis[i]	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D023 D024 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform o-Cresol m-Cresol Spent halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0[g] 200.0[g] NA[e] NA[e]	Chromium (Total), 1,2-Dichloroethane, Selenium
Liquid Wastes (Continued)						
Oil Wastes	Equipment maintenance operations	Acceptable Knowledge[d]	D004 D005 D006 D007 D008 D009 D010 D018 D019 D027 D028 D030 D032 D033 D034 D036 D037 D038 D041 D042 D043 F001 F002 F003 F005	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Benzene Carbon tetrachloride 1,4-Dichlorobenzene 1,2-Dichloroethane 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Pentrachlorophenol Pyridine 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	5.0 100.0 1.0 5.0 5.0 0.2 1.0 0.5 0.5 7.5 0.5 0.13[f] 0.13[f] 0.5 3.0 2.0 100.0 5.0[f] 400.0 2.0 0.2 NA[e] NA[e] NA[e] NA[e]	Diethylphthalate, Di-n-butyl phthalate, Hexachlorobenzene, Hexachlorocyclopentadiene, Nitrobenzene, Thallium, 2,4,5-Trichlorophenol, Silver
Unused Liquid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge[d]	D001 D002 D035 All P- and U-listed EPA Hazardous Waste Numbers[h]	Ignitability Corrosivity Methyl ethyl ketone Discarded commercial chemical products and off-specification species	NA[e] NA[e] 200.0 NA[e]	

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 Los Alamos National Laboratory waste characterization documentation database.

[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 (20.4.1 NMAC), Subpart II, Part 261, Subpart C [6-14-00].

[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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] Not 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 (20.4.1 NMAC, Subpart II, 261.24, Table 1 [6-14-00]).

[g] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter.

[h] Refers to the P- and U-listed wastes found in the "Los Alamos National Laboratory General Part A Permit Application," Revision 3.0, 2002, Los Alamos National Laboratory, Los Alamos, New Mexico.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table C-4

LANL MTRUW Stream Waste Matrix Codes Correlated with LANL Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	A-25	Leached Process Residues	002	Cemented Aqueous Waste	LA111	Solidified Aqueous or Homogeneous Inorganic Solids
			A-26	Evaporator Bottoms/Salts	006	Solidified Inorganic and Organic Process Solids	LA114	Solidified Inorganic Process Solids
			A-76	Cement Paste				
	S3100	Homogeneous Inorganic, Cemented Organics					LA126	Solidified Organic Process Solids
	S3100	Homogeneous Inorganic, Non-cemented	A-75	Chemical Treatment Sludge	003	Stabilized Aqueous Waste (dewatered sludge)	LA122	Solid Inorganic Waste
							LA130	Ash
	S3100	Homogeneous Inorganic, Salts	A-27	Nitrate Salts		Salt Waste	LA124	Pyrochemical Salt Waste
			A-28	Chloride Salts				
			A-29	Hydroxide Cake				
	S3100	Homogeneous Inorganic, Vermiculite	A-20	Hydrocarbon Oil – Liquid (Absorbed)			LA112	Solidified Organic Waste
			A-21	Silicon-Based - Liquid (Absorbed)				
S4000 – Soil/Gravel	S4100	Soil	A-90	Radioactively-Contaminated Soil				

Table B-4 (continued)

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S5000 - Debris	S5300	Combustible Debris	A-14	Combustible Decon Waste	004	Combustible Waste	LA116	Combustible Debris
			A-15	Cellulosics				
			A-16	Plastics				
			A-17	Rubber Materials				
			A-18	Combustible Lab Trash				
			A-35	Combustible Building Debris				
			A-40	Combustible Hot-Cell Waste				
			A-60	Other Combustibles				
	S5400	Heterogeneous Debris	A-10	Graphite Solids	001	Metal Scrap and Incidental Combustibles	LA115	Graphite Waste
			A-19	Combined Combustible/Non-Combustible Lab Trash	005	Combined Noncombustible / Combustible Waste	LA117	Metal Waste
			A-30	PN Equipment	005LG	Glass Waste	LA118	Glass Waste
			A-31	Non-PN Equipment	005LM	Metal Waste	LA119	HEPA Filter Waste
			A-36	Noncombustible Building Debris	005P1	Leaded Rubber and Metal Waste	LA123	Leaded Rubber and Metal Waste

Table C-4 (continued)

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]	IDC[b]	TRUCON Code[c]
			A-41 Noncombustible Hot-Cell Waste A-46 Skull and Oxide A-47 Slag and Porcelain A-50 Metal Crucibles, Scrap, Dies A-51 Precious Metals A-52 Scrap Metal A-55 Filter Media A-56 Filter Media Residue A-61 Other Noncombustibles A-72 Beryllium Contaminated Debris A-74 Ion Exchange Resin A-80 Irradiation Sources A-85 Firing Point Residues A-95 Glass	005P2G Graphite Waste	LA125 Mixed Combustible / Noncombustible Waste

[a] RSWD = Radioactive Solid Waste Disposal [codes]

[b] IDC = Item Description Code

[c] TRUCON = TRUPACT-II Content [codes]

Table C-5

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	Plutonium processing operations	Acceptable Knowledge[d]	D002	Corrosive	NA[e]	
					D003	Reactive	NA[e]	
					D004	Arsenic	5.0	
		Homogeneous Inorganic, Cemented Organics	Plutonium processing operations	Acceptable Knowledge[d]	D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
		Homogeneous Inorganic, Non-cemented	Plutonium processing operations	Acceptable Knowledge[d]	D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
		Homogeneous Inorganic, Salts	Plutonium processing operations	Acceptable Knowledge[d]	D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	

Table C-5 (continued)

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Vermiculite	Plutonium processing operations	Acceptable Knowledge[d]	D002	Corrosive	NA[e]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D027	1,4-Dichlorobenzene	7.5	
					D028	1,2-Dichloroethane	0.5	
					D030	2,4-Dinitrotoluene	0.13[g]	
					D032	Hexachlorobenzene	0.13[g]	
					D033	Hexachlorobutadiene	0.5	
					D034	Hexachloroethane	3.0	
					D035	Methyl ethyl ketone	200.0	
					D036	Nitrobenzene	2.0	
					D037	Pentachlorophenol	100.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D042	2,4,6-Trichlorophenol	2.0	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	

Table C-5 (continued)

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S4000 – Soil/ Gravel	S4100	Soil	D&D	Acceptable Knowledge[d]	D004	Arsenic	5.0	D004
					D005	Barium hydroxide	100.0	D005
					D006	Cadmium	1.0	D006
					D007	Chromium	5.0	D007
					D008	Lead	5.0	D008
					D009	Mercury	0.2	D009
					D010	Selenium	1.0	D010
					D011	Silver	5.0	D011
					D018	Benzene	0.5	D018
					D019	Carbon tetrachloride	0.5	D019
					D021	Chlorobenzene	100.0	D021
					D022	Chloroform	6.0	D022
					D035	Methyl ethyl ketone	200.0	D035
					D038	Pyridine	5.0[g]	D038
					D039	Tetrachloroethylene	0.7	D039
					D040	Trichloroethylene	0.5	D040
					F001	Spent halogenated solvents	NA[e]	F001
					F002	Spent halogenated solvents	NA[e]	F002
					F003	Spent non-halogenated solvents	NA[e]	F003
					F005	Spent non-halogenated solvents	NA[e]	F005

Table C-5 (continued)

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S5000 - Debris	S5300	Combustible Debris	Plutonium processing operations	Acceptable Knowledge[d]	D003	Reactive	NA[e]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
	S5400	Heterogeneous Debris	Plutonium processing operations; D&D	Acceptable Knowledge[d]	D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F004	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	
					U080	Methylene Chloride	NA[e]	

[a] This table is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), (TWCP-AK-2.1-019, R.0) (LA-UR-03-4870); and from waste characterization documentation information maintained by the Facility and Waste Operations Division. Waste with EPA Hazardous Waste Numbers that are not included in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit will not be transported to WIPP.

[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, additional characterization 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] Not Applicable.

[f] Potential underlying hazardous constituents (UHC) have been included, where the information is available. UHC characterization for the purpose of Land Disposal Restrictions will apply for mixed transuranic waste to be disposed of at WIPP.

[g] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table C-6

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 Water	Laboratory analysis; HE processing; maintenance, Environmental Restoration (ER), decontamination and decommissioning (D&D), research and development (R&D), and drilling 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
			D028	1,2-Dichloroethane	0.5
			D029	1,1-Dichloroethylene	0.7
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			D040	Trichloroethylene	0.5
			F001	Spent halogenated solvents	NA[d]
			F002	Spent halogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
HE-Contaminated Oil/Solvent Waste	Laboratory analysis; dissolving HE and polymers; HE production; spills; and ER, D&D, and R&D activities	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D002	Corrosivity	NA[d]
			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
			D029	1,1-Dichloroethylene	0.7
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
HE-Contaminated			D038	Pyridine	5.0

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)
Oil/Solvent Waste (Continued)			D040	Trichloroethylene	0.5
			F001	Spent halogenated solvents	NA[d]
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
Solid and Scrap HE	HE-processing; R&D, ER, and D&D activities; testing operations; disposition of weapons	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D018	Benzene	0.5
			D030	2,4-Dinitrotoluene	0.13
HE-Contaminated Commercial Chemical Products	Spilled commercial chemical products contaminated with HE	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D003	Reactivity	NA[d]
			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]

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)
Wet HE	Filtration of HE wastewater; ER, R&D, and D&D activities; HE processing	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			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
			D029	1,1-Dichloroethylene	0.7
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			D040	Trichloroethylene	0.5
			F001	Spent halogenated solvents	NA[d]
			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]

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; D&D, ER, R&D, and drilling activities; and laboratory use	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D002	Corrosivity	NA[d]
			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
			D029	1,1-Dichloroethylene	0.7
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			D040	Trichloroethylene	0.5
			F001	Spent halogenated solvents	NA[d]
			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, R&D, and ER activities; 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
			D030	2,4-Dinitrotoluene	0.13

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/or 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
			F001	Spent halogenated solvents	NA[d]
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	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, additional characterization 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 C-7

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)
HE-Contaminated Solid Waste	HE processing activities; D&D, ER, R&D, and drilling activities; and laboratory use	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D002	Corrosivity	NA[d]
			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
			D029	1,1-Dichloroethylene	0.7
			D030	2,4-Dinitrotoluene	0.13
			D035	Methyl ethyl ketone	200.0
			D036	Nitrobenzene	2.0
			D038	Pyridine	5.0
			D040	Trichloroethylene	0.5
			F001	Spent halogenated solvents	NA[d]
			F002	Spent halogenated solvents	NA[d]
			F003	Spent nonhalogenated solvents	NA[d]
			F004	Spent nonhalogenated solvents	NA[d]
			F005	Spent nonhalogenated solvents	NA[d]
Solid and Scrap HE	HE-processing; R&D, ER, and D&D activities; testing operations; disposition of weapons	Acceptable Knowledge[c]	D001	Ignitability	NA[d]
			D003	Reactivity	NA[d]
			D005	Barium	100.0
			D006	Cadmium	1.0
			D007	Chromium	5.0
			D008	Lead	5.0
			D018	Benzene	0.5
			D030	2,4-Dinitrotoluene	0.13

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, additional characterization 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 C-8

Descriptions of Waste Generated at Off-Site Facilities That May Be 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

Table C-9

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

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Spent Solvents	– Flash point (for liquid waste) – pH (for liquid waste) – RCRA[c]-regulated metals – Volatile organic compounds (VOC) – Semivolatile organic compounds (SVOC)	– 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] – Sampling and Analysis	– Determine characteristic for ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents
Paint and Related Wastes	– Flash point (for liquid waste) – RCRA[c]-regulated metals – VOCs	– Acceptable Knowledge[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
Solid 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 characterisitic for ignitability, corrosivity, and reactivity – Determine presence of D-coded and U- and P-listed wastes
Environmental	– RCRA[c]-regulated metals	– Acceptable Knowledge[d]	– Determine characteristic for

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Restoration (ER) Soils and Sludges	– VOCs – SVOCs		ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
ER 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
ER 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 characterization documentation database.

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

[c] Resource Conservation and Recovery Act. Use of the term "RCRA-regulated metals" refers to hazardous waste as defined in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II, 261.24 [6-14-00].

[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-10

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

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Soils with Heavy Metals	– RCRA-regulated metals[c]	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic
Environmental Restoration Soils	– RCRA-regulated metals[c] – Volatile organic compounds (VOC)	– 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
Lead Waste	– 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

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
			– Determine presence

Table C-10 (continued)

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Wastes (Continued)			
Mercury Wastes	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic – Determine presence of F-listed solvents
Unused Solid Reagent Chemical Wastes	– RCRA-regulated metals[c]	– Acceptable Knowledge[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 – Semivolatile organic compounds (SVOC)	– 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 and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	– Flash point – RCRA-regulated metals[c] – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability and toxicity – Determine concentration of F-listed solvents
Oil Wastes	– RCRA-regulated metals[c] – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and analysis	– Determine characteristic for toxicity – Determine concentration of F-listed solvents
Unused Liquid Reagent Chemical Wastes	– Flash point – pH	– Acceptable Knowledge[d]	– Determine characteristic for ignitability and corrosivity – Determine the presence of P- and U-listed unused commercial chemical product

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Gaseous 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, additional characterization 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 C-11

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

Summary Category Group/Description[a]	Waste Description	Parameters	Characterization Methods	Rationale
		Storage		
S3000-Homogeneous Solids	– Solidified aqueous waste (e.g., concreted/cemented aqueous waste)	– Free liquids in waste matrix – Physical form of the waste	– Visual examination – Real-time radiography (RTR) – Acceptable Knowledge[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 – Acceptable Knowledge[b]	– 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 (GC/MS) – Fourier transform infrared spectrometry – Gas chromatography / Flame ionization detector – Acceptable Knowledge[b]	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 – Acceptable Knowledge[b]	– Determine toxicity characteristic – Determine concentration of metals
		– VOCs in container headspace gas	– GC/MS – Fourier transform infrared	Qualitative screening to confirm the presence of VOCs

Summary Category Group/Description[a]	Waste Description	Parameters	Characterization Methods	Rationale
			spectrometry – Gas chromatography / Flame ionization detector	
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]	– 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
		Treatment		
L1000–Aqueous Liquids/Slurries	Evaporator bottoms solutions, aqueous waste, and laboratory solutions	– RCRA-regulated metals and corrosivity	– Acceptable Knowledge[b] – Sampling and Analysis	– Determine toxicity characteristics – Determine concentration of metals
S3000-Homogeneous Solids	Inorganic process solids and cemented inorganic process solids	– RCRA-regulated metals	– Acceptable Knowledge[b] – Sampling and Analysis	– Determine concentration of metals

[a] information in this column is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), TWCP-AK-2.1-019, R.0, LA-UR-03-4870, Los Alamos National Laboratory, Los Alamos, New Mexico.

[b] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-12

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	– Ignitability – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable Knowledge[b] – Field screening – Sampling and analysis	– Determine characteristic for ignitability and reactivity – Determine toxicity characteristic (metals and organics) – Determine the presence of F-listed solvents
HE-Contaminated Oil/Solvent Waste	– Corrosivity – Ignitability – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable Knowledge[b] – Sampling and analysis	– Determine characteristic for ignitability, corrosivity, and reactivity – Determine toxicity characteristic (organics) – Determine the presence of F-listed solvents
Solid and Scrap HE	– Ignitability – Reactivity – Toxicity	– Acceptable Knowledge[b]	– Determine characteristic for ignitability and reactivity – Determine toxicity characteristic (barium and dinitrotoluene)
HE-Contaminated Commercial Chemical Products	– Ignitability – Reactivity – Spill residues from commercial products	– Acceptable Knowledge[b]	– Determine characteristic for ignitability and reactivity – Determine the presence of U-listed wastes
Wet HE	– Ignitability – Reactivity – Toxicity – Solvents from non-specific sources – Specific source wastes (K wastes)	– Acceptable Knowledge[b]	– Determine characteristic for ignitability and reactivity – Determine toxicity characteristic (organics and metals) – Determine the presence of F- and K-listed solvents

Refer to footnotes at end of table.

Table C-12 (continued)

Waste Description	Parameter[a]	Characterization Method	Rationale
HE-Contaminated Solid Waste	– Ignitability – Corrosivity – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable Knowledge[b] – Field screening – Sampling and analysis	– Determine characteristic for ignitability, corrosivity, and reactivity – Determine toxicity characteristic (organics and metals) – Determine the presence of F-listed solvents
HE-Contaminated Equipment	– Reactivity – Toxicity	– Acceptable Knowledge[b] – Field screening – Sampling and analysis	– Determine characteristic for reactivity – Determine toxicity characteristic (dinitrotoluene and metals)
HE-Contaminated Liquid Acids, Bases, and/or Inorganic Salt Solutions	– Corrosivity – Reactivity – Toxicity – Solvents from non-specific sources	– Acceptable Knowledge[b] – Field screening – Sampling and analysis	– Determine characteristic for corrosivity and reactivity – Determine toxicity characteristic (organics) – Determine the presence of F-listed solvents

[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, additional characterization 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 C-13

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 (Appropriate analytical method from the Method 8300 series)[a]	High Performance Liquid Chromatography or Acceptable Knowledge[b]	Determine HE concentrations directly in homogeneous materials or by process information.
		DX-2 Spot Test, DeTech, or other screening methods	Determine if HE is present in the waste stream.
		Acceptable Knowledge[b]	If all surfaces of heterogeneous waste cannot be directly tested or visually examined (e.g., debris or equipment) 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, additional characterization 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 C-14

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

Parameters	Method Numbers	Test Method	Rationale
Metals: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[b] (1311, 6010B, 7080A, 7081)[b] (1311, 6010B, 7130, 7131A)[b] (1311, 6010B, 7190, 7191)[b] (1311, 6010B, 7420, 7421[d])[b] (1311, 6010B, 7470A, 7471A)[b] (1311, 6010B, 7740, 7741A, 7742)[b] (1311, 6010B, 7760A, 7761)[b] or equivalent methods[c]	Total and/or toxicity characteristic leaching procedure (TCLP) Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor technique Acceptable Knowledge[d]	Determine total and/or TCLP metals concentrations in samples of solid process residues
Volatile Organic Compounds	SW-846 (8260B)	Total VOC analysis by gas chromotography/mass spectrometry (GC/MS) Acceptable Knowledge[d]	Determine total VOC concentrations for comparison with Universal Treatment Standards (UTS
Semivolatile Organic Compounds	SW-846 (8270C)	Total SVOC analysis by GC/MS Acceptable Knowledge[d]	Determine total SVOC concentrations for comparison with UTS

[a] Ash generated by open burning is characterized for all TCLP metals.

[b] U.S. Environmental Protection Agency (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..

[c] Equivalent methods, subject to EPA approval, may be substituted.

[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-15

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 C-15 (continued)

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[g]-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[g]-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

[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

Table C-16

Summary of Characterization Methods for Hazardous Waste

Parameter	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] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) Semivolatile organic compound (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[f]	Determine total and/or TCLP and SVOC/VOC concentration in samples of solids or liquids
SVOCs in waste:	SW-846 (1311 and 8270C)[c] or equivalent methods[d]	Total or TCLP SVOC analysis by GC/MS Acceptable Knowledge[f]	Determine total and/or TCLP and SVOC concentration in samples of solids or liquids
Resource Conservation and Recovery Act-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge[f]	Determine total and/or TCLP concentration in samples of solids or liquids
Reactive Sulfide	SW-846, Test Method to Determine Hydrogen Sulfide Released from Wastes[e] SW-846 (9030B, 9031, 9034)[c] or equivalent methods[d]	Colorimetric, titrametric, or spectrophotometric measurement of hydrogen sulfide released from waste following reflux distillation under acidic conditions	Determine concentration of reactive sulfides
Ignitability (Flash Point)	SW-846 (1010, 1020A, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitability of solids	Determine ignitablity
pH (Corrosivity)	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 (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91001, Office of Research and Development.

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

[d] Equivalent methods subject to EPA approval may be substituted.

[e] *SW-846*, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic.

[f] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-17

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] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) Semivolatile organic compounds (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[e]	Determine total and/or TCLP and VOC concentration in samples of solid process residues and soils
SVOCs in waste:	SW-846 (1311 and 8270C)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[e]	Determine total and/or TCLP and SVOC concentration in samples of solid process residues and soils
Resource Conservation and Recovery Act (RCRA)-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge[e]	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 Acceptable Knowledge[e]	Determine total and/or TCLP and VOC concentration in samples of liquid
SVOCs in waste:	SW-846 (1311 and 8270B)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[e]	Determine total and/or TCLP and SVOC concentration in samples of liquid

Parameter	Method Numbers	Test Method	Rationale
RCRA-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge[e]	Determine total and/or TCLP concentration in samples of liquid

Refer footnotes at end of table.

Parameter	Method Numbers	Test Method	Rationale
Liquid Wastes (Continued)			
Ignitability (Flash Point)	SW-846 (1010, 1020A, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Acceptable Knowledge[e]	Determine ignitability
pH (Corrosivity)	SW-846 (9040B, 9041A, 9045C)[c] or equivalent methods[d]	pH electrometric Measurement pH paper Soil and waste pH Acceptable Knowledge[e]	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91991, Office of Research and Development.

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

[d] Equivalent methods, subject to EPA approval, may be substituted.

[e] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-18

Summary of Characterization Methods for Mixed Transuranic Waste

Parameter	Method Numbers	Test Methods	Rationale
	Storage		
Physical Waste Form (Free liquids in waste matrix)		Waste inspection procedures Real-time radiography Visual examination Acceptable Knowledge[e]	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] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOCs in container headspace gas VOC analysis by gas chromatography/mass spectrometry (GC/MS) Semivolatile organic compound (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[e]	Determine the presence or absence of VOCs in samples
SVOCs in waste	SW-846 (1311 and 8270C)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[e]	Determine the presence or absence of SVOCs in samples
Resource Conservation and Recovery Act (RCRA)-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761) or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge[e]	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 Acceptable Knowledge[e]	Determine ignitability
pH (Corrosivity)	SW-846 (9040B, 9041A, 9045C) or equivalent methods[d]	pH electrometric measurement Acceptable Knowledge[e]	Determine corrosivity

Parameter	Method Numbers	Test Methods	Rationale

Refer to footnotes at end of table.

Parameter	Method Numbers	Test Methods	Rationale
Treatment			
RCRA-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge[e]	Determine total and/or TCLP metals concentration in samples
pH (Corrosivity)	SW-846 (9040B, 9041A, 9045C) or equivalent methods[d]	pH electrometric measurement Acceptable Knowledge[e]	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91001, Office of Research and Development.

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

[d] Equivalent methods, subject to EPA approval, may be substituted.

[e] Acceptable knowledge is broadly defined as process knowledge, additional characterization 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 C-19

Description of Cementation Waste Streams at Technical Area 55

Summary Category Group	Waste Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Constituents in the Waste	Regulatory Limits[a] (milligrams per liter)
L1000 – Aqueous Liquids/Slurries	Evaporator bottoms solutions, aqueous waste, and laboratory solutions	Process residue from evaporator bottoms and other discardable solutions.	Acceptable Knowledge[b]	D002	Nitric acid	NA
				D004	Arsenic	5.0
				D005	Barium hydroxide	100.0
				D006	Cadmium	1.0
				D007	Chromium	5.0
				D008	Lead	5.0
				D009	Mercury	0.2
				D011	Silver	5.0
S3000 – Homogenous Solids	Inorganic process solids and cemented inorganic process solids	Process residue from evaporator bottoms and other discardable solutions; process-leached solids, ash, filter cakes, salts, metal oxides, and fines generated as a result of plutonium-processing	Acceptable Knowledge[b]	D004	Arsenic	5.0
				D006	Cadmium	1.0
				D007	Chromium	5.0
				D008	Lead	5.0
				D009	Mercury	0.2

[a] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *EPA-SW-846*, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C., the extract from a representative sample of the waste contains any of the contaminants listed at a concentration equal to or greater than the respective value given in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II, 261.24, revised June 14, 2000.

[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.

EPA = U.S. Environmental Protection Agency

NA = Not applicable

ATTACHMENT D

CONTINGENCY PLAN

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D-1	General Hazardous and Mixed Waste Emergency Notification Structure

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	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
EM&R	Emergency Management and Response
EMP	Emergency Management Plan
EOC	Emergency Operations Center
HAZMAT	Hazardous Materials
HMGS	Hazardous Materials Group Supervisor
HSR	Health, Safety, and Radiation Protection
HSR-1	Health Physics Operations Group
HSR-2	Occupational Medicine Group
HSR-5	Industrial Hygiene and Safety Group
IC	Incident Commander
ICS	Incident Command System
KSL	KBR-Shaw-LATA
LACFD	Los Alamos County Fire Department
LACPD	Los Alamos County Police Department
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
NAWAS	National Warning System
NIIMS	National Interagency Incident Management System
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
PA	public address
PPE	personal protective equipment
PS	Performance Surety
PTLA	Protection Technology Los Alamos

LIST OF ABBREVIATIONS/ACRONYMS
(Continued)

RRES	Risk Reduction and Environmental Stewardship
RRES-MAQ	Meteorology and Air Quality Group
RRES-SWRC	Solid Waste Regulatory Compliance Group
RRES-WQH	Water Quality and Hydrology Group
S	Security and Safeguards
S-10	Hazardous Materials Response Group
TA	technical area

ATTACHMENT D
GENERAL CONTINGENCY PLAN

This Attachment presents contingency measures applicable to all hazardous or mixed waste units at Los Alamos National Laboratory (LANL). This Contingency Plan is intended to meet the requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, Part 264, Subpart D, revised June 14, 2000 [6-14-00], and 20.4.1 NMAC § 270.14(b)(7) [6-14-00], for hazardous waste treatment and storage facilities. In addition, this Plan is consistent with the LANL Emergency Management Plan (EMP) (LANL, 2002), prepared by the LANL Emergency Management and Response (EM&R) Office. The provisions of this 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 20.4.1 NMAC § 264.51(b) [6-14-00]. When necessary, additional Contingency Plan information will be provided in Attachment E of TA-specific permit applications, permit modification requests, or permit renewal applications. 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 [20.4.1 NMAC §§ 264.52(C) AND 264.53]

The management of hazardous and mixed waste emergency incidents at LANL resides 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 Health, Safety, and Radiation Protection (HSR) Division, Risk Reduction and

Environmental Stewardship (RRES) Division, and Performance Surety (PS) Division at LANL. These groups as well as other groups in S Division 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 and the LACFD. Facility maintenance and heavy equipment operation are provided by KBR-Shaw-LATA (KSL). These contracted services, if changed, will be replaced and/or supplemented with functionally equivalent contracted services required to assume the same duties and responsibilities described in this section. 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 with the U.S. Department of Energy (DOE).

The Laboratory, as required by DOE and the State of New Mexico, uses the Incident Command System (ICS) in response to all emergencies. The ICS is based on the on-scene management structure protocols of 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 modification.

The IC (e.g., Duty Emergency Manager) coordinates all groups and agencies responding to the emergency and personnel operating at the scene using the 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 can 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. The Administrative Section Chief is responsible for keeping records of expenditures. In some instances, some or all of these positions may be activated, as the emergency warrants. 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 copy of this Contingency Plan and any revisions will be provided to each of the emergency response groups/agencies (including the LACPD, LACFD, and LAMC). LANL's Solid Waste Regulatory Compliance Group (RRES-SWRC) is responsible for the controlled distribution of this plan. Amendments to this plan are discussed in Section D.12.

D.1.1 EMERGENCY MANAGEMENT AND RESPONSE OFFICE [20.4.1 NMAC §§ 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 LANL's 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 (20.4.1 NMAC § 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-69, Building 33 (TA-69-33). An alternate EOC is located at TA-49-113. Should an EOC be activated during an emergency, additional emergency personnel can be requested by the IC through 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).

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 to control and contain the waste. In the event of an emergency, the Emergency Manager typically becomes the IC with full responsibility for field activities (including safety, operations, and planning, 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.

Listed below is the name, address, and phone number of the current Primary and Alternate Emergency Coordinator, as required by 20.4.1 NMAC § 264.52(d) [6-14-00].

Primary	Alternate
Dennis	ArmstrongWilliam Purtymun
998 Capulin Road	1813 Mountain View Place
Los Alamos, NM 87544	Los Alamos, NM 87544
(H) 505-662-3514	(H) 505-662-9886
(W) 505-667-6211	(W) 505-667-6211

To assure timely notifications during an emergency, one must call 911 or 667-6211 to obtain the on-call Duty Emergency Manager.

D.1.2 Hazardous Materials Response Group

The Hazardous Materials (HAZMAT) Team is comprised of personnel from the Hazardous Materials Response Group (S-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, §1910.120(q)(6)(iii), (iv), and (v). The HAZMAT Team acts as part of the ICS reporting through the HAZMAT Group Supervisor (HMGS) via the Operations Section Chief. The LANL HMGS coordinates the HAZMAT Team and radiological field monitoring activities.

During an emergency response, S-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, S-10 may obtain resources from HSR groups, such as the Health Physics Operations Group (HSR-1) and the Industrial Hygiene and Safety Group (HSR-5).

D.1.3 RRES Division Response Groups

At the scene, representatives and technical advisors from RRES Division 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 RRES 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 Ecology Group

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

D.1.3.2 Meteorology and Air Quality Group

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

D.1.3.3 Solid Waste Regulatory Compliance Group

RRES-SWRC provides guidance on regulatory requirements for proper treatment, storage, and transportation of hazardous and mixed wastes to other LANL groups. After an emergency, RRES-SWRC provides field sampling (e.g., of soil, spills, or potentially hazardous waste) to determine environmental effects of exposure.

D.1.3.4 Water Quality and Hydrology Group

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

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 high explosive waste. Engineering Sciences and Applications Division personnel are responsible for hazardous 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. Personnel from the Facilities and Waste Operations Division may provide guidance on proper treatment, storage, and transportation of hazardous and mixed waste at TA-50 and TA-54.

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 the subcontractor 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.

D.1.5.2 KBR-Shaw-LATA (KSL)

KSL provides a maintenance support force under contract to LANL. This support force is under LANL's direction in an emergency. KSL 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.

D.1.6 LANL Support Groups

D.1.6.1 Health Physics Operations Group

HSR-1 provides field personnel to perform routine site evaluation and monitoring to determine radiological conditions in facilities. HSR-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 (HSR-2). HSR-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, HSR-2 maintains records of the health status of employees and related occupational medicine activities.

Although HSR-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. The location of this and other emergency facilities are shown on Figure D-2 (LANL, 2002a). Medical staff at these facilities includes physicians, physician's assistants, nurses, technicians, and counselors. All full-time physicians and nurses receive radiation accident training. HSR-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

HSR-5 assists HSR-2 with its ability to obtain additional exposure and treatment information. In addition, HSR-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, HSR-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 Reporting Group

The PS Division hosts the Occurrence Reporting Group, whose 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 may assume IC under unique circumstances, but usually has only minimal interaction with LANL in an on-site emergency. This interaction normally involves traffic control on DOE roads with public access, handling criminal activity, and criminal investigations.

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 LAMC. In the event that a case is sent to LAMC, support for the emergency room staff is provided by HSR-2 medical personnel. HSR-1, HSR-5, and S-10 personnel also provide assistance to the emergency room staff; assistance from additional LANL resources is provided, as necessary. Assistance is coordinated through the EM&R Office.

D.2 EMERGENCY EQUIPMENT AND COMMUNICATIONS [20.4.1 NMAC § 264.52(E)]

D.2.1 Emergency Equipment

20.4.1 NMAC, 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 management units. The list includes emergency equipment available in the HAZMAT vehicles and trailers as well as supplemental emergency equipment maintained by the LACFD, KSL, and HSR-2. A list of emergency equipment available for use at specific hazardous and/or mixed waste management units is presented in Attachment E of TA-specific permit applications, permit modification requests, or permit renewal applications. Emergency equipment listed in Table D-2 may be replaced and/or upgraded with functionally equivalent components and equipment, as necessary, for routine maintenance and repair.

D.2.2 Emergency Communications [20.4.1 NMAC § 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 manned by PTLA or security 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 Power Dispatch

The Power Dispatch is maintained 24 hours a day. Alarms at this facility 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
  - 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 [20.4.1 NMAC § 264.56]

The following sections discuss guidelines used to implement this plan, emergency notification, emergency manager actions, and actions to be taken in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents into the environment at LANL.

D.3.1 Guidelines for Implementation [20.4.1 NMAC §§ 264.51(b) and 264.56]

The decision to implement this plan depends upon whether an emergency exists, which for the purposes of this section is defined as an imminent or actual incident arising from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents that 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 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 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
- 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.
- Other Acts of Force Majeure (i.e., acts of God)
  - If an earthquake or other natural disaster threatens containment integrity, including precipitation that threatens to move spilled material off site.

D.3.2 Emergency Notification [20.4.1 NMAC § 264.56(a) and (b)]

Emergency notification requires immediate notification of 911 or the EM&R Office upon discovery of an imminent or actual incident involving hazardous and/or mixed waste. During nonworking hours, personnel will report all imminent or actual incidents involving hazardous and/or mixed waste to the Emergency Manager or the CAS operator at 667-6211. In the case of fire, 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. 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 emergency exists.

D.3.3 Emergency Manager Actions [20.4.1 NMAC § 264.56(b-h)]

Upon notification of an emergency 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 and/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 plan is warranted.
- Activate the EOC, if necessary.

Upon deciding to implement this 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 Leader (or his/her designee) 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 Guidelines. 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, make reasonable efforts to 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 RRES representative to notify the New Mexico Environment Department (NMED) at (505) 827-9329 and the National Response Center at (800) 424-8802, reporting:
  - The name and telephone number of the RRES 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.
- 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.

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 the Recovery Manager. These responsibilities may 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 National Nuclear Security Administration (NNSA) Los Alamos Site Office (LASO) will submit a report to the Secretary of the NMED. The contents of this report are generated by several LANL groups responding to the emergency, as detailed in Section D.11.

D.4 SPILLS [20.4.1 NMAC § 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 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). Monitoring will be conducted to ensure that chemical and, as appropriate, radiological exposure is 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 hazardous 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. The Tables D-1 in the Sections of this Attachment list 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 20.4.1 NMAC § 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 20.4.1 NMAC § 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 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 concrete 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 appropriate parameters listed in Table D-3. All personnel conducting decontamination verification will wear appropriate PPE. HSR-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 may be repeated. An alternative demonstration of decontamination may be proposed and justified to 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 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" (EPA, 1986), and approved updates, 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 either be excavated and containerized or remediated in situ. HSR-5 will conduct industrial hygiene monitoring and, if mixed waste is involved, HSR-1 will conduct health physics monitoring, if deemed necessary, to minimize exposure during soil removal or remediation 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 from the spill has been removed or remediated.

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 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 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. Information related to the various fire alarms at the specific units is included in this Attachment's tables.

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 they are 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 this Permit. 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 area-wide environmental monitoring network maintained by RRES. 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, groundwater, 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 HSR-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 HSR-2 medical facility or to LAMC. An HSR-1, HSR-5, or S-10 representative will attempt to ascertain what, if any, exposure occurred and what corrective measure is appropriate.

D.9 EVACUATION [20.4.1 NMAC § 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 proper equipment and PPE. If they are on location, HSR-1, HSR-5, and/or S-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 E of TA-specific permit applications, permit modification requests, or permit renewal applications.

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 E of TA-specific permit applications, permit modification requests, or permit renewal applications 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 and the LACFD Battalion Chief 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 Leader (or his/her 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 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 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 [20.4.1 NMAC § 264.56(G) AND (H)]

Appropriate representatives from the RRES groups will survey the affected area before salvage and cleanup begin. They will conduct visual inspections and sampling, as appropriate, 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 PPE 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 NNSA/LASO) 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, RRES groups, KSL, and other on-site resources will also be used to estimate cleanup costs and operational impact.

D.11 EMERGENCY RESPONSE RECORDS AND REPORTS [20.4.1 NMAC § 264.56(J)]

Any emergency that requires implementation of this plan will be documented by the Group Leader (or his/her designee) responsible for the hazardous or mixed waste unit associated with the emergency, and reported orally within 24 hours and in writing within 5 days of the incident to the NMED. The incident report, submitted by DOE NNSA/LASO, 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.

In addition, LANL personnel responding to any emergency requiring implementation of this plan will record the date, time, location, and details of the incident. This information will be maintained in the facility operating record.

D.12 CONTINGENCY PLAN AMENDMENT [20.4.1 NMAC § 264.54]

This 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, 2002, "Los Alamos National Laboratory Emergency Management Plan," LIR 403-00-01.0, Los Alamos National Laboratory, Emergency Management and Response Office, Los Alamos, New Mexico.

LANL, 2002a, "Los Alamos National Laboratory General Part B Permit Renewal Application", Revision 2.0, August 2002, LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

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
HSR-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).
HSR-2, Occupational Medicine	667-0660	Provides emergency medical treatment.
HSR-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).
PS-7, Occurrence Reporting	667-0598	Reports occurrences and tracks follow-up actions.
S-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.
RRES-MAQ, Meteorology & Air Quality	665-8855	Provides information on meteorological conditions.
RRES-WQH, Water Quality and Hydrology	665-1859	Provides information on hydrologic conditions.
RRES-SWRC, Solid Waste Regulatory Compliance	665-9527	Provides guidance on regulatory requirements. Provide guidance on proper treatment, storage, and off-site shipment of hazardous and mixed waste. Conducts field surveys to determine spread of contamination and adequacy of cleanup.
RRES-ECO, Ecology	665-8961	Provides information on biotic conditions.
PTLA, Protection Technology Los Alamos	667-4531	Provides traffic control and security.
KSL[b]	662-9080	Dispatches maintenance personnel and equipment. Assists in waste cleanup under the direction of the Recovery Manager.
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.

LANL[a]-Controlled Response Group	Telephone	Responsibilities
DX, Dynamic Experimentation Division	667-5653	Provides information and/or assistance during emergencies at TA-14, TA-15, 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.
Los Alamos County Fire Department	911 662-8301	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[c]	662-4201	Provides medical services. Provides and maintains Emergency Room.

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

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 Security and Safeguards (S) Hazardous Materials Response Group (S-10) for emergency response to all of the TAs at Los Alamos National Laboratory (LANL). S-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, some or all of the following:

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
Neutralizing solutions: acids, bases, and caustics
Two-way radios, cellular phones, facsimile, 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

Decontamination equipment
Sampling equipment
Lifting equipment and vetter bags
Assorted tools, tape, and other supplies
Non-sparking tools
Biological detection equipment
Chemical vacuums
Sandia foam
Plugging and diking equipment
Sample van equipped with a glovebox and analysis equipment
Environmental continuous air monitoring equipment
Robot
National Atmospheric Release Advisory Center-Internet Client (NARAC Client)
Hotspot plume modeling program
Mass decontamination trailer with tent and supplies
Portable decontamination trailer
Portable structures
Tents
Trucks
Trailers
International Shipping Units
Portable hot water heater
Forklift
Automated external defibrillators.

Supplemental Emergency Equipment and Personnel Available From the Los Alamos County Fire Department (LACFD)

Supplemental emergency equipment available from the LACFD may include, but is not limited to, some or all of the following:

Fire engines
Mini-tankers with compressed air foam capability
Modular ambulances
Rescue vehicles
Crash-Fire-Rescue (CFR) unit
Water tankers with compressed air foam capability
Incident Command vehicles
SCBA units
SCBA air tanks
Remote air system for confined space rescue
Ladder truck with pump
Personnel with Hazardous Material First Response Operational Level training
Personnel with Basic Emergency Medical Technician training
Personnel with Advanced Life Support training

Supplemental Emergency Equipment and Personnel Available from KBR-Shaw-LATA (KSL)

Supplemental emergency equipment available from KSL may include, but is not limited to, some or all of the following:

TRANSPORTATION EQUIPMENT

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

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
Cranes
Forklifts

TRAINED PERSONNEL

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

Truck drivers
Rodent/Pest Control personnel
HAZMAT response/cleanup personnel
Welders
Electricians

Emergency Equipment and Personnel at the Occupational Medicine Clinic

Occupational Medicine Group (HSR-2)

At TA-3 (SM-409) Central Clinic

Emergency equipment and supplies available from HSR-2 may include, but are not limited to, some or all of the following:

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
First-aid kits

Extrication and cervical collars, crutches, canes
Suture sets
Protective apparel
Morgan lens irrigation sets
Decontamination equipment (portabl

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.

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, SW1020A (S) SW1030 (L, S) ASTM D93-02a
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	
Arsenic		(L, S) SW7060A, SW7061A
Barium		(L, S) SW7080A, SW7081
Cadmium		(L, S) SW7130, SW7131A
Chromium		(L, S) SW7190, SW7191
Lead		(L, S) SW7420, SW7421
Selenium		(L, S) SW7740, SW7741A
Silver		(L, S) SW7760A, SW7761
Mercury	Manual cold-vapor technique	(L) SW7470A, (S) SW7471A
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[c] (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

Table D-3 (Continued)

Parameter	Test Method	Reference[b]
Total RCRA metals[c,d]	Acid digestion Inductively coupled plasma atomic emission spectroscopy	(L) SW3010A, (S) SW3050B (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) SW9095A

[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] "A" (e.g., A006) refers to U.S. Environmental Protection Agency, 1984, "Sampling and Analysis Methods for Hazardous Waste Combustion," *EPA-600/8-84-002*.
"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] See also atomic absorption methods. Total metals may be substituted for TCLP metals, if appropriate.

[d] RCRA = Resource Conservation and Recovery Act.

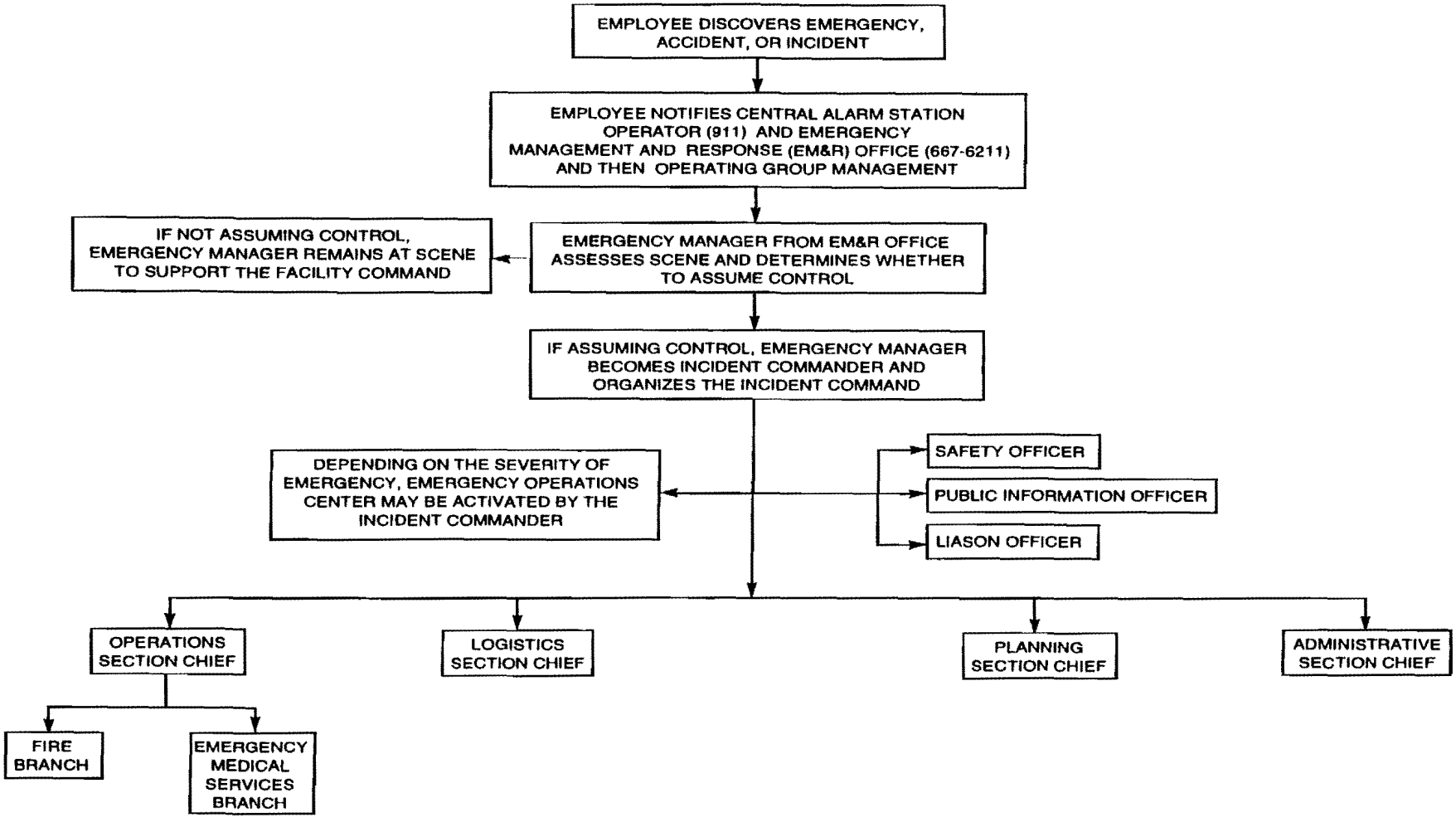
Table D-4
Evacuation Determination and Re-Entry Conditions

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 HSR-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] "HSR-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



TA-3

ATTACHMENT D

CONTINGENCY PLAN

TA-3
ATTACHMENT D
CONTINGENCY PLAN

In accordance with 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 January 1, 1997, contingency measures applicable to the hazardous and mixed waste container storage unit at Technical Area (TA) 3, Building 29 (TA-3-29), Chemistry and Metallurgy Research (CMR) Building are provided in this Attachment.

The CMR Building at Los Alamos National Laboratory (LANL) has a facility-specific Emergency Management Plan (EMP) to ensure that emergency planning and preparedness for the CMR Building are commensurate with the facility and the nature of work performed there and to provide sufficient subject matter experts at the facility, should an emergency occur.

The plan establishes the CMR Facility Emergency Response Organization, which is comprised of a facility Emergency Response Team (ERT), Facility Incident Command (FIC), and the CMR Operations Center. The CMR ERT is a 15 - 20 member group of volunteer facility personnel trained to provide initial response to emergencies. The FIC is comprised of division and line managers and key personnel who respond to pre-designated locations for the purpose of initial command and control of events that occur at CMR Building emergencies. The CMR Operations Center is the emergency communications focal point and has the responsibility of development and maintenance of alarm response instructions, notification lists, and call-out lists.

"The CMR Facility Emergency Management Plan Training for CMR Workers" (LANL, 1999), includes information on emergency equipment (see Table D-1 of this Attachment Section); evacuation routes (Figure E-1, LANL, 1998) and primary and secondary evacuation assembly areas (Figure E-2, LANL, 1998); and evacuation procedures for the FIC, persons wearing anti-C clothing, and persons in non-anti-C clothing. The CMR EMP also includes emergency categorization, lists of potential facility emergencies, their associated alarms, and the appropriate response to the emergency and/or the alarms. Figure E-3 (LANL, 1998) shows the locations of fire hydrants in the vicinity of TA-3-29. Evacuation routes, evacuation area locations, and emergency equipment are subject to change.

REFERENCES

LANL, 1999, "The CMR Facility Emergency Management Plan Training for CMR Workers," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table D-1
TA-3
Emergency Equipment

FIRE CONTROL EQUIPMENT

Dry chemical fire extinguishers are available in Rooms 9010, 9020, and 9030.

Description of General Capabilities:
Each fire extinguisher has a 10-pound minimum capacity and may be used by any qualified employee in the event of a small fire.

Nine fire hydrants are located around the outside perimeter of Technical Area (TA) 3, Building 29 (TA-3-29). The nearest fire hydrants to Rooms 9010, 9020, and 9030 are located on the south side of Wing 9 and west of Wing 5.

Description of General Capabilities:
The fire hydrants supply water at an adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart V, 264.32, revised January 1, 1997.

Fire alarm pull boxes are located in Rooms 9010 and 9020.

Description of General Capabilities:
Manually-operated fire alarms may be activated by any employee in the event of fire to notify the Los Alamos County Fire Department (LACFD) and Protection Technology Los Alamos (PTLA).

Sprinkler systems are located in Rooms 9010, 9020, and 9030.
Automatic thermal alarm systems are located in Rooms 9010, 9020, and 9030.
Description of General Capabilities:

The sprinkler systems and thermal alarm systems are heat activated. PTLA and the LACFD are alerted when a system has been activated.

SPILL CONTROL EQUIPMENT

Spill control kits are located in Rooms 9010, 9020, and 9030. Spill kits include (but are not limited to) sorbent pillows, safety glasses, and gloves.

Description of General Capabilities:
Sorbent is used in the event of a small spill.

COMMUNICATION EQUIPMENT

Telephones are located in the north enclosure of Room 9010, in Room 9020, and in Room 9030.

Paging phones and evacuation alarms are located in Rooms 9010, 9020, and 9030.

Description of General Capabilities:
Telephones are used for internal and external communication and have paging capabilities. The evacuation alarm is a pulsating sound that can be heard over the public address system. The fire alarm is a double slow-whoop sound.

DECONTAMINATION EQUIPMENT

Emergency shower and eyewash stations are located in the two enclosures in Room 9010, and in Room 9030.

Material safety data sheets (MSDS) are available in Room 9030.

Description of General Capabilities:
Emergency shower and eyewash stations are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemicals should be obtained prior to working with hazardous or mixed waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Personnel at TA-3-29 are required to use appropriate personal protective equipment (PPE) to protect themselves from hazards found in the workplace under normal conditions. This PPE may include gloves, steel-toed shoes, and safety glasses. Additional PPE may be required during an unusual hazardous situation or during sampling activities.

Self-contained breathing apparatus are available in Room A130 (Administrative Wing).

Room 9102 is a change room with protective clothing available.

Full-mask negative pressure respirators are located in the hallway outside of Room 9104; radioactive particulate filters are available.

OTHER

See Table E-2 in Appendix E of the "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0 (LANL, 1998) for equipment available in the Hazardous Materials Response Group vehicles and trailers.

TA-16

ATTACHMENT D

CONTINGENCY PLAN

TA-16
ATTACHMENT D
CONTINGENCY PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, Part 264, Subpart D, and 20.4.1 NMAC § 270.14(b)(7), revised June 14, 2000, contingency measures applicable to the open burning (OB) units at the Technical Area (TA) 16 Burn Ground are provided in this Attachment's General Section. Specific information on emergency response resources and release prevention/mitigation at TA-16 is provided below.

Figure E-1 (LANL, 2003) shows the evacuation routes and muster area that may be used at the TA-16 OB units in the event of an emergency. In addition, a listing of emergency equipment currently available for use at the TA-16 Burn Ground is included as Table D-1 below. The evacuation routes, muster area location, and emergency equipment are subject to change as conditions or facility procedures warrant.

D.1 EMERGENCY RESPONSE RESOURCES

The Engineering Sciences and Applications (ESA) Division is responsible for the TA-16 OB units. Appropriate ESA personnel have been trained in emergency procedures.

D.2 RESPONSIBILITY

At TA-16, ESA Division is responsible for correction of a nonsudden release from the TA-16 OB units if the correction can be performed safely with normal maintenance and management procedures. Personnel from the Emergency Management and Response 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 New Mexico Environment Department.

D.3 REMEDIAL ACTION

Contingency or emergency measures are unanticipated "fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste . . ." for which a schedule of remedial actions cannot be reasonably ascertained. Any remedial actions carried out under the provisions of the Contingency Plan will be performed as soon as possible to ensure protection of human health and the environment, as described in Appendix D. These remedial actions may include site cleanup; proper handling of recovered waste, contaminated soil, or

contaminated surface water; decontaminating equipment, as needed; replacing or repairing equipment, as needed; and testing to verify successful cleanup.

ESA Division personnel conduct regularly scheduled inspections at TA-16 to detect deterioration and/or failure of containment at the TA-16 OB units. If an inspection reveals deterioration or failure, personnel ensure that maintenance or replacement is performed, as appropriate.

D.4 REFERENCES

LANL, 2002, "Los Alamos National Laboratory General Part B Permit Renewal Application", Revision 2.0, August 2002, LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Application", Revision 4.0, June 2003, LA-UR-03-3903, Los Alamos National Laboratory, Los Alamos, New Mexico.

TABLE D-1

TA-16

Emergency Equipment

FIRE CONTROL EQUIPMENT

Fire extinguishers are located at or in:

Tank-truck garage (TA-16-1507)
Control Building (TA-16-389)
High Explosives Wastewater Treatment Facility (HEWTF) (TA-16-1508)
Each truck used to transport high explosives

General Capabilities
These portable units may be used by any properly trained employee in the event of fire.

Seven fire hydrants are located at the TA-16 Burn Ground.

General Capabilities
The fire hydrants will supply water at adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, § 264.32, revised June 14, 2000.

Water spigots are located at TA-16-388 and TA-16-399.

A fire alarm pull station is located at the HEWTF.

The Central Alarm Station is notified before all open burning operations. In dry conditions, when operations may result in a grass fire, the Los Alamos County Fire Department is notified and requested to prepare to respond.

SPILL CONTROL

Portable berms to contain spills are stored in an all-weather cabinet near the center of the TA-16 Burn Ground, at the less-than-90-day storage area (TA-16-386), and beside the Control Building.

COMMUNICATION EQUIPMENT

Telephones are available at the Control Building, at the HEWTF, and at the railroad gate at the entrance to the Burn Ground.

General Capabilities
Telephones for internal and external communication are available for use by all employees.

DECONTAMINATION EQUIPMENT

Eyewash stations are located in the tank-truck garage and in the HEWTF.

Water spigots with hoses attached are available at the TA-16-388 Flash Pad/Burn Tray and the TA-16-399 HE Burn Tray for general wash down.

Material Safety Data Sheets (MSDS) are available at the Control Building.

General Capabilities

Eyewashes are used by personnel who receive a chemical splash to the eyes. MSDSs for the chemical(s) should be obtained prior to working with hazardous waste or hazardous material to determine if the application water is indicated for decontamination. The MSDSs are also maintained to provide information during emergency response.

PERSONNEL PROTECTION EQUIPMENT

Respirators, coveralls, and safety glasses are available for TA-16 personnel during waste-handling operations.

All vehicles are equipped with first-aid kits.

TA-50

ATTACHMENT D

CONTINGENCY PLAN

TA-50
ATTACHMENT D
CONTINGENCY PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, Part 264, Subpart D, "Contingency Plan and Emergency Procedures," and 20.4.1 NMAC, Subpart IX, 270.14(b)(7), revised June 14, 2000, contingency measures applicable to the hazardous and mixed waste container storage units (CSU) at Technical Area (TA) 50 are provided in this Attachment's General Section.

Figure E-1 (LANL, 2002) shows evacuation routes and muster areas that may be used in the event of an emergency. In addition, lists of emergency equipment currently available for use at TA-50 CSUs are included in Table D-1 below. A list of emergency equipment (including spill equipment) available from the Hazardous Materials Response Group is presented in Table D-1 in this Attachment. Evacuation routes, muster area locations, and emergency equipment are subject to change.

Hazardous and mixed waste spills are managed by type and severity of the incident. If a hazardous/mixed waste spill occurs, the Incident Command evaluates the type and severity of the spill and determines if assistance from LANL's Emergency Management Response Group is required. If not, the spill is managed internally by TA-50 personnel.

REFERENCES

LANL, 1998, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002, "Los Alamos National Laboratory Technical Area 50 Part B Permit Renewal Application", Revision 3.0, August 2002, LA-UR-02-4739, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table D-1
TA-50
EMERGENCY EQUIPMENT

FIRE CONTROL EQUIPMENT

- **FIRE EXTINGUISHERS**

  Description of General Capabilities

  The fire extinguishers are portable, manually operated units and may be used by any employee in case of fire. They consist of Class A, B, and C units of approximately 9 to 15 pounds capacity used in wet chemical laboratory applications.

  Locations

  2 fire extinguishers are located in TA-50-69, Indoor Container Storage Unit (CSU) (Room—102)

  1 fire extinguisher is located within 20 feet (ft) of the TA-50-69, Outdoor CSU

- **FIRE ALARM PULL BOXES CONNECTED TO THE CENTRAL ALARM STATION**

  Description of General Capabilities

  Fire alarms may be activated by any employee in the event of fire to notify the Central Alarm Station. Upon activation, fire alarm horns and strobes provide audible and visual signals for personnel notification. The fire alarm is a pulsing sound. The evacuation alarm is a wailing sound that can be heard throughout TA-50-69, Indoor CSU and at the TA-50-69, Outdoor CSU.

  Locations

  Two fire alarm pull stations are located in the TA-50-69, Indoor CSU. One is just inside the south door of Room 102 and the other is inside the east door of TA-50-69. Personnel working at the TA-50-69, Outdoor CSU may use the pull stations at TA-50-69 in the event of a fire.

- **AUTOMATIC FIRE SUPPRESSION SYSTEM**

  Description of General Capabilities

  A wet-pipe automatic sprinkler system that is hydraulically designed for ordinary hazard Group II coverage is in place throughout TA-50-69. This system is activated at 100°C (212°F). The glovebox cutting and disassembly modules are equipped with an automatic water deluge sprinkler system. One sprinkler head is mounted on the west wall of the cutting module and one sprinkler head is mounted on the east wall of the disassembly module. Additionally, a manually operated carbon dioxide (CO_2) system is in place inside the cutting enclosure which allows an operator to apply CO_2 to minor flare-ups that can originate on the waste item being cut up with the plasma-torch. The CO_2 system cannot over pressurize the enclosure.

  Locations

  Throughout TA-50-69, as described above.

- **FIRE HYDRANT**

  Description of General Capabilities

  Fire hydrants provide water for fire fighting. All fire hydrants are supplied by an 8-inch (in.) water line connected to the 12-in. water main on Pecos Drive.

  Location

  A fire hydrant is located approximately 55 ft west of TA-50-69.

SPILL CONTROL EQUIPMENT

- **CURBING AND DRAINS**

  The main process room (Room 102) and unloading area (Room 103) at TA-50-69 provide secondary containment by use of curbs or floor drains. The storage capacity plus curbed area storage would be adequate to contain water generated during fire fighting.

- **SPILL CENTERS**

  Description of General Capabilities

  The spill centers contain at a minimum personnel protective equipment (i.e., gloves), and sorbents (i.e., pillows and pigs). The Emergency Management and Response Group provides additional spill control and clean up equipment as needed.

  Spill Center Location

  2 - TA-50-69, Indoor CSU (Room 102)
  2 - TA-50-69, Outdoor CSU

COMMUNICATION EQUIPMENT

Description of General Capabilities

Telephones with public address (PA) capabilities for internal and external communication are available for use by any employee. Fire and evacuation alarms are activated in the event of a fire or in case an evacuation is required. The fire alarm is a double slow whoop sound. The evacuation alarm is a high-pitched wailing sound. The PA system can be heard at the TA-50-69, Outdoor CSU. When working at the CSUs, personnel will have immediate access to emergency communication equipment either directly or through visual or voice contact with another employee.

Location of Communication Equipment

Four telephones, three with PA capabilities, are located in TA-50-69. One is located outside Room 104 near the door. Personnel working at the TA-50-69, Outdoor CSU have access to the phone outside Room 104, will carry cellular phones, or will have immediate access to communication equipment through visual or voice contact with another employee.

DECONTAMINATION EQUIPMENT

- **SAFETY SHOWERS**

  Description of General Capabilities

  Safety showers are available to personnel who receive a chemical splash to the skin.

  Location of Safety Showers

  Safety showers are located in TA-50-69, Room 102 and Room 103. One standard shower is located adjacent to the change room in TA-50-69.

- **EYEWASHES**

  Description of General Capabilities

  Eyewashes are available to personnel who receive a chemical splash to the eye(s). Specific MSDSs for the chemicals being managed are available to personnel working with hazardous or mixed waste to determine if the application of water is indicated for decontamination.

  Location of Eyewashes and Material Safety Data Sheets

  An eyewash is located in the TA-50-69, Indoor CSU (Room 102). The safety shower and eyewash in TA-50-69 are available to personnel working at the TA-50-69, Outdoor CSU.

TA-54

ATTACHMENT D

CONTINGENCY PLAN

TA-54
ATTACHMENT D
CONTINGENCY PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, Part 264, Subpart D, and 20.4.1 NMAC § 270.14(b)(7), revised June 14, 2000, contingency measures applicable to the hazardous and mixed waste management units at Technical Area (TA) 54 are provided in this Attachment's General Section.

Listings of emergency equipment currently available for use at Area L, Area G, and TA-54 West are presented in Tables D-1 through D-3 below. Figures E-1 and E-2 (LANL, 2003) show evacuation routes and muster areas that may be used at TA-54 in the event of an emergency. Emergency equipment, evacuation routes, and muster area locations are subject to change.

REFERENCES

LANL, 2002, "Los Alamos National Laboratory General Part B Permit Renewal Application", Revision 2.0, August 2002, LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 54 Part B Permit Renewal Application", Revision 3.0, June 2003, LA-UR-03-3579, Los Alamos National Laboratory, Los Alamos, New Mexico.

TABLE D-1
TA-54 AREA L
Emergency Equipment

FIRE CONTROL EQUIPMENT

Halon, water, dry chemical, and/or carbon dioxide fire extinguishers are available at TA-54-37, TA-54-60, TA-54-51, TA-54-32, TA-54-39, the southeast end of Area L, TA-54-31, 30 feet from the southeast side of TA-54-32, TA-54-117, TA-54-62, on the forklift and Bobcat operating in Area L, TA-54-68, TA-54-69, TA-54-70, TA-54-185, TA-54-215, and TA-54-221.

A dry-pipe sprinkler system is located at TA-54-215.

Dry chemical fire-suppression systems are located in the storage sheds.

Description of General Capabilities:
Fire extinguishers may be used by any qualified employee in the event of a small fire. The automatic dry-pipe sprinkler system is heat activated. Protection Technology Los Alamos (PTLA) and the Los Alamos County Fire Department (LACFD) are alerted when this system has been activated.

Fire alarm pull boxes are located inside TA-54-37, TA-54-39, TA-54-51, TA-54-60, TA-54-117, TA-54-210, and TA-54-221.

Description of General Capabilities:
Fire alarms may be activated by any employee in the event of a fire to notify the LACFD and PTLA.

There are fire hydrants located near TA-54-37 and the southeast corner of TA-54-62. These fire hydrants supply water at an adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart V, 264.32, revised January 1, 1997.

A freeze-proof faucet is located approximately 25 feet east of TA-54-31.

SPILL CONTROL EQUIPMENT

Shovels (located in TA-54-46)
Oversized drums (various locations on site)
Absorbent (various locations on site)

Spill kits are located throughout Area L. Each kit includes bags of Zorball, caustic neutralizer, acid neutralizer, and an inventory of tools and supplies..

COMMUNICATION EQUIPMENT

Telephones are located in TA-54-32, TA-54-37, TA-54-51, TA-54-60, TA-54-62, TA-54-117, TA-54-185, TA-54-210, TA-54-211, and TA-54-221.

Paging phones and evacuation alarms are located at the northeast end of TA-54-32, the exterior west end of TA-54-215, at TA-54-37, and at TA-54-62.

Additional equipment includes two-way radios and portable telephones.

Description of General Capabilities:
The evacuation alarm is a pulsating sound that can be heard throughout Area L. The fire alarm is a double slow-whoop sound.

DECONTAMINATION EQUIPMENT

Emergency shower and eyewash stations are located immediately east of TA-54-31, at TA-54-215, at TA-54-35, and at TA-54-39.

Material Safety Data Sheets (MSDS) are available in TA-54-46.

Description of General Capabilities:
Emergency shower and eyewash stations are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with hazardous or mixed waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Personnel at Area L are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the workplace under normal conditions. This PPE may include gloves, steel-toed shoes, and safety glasses. Additional PPE may be required during an unusual hazardous situation or during sampling and can be found in the spill kits or at TA-54-50.

Self-contained breathing apparatus are located in TA-54-50.

Gloves, goggles, safety glasses, coveralls, and face shields are found in the spill kits located throughout Area L.

Table D-2
TA-54 AREA G
Emergency Equipment

FIRE CONTROL EQUIPMENT

Halon, water, and/or carbon dioxide fire extinguishers are available at TA-54-2, TA-54-8, TA-54-11, TA-54-20, TA-54-33, TA-54-48, TA-54-49, TA-54-92, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-283, TA-54-375, and TA-54-412.

Description of General Capabilities:
Fire extinguishers may be used by any qualified employee in the event of a small fire. For larger fires, Protection Technology Los Alamos (PTLA) and the Los Alamos County Fire Department (LACFD) are alerted.

Dry-chemical fire suppression systems are available at TA-54-1027, TA-54-1028, TA-54-1030, and TA-54-1041.

A dry-pipe fire suppression system is available at TA-54-412.

Fire alarm pull stations are available at TA-54-2, TA-54-11, TA-54-33, TA-54-48, TA-54-49, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-273, TA-54-283, TA-54-375, and TA-54-412.

Description of General Capabilities:
Fire alarms may be activated by any employee in the event of a fire to notify the LACFD and PTLA.

Several fire hydrants are located in Area G. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, § 264.32, revised June 14, 2000.

SPILL CONTROL EQUIPMENT

Spill control stations and/or portable spill kits are located at TA-54-8, TA-54-11, TA-54-20, TA-54-33, TA-54-48, TA-54-49, TA-54-92, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-283, TA-54-375, and TA-54-412.

Each spill kit generally includes bags of Zorball and an inventory of tools and supplies.

COMMUNICATION EQUIPMENT

Pole-mounted paging telephones are located near TA-54-33, TA-54-48, TA-54-49, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, and TA-54-283, inside TA-54-2, and at TA-54-11, and TA-54-412.

Evacuation alarm buttons are located at or near TA-54-2, TA-54-11, TA-54-33, TA-54-48, TA-54-49, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-283, TA-54-375, TA-54-412, and at various muster stations.

Additional equipment includes portable two-way radios located at muster stations.

Description of General Capabilities:
Telephones and alarms are located throughout Area G. Paging telephones are equipped with public address capabilities. Evacuation alarms have horns mounted on telephone poles throughout Area G. The evacuation alarm is a high-pitched wailing sound that can be heard throughout Area G.

DECONTAMINATION EQUIPMENT

Portable eyewash stations equipped with first aid kits are located in TA-54-33, TA-54-224, and TA-54-412.

One permanent, hard-plumbed eyewash station and a safety shower are located in TA-54-33.

Material Safety Data Sheets (MSDS) and waste characterization documentation are available in the event of an exposure.

Description of General Capabilities:
Emergency shower and eyewash stations are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with hazardous or mixed waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Personnel at Area G are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the workplace under normal conditions. This PPE may include gloves, steel-toed shoes, and safety glasses. Additional PPE may be required during an unusual hazardous situation and can be found in the spill kits or at various locations listed below.

Gloves and goggles or safety glasses are available in the spill kits located at TA-54-8, TA-54-11, TA-54-20, TA-54-33, TA-54-48, TA-54-49, TA-54-92, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-283, TA-54-375, and TA-54-412.

OTHER

Continuous air monitors and giraffe monitors (or other appropriate air monitoring equipment) are located in TA-54-33, TA-54-48, TA-54-49, TA-54-153, TA-54-224, TA-54-226, TA-54-229, TA-54-230, TA-54-231, TA-54-232, TA-54-283, TA-54-375, TA-54-412, TA-54-1027, and TA-54-1028 for detection of airborne radioactive constituents.

Heavy equipment available on site includes:

- Scraper
- Bulldozer
- Front-end loader

Portable emergency generators

Vehicles available to evacuate personnel from Area G include:

- All-terrain vehicles
- Pickup truck
- Flat-bed truck
- Daihatsu vehicles
- Vans

TABLE D-3
TA-54 WEST
Emergency Equipment

FIRE CONTROL EQUIPMENT

Halon fire extinguishers are available at TA-54-38 in the high and low bays and at the outdoor container storage unit.

Description of General Capabilities:
Fire extinguishers may be used by any employee in the event of a small fire. Protection Technology Los Alamos (PTLA) and the Los Alamos County Fire Department (LACFD) are alerted when the automatic dry-pipe sprinkler system has been activated.

A dry-pipe sprinkler system is available throughout TA-54-38, including the loading dock area. The dry-pipe sprinkler system is heat activated in the high bay and at the loading dock. It is smoke activated in the low bay.

Fire alarm pull boxes are available inside TA-54-38 at the main entrance, in the high bay, and in the low bay.

Description of General Capabilities:
Fire alarms may be activated by any employee in the event of a fire to notify the LACFD and PTLA.

A fire hydrant is located approximately 220 feet west of TA-54-38 near the entrance to TA-54 West. This fire hydrant supplies water at adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, § 264.32, revised June 14, 2000.

A wall hydrant is located on the northwest side of TA-54-38.

Freeze-proof faucets are located on the northwest, southwest, and southeast sides of TA-54-38.

SPILL CONTROL EQUIPMENT

A mobile response kit is located at TA-54-38. The kit includes sorbent socks, pillows, and sheets; goggles; and large plastic bags.

COMMUNICATION EQUIPMENT

Telephones with public address (PA) capabilities are located in TA-54-38 in the high bay, in the low bay, and outside the main entrance. An emergency telephone is also located outside the main entrance.

Description of General Capabilities:

Telephones with PA capabilities for internal and external communication are available for use by any employee. The evacuation alarm is a high-pitched wailing sound that can be heard throughout TA-54-38 and TA-54-34. The fire alarm is a double slow-whoop sound. Fire and evacuation alarms are activated in the event of a fire or evacuation.

DECONTAMINATION EQUIPMENT

Safety showers and eyewash stations are located in TA-54-38 in the high bay and on the loading dock.

Material Safety Data Sheets (MSDS) are located at the TA-54-38 muster area (approximately 120 feet northwest of TA-54-38) and in the TA-54-38 main entry area.

Description of General Capabilities:
Safety showers and eyewashes are used by personnel who receive a chemical splash to the skin or to the eyes. Specific MSDSs for the chemical(s) being managed should be obtained prior to working with mixed waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Personnel at TA-54 West are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the workplace under normal conditions. This PPE includes gloves, steel-toed shoes, and safety glasses. Additional PPE may be required during an unusual hazardous situation and can be found in the spill kits.

Gloves, goggles, safety glasses, coveralls, and face shields are found in the spill kits located at TA-54-38.

All workers located within the operating limits of a crane (fixed or mobile) wear hard hats.

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In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) Subpart V, Part 264, Subpart D and 20.4.1 NMAC §270.14(b)(7), revised June 14, 2000, contingency measures applicable to the hazardous and mixed waste management units at Technical Area (TA) 55 are provided in this Attachment's General Section.

Figure E-1 (LANL, 2003) shows evacuation routes and muster areas that may be used at TA-55 in the event of an emergency. In addition, lists of emergency equipment currently available for use at TA-55 are included as Tables D-1 through D-4 in this Attachment. A list of emergency equipment (including spill control equipment) available from the Hazardous Materials Response Group is presented in Table D-2 of this Attachment's General Section. Evacuation routes, muster area locations, and emergency equipment are subject to change. Emergency equipment discussed in this plan may be replaced and/or upgraded with functionally equivalent components and equipment as necessary for routine maintenance and repairs.

Hazardous waste spills are managed by type and severity of the incident. If a hazardous waste spill occurs, the Incident Command evaluates the type and severity of the spill and determines if assistance from LANL's Emergency Management and Response Group is required. If not, the spill is managed internally by TA-55 personnel.

REFERENCES

LANL, 2002, "Los Alamos National Laboratory General Part B Permit Renewal Application", Revision 2.0, August 2002, LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 54 Part B Permit Renewal Application", Revision 3.0, June 2003, LA-UR-03-3579, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table D-1
TA-55 VAULT
Emergency Equipment

FIRE CONTROL EQUIPMENT

Dry-chemical fire extinguishers are located in Room 401.

Description of General Capabilities:

The fire extinguishers are portable, manually-operated units and can be used by any employee in case of fire. The fire extinguishers in Room 401 are for use only in case of fire outside the gloveboxes.

Fire alarm pull boxes and push button stations are available in Room 401.

Description of General Capabilities:

Fire alarms can be activated by any employee in the event of fire to notify the Central Alarm Station.

An automatic fire suppression sprinkler system is located in Room 401.

Automatic thermal alarms are located in the gloveboxes in Room 401.

Fire hydrants are located outdoors on the north, south, and west sides of TA-55-4.

SPILL CONTROL EQUIPMENT

Room 401 provides secondary containment for the storage tank system and cementation unit.

COMMUNICATION EQUIPMENT

Telephones are located in Room 401. The telephones are capable of handling incoming/outgoing calls and paging.

A telephone is located at each of the two west exit doors of TA-55-4.

Two-way radios are available from the Nuclear Materials Technology Facility Incident Command located at TA-55-3, Room 179, for personnel working in Room 401.

Alarms at TA-55-4:
The fire alarm is a zone-wide whooping sound.

If a drop-box pushbutton station is used, a zone-wide, high-pitched constant tone will be activated and then switch to the standard whooping sound.

The evacuation alarm is a facility-wide mid-range pulsating tone.

The continuous air monitor alarm is a local high-pitched pulsating tone.

The ventilation alarm is a local slow, repeating chime tone.

The public address system may also be used to announce an evacuation.

DECONTAMINATION EQUIPMENT

Safety showers and eyewash stations are located in Room 401.

Description of General Capabilities:
Safety showers and eyewashes are available for decontamination of personnel who receive a chemical splash to the skin or eyes.

Material Safety Data Sheets (MSDS) are available in Room 401 and at TA-55-4.

Specific MSDSs may be obtained prior to working with any hazardous waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Self-contained breathing apparatus (SCBA) are located in the southside hallway outside of Room 401, in the northside hallway of TA-55-4, and in TA-55-3, Room 179. The SCBAs are available for personnel working in or near Room 401.

Change/decontamination rooms with protective clothing available are located on the first floor of TA-55-4 and in TA-55-3. Protective clothing is also available in a locker located in the hallway near Room 401 for use by personnel working in or near Room 401.

Respirators located in TA-55-3 (Room 107) and in TA-55-4 (Room 515) are available for all personnel working in or near TA-55-4. Respirators are re-issued on a regular basis to TA-55-4 personnel for radiation work. These respirators are stored in the personnel's individual lockers. Combination gas canisters (particulate, organic, and acid) are available in TA-55-4 (Room 515).

OTHER:
If transportation is needed for evacuation, vehicles may be obtained through the Emergency Management and Response Group.

TABLE D-2

TA-55 Building 4 Basement

Emergency Equipment

FIRE CONTROL EQUIPMENT

Halon, dry chemical, and/or carbon dioxide fire extinguishers are available near B40, B05, K13, B45, and the Vault.

Description of General Capabilities:
The fire extinguishers are portable, manually-operated units and can be used by any employee in case of fire.

Fire alarm pull boxes are located at B05, K13, B45, the Vault, and on each side of the fire door.

Description of General Capabilities:
Fire alarms can be activated by any employee in the event of fire to notify the Central Alarm System.

An automatic fire suppression sprinkler system is located throughout the basement at TA-55-4, including the Vault and the office and corridor associated with the Vault.

Fire hydrants are located outdoors on the north, south, and west sides of TA-55-4.

SPILL CONTROL EQUIPMENT

Self-containment pallets or cabinets are provided for containers of liquid and/or potentially liquid-bearing wastes stored at B40, K13, and the Vault.

COMMUNICATION EQUIPMENT

Telephones and intercom stations are located throughout the basement of TA-55-4. The telephones are capable of handling both incoming and outgoing calls. The intercom system is connected to the TA-55-3 Operations Center and allows the Operations Center to easily mobilize emergency response support.

Two-way radios are available from the Nuclear Materials Technology Facility Incident Command located at TA-55-3, Room 179, for personnel working in the basement at TA-55-4.

Personal pagers are issued to and carried by assigned personnel working in the basement of TA-55-4. These pagers are accessed by telephone.

Alarms at TA-55-4:

The fire alarm is an area-wide whooping sound.

The evacuation alarm is a facility-wide mid-range pulsating tone.

The continuous air monitor alarm is a local high-pitched pulsating tone.

The ventilation alarm is a local slow, repeating chime tone.

The public address system activated from the TA-55-3 Operations Center may be used to announce an evacuation.

A site-wide paging system activated from the TA-55-3 Operations Center can be heard throughout TA-55-4.

DECONTAMINATION EQUIPMENT

Eyewashes are located throughout the basement of TA-55-4.

Description of General Capabilities:
The eyewash stations are available for decontamination of personnel who receive a chemical splash to the eyes.

Safety showers are located near B40, K13 and in the office for the Vault.

Description of General Capabilities:
The safety showers are available for decontamination of personnel who receive a chemical splash to the skin.

Material Safety Data Sheets (MSDSs) are available at TA-55-41. Specific MSDSs may be obtained prior to working with any hazardous waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Change/decontamination rooms with protective clothing available are located on the first floor of TA-55-4 and in TA-55-3.

Respirators located in TA-55-4 and in TA-55-3 are available for all personnel working in or near TA-55-4. Particulate and toxic gas canisters are available in TA-55-4.

Self-contained breathing apparatus are located in the TA-55, Basement.

OTHER:
If transportation is needed for evacuation, vehicles may be obtained through the Emergency Management and Response Group.

Forklifts stored in the basement are available for use in the basement and are stored near the north basement doorway.

TABLE D-3
TA-55 CONTAINER STORAGE PAD
Emergency Equipment

FIRE CONTROL EQUIPMENT

A dry chemical fire extinguisher is located on the Container Storage Pad.

Description of General Capabilities:
The fire extinguishers are portable, manually-operated units and can be used by any employee in case of fire.

Fire hydrants are located along the north, south, and west sides of TA-55-4.

One fire hydrant is located just south of the Container Storage Pad.

Fire alarm pull boxes are located in TA-55-42 at the northwest corner of TA-55-4.

One fire alarm pull box is located outside on the south side of TA-55-4.

COMMUNICATION EQUIPMENT

A telephone is located on the east side of TA-55-11, and additional phones are located in TA-55-185 and on the south side of TA-55-4.

Two-way radios are available from the Nuclear Materials Technology (NMT) Facility Incident Command located at TA-55-3, Room 179, for personnel working at the Container Storage Pad.

Personal pagers are issued to and carried by assigned personnel working at the Container Storage Pad. These pagers are accessed by telephone.

Alarms at TA-55:
The fire alarm is an area-wide whooping sound.

The evacuation alarm is a facility-wide mid-range pulsating tone.

The public address (PA) system activated from the TA-55-3 Operations Center may be used to announce an evacuation. PA speakers are located on the west side of TA-55-4.

Two intercom systems to the TA-55-3 Operations Center are located on the south and north sides of TA-55-4.

DECONTAMINATION EQUIPMENT

A safety shower and eyewash station are located outdoors on the Container Storage Pad.

Description of General Capabilities:
The safety shower and eyewash are available for personnel who receive a chemical splash to the skin or eyes.

Material Safety Data Sheets (MSDSs) are available at TA-55-2. Specific MSDSs may be obtained prior to working with any hazardous waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT

Change rooms with protective clothing available are located on the first floor of TA-55-4 and in TA-55-3.

Respirators are located in TA-55-4 and in TA-55-3 for all personnel working in or near TA-55-4.

OTHER:

If transportation is needed for evacuation, vehicles may be obtained through the Emergency Management and Response Group.

Two forklifts are available for NMT-7 use.

TABLE D-4
TA-55 BUILDING 185
Emergency Equipment

FIRE CONTROL EQUIPMENT:
Fire hydrants are located along the north, south, and west sides of TA-55, Building 4 (TA-55-4).

One fire alarm pull box is located inside TA-55-185.

Fire alarm pull boxes are located in TA-55, Building 42, at the northwest corner of TA-55-4.

One fire alarm pull box is located outside on the south side of TA-55-4.

COMMUNICATION EQUIPMENT:
One telephone is located inside TA-55-185.

A telephone is located on the east side of TA-55-11 and additional phones are located in TA-55-185 and on the south side of TA-55-4.

Two-way radios are available from the Nuclear Materials Technology (NMT) Facility Incident Command located at TA-55-3, Room 179, for personnel working at TA-55-185.

Personal pagers are issued to and carried by assigned personnel working at TA-55-185. These pagers are accessed by telephone.

Alarms at TA-55-4:
The fire alarm is an area-wide whooping sound.

The evacuation alarm is a facility-wide mid-range pulsating tone.

The pubic address (PA) system activated from the TA-55-3 Operations Center may be used to announce an evacuation.

PA speakers are located on the west side of TA-55-4 near TA-55-185. Intercom systems to the TA-55-3 Operations Center are located on the south and north sides of TA-55-4.

DECONTAMINATION EQUIPMENT:
TA-55-185 will be equipped with a portable safety shower and eyewash station before wastes are managed there.

PERSONAL PROTECTIVE EQUIPMENT:
Change rooms with protective clothing available are located in TA-55-3.

Respirators located in TA-55-4 and in TA-55-3 are available for all personnel working in or near TA-55-185.

OTHER:
If transportation is needed for evacuation, vehicles may be obtained through the Emergency Management and Response Group.

A forklift is available inside of TA-55-185.

Two forklifts are available to NMT-7.

ATTACHMENT E

INSPECTION PLAN

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LIST OF FIGURES

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

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AR	Action Required
CSU	container storage unit
IRF	Inspection Record Form
LANL	Los Alamos National Laboratory
NA	Not Applicable
TA	technical area

ATTACHMENT E
INSPECTION PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 264.15, revised June 14, 2000 [6-14-00], this Attachment presents inspection requirements applicable to all currently existing hazardous or mixed waste management units at Los Alamos National Laboratory (LANL) that are included in technical area (TA)-specific permit applications, permit modification requests, or permit renewal applications. Pursuant to 20.4.1 NMAC § 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. As specified in 20.4.1 NMAC § 270.14(b)(5) [6-14-00], this Inspection Plan presents general inspection schedules. Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment. Inspection schedules or methods may differ at certain waste management units based upon worker safety issues or the nature of the safety and emergency equipment. In these cases, the specific inspection schedules or methods are included in this Attachment.

E.1 GENERAL INSPECTION SCHEDULES AND REQUIREMENTS [20.4.1 NMAC § 270.14(b)(5) and 20.4.1 NMAC § 264.15(b) and (c)]

In accordance with the requirements of 20.4.1 NMAC § 270.14(b)(5), and 20.4.1 NMAC § 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. A copy of this Inspection Plan, which includes inspection schedules, will be maintained by LANL's Solid Waste Regulatory Compliance Group and by the site operator (i.e., the division or operating group that is responsible for or manages the unit), as required in 20.4.1 NMAC § 264.15(b)(2) [6-14-00].

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 are provided in this Attachment's Sections E.2 through E.9. The IRF and instructions for its completion are provided for as Figure C-1 of this Attachment Section; the form may be supplemented, changed, or otherwise

replaced with an equivalent form with the approval of the Department. Pursuant to 20.4.1 NMAC § 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 management units.

E.1.1 Inspection Records [20.4.1 NMAC § 264.15(d)]

Inspection training is provided through LANL's Performance Surety Division's ES&H Training Group. The division or operating group is responsible for ensuring that training is repeated, as necessary. 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 inspection records for a minimum of three years from the date of inspection. An electronic version of the records will be maintained through the closure or post-closure periods dependent upon the type of facility. During that timeframe, 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 20.4.1 NMAC, Subpart V, Part 264 [6-14-00], requirements for permitted hazardous and mixed waste management 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 E.2 through E.9. 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. Other records, such as a memo to file, may be used to document a condition of "No Use" at a unit.

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.

E.1.2 Inspection Frequency [20.4.1 NMAC § 264.15(b)(4)]

Inspection frequencies relevant to the unit types at LANL are presented in Sections E.2 through E.9 of this Attachment Section and/or in TA-specific Sections of this Attachment. Inspection frequencies may be increased at LANL's discretion when it determines that increased frequency may further assist in the detection or prevention of environmental hazards.

E.1.3 Actions Resulting From Inspections [20.4.1 NMAC § 264.15(c)]

If any defects, deterioration, operator errors, discharges, 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 or IRF documentation.

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 (Permit Attachment D) will be implemented. The contingency plan discusses the appropriate responses to emergency situations. Evacuation determinations will be made as outlined in Table E-4 of the contingency plan. 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.

E.2 INSPECTION SCHEDULE AND REQUIREMENTS FOR CONTAINER STORAGE UNITS [20.4.1 NMAC §§ 264.15(b) and 264.174]

Container storage units (CSU) are inspected according to the schedule provided below and/or in TA-specific permit applications, permit modification requests, or permit renewal applications. 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.

E.2.1 On Day(s) of Waste Handling

Inspections will be conducted every day of or the day after waste handling, 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 CSU. For inspections of CSUs, the following items will be addressed, as appropriate:

- General information (Items 1-6)
- 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

E.2.2 Weekly

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

- General information (Items 1-6)
- 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

E.3 INSPECTION SCHEDULE AND REQUIREMENTS FOR TANK SYSTEMS [20.4.1 NMAC §§ 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 and/or in TA-specific permit applications, permit modification requests, or permit renewal applications. 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.

E.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 (Items 1-6)
- 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)

E.3.2 Weekly

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

- General information (Items 1-6)
- 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, overfill/spill control equipment, tank monitoring and leak detection systems, and data from these systems
- Proper operating condition of treatment tank (if applicable)

E.3.3 Annually

In accordance with 20.4.1 NMAC § 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.

E.4 INSPECTION SCHEDULE AND REQUIREMENTS FOR OPEN BURNING/OPEN DETONATION UNITS [20.4.1 NMAC §§ 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.

E.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 (Items 1-6)
- Secondary containment structures (if applicable)
- Detonation pad run on/off control (if applicable)
- (Un)loading area

E.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 (Items 1-6)
- Communications equipment
- Warning signs
- Security
- Work surfaces
- Spill/fire equipment
- Eyewashes/safety showers
- Wind sock (if applicable)
- Secondary containment structures (if applicable)
- Detonation pad run on/off control (if applicable)
- Open burning units covered when not in use
- (Un)loading area

E.5 INSPECTION SCHEDULE AND REQUIREMENTS FOR CEMENTATION UNITS [20.4.1 NMAC §§ 264.15(b) and 264.602]

Cementation units will be inspected according to the schedule provided below and/or in TA-specific permit applications, permit modification requests, or permit renewal applications. 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.

E.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 the cementation unit, the following items will be addressed, as appropriate.

- General information (Items 1-6)
- Warning signs
- Work surfaces/floors
- Secondary containment structures
- Covers/lids of containers
- Labels
- (Un)loading area
- Structural integrity of cementation unit

E.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 (Items 1-6)
- 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

E.6 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART AA REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart AA]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart AA [6-14-00], are addressed, if applicable, in the TA-specific Sections of this Attachment.

E.7 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART BB REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart BB]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart BB [6-14-00], are addressed, if applicable, in the TA-specific Sections of this Attachment.

E.8 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], are addressed, if applicable, in the TA-specific Sections of this Attachment.

E.9 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART DD REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart DD]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart DD [6-14-00], are addressed, if applicable, in the TA-specific Sections of this Attachment.

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, legible, and not exceeding limit							
[20] COMPATIBILITY	Separated according to compatibility							
[21] INTEGRITY (Containers, tanks, and ancillary equipment)	Integrity, leakage, deterioration, corrosion, and damage							

HAZARDOUS AND MIXED WASTE FACILITY INSPECTION RECORD FORM

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, leakage, and cover							
30	OPEN DETONATION UNITS	Condition, vegetation, and erosion							
31	CEMENTATION UNITS	Structural integrity and condition of equipment and systems							

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.[35]

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-59-1-S, 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 RRES-SWRC 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 RRES-SWRC prior to use of the facility/location is available, if necessary.

9. Required signs must be legible and prominently posted. TSD units 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.

- 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.
- 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."

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.

TANKS SYSTEMS:

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.

HAZARDOUS AND MIXED WASTE FACILITY INSPECTION RECORD FORM

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, the condition of sand (as appropriate), and assure that the unit is covered when not in use. 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.

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.

TA-3

ATTACHMENT E

INSPECTION PLAN

TA-3
ATTACHMENT E
INSPECTION PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(5), and 20 NMAC 4.1, Subpart V, 264.15, "General Inspection Requirements," revised January 1, 1997 [1-1-97], inspection requirements for all hazardous and/or mixed waste management units at Los Alamos National Laboratory (LANL) are addressed in the General Section of this Attachment. This Attachment Section presents additional inspection requirements specific to the container storage unit (CSU) at Technical Area (TA) 3, Building 29 (TA-3-29). Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

E.1 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20 NMAC 4.1, SUBPART V, PART 264, SUBPART CC]

The hazardous wastes stored in containers at the TA-3-29 CSU may be subject to the Code of Federal Regulations (CFR), Title 40, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on applicability criteria specified in 40 CFR 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency (59 *Federal Register* 62896), require that containers be covered so that there are no detectable emissions. These standards are not applicable to mixed waste management units, and are not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gallons) capacity, or that have received waste prior to December 6, 1996. 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 volatile organics in a waste stream at the point of generation is less than 500 ppmw, or is equal to or greater than 500 ppmw. The generator documents this determination for that waste stream, as described in Appendix B of the LANL General Part B (LANL, 1998).

Containers of less than 0.46 m^3 (approximately 119 gallons) capacity and that meet U.S. Department of Transportation (DOT) specifications under 49 CFR, Part 178, will be kept closed during storage pursuant to 40 CFR 264.1086(b)(1)(ii). Containers undergoing the waste characterization activities described in this permit application may be opened for access for the

purposes described in 40 CFR 264.1086(c). Containers of greater than 0.46 m^3 capacity that contain waste with greater than 500 ppmw volatile organics or those that are greater than 0.1 m^3 capacity, do not meet DOT specifications, and contain wastes of greater than 500 ppmw volatile organics will be subject to a visual inspection and monitoring program as required by 40 CFR 264.1088(b).

E.2 REFERENCES

LANL, 1998, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

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In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 270.14(b)(5), and 20.4.1 NMAC § 264.15, revised June 14, 2000, inspection requirements for the hazardous waste management units at Technical Area 16 are addressed in the General Section of this Attachment.

REFERENCES

LANL, 2003, "Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Application", Revision 4.0, June 2003, LA-UR-03-3903, Los Alamos National Laboratory, Los Alamos, New Mexico.

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In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, 270.14(b)(5), and 20.4.1 NMAC, Subpart V, 264.15, "General Inspection Requirements," revised June 14, 2000 [6-14-00], inspection requirements for all hazardous and/or mixed waste management units at Los Alamos National Laboratory (LANL) are addressed in the General Section of this Attachment. This Attachment Section presents additional inspection requirements applicable to the container storage units (CSU) at Technical Area (TA) 50, Building 69 (TA-50-69). Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

E.1 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

The hazardous wastes stored in containers at the TA-50 CSUs are subject to 20.4.1 NMAC, Subpart V, 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundment and Containers." Subpart CC standards for containers require that containers be covered so that there are no detectable emissions. The standards are met by placement of waste in DOT-compliant containers and are not applicable to containers of radioactive mixed waste. These standards are also not applicable to containers of waste with less than 500 parts per million by weight average volatile organics concentration, containers of less than a 0.1 cubic meters (m^3) (approximately 26 gallons [gal.]) capacity, and containers that have received waste before December 6, 1996.

Containers of hazardous waste that are less than or equal to 0.46 m^3 (approximately 119-gal.) capacity and meet U.S. Department of Transportation specifications under 49 Code of Federal Regulations, Part 178 will be closed while they are in storage so that there are no detectable emissions. All other containers subject to 20.4.1 NMAC, Subpart 264, Subpart CC [6-14-00] requirements will be inspected and monitored, as required at 20.4.1 NMAC, Subpart V, 264.1088(b) [6-14-00].

E.2 REFERENCES

LANL, 1998,"Los Alamos National Laboratory General Part B Permit Application", Los Alamos, New Mexico, Los Alamos National Laboratory.

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In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), § 270.14(b)(5), and 20.4.1 NMAC § 264.15, revised June 14, 2000 [6-14-00], inspection requirements for all hazardous and/or mixed waste management units at Los Alamos National Laboratory (LANL) are addressed in the General Section of this Attachment. This Attachment Section presents additional inspection requirements specific to the container storage units at Technical Area (TA) 54. Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

E.1 INSPECTION REQUIREMENTS FOR TRUPACT-II CONTAINERS [20.4.1 NMAC §§ 264.15(b) and 264.174]

Transuranic Package Transporter-II (TRUPACT-II) containers will be used to store transuranic (TRU) and mixed TRU waste containers prior to shipment from TA-54 West to the Waste Isolation Pilot Plant. These double containment, stainless-steel shipping containers are designed to contain up to 14 drums, two rounded-end standard waste boxes, or one ten-drum overpack.

TRUPACT-II containers are intended to store only waste containers of structural integrity. Waste containers will be visually inspected prior to their placement in the TRUPACT-II containers to ensure their integrity. The inspection will include a close examination of the cover and closure devices for visible cracks, holes, gaps, or other open spaces into the interior of the waste container when the cover and closure devices are secured in the closed position. The TRUPACT-II will be loaded with waste containers and sealed with a locking-ring closure mechanism. After the TRUPACT-II has been sealed, only the outside of the TRUPACT-II will be inspected to ensure its integrity and that there has been no human intervention.

E.2 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

The hazardous wastes stored in containers at TA-54 may be subject to 20.4.1.500 NMAC (incorporating the Code of Federal Regulations [CFR], Title 40, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers") based on the applicability criteria specified in 40 CFR § 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so

that there are no detectable emissions of volatile organic compounds to the air. Inspection and monitoring requirements are also specified.

As indicated in 40 CFR § 264.1080(b)(6), these standards are not currently applicable to containers that are used solely for management of radioactive mixed waste in accordance with all regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gallons) capacity, or that have received waste prior to the effective date of the regulation (December 6, 1996). The following management standards apply for hazardous wastes managed at LANL that do not meet any of the exemptions listed in 40 CFR §264.1080(b).

LANL requires that Subpart CC requirements be evaluated by the generator as part of the waste characterization process. Generator information is used to determine whether the concentration of volatile organics in a waste stream at the point of generation is equal to or greater than 500 ppmw, which is the threshold concentration for Subpart CC requirements. The generator documents this determination for that waste stream. In the event that this information is not available, the waste will be characterized in accordance with Permit Part 2, Section 2.4, and Attachment C (*Waste Analysis Plan*). Any hazardous waste that is newly-generated through the treatment or re-characterization of mixed waste at TA-54 will be characterized for the volatile organic content in accordance with Attachment C.

Three levels of air emission controls based on container design capacity are established in 40 CFR § 264.1086(b). TA-54 hazardous waste storage procedures require Level 1 controls based upon container design capacities. Containers of greater than 0.1 m^3 and less than 0.46 m^3 (approximately 119 gallons) capacity and that meet U.S. Department of Transportation specifications under 49 CFR, Part 178, are kept closed during storage pursuant to 40 CFR § 264.1086(c)(3). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR § 264.1086(c)(3). As required by 40 CFR § 264.1086(c)(4), these containers are subject to a visual inspection and monitoring program. On or before acceptance of the waste container at TA-54, the container is inspected to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position, in accordance with 40 CFR § 264.1086(c)(1)(ii). This inspection is documented in uniform hazardous waste manifests. Pursuant to the Inspection Plan (Attachment F) the containers are

inspected weekly at TA-54 to ensure that the containers remain closed during storage, thereby exceeding the monthly inspection requirements of 40 CFR § 264.1086(c)(4)(ii).

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In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.14(b)(5) and 20.4.1 NMAC §264.15, revised June 14, 2000 [6-14-00], inspection requirements for all hazardous and/or mixed waste management units at Los Alamos National Laboratory (LANL) are addressed in the General Section of this Attachment. This Attachment Section presents additional inspection requirements applicable to the waste management units at Technical Area (TA) 55. These requirements 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 to the environment or a threat to human health. Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

E.1 TA-55 VAULT [20.4.1 NMAC §264.15(b) and 264.174]

The Vault is a container storage unit (CSU) located in the basement at TA-55-4. The CSU consists of a completely enclosed area consisting of 13 rooms located along a central corridor. Because of high levels of radioactivity, the Vault must have specialized inspection procedures to adhere to "as low as reasonably achievable" principles established by the Atomic Energy Act. Performance of a weekly inspection of the storage rooms pursuant to the requirements of 20.4.1 NMAC §264.174 [6-14-00], would result in an annual employee exposure of 2.7 Roentgen equivalent man (rem) of neutron radiation. This exceeds the annual allowable employee exposure rate of 2 rems. Therefore, the following alternative inspection procedures have been implemented. These inspection requirements are applicable only to those rooms in the Vault that store mixed waste regulated pursuant to 20.4.1 NMAC Subpart V, Part 264 [6-14-00].

E.1.1 Non-Intrusive Inspection Systems

Continuous air monitors (CAM) are located in each individual storage room within the Vault to continuously monitor airborne radioactivity levels. If the concentration of an airborne material reaches a preset level, an alarm will sound. All of the containers in the Vault contain radioactive material. If container integrity is compromised and the material inside the container becomes airborne, the CAM will detect the release and sound an alarm. CAM air intakes have been placed near the negative air exhaust vent for each room. Placing CAM air intakes near room-exhaust

points provides the most beneficial location within the room to detect a release because air vented from each room must pass by the CAM intake prior to exhausting from the room. Each room has a single exhaust vent. If a problem with a container is identified, it is removed from the Vault and inspected in an open-front hood.

Information obtained during inspections and all container transfers are noted on the Vault Traffic Log Book maintained at TA-55. The Vault Traffic Log Book will be inspected weekly by Nuclear Materials Technology staff as a quality assurance measure to verify receipt or transfer of mixed waste from the Vault. If mixed waste is not currently being stored in the Vault and the weekly inspection indicates that no mixed waste has been received, the Inspection Record Form (IRF) will be marked "No Use" and completed according to the IRF instructions.

The Vault has extremely strict security and safeguards. Therefore, there is no significant potential for container breaches through inadvertent and uncontrolled access to the Vault.

E.1.2 Intrusive Inspection Procedures

The central hallway of the Vault will be inspected weekly when mixed waste is in storage and will address the following items:

- Vault Traffic Log Book inspected for receipt or transfer of waste
- Communications equipment
- Warning signs
- Security
- Work surfaces/floors in central corridor
- Spill/fire equipment
- Secondary containment
- (Un)loading area
- Visual inspection of storage rooms from hallway
- Nuclear Materials Custodian contacted to verify no alarms or problems

When containers are placed into or removed from a storage room within the Vault, the following items will be inspected in that storage room, as appropriate:

- Vault Traffic Log Book inspected for receipt or transfer of waste
- Communication equipment
- Warning signs

- Security
- Work surfaces/floors
- Spill/fire equipment
- Secondary containment
- (Un)loading area
- Nuclear Materials Custodian contacted to verify no alarms or problems
- Emergency equipment/lighting
- Covers/lids of containers
- Labels
- Accumulation start date
- Compatibility
- Structural integrity of containers
- Aisle spacing/stacking
- Pallets/raised containers

Inspection results are recorded on the IRF maintained at TA-55.

E.2 STORAGE TANK SYSTEM [20.4.1 NMAC §264.15(b), 264.193(i), and 264.195]

The storage tank system components located at TA-55-4, Room 401, are inspected according to the schedule provided below. The inspection frequency is 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.

E.2.1 Daily (During Operation)

The storage tank system components (including ancillary equipment) will be inspected at least once each operating day. An operating day includes when mixed waste is added to or emptied from a tank. For daily inspections, the following items will be inspected, as appropriate, and recorded on the IRF:

- Work surfaces/floors
- Secondary containment structure
- Structural integrity of tanks and ancillary equipment
- Labels
- (Un)loading areas

- All 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 tank

E.2.2 Weekly

Weekly inspection of the storage tank system components will be conducted and will include the following items, as appropriate, and recorded on the IRF:

- Warning signs
- Work surfaces/floors
- Secondary containment structures
- Covers/lids of tanks
- Labels
- Structural integrity of tanks and ancillary equipment
- (Un)loading areas
- All 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 tank

E.2.3 Annually

An annual assessment, as required by 20.4.1 NMAC §264.193 (i) [6-14-00], is not necessary for the TA-55 storage tank system and ancillary equipment because the storage tank system and the ancillary equipment have secondary containment.

E.3 CEMENTATION UNIT [20.4.1 NMAC §§264.15(b) and 264.602]

The cementation unit is located at TA-55-4, Room 401, and is inspected according to the schedule provided below. The inspection frequency is 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.

E.3.1 Daily (During Operation)

The cementation unit is inspected each operating day (i.e., when mixed waste is treated in the unit). For the daily inspection of the cementation unit, the following items will be inspected, as appropriate, and recorded on the IRF:

- Work surfaces/floors
- Secondary containment structures
- Labels
- Structural integrity of cementation unit
- (Un)loading area
- C.3.2 Weekly

Weekly inspection of the cementation unit will be conducted and will address the following items, as appropriate and recorded on the IRF:

- Warning signs
- Work surfaces/floors
- Secondary containment structure
- Labels
- Structural integrity of cementation unit
- (Un)loading area

E.4 ADDITIONAL INSPECTION ITEMS

The items listed below are inspected monthly and documented by the Facility and Waste Operations Division (FMU-7) on a separate form:

- Evacuation alarms
- Ventilation alarms
- Fire alarms
- Fire pumps
- Fire extinguishers
- Communication equipment
- Eyewashes/safety showers

These inspection items may be changed at the discretion of FMU-7 to ensure consistency with the inspection items and frequencies specified in the most current version of the "TA-55 Final Safety Analysis Report" (LANL, 1996) and the "TA-55 Technical Safety Requirements" (LANL, 2000).

Additionally, security inspections of the fences and TA-55 access controls are conducted daily.

E.5 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPARTS AA AND BB REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subparts AA and BB]

The TA-55 CSUs are not subject to the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subparts AA and BB because they do not operate applicable process vents or equipment.

E.6 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

The hazardous wastes stored in containers at the TA-55 CSUs may be subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart CC (incorporating the Code of Federal Regulations [CFR], Title 40, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers") based on the applicability criteria specified in 40 CFR §264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so that there are no detectable emissions of volatile organic compounds to the air. Inspection and monitoring requirements are also specified.

As indicated in 40 CFR §264.1080(b)(6), these standards are not currently applicable to containers that are used solely for management of radioactive mixed waste in accordance with all regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gallons) capacity, or that have received waste prior to the effective date of the regulation (December 6, 1996). The following management standards apply for hazardous waste managed at LANL that do not meet any of the exemptions listed in 40 CFR §264.1080(b).

LANL requires that Subpart CC requirements be evaluated by the generator as part of the waste characterization process. Generator information is used to determine whether the concentration of volatile organics in a waste stream at the point of generation is less than 500 ppmw or is equal to or greater than 500 ppmw, which is the threshold concentration for Subpart CC requirements. The generator documents this determination for that waste stream. In the event that this information is not available, the waste will be characterized in accordance with Attachment C (*Waste Analysis*

Plan). Any hazardous waste that is newly-generated through the treatment or re-characterization of mixed waste at TA-55 will be characterized for the volatile organic content in accordance with Attachment C.

Three levels of air emission controls based on container design capacity are established in 40 CFR §264.1086(b). TA-55 hazardous waste storage procedures require Level 1 controls based upon container design capacities. Containers of greater than 0.1 m^3 and less than 0.46 m^3 (approximately 119 gallons) capacity and that meet U.S. Department of Transportation specifications under 49 CFR, Part 178, are kept closed during storage pursuant to 40 CFR §264.1086 (c)(3). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR §264.1086(c)(3). As required by 40 CFR §264.1086(c)(4), these containers are subject to a visual inspection and monitoring program. On or before acceptance of the waste container, the container is inspected to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position, in accordance with 40 CFR §264.1086(c)(1)(ii). This inspection is documented in uniform hazardous waste manifests. Pursuant to the Inspection Plan in Appendix C of the most recent version of the LANL General Part B, containers are inspected weekly at TA-55 to ensure that the containers remain closed during storage, thereby exceeding the requirements of 40 CFR §264.1086(c)(4)(ii).

E.7 REFERENCES

LANL, 2000 and all recent revisions, "TA-55 Technical Safety Requirements," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1996 and all recent revisions, "TA-55 Final Safety Analysis Report," Los Alamos National Laboratory, Los Alamos, New Mexico.

ATTACHMENT F

PERSONNEL TRAINING PLAN

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
EDS	Employee Development System
EM&R	LANL's Emergency Management and Response
EMP	Emergency Management Plan
ES&H	environment, safety, and health
FWO	LANL's Facility and Waste Operations Division
KSL	KBR-Shaw-LATA
LANL	Los Alamos National Laboratory
OJT	on-the-job training
PS-13	LANL's ES&H Training Group
PTLA	Protection Technology Los Alamos
RCRA	Resource Conservation and Recovery Act
S-10	LANL's Hazardous Material Response Group
SWRC	LANL's Solid Waste Regulatory Compliance Group
TSF	treatment and storage facility
USC	United States Code

ATTACHMENT F
PERSONNEL TRAINING

This Attachment describes the personnel training program for Los Alamos National Laboratory (LANL) treatment and storage facility (TSF) workers. Training requirements for treatment, storage, and disposal facility personnel are specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 264.16, revised June 14, 2000 [6-14-00], and are included in this Attachment, as required by 20.4.1 NMAC § 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 20.4.1 NMAC, Subpart V, Part 264 [6-14-00]. This training program applies to all employees of the U.S. Department of Energy and any subcontractors who work regularly at LANL TSFs and manage hazardous and/or mixed waste. The degree of training varies with the job duties.

F.1 HAZARDOUS AND MIXED WASTE MANAGEMENT/RESPONSIBILITIES

Waste management activities and responsibilities at specific hazardous and/or mixed waste management units are handled by the appropriate LANL division or group. Waste management groups within the Facility and Waste Operations (FWO) Division are responsible for most centralized waste management activities at LANL. The Solid Waste Regulatory Compliance Group (SWRC) 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 (*Contingency Plan*).

Laboratory-contracted support services (e.g., KBR-Shaw-LATA [KSL]) 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 Nuclear Criticality Safety Group, the Occurrence Reporting Group, the Hazardous Material Response Group (S-10), the Meteorology and Air Quality Group, the Water Quality and Hydrology Group, the Ecology Group, and personnel in SWRC 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 (EM&R) Office provides emergency planning and response at LANL and has the overall responsibility for LANL's Emergency Management Plan

(EMP) training. The Performance Surety Division ES&H Training Group (PS-13) is responsible for the analysis, design, development, and delivery of LANL-wide environment, safety, and health (ES&H) training. Courses on hazardous and/or mixed waste are designed with substantial input from SWRC and FWO waste management groups, and other subject matter experts, as appropriate.

F.2 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES [20.4.1 NMAC § 270.14(b)(12) and 20.4.1 NMAC § 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 and are usually classroom-based. Facility-specific training may be developed and delivered within a particular TSF, 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 F.2.1 through F.2.3. All LANL employees and LANL contract and support personnel who handle hazardous and/or mixed waste at TSFs receive the appropriate level of training within six months of their date of hire or transfer for work at a TSF. Personnel will not work in unsupervised waste handling positions at TSFs 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 PS-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 TSF. 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 TSF training records for currently employed workers until the TSF closes.

Table F-1 presents components of the LANL-wide training program as administered through PS-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 F-1 include TSF hazardous/mixed waste workers, managers and supervisors of TSF hazardous/mixed waste workers, emergency responders, and uncontrolled area potential release site workers. Table F-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.

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

Managers and Supervisors of TSF Hazardous/Mixed Waste Workers are directly responsible for day-to-day operations related to TSF 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., S-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 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 on a regular schedule and updated as required to keep materials current with hazardous waste management regulations. Alternative forms of training (e.g., paper-based self-study courses, web-based training) may be taken to meet specific training requirements. Such alternate forms of training must be approved by PS-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 20.4.1 NMAC § 264.16(d)(2) [6-14-00].

F.2.1 LANL-Wide Courses

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

The RCRA Personnel Training course 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.)*. PS-13, with guidance from SWRC, provides an annual refresher of applicable hazardous waste management requirements. TSF personnel who handle hazardous and/or mixed waste and/or clean up spills or releases of hazardous and/or mixed waste at TSFs and the managers and supervisors of these workers also receive instruction on appropriate topics listed in Table F-1. In addition, personnel responsible for shipping or transporting hazardous and/or mixed waste require supplementary training, as necessary.

F.2.2 Facility-Specific Training [20.4.1 NMAC § 264.16(a)(3)]

Waste-handling personnel will participate in facility-specific training at their particular work locations, as appropriate. Table F-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.

F.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 TSF-

specific inspection requirements. TSF emergency response personnel receive TSF-specific training regarding emergency response and shutdown procedures at the TSF to which they are assigned.

F.2.4 Training Coordinator [20.4.1 NMAC § 264.16(a)(2)]

The PS-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.

F.3 EMERGENCY TRAINING [20.4.1 NMAC § 264.16(a)(3) and (c)]

If called upon by the EM&R Office, additional non-LANL emergency response personnel (e.g., KSL, 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. Appendix D (*Contingency Plan*) 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, TSF personnel involved in waste handling and emergency response must be knowledgeable about appropriate building and operating area emergency procedures. These workers receive training in TSF-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 TSF-specific emergency procedures are provided to all personnel under their supervision. Training in TSF-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 TSF-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 E), 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, TSF 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.

F.4 IMPLEMENTATION OF TRAINING PROGRAMS [20.4.1 NMAC § 264.16(b) and (c)]

Waste Generation Overview Live is an introductory course that provides an overview of federal and state waste management regulations and Laboratory policies and procedures for waste management operations. The training addresses the information needed to identify and properly manage wastes that are subject to hazardous waste regulations in 20.4.1 NMAC, Subpart II [6-14-00].

In addition to Waste Generation Overview Live, all TSF workers who handle hazardous and/or mixed waste are required to complete RCRA Personnel Training and annual RCRA refresher courses. These refresher courses are intended to update personnel on LANL procedures and changes in RCRA *(42 USC § 6901 et seq.)* provisions and 20.4.1 NMAC regulations and to provide them with an overview of their introductory training. Line managers and group leaders are responsible for ensuring that personnel participate in the appropriate introductory and annual training courses.

TABLE F-1

Los Alamos National Laboratory-Wide Training Program Outline

Courses[a]	TSF[b] Hazardous/ Mixed Waste Worker	Manager/ Supervisor of TSF 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 (6-14-00); 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]	*
RCRA Refresher Training (includes regulatory and legislative updates, occurrence reports and lessons learned, audit findings, modification/review of the contingency plan; provides	X	X	*	*

Courses[a]	TSF[b] Hazardous/ Mixed Waste Worker	Manager/ Supervisor of TSF Hazardous/Mixed Waste Workers	Emergency Responder	Uncontrolled Area Potential Release Site Worker
required retraining)				
Waste Generation Overview Live (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 TSF = Treatment and storage 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 F-2

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

Facility-specific and/or on-the-job training (OJT) is provided to treatment and storage facility (TSF) 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
- TSF-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 TSF.

TA-3
ATTACHMENT F
PERSONNEL TRAINING PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 270.14(b)(12), and 20.4.1 NMAC § 264.16, revised June 14, 2000, training requirements for workers who manage hazardous waste at the Technical Area 3 container storage units are addressed in this Attachment.

TA-16
ATTACHMENT F
PERSONNEL TRAINING PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 270.14(b)(12), and 20.4.1 NMAC § 264.16, revised June 14, 2000, training requirements for workers who manage hazardous waste at the Technical Area 16 open burning units are addressed in this Attachment.

TA-50
ATTACHMENT F
PERSONNEL TRAINING PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, 270.14(b)(12), and 20.4.1 NMAC, Subpart V, 264.16, "Personnel Training," revised June 14, 2002 [6-14-00], training requirements for treatment, storage, and disposal facility workers who work at Technical Area 50 are addressed in this Attachment.

TA-54
ATTACHMENT F
PERSONNEL TRAINING PLAN

PERSONNEL TRAINING PLAN In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), § 270.14(b)(12), and 20.4.1 NMAC § 264.16, revised June 14, 2000, training requirements for workers who manage hazardous or mixed waste at Technical Area 54 are addressed in this Attachment.

TA-55
ATTACHMENT F
PERSONNEL TRAINING PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.14(b)(12) and 20.4.1 NMAC Subpart V, Part 264.16, revised June 14, 2000 [6-14-00], training requirements for workers who manage hazardous and/or mixed waste at Technical Area 55 are addressed in this Attachment.

ATTACHMENT G

CONTAINER MANAGEMENT

TA-3

ATTACHMENT G

CONTAINER STORAGE

TA-3
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LIST OF ABBREVIATIONS/ACRONYMS

CFR	Code of Federal Regulations
CMR	Chemistry and Metallurgy Research Building
CSU	container storage unit
DOT	U.S. Department of Transportation
ft	feet/foot
in	inch/inches
LANL	Los Alamos National Laboratory
m^3	cubic meters
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
PPE	personal protective equipment
ppmw	parts per million by weight
PTLA	Protection Technology Los Alamos
STTP	Actinide Source-Term Waste Test Program
SWB	standard waste box
TA	technical area
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

TA-3
ATTACHMENT G
TA-3 CONTAINER MANAGEMENT

The information provided in this Attachment addresses the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.15, and 20 NMAC 4.1, Subpart V, Part 264, Subpart I, revised January 1, 1997 [1-1-97]. This Attachment provides an overview of current facility operations and waste management practices for the Technical Area (TA) 3, Building 29 (TA-3-29), Chemistry and Metallurgy Research (CMR) Building container storage unit (CSU) at Los Alamos National Laboratory (LANL) and complements the information provided in Section 2.0 of the LANL permit application (LANL, 1999). It includes detailed descriptions of the storage structures and locations within the TA-3-29 CSU and the current waste management practices associated with them.

G.1 CONTAINER STORAGE WITHIN TA-3-29

TA-3 is located in the northern portion of LANL on South Mesa between Los Alamos Canyon on the north and Two Mile Canyon on the south. Sandia and Mortandad Canyons head on the east margin of TA-3, forming steep cliffs at the top of canyon walls. TA-3-29, the CMR Building, was established in 1952 as a research facility. It is a three-story structure containing offices, laboratories, and one CSU located on the basement floor of Wing 9. The TA-3-29 CSU consists of three storage locations within Rooms 9010, 9020, and 9030 for storage of hazardous and mixed wastes. The following provides descriptions of the storage structures and locations for the TA-3-29 CSU.

G.1.1 TA-3-29 Room 9010

Room 9010 is located in the basement of Wing 9 of the CMR Building. It measures 21 feet (ft), 8 inches wide by 106 ft, 9 inches (in.) long (see Figure G-1 in LANL, 1999,). The floor is concrete and is painted with an epoxy sealant. Waste storage generally takes place in the lower level portion of Room 9010 but may also take place in or near two room enclosures, located within Room 9010, that currently contain the Actinide Source Term Waste Test Program (STTP) research experiments. These enclosures are described below.

The STTP is currently located within Room 9010 in two stand-alone enclosures (see Figure G-2 in LANL, 1999). The northern enclosure is approximately 10 ft wide by 24 ft long; the southern enclosure measures approximately 17 ft wide by 54 ft long. The enclosures have ceilings, walls with windows, and doors for entry through airlocks; the enclosures are anchored to the floor. The wall to floor joints are sealed with grout. Floors and the lower six inches of the interior enclosure walls are coated with an epoxy sealant. Each enclosure includes emergency and communication equipment as well as ventilation, fire sprinkler, water, and electrical support functions connected to the main building systems. The enclosures are kept at negative pressure by exhaust fans ducted to the building's high-efficiency particulate air filters to provide radioactive material air-release protection.

The STTP is designed to measure time-dependent concentrations of actinide elements from transuranic (TRU) waste immersed in brines that are chemically similar to brines typically found in the underground formations of the Waste Isolation Pilot Plant (WIPP). The STTP will determine the effect of TRU waste matrices and brine chemistry on the concentrations of actinides under WIPP bounding conditions and variables. It will also test the predictive capability of the Actinide Source-Term Program Model for mobilization of actinides. TRU waste types typical of U.S. Department of Energy waste inventories will be characterized and loaded into specially designed test containers filled with brine containing additives to enhance the action of each influencing variable. The experiments are currently located within the CSU for safe and efficient processing of the experimental containers and to assure that during and after the research experiments, the containers will be stored and managed in a manner that is protective of human health and the environment. The experiments housed within the STTP enclosures are in a phased-down mode and the enclosures may be relocated to a different building at LANL. The experiments in the STTP do not constitute a Resource Conservation and Recovery Act-regulated treatment process for the hazardous component of the mixed waste.

G.1.2 TA-3-29 Room 9020

Room 9020 is located in the basement of Wing 9 of the CMR Building and is approximately 27 ft wide by 141 ft long. The container storage location within Room 9020 measures 19 ft wide by 25 ft long (see Figure G-1 in LANL, 1999) and is located in the northeast end of the room. The floor is concrete and painted with an epoxy sealant. Waste storage takes place in a cleared area on the northeast side of Room 9020. Security posts and chains are used to alert workers to the presence of waste containers.

G.1.3 TA-3-29 Room 9030

Room 9030 is located in the basement of Wing 9 in the CMR Building and is approximately 62 ft wide by 141 ft long. The container storage location within Room 9030 measures approximately 30 feet long by 8 feet wide (see Figure G-1 in LANL, 1999) and is located in the southwest corner of Room 9030. The floor is concrete and has been painted with an epoxy sealant. Security posts and chains, used to alert workers to the presence of waste containers, are planned to be installed.

G.2 GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES [20 NMAC 4.1, SUBPART V, PART 264, SUBPART I]

The following provides an overview of current facility operations and waste management practices that are applicable to the TA-3-29 CSU. This overview includes a discussion of container handling and inspection; security and access control; preparedness and prevention; hazards prevention; special requirements for ignitable, reactive, or incompatible waste; and air emission standards for containers. This information is submitted to fulfill the requirements of 20 NMAC 4.1, Subpart V, Part 264, Subpart I [1-1-97]. Specific waste management practices and procedures detailed herein may be subject to change as a result of LANL safety and waste management policy changes.

G.2.1 Container Handling and Inspection [20 NMAC 4.1, Subpart V, 264.171, 264.173, and 264.174]

Handling and inspection requirements for containers stored within the TA-3-29 CSU are presented in Attachment E and Sections 2.5 and 2.7, respectively, of the TA-3 Part B permit application (LANL, 1999). This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.171, 264.173, and 264.174 [1-1-97].

G.2.2 Security and Access [20 NMAC 4.1, Subpart IX, 270.14 (b)(4) and 270.14(b)(19)(viii); 20 NMAC 4.1, Subpart V, 264.14]

Security at TA-3-29, the CMR Building, is maintained with physical and administratively-controlled barriers. These barriers prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock into the areas and thus satisfy the requirements of 20 NMAC 4.1, Subpart V, 264.14(a) and 264.14(b)(2) [1-1-97].

Eight-foot-high chain-link security fences with barbed wire at the top surround the entire perimeter of TA-3-29. Pursuant to the requirements of 20 NMAC 4.1, Subpart V, 264.14(c) [1-1-97], bilingual (i.e., English and Spanish) warning signs are also posted at the entrances to each storage location within the TA-3-29 CSU and can be seen from any approach to these

locations. The legends on the signs indicate "Danger: Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of at least 25 ft.

There are four entry gates through the security fence at TA-3-29 (see Figure 2-1, Permit Part 2). A fire access and shipping gate is located south of TA-3-29 and is routinely closed and locked. When the gate is opened for shipments of material or waste, personnel are present at the gate to limit entry/exit by unauthorized persons. One combined pedestrian and vehicular entry gate manned by security personnel is located at the northwest corner of the TA-3-29 fence line. Another pedestrian gate manned by security personnel is located at the southeast corner of the building fence line. This gate is combined with a double vehicular gate which allows access from the parking area south of the building. Protection Technology Los Alamos (PTLA) provides the security personnel present at each of these gates during operational hours to limit entry/exit by unauthorized persons.

Outside doors to the main wings of TA-3-29 are always locked. Access for visitors to the operational portion of the building is controlled through a manned security station in the east side lobby and another on the west side of the building. Roll-up doors to the building can only be opened from inside the building and are also locked; opening these doors must be coordinated with PTLA security personnel. The building site is patrolled by PTLA security personnel during non-operational hours to ensure that the gates are locked and that unauthorized entry has not occurred. The security fence is also inspected weekly by on-site personnel and repairs are made, as necessary. In accordance with 20 NMAC 4.1, Subpart IX, 270.14(b)(19)(viii) [1-1-97], the locations of the security fences, access gates, and guard and entry stations at TA-3-29 are shown in Attachment A (Figure 2-1 in Permit Part 2).

G.2.3 Preparedness and Prevention [20 NMAC 4.1, Subpart V, Subpart C; and 20 NMAC 4.1, Subpart IX, 270.14(b)(8)]

The following presents how waste management operations at the TA-3-29 CSU comply with the preparedness and prevention requirements of 20 NMAC 4.1, Subpart V, Part 264, Subpart C [1-1-97]. This section includes a discussion of emergency equipment required at the facility, testing and maintenance of this equipment, personnel access to communications or alarm systems, aisle space and storage configuration, and support agreements with outside agencies.

G.2.3.1 Required Equipment [20 NMAC 4.1, Subpart V, 264.32]

TA-3-29 is equipped with an audible alarm system to alert personnel to evacuate the area. The evacuation alarm system may be activated by facility personnel pushing one of the evacuation

buttons located throughout TA-3-29. The building also contains a fire alarm system which may be activated by manual pull stations, heat and smoke detectors, and sprinkler system flow valves found throughout TA-3-29. Rooms 9010, 9020, 9030, and the STTP enclosures contain wet-pipe sprinkler systems that are equipped with fusible-link heads that actuate at 212 degrees Fahrenheit. Wing 9 of TA-3-29 contains gamma alarms that monitor for the presence of gamma radioactive contamination. Continuous air monitors are utilized throughout TA-3-29 to detect airborne radioactive contamination and, when detected, sound an alarm. The building also has a public address system for announcing fires or evacuations. Telephones with paging capabilities are located throughout TA-3-29. Paging telephones are used to page on-site personnel and may be used in the event of an emergency to communicate the location and nature of hazardous conditions to personnel in the area. The alarm system is interrupted when the paging telephone system is activated to allow personnel to hear the announcement. Personnel working in Rooms 9010, 9020, and 9030 can also use these phones to summon assistance from local emergency response teams in case of emergency.

The building is also equipped with fire extinguishers in Rooms 9010, 9020, and 9030 and pull stations in Rooms 9010 and 9020. Depending on the size of a fire and the fuel source, fire extinguishers may be used by on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. The fire alarm control panel continuously monitors all fire-suppression and detection systems and transmits signals to the Los Alamos County Fire Department through LANL's central alarm system.

Fire hydrants installed according to National Fire Protection Association standards are located around the outside of TA-3-29 (see Figure E-3 in LANL, 1999). Water is supplied to the fire hydrants by a municipal water system through 8-in. pipes at an adequate volume and pressure (i.e., 200 gallons per minute and 90 pounds per square inch static pressure) to supply a water hose in the event of a fire.

Spill centers are located at the south end of Room 9010 and in the STTP enclosures. They contain sorbent pillows, safety glasses, and gloves. Trained personnel may use this equipment to mitigate small containable spills when they are certain their actions will not put themselves or others at risk. Personnel decontamination equipment available includes safety showers and emergency eyewashes in the enclosures in Room 9010. Personnel working in Room 9020 have access to the eyewashes in the Room 9010 enclosures and a safety shower and emergency eyewash in Room 9030. The buddy system will always be employed when

containers are actively managed in Rooms 9010, 9020, and 9030 to assure that safety showers and eyewashes can be reached in an emergency. Material Safety Data Sheets provide useful exposure information and are available in Room 9010, Room 9030, and outside Room 9130.

G.2.3.2 Testing and Maintenance of Equipment [20 NMAC 4.1, Subpart V, 264.33]

The communication, alarm system, fire protection, spill control, and decontamination equipment associated with operations at the TA-3-29 CSU is inspected and/or tested according to the inspection schedule detailed in Attachment D (*Contingency Plan*). Maintenance, repair, and replacement of emergency equipment are performed, as needed.

G.2.3.3 Access to Communications or Alarm System [20 NMAC 4.1, Subpart V, 264.34]

Whenever waste is being handled at the TA-3-29 CSU, all personnel involved have immediate access to internal alarms or telephones in Rooms 9010, 9020, and 9030 either directly or through visual or voice contact with another individual. In the event of an emergency, communication equipment allows personnel to contact the CMR Operations Center, operating group management, the Emergency Management and Response Office, and/or the Central Alarm Station operator. In addition to the communications and alarm systems described in Section G.2.3.1, on-site personnel may carry pagers so that they can be contacted by on-site and LANL emergency support personnel at all times.

G.2.3.4 Aisle Space and Storage Configuration [20 NMAC 4.1, Subpart V, 264.35]

Information on aisle space and storage configurations for the TA-3-29 CSU is presented in Permit Part 3 and Section 2.1.3 of the TA-3 Part B permit application (LANL, 1999). This information meets the requirements of 20 NMAC 4.1, Subpart V, 264.35 [1-1-97].

G.2.3.5 Support Agreements with Outside Agencies [20 NMAC 4.1, Subpart V, 264.37(a)]

LANL maintains support agreements and contracts with outside agencies for emergency response assistance. Information regarding these contracts and support agreements is provided in Attachment D (*Contingency Plan*).

G.2.4 Hazards Prevention [20 NMAC 4.1, Subpart V, Part 264, Subpart C; 20 NMAC 4.1, Subpart IX, 270.14(b)(8)]

The TA-3-29 CSU is designed and operated to minimize the possibility of fire, explosion, or unplanned releases of hazardous constituents to the environment. The following discusses the general procedures, equipment, and structures that are currently used at TA-3-29 to prevent hazards. This includes preventing hazards during unloading of waste containers, preventing run-on and runoff, preventing contamination of the water supply, mitigating the effects of power outages, preventing undue exposure to personnel, and preventing releases to the atmosphere.

G.2.4.1 Preventing Hazards in Unloading

Trucks conforming to LANL specifications for Type B shipments requiring road closures are used to transport hazardous and mixed waste containers to TA-3-29 for storage and processing. The STTP waste drums are moved with individual multi-wheel dollies set into the bottom of the drums. STTP liter-scale test containers are moved with specialized fixtures referred to as "six-packs". The packaged wastes are unloaded by hydraulic lift onto the ground and moved into the south entrance of Wing 9 at TA-3-29. An electric, riding lift truck equipped with a blunt-ended drum grappler may be used to unload drums from the delivery truck one at a time. The drum grapplers will be equipped with blocks to prevent drums from being damaged. Metal standard waste boxes (SWB) and other large containers will be handled with a diesel forklift. Hand trucks or dollies will be used to move waste containers from the loading area to the CSU. Should a spill occur during waste handling activities, management of the spill and/or residual material will be performed in accordance with the Contingency Plan (see Attachment D).

The methods used to move drums at or within the TA-3-29 CSU will be selected based on the type of structure on which the drum is located. Drums on dollies will be moved manually. Drums located on secondary containment pallets will be moved using lift trucks equipped with drum grapplers. Drums containing liquids will only be set on dollies for placement at process equipment stations. The lift trucks will also be used to return drums from dollies to secondary containment pallets. A forklift will be used to move SWBs. The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while moving containers within the CSU. All damaged containers (e.g., severely corroded drums) are repaired or overpacked or the wastes are repackaged in new containers before being stored at the CSU.

G.2.4.2 Preventing Run-on and Runoff [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(ii)]

Run-on and runoff control methods for the TA-3-29 CSU are presented in Section 2.10 of the TA-3 Part B permit application (LANL, 1999). This information is provided to meet the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(8)(ii) [1-1-97].

G.2.4.3 Preventing Water Supply Contamination [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(iii)]

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of waste-handling operations at the TA-3-29 CSU. The CSU is located inside the building and any material spilled during waste management activities will be remediated pursuant to the appropriate contingency plan as part of normal operations. In addition, potential liquid-bearing wastes will be stored in secondary containment systems or on self-containment pallets. All water supply lines are under pressure and are equipped with backflow prevention devices to prevent contamination of these lines during emergencies. The depth to groundwater at TA-3-29 is approximately 1,100 ft (Purtymun, 1984). Geologic units underlying similar waste management units at TA-54 include layers of unsaturated volcanic tuff and ash, the moisture content of which ranges from 0.2 to 2.0 percent by weight (IT, 1987). This moisture content is insufficient for direct moisture migration through the Bandelier Tuff. Thus, no impact to groundwater is expected due to the release of the wastes managed at these units.

G.2.4.4 Mitigating Effects of Power Outages [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(iv)]

Electrical power is supplied to TA-3-29 by a 13.8 kilovolt distribution line through an underground conduit to an on-site substation. Supplied power is used to operate continuous air monitors and other electrical equipment in the building. In the event of a power failure, operations in the building would cease and personnel would exit the facility. Operations in the storage locations would be discontinued temporarily if electrical power was not restored quickly or if container handling equipment failed. However, neither a power outage nor an equipment failure would affect containment at any of these locations.

G.2.4.5 Preventing Undue Exposure [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(v)]

Personnel at the TA-3-29 CSU are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the work place under normal conditions. Use of PPE protects workers from direct contact with and inhalation or ingestion of hazardous materials. At TA-3-29, PPE is used routinely during waste-handling operations and when responding to unusual hazardous situations. The different levels of PPE are defined by the Occupational Safety and Health Administration as follows:

- X *Level D*: Coveralls; safety boots; safety glasses or goggles; hard hat; and appropriate gloves
- X *Level C*: Full-face, air-purifying respirator with appropriate cartridges for the chemicals or hazards present; chemical-resistant suits; chemical-resistant safety boots or booties; and inner and outer gloves
- X *Level B*: All Level C equipment plus self-contained breathing apparatus in place of a Level C full-face respirator
- X *Level A*: All Level B equipment, plus a fully-encapsulating chemical-resistant suit.

Most operations at the TA-3-29 CSU require that personnel handling wastes or working in the CSU wear modified Level D PPE (safety glasses and hard hats are not always required). There are instances where an increased level of PPE is required, such as during an emergency or unusual hazardous situation. All personnel that use PPE are trained and qualified to use the equipment properly.

G.2.4.6 Preventing Releases to the Atmosphere

Releases to the atmosphere are not anticipated at the TA-3-29 CSU because containers are kept closed during storage. The only exceptions to this practice are when, upon inspection, it is determined that a container currently in storage needs to be overpacked or repackaged in a new container.

G.2.5 Special Requirements for Ignitible, Reactive, and Incompatible Wastes [20 NMAC 4.1, Subpart IX, 270.14(b)(9), 270.15(c) and (d); 20 NMAC 4.1, Subpart V, 264.17, 264.176, and 264.177]

Special requirements for ignitable, reactive, or incompatible waste at the TA-3-29 CSU are presented in Permit Part 2 (Section 2.8). This information is provided to meet the requirements of

20 NMAC 4.1, Subpart V, 264.17(a), 264.176, and 264.177(a)(b) and (c); and 20 NMAC 4.1, Subpart IX, 270.14(b)(9) and 270.15(d) [1-1-97].

G.2.6 Air Emission Standards for Containers [40 CFR, Part 264, Subpart CC]

The hazardous wastes stored in containers at TA-3-29 may be subject to the Code of Federal Regulations (CFR), Title 40, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on the applicability criteria specified in 40 CFR 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so there are no detectable emissions. These standards are not applicable to mixed waste management units. The standards are also not applicable to containers of hazardous waste

with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gallons) capacity, or that have received waste prior to the effective date of regulation (December 6, 1996). 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 volatile organics in a waste stream at the point of generation is less than 500 ppmw, or is equal to or greater than 500 ppmw. The generator documents this determination for that waste stream, as described in Attachment C (*Waste Analysis Plan*).

Containers of less than 0.46 m^3 (approximately 119 gallons) capacity and that meet U.S. Department of Transportation (DOT) specifications under 49 CFR, Part 178, will be kept closed during storage pursuant to 40 CFR 264.1086(b)(1)(ii). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR 264.1086(c). Containers of greater than 0.46 m^3 capacity that contain waste with greater than 500 ppmw volatile organics or those that are greater than 0.1 m^3 capacity, do not meet DOT specifications, and contain wastes of greater than 500 ppmw volatile organics will be subject to a visual inspection and monitoring program as required by 40 CFR 264.1088(b) and addressed in Attachment C (*Inspection Plan*).

G.3 REFERENCES

LANL, 1999, "Los Alamos National Laboratory Technical Area 3, Building 29, Chemistry and Metallurgy and Research Building, Part B Permit Application," Revision 0.0 (Project No. 774830.21), Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

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CONTAINER STORAGE

TA-50

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CAM	continuous air monitor
CSU	container storage unit
FRP	fiberglass-reinforced plywood
ft	feet/foot
LANL	Los Alamos National Laboratory
m^3	cubic meters
MDA	Material Disposal Area
ppmw	parts per million by weight
TA	Technical Area
TRU	transuranic
WCRRF	Waste Characterization, Reduction, and Repackaging Facility

TA-50
CONTAINER MANAGEMENT

The information provided in this Attachment addresses the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, 270.15, and 20.4.1 NMAC, Subpart V, Part 264, Subpart I , revised June 14, 2000 [6-14-00]. This Attachment provides an overview of current facility operations and waste management practices for the Technical Area (TA) 50 container storage units at Los Alamos National Laboratory (LANL) and complements the information provided in Section 2.0 of the TA-50 Part B permit renewal application (LANL, 2002). It includes detailed descriptions of the TA-50 container storage units (CSUs) and the waste management practices associated with them.

G.1 CONTAINER STORAGE

TA-50 is located at the northeast corner of the intersection of Pajarito Drive and Pecos Road, on the finger mesa bounded by Mortandad Canyon to the north and Two-Mile Canyon to the south. TA-50-69 is located in the southwest quadrant of TA-50 and was constructed in 1979 to house the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) (formerly the Size Reduction Facility). The primary purpose of WCRRF was to size reduce large metallic items (e.g., glove boxes and other process equipment) that were transuric (TRU)-contaminated and repackage them into standard-sized containers capable for transportation and disposal at the Waste Isolation Pilot Plant. The facility was first used to size reduce mixed TRU waste in 1982. The original function of the WCRRF has since been expanded to include other activities related to hazardous and mixed waste management including waste characterization and experimental process demonstration support.

TA-50-69 is a single-story building constructed in two phases. The original structure (45 feet (ft) by 52 ft) was built in 1979, to house the main process room (Room 102) and personnel change rooms. An unloading area (Room 103) and a vehicle airlock entrance (Room 104) were added to the building in 1986. The dimensions of the 1986 addition are 20 ft by 36 ft. The longest dimension of the building is now 88 ft, and the building is oriented northwest-southeast. A mezzanine was also added in 1986 over the western third of the main process room. The exterior walls of TA-50-69 are load-bearing and constructed of structural steel framing with a plastic veneer finish on polystyrene insulation and gypsum wallboard. The interior walls are

similarly constructed. The epoxy-painted floor of the building is a reinforced concrete slab on compacted fill. The CSUs at TA-50 include the TA-50-69, Indoor CSU and the TA-50-69, Outdoor CSU.

G.1.1 TA-50-69, Indoor CSU

The TA-50-69, Indoor CSU consists of Rooms 102 and 103 as shown in Figure G-1 (LANL, 2002). Room 102, the main process room, measures approximately 45 ft wide and 52 ft long. The long dimension is oriented northwest-southeast. Room 103, the unloading area, measures approximately 18 ft wide and 19 ft long and is located adjacent to and southeast of Room 102. A 12-ft by 20-ft roll-up vehicle access door is located at the southernmost end of Room 103, separating the unloading area (Room 103) from the vehicle airlock entrance (Room 104). This design allows for unobstructed transport of oversized fiberglass-reinforced plywood (FRP) boxes from outside the facility, through the vehicle airlock entrance, into the unloading area, and into the glove box cutting enclosure.

G.1.2 TA-50-69, Outdoor CSU

The TA-50-69, Outdoor CSU was constructed before 1980, and was first used to store mixed waste in 1982. It is located in the southwest corner of TA-50. The TA-50-69, Outdoor CSU (see Figure G-1 in LANL, 2002) asphalt pad is not lined or coated, and measures 24 ft wide and 90 ft long, with an additional strip 12 ft wide and 90 ft long added to the southeast end. The asphalt pad is approximately 4 in. thick. The long dimension of this CSU is oriented east-southeast. The pad slopes gently (approximately 1 to 5 percent) from west to east and up to 2.5 percent toward the centerline. Transportainers and other weather protective structures (i.e., containers covered with tarps, containers inside SWBs) within the TA-50-69, Outdoor CSU provide weather protection for containers of various sizes. Supplement 2-1 (LANL, 2002) provides detailed information regarding standard transportainers. Painted lines are used to visually delineate the TA-50-69, Outdoor CSU boundary.

G.2 GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES

The following provides an overview of current facility operations and waste management practices that are applicable to the TA-50 CSUs. This overview includes a discussion of container handling and inspection; security and access control; preparedness and prevention; hazards prevention; special requirements for ignitable, reactive, or incompatible waste; and air emission standards for containers. This information is submitted to fulfill the requirements of

20.4.1 NMAC, Subpart V, Part 264, Subpart I [6-14-00]. Specific waste management practices and procedures detailed herein may be subject to change as a result of LANL safety and waste management policy changes.

G.2.1 Container Handling and Inspection

Handling and inspection requirements for containers stored within the TA-50 CSU are presented in Attachment E and in Sections 2.1.5 and 2.1.7, respectively, of the TA-50 Part B permit renewal application (LANL, 2002). This information is provided to meet the requirements of 20.4.1 NMAC, Subpart V, 264.171, 264.173, and 264.174 [6-14-00].

G.2.2 Security and Access

Security at TA-50 is predominantly maintained with artificial barriers. These barriers prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock into the area and, thus, satisfy the requirements of 20.4.1 NMAC, Subpart V, 264.14(a) and (b)(2) [6-14-00].

An 8-ft high chain-link security fence surrounds the entire perimeter of TA-50. Bilingual (i.e., English and Spanish) warning signs are posted on the fences at approximately 50- to 75-ft intervals. In accordance with the requirements of 20.4.1 NMAC, Subpart V, 264.14(c) [6-14-00], warning signs are also posted at the entrances to each area that will manage hazardous and mixed waste and are visible from any approach to these areas. The legends on the posted signs indicate "Danger, Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of 25 ft. In addition, signs will be posted at the entrance to each hazardous and mixed waste management area to address requirements associated with entering and working in the area.

There are four entry gates into TA-50. Two entry gates are located north of TA-50-1. During normal business hours, the easternmost of these two gates may remain open to receive deliveries. After normal business hours, this gate is padlocked. The westernmost of these two gates is the main access gate and remains open during normal business hours for personal and government-owned passenger vehicles. After normal business hours, access through this gate is by badge-reader only. A fire access and shipping gate is located west of TA-50-69 and is routinely kept closed and locked. When this gate is opened for shipments of materials or waste, facility personnel are present in the yard west of TA-50-69 to limit egress by unauthorized persons. A fourth gate to the south of TA-50-1 is locked except when authorized access is

necessary. TA-50 is patrolled by Protection Technology Los Alamos security personnel during non-operational hours to ensure that unauthorized entry has not occurred. In accordance with 20.4.1 NMAC, Subpart IX, 270.14(b)(19)(viii) [6-14-00], the locations of the security fences and entry gates at TA-50 are shown on Figure A-10 (LANL, 2002).

TA-50-69 is always locked and access is gained by a badge reader. Doors to the building and transportainers are locked. Keys to these doors are distributed to designated personnel only. Building access also limits access to the Indoor CSU. Access to the TA-50-69, Outdoor CSU is controlled by a chain around the CSU and a posted sign that indicates "Authorized Personnel Only."

G.2.3 Preparedness and Prevention

The following sections present how waste management operations at TA-50 comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. Additional information on the communication and alarm equipment available at LANL as well as a list of the emergency equipment available for use at the TA-50 CSUs is presented in Attachment D (*Contingency Plan*).

G.2.3.1 Required Equipment [20.4.1 NMAC, Subpart V, 264.32]

All personnel involved in waste management activities at the TA-50 CSUs have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another individual in accordance with 20.4.1 NMAC, Subpart V, 264.34 [6-14-00]. In the event of an emergency, this communication equipment will allow personnel to contact the operating group management, the Emergency Management and Response Office, and/or the Central Alarm Station operator.

TA-50-69 is equipped with an audible alarm system to alert personnel to evacuate the area. The alarm system may be activated by one of the fire alarm pull stations located throughout the building. TA-50-69 also has a public address system for announcing fires or evacuations and telephones with paging capabilities. Paging telephones are used to page on-site personnel and may be used in the event of an emergency to communicate the location and nature of hazardous conditions to personnel in the area. The alarm system is interrupted when the paging telephone system is activated to allow personnel to hear the announcement. Personnel can also use these phones to summon assistance from local emergency response teams in case of

emergency. Personnel may carry pagers, two-way radios, and/or cellular telephones so they can contact or be contacted by on-site and LANL emergency support personnel at all times.

TA-50-69 is equipped with fire extinguishers and fire suppression systems. Depending on the size of a fire and the fuel source, fire extinguishers may be used by on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. The fire alarm control panel continuously monitors all fire suppression and detection systems and transmits signals to the Los Alamos County Fire Department through LANL central alarm system.

A fire hydrant installed according to National Fire Protection Association standards is located approximately 55 ft west of TA-50-69. Water is supplied to the fire hydrant by a municipal water system through 8 inch pipes at an adequate volume and pressure (i.e., 200 gallons per minute and 90 pounds per square inch static pressure) to supply a water hose in the event of a fire.

TA-50-69 has an automatic wet-pipe sprinkler system in the main building and in the large glove box enclosure. The sprinkler system is heat-activated at 100°C (212°F). The TA-50-69, Outdoor CSU transportainers and weather protective structures are not equipped with automatic sprinkler systems, but are provided with a fire extinguisher located within 20-ft of the CSU. Personnel may use the fire alarm pull station at TA-50-69 in the event of a fire at both the Indoor and Outdoor CSUs.

Two spill centers are located in TA-50-69 in Room 102. They contain spill control equipment, personal protective equipment, and sorbents. Trained personnel may use this equipment to mitigate small containable spills when they are certain their actions will not put themselves or others at risk. EM&R provides additional spill control equipment and assistance upon request and depending on the size and severity of the spill. Personnel decontamination equipment available includes safety showers and eye wash stations located at TA-50-69. Material safety data sheets located at all operations areas provide useful exposure information.

G.2.3.2 Testing and Maintenance of Equipment [20.4.1 NMAC, Subpart V, 264.33]

The communication, alarm systems, fire protection, spill control, and decontamination equipment described above are tested and/or maintained according to the inspection schedule provided in Attachment E (*Inspection Plan*). The frequency of inspection is adequate to ensure proper operation in the event of an emergency. Repair and replacement of emergency equipment is performed as required.

G.2.3.3 Access to Communications or Alarm System

Whenever waste is being handled at the TA-50 CSUs, all personnel involved have immediate access to internal alarms or telephones either directly or through visual or voice contact with another individual. In the event of an emergency, communication equipment allows personnel to contact the operating group management, the Emergency Management and Response Office, and/or the Central Alarm Station operator. In addition to the communications and alarm systems described in Section G.2.3.1, on-site personnel may carry pagers so that they can be contacted on-site and LANL emergency support personnel at all times.

G.2.3.4 Aisle Space and Storage Configuration

Information on aisle space and storage configurations for the TA-50 CSUs is presented in Permit Part 3, Section 3.5.1, and Section 2.1.3 of the TA-50 Part B permit renewal application (LANL, 2002). This information is provided to meet the requirements of 20.4.1 NMAC, Subpart V, 264.35 [6-14-00].

G.2.3.5 Support Agreements with Outside Agencies

LANL maintains support agreements and contracts with outside agencies for emergency response assistance. Information regarding these contracts and support agreements is provided in Attachment D (*Contingency Plan*).

G.2.4 Hazards Prevention [20.4.1 NMAC, Subpart IX, 270.14(b)(8) and 20.4.1 NMAC, Subpart V, Part 264 Subpart C]

In accordance with 20.4.1 NMAC, Subpart V, Part 264, Subpart C and 20.4.1 NMAC, Subpart IX, 270.14(b)(8) [6-14-00], the TA-50 CSUs addressed in this Attachment are designed and operated to minimize the possibility of fire, explosion, or unplanned releases of hazardous constituents to any environmental medium. The following sections describe the general preventive procedures, structures, and equipment at the TA-50 CSUs to meet these

requirements. Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards and exposure to personnel and releases to the environment.

G.2.4.1 Preventing Hazards in Unloading

TA-50 personnel will use proper handling equipment, appropriate to a container's size and weight, to help prevent hazards while moving containers within the CSUs. Flatbed trucks or trailers will be used to transport containers to TA-50-69 for storage and processing. A forklift will be used to move containers at the TA-50-69, Outdoor CSU, from outside the building into the TA-50-69 airlock, and then within the TA-50-69, Indoor CSU. FRP boxes and palletized drums will be handled with a forklift equipped with tines. Individual drums of waste will be manipulated with a drum-grapple attachment on the forklift. Small containers may be handled manually or with a dolly. Inside TA-50-69, two cranes are available to move heavy objects. Load limits are restricted to the rated capacity of these cranes for safe operation. All damaged containers (e.g., severely corroded drums) will be repaired or overpacked, or the wastes repackaged in new containers before being staged at the CSUs.

Waste management personnel at TA-50 do not perform loading/unloading operations during precipitation events. The waste stored in the TA-50 CSUs is Waste Isolation Pilot Plant-certifiable and does not contain free liquids; therefore, if a drum is opened and the contents spilled, it is easily contained. In the case of spills, on-site personnel follow site procedures, emergency response plans, and implement the Attachment D (*Contingency Plan*), if necessary. Because the waste does not contain free liquids, secondary containment and temporary berms are not necessary during loading/unloading operations.

G.2.4.2 Runoff and Runon Controls [20.4.1 NMAC, Subpart V, 264.31 and 264.175(b); and 20.4.1 NMAC, Subpart IX, 270.15(a)(4) and (5)]

Runoff from the TA-50 CSUs to other areas or to the environment will be prevented. Engineered surfaces/structures or secondary containment pallets/devices are provided for potential liquid-bearing containers. All secondary containment systems are sufficient to contain at least 10 percent of the volume of potential liquid-bearing containers or the volume of the largest container, whichever is greater, in accordance with the requirements of 20.4.1 NMAC, Subpart V, 264.175(b)(3) [6-14-00].

As a practice at TA-50, runoff and erosion controls are designed to guide surface water away from waste management activities and into the natural drainages. Storm water feeds into

Mortandad Canyon and is managed according to the Clean Water Act. Liquids that may accumulate in the self-containment pallets as a result of leaks or spills will be collected into a container using a portable pump and/or sorbents, depending on the volume of accumulated liquid. Accumulated liquids will be removed as soon as possible and sampled in accordance with Attachment D (*Contingency Plan*).

G.2.4.2.1 TA-50-69, Indoor CSU

Run-on into the TA-50-69, Indoor CSU from outdoors is not likely to occur due to positive surface drainage that directs potential run-on away from the building. Figure A-11 (LANL, 2002) provides the contours and surface drainage around TA-50. The northern and eastern portions of TA-50 drain mainly to an unlined channel on the boundary between TA-50 and TA-35 (east of TA-50), although some flow diverges into a shallow channel running southward between TA-50-37 and TA-50-1.

To meet the requirements of 20.4.1 NMAC, Subpart IX, 270.15(a)(5) [6-14-00], any liquids that may accumulate within the self-containment pallets or devices, trenches and pits, or glove box enclosure will be removed as soon as possible to prevent overflow. The accumulated liquid will be sampled and analyzed. Depending upon the volume of the accumulated liquid, a high-efficiency particulate air vacuum, portable pump, universal sorbents, and/or other methods suitable for retrieval will be used to remove the liquid. Accumulated liquids are removed as soon as possible. The collected liquids and/or sorbents will be transferred to compatible containers, which will be stored temporarily at the respective CSU pending sample analysis, which will dictate how the wastes will be managed. Should a spill occur during waste handling activities, the spill and/or residual material will be sampled and managed in accordance with Attachment D (*Contingency Plan*).

G.2.4.2.2 TA-50-69, Outdoor CSU

Run-on into the TA-50-69, Outdoor CSU is prevented because the CSU is elevated by design. The TA-50-69, Outdoor CSU is sloped sufficiently to prevent the accumulation of precipitation. In addition, drainage swales located in the vicinity, divert storm water away from the pad. One drainage swale is located just south of the CSU, between it and the material disposal area (MDA)-C. A second drainage swale is located on the west side of the CSU between Pecos Drive and the TA-50 fence line. Inspections of TA-50 waste management facilities, areas that may be prone to soil erosion and drainage control structures are conducted as described in the

"Storm Water Pollution Prevention Plan for Technical Area 50 Waste Treatment Facilities" (LANL, 1993). Together, the containment design and operations meet the requirements of 20.4.1 NMAC, Subpart V, 264.175(b), and 20.4.1 NMAC, Subpart IX, 270.15(a)(4) [6-14-00].

G.2.4.3 Preventing Water Supply Contamination [20.4.1 NMAC, Subpart V, 264.31]

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of waste-handling operations at TA-50 CSUs. The TA-50-69, Indoor CSU is located inside a building. Any material spilled during waste management activities are immediately remediated pursuant to Attachment D (*Contingency Plan*). All water supply lines at TA-50 are under pressure and are equipped with backflow prevention devices to prevent contamination of these lines during emergencies. Therefore, no impact to water supplies is expected. The depth to groundwater at TA-50 is approximately 1,000 ft (Purtymun and Johansen, 1974). Geologic units underlying TA-54 (located 4 miles east of TA-50) include layers of unsaturated volcanic tuff and ash, the moisture content of which ranges from 0.2 to 2.0 percent by weight (IT Corporation, 1987).

G.2.4.4 Mitigating Effects of Power Outages [20.4.1 NMAC, Subpart IX, 270.14(b)(8)]

Electrical power is supplied to TA-50-69 by a 13.4-kilovolt overhead distribution line through an underground conduit to an on-site substation that provides distribution to the building. Supplied power is used to operate continuous air monitors (CAMs) and other electrical equipment in the buildings. Additionally, an uninterruptible power source has been installed to operate the CAMs in the event of a power outage. In the event of a power failure, operations would cease and personnel would exit the affected building. Operations at the CSUs will be discontinued temporarily if electrical power is not restored quickly. A power failure or equipment failure would not affect containment within the TA-50 CSUs.

G.2.4.5 Preventing Undue Exposure [20.4.1 NMAC, Subpart V, 264.32]

To prevent undue exposure of personnel to hazardous or mixed waste, personal protective equipment appropriate for the waste being handled is worn by all on-site personnel at TA-50 involved in waste management activities at any of the waste management units. Workers involved in waste handling at TA-50 are required to wear protective work uniforms and steel-toed /composite-toed shoes, as appropriate. Hard hats and gloves may also be worn while equipment is being operated and when containers are being loaded or unloaded.

G.2.4.6 Air Emission Standards [20.4.1 NMAC, Subpart V, 264.31 and 264.179]

Releases to the atmosphere are not anticipated from any of the TA-50 CSUs. Containers are kept closed during handling and storage except when, upon inspection, it is determined that containers need to be overpacked or the contents repackaged in new containers or when it is necessary to add or remove waste. Inspections are conducted to ensure the integrity of all stored containers. In the event of an unexpected release, all personnel working within or near the area would be notified immediately to evacuate.

G.2.5 Ignitable, Reactive, or Incompatible Waste [20.4.1 NMAC, Subpart IX, 270.14(b)(9) and 270.15(c) and (d); and 20.4.1 NMAC, Subpart V, 264.17, 264.176, and 264.177]

Special requirements for ignitable, reactive, or incompatible waste at the TA-50 CSUs are presented in Permit Part 2, Section 2.8. This information is provided to meet the requirements of 20.4.1 NMAC, Subpart V, 264.17(a), 264.176, and 264.177(a)(b)(c); and 20.4.1 NMAC, Subpart IX, 270.14(b)(9) and 270.15(d) [6-14-00].

G.2.6 Air Emission Standards for Containers [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

This section addresses potential applicability of 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers" to containers at TA-50, based on applicability criteria specified in 20.4.1 NMAC, Subpart V, 264.1080 [6-14-00]. Subpart CC standards require that the containers be covered or controlled so that there are no detectable emissions. The standards are met by placement of waste in DOT-compliant containers and are not applicable to containers of radioactive mixed waste. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers that have received waste prior to the effective date of regulation (December 6, 1996), or containers of less than 0.1 cubic meters (m^3) (approximately 26 gallon) capacity.

Containers of less than 0.46 m^3 (approximately 119 gallon) capacity and that meet DOT specifications under the Code of Federal Regulations, Title 49, Part 178, will be kept closed during storage pursuant to 20.4.1 NMAC, Subpart V, 264.1086(b)(1)(ii) [6-14-00]. Containers undergoing waste characterization activities may be open for access for the purposes described in 20.4.1 NMAC, Subpart V, 264.1086(c) [6-14-00]. Containers of greater than 0.46 m^3 capacity that contain waste with greater than 500 ppmw volatile organics or those that are greater than 0.1 m^3 capacity, do not meet U.S. Department of Energy specifications, and contain wastes of

greater than 500 ppmw volatile organics will be subject to a visual inspection and monitoring program as required by 20.4.1 NMAC, Subpart V, 264.1088(b) [6-14-00].

G.3 REFERENCES

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
CSU	container storage unit
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DVRS	Decontamination and Volume Reduction System
FRP	fiberglass-reinforced plywood
ft	feet/foot
ft^2	square feet/foot
HDPE	high-density polyethylene
HEPA	high-efficiency particulate air
LACFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
m^3	cubic meters
MLLW	mixed low-level waste
MSDS	Material Safety Data Sheet
MTRUW	mixed transuranic waste
PPE	personal protective equipment
ppmw	parts per million by weight
PTLA	Protection Technology Los Alamos
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
TA	technical area
TRU	transuranic
UV	ultraviolet

TA-54
CONTAINER MANAGEMENT

The information in this Attachment addresses the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), § 270.15, and 20.4.1 NMAC , Subpart V, Part 264, Subpart I, revised June 14, 2000 [6-14-00]. This Attachment provides an overview of current facility operations and waste management practices at Technical Area (TA) 54 at Los Alamos National Laboratory (LANL) and complements the information provided in Section 2.0 of the TA-54 Part B permit renewal application (LANL, 2003). It includes detailed descriptions of the TA-54 container storage units (CSU) and the current waste management practices associated with them..

G.1 GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES [20.4.1 NMAC, Subpart V, Part 264, Subpart I]

TA-54 consists of 130 acres atop Mesita del Buey and is used for storage of hazardous and mixed waste generated throughout LANL. A principal mission of TA-54 is to manage LANL waste safely and efficiently, consistent with federal and state regulations and U.S. Department of Energy (DOE) requirements. TA-54 has three separate areas where hazardous and/or mixed waste is stored; the three areas include Area L, Area G, and TA-54 West (see Figure G-1 in LANL, 2003). There are two CSUs at Area L, nine CSUs at Area G, and two CSUs at TA-54 West. These CSUs are described in below..

The following provides an overview of current facility operations and waste management practices that are applicable to the CSUs at TA-54. This overview includes a discussion of container handling and inspection; security and access control; preparedness and prevention; hazards prevention; special requirements for ignitable, reactive, or incompatible waste; and air emission standards for containers. Similar information specific to the Area L, Area G, and TA-54 West CSUs is provided in Sections G.2, G.3, and G.4 of this Attachment Section. This information is submitted to fulfill the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart I [6-14-00]. Specific waste management practices and procedures detailed herein are subject to change.

G.1.1 Container Handling and Inspection [20.4.1 NMAC §§ 264.171, 264.173, and 264.174

Handling and inspection requirements for containers stored within the TA-54 CSUs are presented in Attachment E and Sections 2.5 and 2.7, respectively, of the TA-54 Part B permit renewal application (LANL, 2003). This information is provided to meet the requirements of 20.4.1 NMAC §§ 264.171, 264.173, and 264.174 [6-14-00].

G.1.2 Security and Access Control [20.4.1 NMAC §§ 270.14(b)(4) and 270.14(b)(19)(viii); 20.4.1 NMAC § 264.14]

The CSUs at TA-54 are provided security by both their locations on top of Mesita del Buey and by 8-foot (ft) industrial chain-link fences topped by razor wire or barbed wire. Additional security is provided by a system of facility access controls to ensure that only authorized personnel are granted access. These access controls also ensure that all facility personnel can be identified and located in an emergency.

Depending on national security conditions, a guard station will be manned west of the TA-54 timed vehicle-access control gate. During intervals of high national security, it is currently planned that guard stations will also control public access on Pajarito Road east and west of TA-54. Therefore, only properly identified LANL and DOE employees or individuals under their escort will have access to TA-54 during those times.

During low national security conditions, any access to the TA-54 administrative area for Areas L and G is limited by a timed vehicle-access control gate on the entrance road to TA-54. This gate is open during normal working hours from 6:00 a.m. to 6:30 p.m., Monday through Friday (except holidays). Gate hours are subject to change. Access to TA-54 West is by a manually operated gate on the west side of the facility. The gate is also open during normal working hours. Access to any part of TA-54 before or after normal working hours or on weekends requires approval of the appropriate Group Leader or Facility Manager at TA-54. TA-54 is patrolled by Protection Technology Los Alamos (PTLA) security personnel during non-operational hours to ensure that the gates are locked and that unauthorized entry has not occurred.

Anyone entering the fenced Area L and Area G waste management areas from the TA-54 administrative area must be "badged in" via access control at TA-54-245 before proceeding. Badging in is the process of identifying the person, assessing his/her security and training status using DOE security badges, and determining the need for an escort. Authorized personnel may enter the fenced portions of Areas L and G only after negotiating additional access controls in

the form of walk-through turnstiles and motorized vehicle gates. Each turnstile and vehicle gate is equipped with a badge reader to ensure authorized access only.

Resident personnel are required to badge in upon arrival and prior to leaving TA-54, Areas L and G, and TA-54 West. Nonresident personnel and visitors are required to badge or sign in and out at an access control point. Depending on their level of training, nonresident personnel may be required to be escorted in order to access TA-54, Areas L and G, and TA-54 West. Access to the Area L, Area G, and TA-54 West CSUs requires additional controls. These controls are described in Sections G.2.1, G.3.1, and G.4.1 of this Attachment Section, respectively.

G.1.3 Preparedness and Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; and 20.4.1 NMAC § 270.14(b)(8

The following presents information on the waste management techniques used at TA-54 to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. This includes a discussion of the emergency equipment required at the facility, testing and maintenance of this equipment, personnel access to communications or alarm systems, aisle space and storage configuration, and support agreements with outside agencies. Each CSU at TA-54 has been or will be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, in accordance with 20.4.1 NMAC § 264.31.

G.1.3.1 Required Equipment [20.4.1 NMAC § 264.32

Emergency equipment is located throughout TA-54 and includes internal communications, alarm systems, fire alarms, spill kits, and decontamination equipment. Detailed information on the required emergency and safety equipment located at the Area L, Area G, and TA-54 West CSUs is provided in Sections G.2.2, G.3.2 and G.4.2 of this Attachment Section, respectively. For additional information see Attachment E.

G.1.3.2 Testing and Maintenance of Equipment [20.4.1 NMAC § 264.33]

The communication, alarm system, fire protection, spill control, and decontamination equipment located within TA-54 is inspected and/or tested according to the inspection schedule detailed in Attachment E (*Inspection Plan*). Maintenance, repair, and replacement of emergency equipment are performed, as needed.

G.1.3.3 Access to Communications or Alarm System [20.4.1 NMAC § 264.34

All personnel involved in waste management activities at TA-54 have immediate access to internal alarms or emergency communication devices, either directly or through visual or voice contact with another individual. These devices include fire alarms, evacuation alarms, paging telephones, radios, and cellular telephones. The nature and locations of these devices are specific to the Area L, Area G, and TA-54 West CSUs. Detailed information for Area L, Area G, and TA-54 West is provided in Sections G.2.2, G.3.2, and G.4.2 of this Attachment Section, respectively.

G.1.3.4 Aisle Space and Storage Configuration [20.4.1 NMAC § 264.35

Information on aisle space and storage configurations for the TA-54 CSUs is presented in Part 3 (Container Storage). This information is provided to meet the requirements of 20.4.1 NMAC § 264.35 [6-14-00].

G.1.3.5 Support Agreements with Outside Agencies [20.4.1 NMAC § 264.37(a

DOE maintains support agreements and contracts with outside agencies for emergency response assistance. Information regarding these contracts and support agreements is provided in Attachment D (*Contingency Plan*).

G.1.4 Hazards Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; 20.4.1 NMAC § 270.14(b)(8)]

The following discusses the general procedures, equipment, and structures that are currently used at TA-54 to prevent hazards. This includes preventing hazards during unloading of waste containers, preventing run-on and runoff, preventing contamination of the water supply, mitigating the effects of power outages, preventing undue exposure to personnel, and preventing releases to the atmosphere.

G.1.4.1 Preventing Hazards in Unloading [20.4.1 NMAC § 270.14(b)(8)(i)]

Waste containers are transported to the Area L, Area G, and TA-54 West CSUs by flatbed trucks, closed-box trucks, or trailers. The CSUs have design features that promote safe unloading and handling of waste containers from these trucks and trailers. Ramps are typically located at the vehicle entrances to the dome structures at the Area L and Area G CSUs. Shed 31 at Area L and Shed 8 at Area G have sloped entryways for container-handling equipment. The storage domes have roll-up or roll-away vehicle access doors. The loading dock at TA-54 West allows access from the transport vehicles to the loading dock platform. These design features facilitate safe handling of containers in and out of the CSUs.

All waste containers at the TA-54 CSUs are handled in a manner that will not cause them to rupture or leak, as required in 20.4.1 NMAC § 264.173(b) [6-14-00]. Most containers are handled with forklifts (using drum grapplers, when appropriate) and are placed directly in the appropriate CSU. For larger containers, personnel can use a boom or, at TA-54 West and in portions of Area L, a bridge crane or mobile crane, respectively. At TA-54-412, waste containers (FRP crates, drums, and large boxes) are generally handled with forklifts, overhead cranes, and frictionless air pallets. Smaller containers are generally handled manually or with drum dollies. The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while moving containers (e.g., when loading and unloading containers).

G.1.4.2 Preventing Run-on and Runoff [20.4.1 NMAC § 270.14(b)(8)(ii)]

Run-on and runoff control methods for the TA-54 CSUs are presented in Section 2.10 of the permit renewal application (LANL, 2003). This information is provided to meet the requirements of 20.4.1 NMAC § 270.14(b)(8)(ii) [6-14-00].

G.1.4.3 Preventing Water Supply Contamination [20.4.1 NMAC § 270.14(b)(8)(iii)]

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of routine waste-handling operations at TA-54 because engineering and operational controls ensure that run-on and runoff are minimized. Containers are stored inside structures or with second containment, as necessary. Water supply lines are under pressure and are equipped with backflow prevention devices. Therefore, no impact to water supplies as a result of storage at the TA-54 CSUs is expected.

The depth to groundwater is approximately 890 ft (Ball et. al., 2002, p. 30), and no perched aquifers have been identified beneath Mesita del Buey (LANL, 1998, p. 4-59). In 1985, test wells were installed in the canyons north and south of TA-54 to determine if perched water exists within canyon alluvium, to determine if perched water extends beneath Mesita del Buey, and to sample/monitor perched water, if present. Three test wells were installed in a tributary to Cañada del Buey; they include CDBO-1, CDBO-2, and CDBO-3. Test well CDBO-4 was installed further to the east in Cañada del Buey (see Figures 2-1 and 2-3 in LANL, 2003). All four wells were dry; however, they were completed as observation wells to monitor the alluvium for possible water in the future (LANL, 1995, pp. 116 and 127-128).

Three test wells were installed in Pajarito Canyon; they are PCO-1, PCO-2, and PCO-3 (LANL, 1995, pp. 116 and 129) (see Figures 2-1 and 2-3 in LANL, 2003). These three wells are sampled annually for radionuclides, metals, and general inorganics; they are sampled triennially for organics. Sampling results are compiled annually in environmental surveillance reports and submitted to the New Mexico Environment Department. To ensure that the alluvial aquifer in Pajarito Canyon did not extend northward beneath Mesita del Buey, four test holes were drilled in the canyon floor north of the intermittent stream channel. These four test holes, designated PCM-1, PCM-2, PCM-3, and PCM-4, were dry. They were completed for use as moisture-access holes (LANL, 1995, pp. 115 and 130). It was concluded that perched water in Pajarito Canyon is confined to the alluvium in the stream channel and does not extend to the flank of the canyon (LANL, 1995, p. 113).

Five observation wells were installed in Cañada del Buey, mostly up-gradient from Area L, as part of a 1992 investigation for a proposed sanitary wastewater treatment plant. These wells, installed to study the effect of effluent release on the environment in the canyon, are CDBO-5, CDBO-6, CDBO-7, CDBO-8 and CDBO-9. In addition, two moisture-access holes (CDBM-1 and CDBM-2) were drilled north of Area L in 1992. Perched water was encountered in the canyon alluvium at wells CDBO-6 and CDBO-7. It was determined that the perched water at these locations is likely the result of operational discharges from well PM-4 (LANL, 1995, p. 114).

Regional well R-22, located on Mesita del Buey just east of Area G, was drilled to a total depth of 1,489 ft in 2000. Two potential perched zones and one regional zone of saturation were originally predicted at well R-22. The two zones that could potentially support perched water were predicted at a depth of 148 ft in the Cerros del Rio basalt and at a depth of 487 ft in the Puye Formation; the regional water table was anticipated to be at a depth of 922 ft in the Puye Formation. No water was encountered until the drillers first noted water at a depth of approximately 890 to 900 ft. The water is believed to be associated with the regional zone of saturation because the regional water table was projected to be at a similar depth, no obvious perching horizon was encountered, and saturation continued from 900 ft to the total depth drilled. Regional well R-21, located in Cañada del Buey just north of Mesita del Buey, was drilled in 2002. A report describing this well will be provided to the NMED upon completion.

G.1.4.4 Mitigating Effects of Power Outages [20.4.1 NMAC § 270.14(b)(8)(iv)

Electrical power is supplied to the structures at TA-54 to operate evacuation alarms, lighting, and various types of monitoring equipment. Battery backup systems (uninterruptible power systems) are provided at Areas G and L for the emergency evacuation alarm, which will continue to operate for eight hours. TA-54-412 has a backup generator that will provide electricity to the Decontamination and Volume Reduction System (DVRS) operations and its monitoring equipment to allow workers to safely cease operations and exit the building. TA-54-33 and TA-54-412 at Area G and TA-54-39 and TA-54-215 at Area L have battery-powered emergency lighting. Operations in each CSU are discontinued if the electrical power is not restored quickly. Specific procedures and contingencies have been developed to handle power outages at the Area L, Area G, and TA-54 West CSUs. These include the procedure to exit domes when electricity goes out. When power is restored, performance tests on monitoring equipment are conducted to ensure they are operating properly prior to allowing any workers to return to the domes. Based on the TA-54 procedures, the loss of electricity will not affect secondary containment or significantly affect health and safety issues.

TA-54 has a Maintenance Implementation Plan that addresses maintenance implementation for equipment associated with all facility operations. The plan provides the basis for planning, scheduling, and coordinating preventive and/or corrective maintenance to keep equipment associated with all facility operations in proper working order.

G.1.4.5 Preventing Undue Exposure [20.4.1 NMAC § 270.14(b)(8)(v)

Personnel at the TA-54 CSUs are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the workplace under normal conditions. Use of PPE protects workers from direct contact with and inhalation or ingestion of hazardous materials. At TA-54, PPE is used routinely during waste-handling operations and when responding to unusual hazardous situations. The different levels of PPE are defined by the Occupational Safety and Health Administration as follows:

- *Level D*: Coveralls; safety boots; safety glasses or goggles; hard hat; and appropriate gloves
- *Level C*: Full-face, air-purifying respirator with appropriate cartridges for the chemicals or hazards present; chemical-resistant suits; chemical-resistant safety boots or booties; and inner and outer gloves
- *Level B*: All Level C equipment plus self-contained breathing apparatus in place of a Level C full-face respirator
- *Level A*: All Level B equipment, plus a fully-encapsulating chemical-resistant suit.

Most waste-handling operations at the TA-54 CSUs require that personnel handling wastes or working in the CSUs wear modified Level D PPE, depending on the associated work hazards identified in job-specific hazard control plans. Modified Level D may include any item in Level D. There are instances where an increased level of PPE is required, such as during an emergency or unusual hazardous situation. If a situation arises during an emergency and an increased level of PPE is required, the PPE will be compatible with the wastes present. All personnel that use PPE are trained and qualified to use the equipment properly.

All personnel involved in waste-handling operations in the TA-54 CSUs are required to have training appropriate for their work. Training requirements are presented in Attachment D of this permit renewal application and in Appendix D of the LANL General Part B. Personnel are also required to review job hazards prior to performing waste-handling activities. Sampling plans, hazard control plans (which address monitoring equipment), and work authorizations are required, in accordance with LANL safety procedures. Personal monitoring equipment is established using the job hazard review process. Together, the required training, plans, and work authorizations help to prevent undue exposure to personnel.

G.1.4.6 Preventing Releases to the Atmosphere [20.4.1 NMAC § 270.14(b)(8)(vi)]

Releases to the atmosphere are limited at the TA-54 CSUs because containers are kept closed during storage. In routine hazardous waste and mixed low-level waste (MLLW) operations, the only exceptions to this practice are when, upon inspection, it is determined that a container currently in storage needs to be overpacked or repackaged in a new container, or during waste characterization or verification activities.

For MLLW and mixed transuranic waste (MTRUW), operations at TA-54-412 are contained in a pre-engineered metal structure to provide containment. An external secondary confinement structure surrounds the internal primary confinement structure. Both primary and secondary confinement structures are equipped with an air filtration system that includes a high-efficiency

particulate air (HEPA) ventilation system to prevent the release of particulates to the environment.

The transuranic waste characterization facilities on Pad 10 (former Pads 2 and 4) will include glove boxes and hoods for managing mixed waste. The transuranic waste characterization facilities transportainers will provide external confinement for those operations. The equipment and the transportainers will have HEPA filtration systems to contain potential releases.

MTRUW containers are vented with one or more filters to allow any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization within the container. The HEPA-grade vent filters prevent the escape of any radioactive particulates.

G.1.5 Special Requirements for Ignitable, Reactive, or Incompatible Waste [20.4.1 NMAC §§ 264.17(a), 264.176, and 264.177(a)(b) and (c); 20.4.1 NMAC § 270.14(b)(9)]

Special requirements for ignitable, reactive, or incompatible waste at the TA-54 CSUs are presented in Permit Part 2, Section 2.8. This information is provided to meet the requirements of 20.4.1 NMAC §§ 264.17(a), 264.176, and 264.177(a)(b) and (c); and 20.4.1 NMAC §§ 270.14(b)(9) and 270.15(d) [6-14-00].

G.1.6 Air Emission Standards for Containers [40 CFR, Part 264, Subpart CC]

The hazardous wastes stored in containers at TA-54 may be subject to 20.4.1.500 NMAC (incorporating the Code of Federal Regulations [CFR], Title 40, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers") based on the applicability criteria specified in 40 CFR § 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so that there are no detectable emissions of volatile organic compounds to the air. Inspection and monitoring requirements are also specified.

As indicated in 40 CFR § 264.1080(b)(6), these standards are not currently applicable to containers that are used solely for management of radioactive mixed waste in accordance with all regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gallons) capacity, or that have received waste prior to the effective date of the

regulation (December 6, 1996). The following management standards apply for hazardous wastes managed at LANL that do not meet any of the exemptions listed in 40 CFR §264.1080(b).

LANL requires that Subpart CC requirements be evaluated by the generator as part of the waste characterization process. Generator information is used to determine whether the concentration of volatile organics in a waste stream at the point of generation is less than 500 ppmw, or is equal to or greater than 500 ppmw, which is the threshold concentration for Subpart CC requirements. The generator documents this determination for that waste stream. In the event that this information is not available, the waste will be characterized in accordance with Attachment C (*Waste Analysis Plan*) prior to being received by TA-54. Any hazardous waste that is newly-generated through the treatment or re-characterization of mixed waste at TA-54 will be characterized for the volatile organic content also in accordance with Attachment C.

Three levels of air emission controls based on container design capacity are established in 40 CFR § 264.1086(b). TA-54 hazardous waste storage procedures require Level 1 controls based upon container design capacities. Containers of greater than 0.1 m^3 and less than 0.46 m^3 (approximately 119 gallons) capacity and that meet U.S. Department of Transportation (DOT) specifications under 49 CFR, Part 178, are kept closed during storage pursuant to 40 CFR § 264.1086(c)(3). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR § 264.1086(c)(3). As required by 40 CFR § 264.1086(c)(4), these containers are subject to a visual inspection and monitoring program. On or before acceptance of the waste container at TA-54, the container is inspected to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position, in accordance with 40 CFR § 264.1086(c)(1)(ii). This inspection is documented in uniform hazardous waste manifests. Pursuant to the Inspection Plan in Attachment E, containers are inspected weekly at TA-54 to ensure that the containers remain closed during storage, thereby exceeding the requirements of 40 CFR § 264.1086(c)(4)(ii).

G.2 AREA L CONTAINER STORAGE UNITS [20.4.1 NMAC, Subpart V, Part 264, Subpart I]

The following provides specific information on current facility operations and waste management practices at the two Area L CSUs. This includes a discussion of security and access control, preparedness and prevention, hazards prevention, and design information for the Area L CSUs.

This information is submitted to fulfill the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart I [6-14-00]. Detailed information is subject to change.

G.2.1 Security and Access Control [20.4.1 NMAC §§ 270.14(b)(4) and 270(b)(19)(viii); 20.4.1 NMAC § 264.14]

Security at the Area L CSUs is maintained by both artificial and natural barriers. These barriers prevent unauthorized entry of persons or livestock into Area L and satisfy the requirements of 20.4.1 NMAC §§ 264.14(a) and 264.14(b)(2) [6-14-00]. An 8-ft-high chain-link security fence with razor or barbed wire at the top surrounds the entire perimeter of Area L. Bilingual (i.e., English and Spanish) warning signs are posted on the fence at 50- to 75-ft intervals and can be seen from any approach to this area. The legends on the signs indicate "Danger—Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of 25 ft. The security fence is inspected by on-site personnel and repairs are made, as necessary. An entry gate and station are located on Mesita del Buey Road at the west central portion of Area L. In accordance with 20.4.1 NMAC § 270.14(b)(19)(viii) [6-14-00], the locations of the security fence, entry gates, and entry stations are shown on Figure 2-5 (Permit Part 2). Cliffs on the north and south sides of Area L provide additional security as a natural barrier to discourage unauthorized entry. Access to the Area L CSUs is controlled by a gate. Authorized resident personnel must badge in/out at the magnetic badge reader to enter or leave through the gate. Individuals who do not

have a DOE-issued badge must be escorted after signing the visitor's log located in the administrative area's access control building. These procedures limit access to the Area L CSUs and provide a means of tracking personnel on site, should there be an emergency or evacuation.

G.2.2 Preparedness and Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; and 20.4.1 NMAC § 270.14(b)(8)]

The following presents information on the emergency equipment available at the Area L CSUs to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. This includes the approximate locations of fire extinguishers, shower/eyewash stations, spill kits, windsocks, and communication/alarm systems.

Required Equipment [20.4.1 NMAC § 264.32]

Area L is equipped with an audible alarm system to alert personnel of a fire or the need to evacuate the area. This alarm can be activated by pulling a fire alarm or by pushing the evacuation alarm button. These alarms are located throughout Area L and are connected to the Los Alamos County Fire Department (LACFD) through LANL's central alarm system at all times. In addition to the alarms, there are numerous telephones located in and around the structures within Area L. These telephones ensure that personnel can contact on-site and LANL emergency personnel at all times. Many of these telephones also serve as emergency paging phones so that information can be announced throughout the area. Windsocks are also located at strategic locations to indicate wind direction and strength.

Fire control equipment at Area L includes fire extinguishers (halon, water, carbon dioxide, and/or dry chemical), a dry-pipe sprinkler system, and dry chemical systems. The fire extinguishers are available at or near most structures within Area L for use by on-site personnel, depending on the size and fuel source of a fire. Dome 215 has an automatic dry-pipe sprinkler system that is heat activated in the event of a fire. Storage Sheds 68, 69, and 70 have dry chemical systems. Fire hydrants are located near TA-54-37 and the southeast corner of TA-54-62. The fire hydrants supply water at an adequate volume and pressure to satisfy the requirements of 20.4.1 NMAC § 264.32 [6-14-00].

Personal decontamination equipment at Area L includes emergency eyewash stations and showers. This equipment is for use by personnel in emergencies involving chemical and/or radiological materials. These stations are generally located near or inside structures where waste is being handled. Emergency shower and eyewash stations are currently located at or near TA-54-39, TA-54-31, TA-54-215, TA-54-216, and TA-54-35. Waste characterization documentation and/or Material Safety Data Sheets (MSDS) are also available in the event of a chemical exposure.

There are several spill kits available at Area L to mitigate small containable spills. These kits typically contain sorbents, neutralizers, PPE, and other equipment essential for containment of small spills. Trained personnel use the spill kits only if they know what has been spilled and they are sure their actions will not put themselves or others at risk. In addition to the spill kits, shovels for cleanup are stored in TA-54-46. Oversized drums and sorbents are also stored at various locations throughout Area L. For larger spills or other unusual hazardous situations, a

variety of equipment is available to emergency personnel. This equipment includes forklifts, self-propelled loaders, and other heavy equipment from Area G.

G.2.3 Hazards Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; 20.4.1 NMAC § 270.14(b)(8)]

The Area L CSUs are designed and operated to minimize the possibility of a fire, explosion, or any unplanned releases of hazardous wastes or hazardous waste constituents which could threaten human health or the environment. The following discusses the procedures, equipment, and structures that are used at Area L to mitigate the effects of power outages. Prevention of run-on and runoff at Area L is discussed in Permit Part 2, Section 2.10.1.

Mitigating Effects of Power Outages [20.4.1 NMAC § 270.14(b)(8)(iv)]

Electrical power is supplied to Area L to operate evacuation alarms, lighting, and various types of monitoring equipment. Operations at Area L are discontinued if the electrical power is not restored quickly or if there is the possibility of an ignition. A power failure will not affect containment at the Area L CSUs.

G.2.4 Area L CSUs [20.4.1 NMAC § 270.15]

The following describes the two CSUs at Area L (see Figure 2-1 of LANL, 2003). The two CSUs are the aboveground CSU within the fence and the Storage Shafts CSU. The aboveground CSU within the fence is comprised of several storage structures (TA-54-215; TA-54-216; Storage Sheds 68, 69, and 70; Storage Shed 31; TA-54-32; TA-54-35; TA-54-36; TA-54-58; and TA-54-39) and the asphaltic concrete-covered area. General dimensions, containment features, and materials of construction are discussed in this section to fulfill the requirements of 20.4.1 NMAC §§ 270.15(a)(1) and (2) [6-14-00].

G.2.4.1 Aboveground CSU within the Fence

The aboveground CSU within the fence stores containers of hazardous waste and MLLW in solid and liquid form. Liquid wastes are stored primarily in structures that are designed for secondary containment; however, secondary containment pallets are also used. Secondary containment pallets are typically constructed of polyethylene or metal painted with a chemical-resistant coating (see Supplement G-1 in LANL, 2003). Polyethylene secondary containment pallets used at TA-54 are generally 50 inches long by 50 inches wide by 17 inches deep, with a designed capacity of 83 gallons. Currently, two sizes of metal secondary containment pallets are used at TA-54. One is 52 inches long by 52 inches wide by 6.5 inches deep, with a

designed capacity of 57 gallons; the other is 60 inches wide by 60 inches long by 6.5 inches deep, with a designed capacity of 77 gallons. The metal secondary containment pallets are coated with chemically-resistant urethane. The stressed- or tensioned-membrane fabric used on Storage Dome 215 and Canopy 216 at the aboveground CSU within the fence at Area L are similar. This fabric is coated with ultraviolet (UV)-stabilized plasticized polyvinyl chloride (PVC). It is fungus-resistant and certified flame-retardant (i.e., self-extinguishing). See Supplement G-1 (LANL, 2003), SPRUNG Instant Structures, for additional details.

Storage Dome 215

Storage Dome 215 (TA-54-215) is 60 ft wide, approximately 266 ft long, and 26 ft high (see Figure G-2 in LANL, 2003). It is an arch frame-supported stressed-membrane structure. The dome is of modular construction and uses light construction materials (i.e., aluminum framework with membrane/fabric covering). It is equipped with 14 personnel doors and two roll-up doors. The dome's pad is equipped with a 6-inch-high, 8-inch-wide concrete ring wall that surrounds the perimeter of the dome, and the dome is anchored to the concrete ring wall with anchor bolts. A ramp is located at the vehicle entrance to the dome and allows vehicles and container handling equipment to pass safely over the ring wall. The ring wall and the ramp prevent run-on into the dome. Any liquid that might accumulate within the storage dome (e.g., liquids resulting from fire-suppression activities) is contained within the ring-walled area. Liquid that may result from fire-suppression activities and that is in excess of the capacity inside the ring wall is collected in a double-walled holding tank connected to TA-54-215 by a double-walled pipe.

All waste containers at TA-54-215 are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. All liquid wastes are stored on secondary containment pallets that have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any accumulated liquids are removed and collected for characterization as described in Permit Part 3, Section 3.7.

Canopy 216

Canopy 216 (TA-54-216) is approximately 33 ft wide and 120 ft long (see Figure G-3 in LANL, 2003). This storage structure consists of a rigid aluminum frame that supports a tensioned membrane. A series of aluminum I-beam trusses, spanning the width of the structure, comprise

its framework. The membrane is integrally connected to the frame to provide a fully-tensioned fit for the roof and one side of the structure. The membrane on the remaining three sides of the structure can be rolled down to provide further containment or protection from the weather. The canopy frame is anchored to a sloped asphaltic-concrete pad.

All waste containers at TA-54-216, including gas cylinders, are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers, baskets) to prevent contact with accumulated liquids. All liquid wastes are stored on secondary containment pallets that have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any accumulated liquids are removed and collected for characterization as described in Permit Part 3, Section 3.7

Storage Sheds 68, 69, and 70

Storage sheds 68, 69, and 70 are prefabricated sheds constructed of steel (see Supplement G-1 (LANL, 2003), Safety Storage Building, Model 22). Each shed measures approximately 23 ft long, 9 ft wide, and 8.5 ft high. Access to these storage sheds is obtained through one of three sets of double doors. Storage Shed 68 has three separate compartments, with one door leading to each compartment. Storage Sheds 69 and 70 each have two separate compartments, with one door leading to the smaller compartment and two doors leading to the larger compartment. The sheds are elevated by design, which prevents run-on.

Each shed is constructed with liquid-tight sumps to ensure containment of any potential leaks or spills and to prevent runoff. The floor of each shed consists of a metal grate that covers the sump areas. Containers are placed directly on the metal grates, which prevent contact with liquids that may have accumulated in the sumps. The interior of each shed and sump is coated with chemically-resistant epoxy paint. The designed sump storage capacity of each shed is 750 gallons, which exceeds the amount necessary to hold 10% of the total storage capacity of each shed (1,760 gallons; see Supplement 2-1 in LANL, 2003). Shed 68 has three separate compartments (see Figure G-4 in LANL, 2003), each having its own sump with individual capacities of 250 gallons. Sheds 69 and 70 have two separate compartments (see Figure G-4 in LANL, 2003), each having its own sump. One compartment consists of two thirds of the surface area (and capacity) of Sheds 69 and 70. The capacity of this compartment's sump is 500 gallons; the smaller compartment's sump capacity is 250 gallons. Additional engineering

details and technical specifications for these sheds are provided in Supplement G-1 (LANL, 2003). Potential liquids that might accumulate within the sump areas (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Part 3, section 3.7.

Storage Shed 31

Storage Shed 31 is a prefabricated shed constructed of steel. It measures approximately 14 ft long, 13 ft wide, and 8 ft high (see Figure G-4 in LANL, 2003). The shed sits on a concrete foundation that has a raised edge and is surrounded by asphaltic concrete that is sloped away from the shed to prevent run-on.

The shed has three separate liquid-tight recessed sumps in the concrete foundation that are each covered with a steel grate (see Figure G-4 in LANL, 2003). Containers are stored on the steel grates, which prevent contact with liquids that may have accumulated in the sumps. The sumps and the concrete foundation are coated with chemically-resistant paint. Two of the sumps are approximately 6 ft long by 4 ft wide; the third sump is approximately 7 ft long by 6 ft wide. All three sumps are 5 inches deep. The total capacity of the three sumps is approximately 285 gallons, which exceeds the amount necessary to hold 10% of the total storage capacity of the shed (1,320 gallons; see Supplement 2-1 in LANL, 2003). Potential liquids that might accumulate within the sumps (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

TA-54-32

TA-54-32 (see Figure G-5 in LANL, 2003) consists of a concrete pad that is 116.5 ft long by 15.5 ft wide. The structure is covered by a 117.75-ft-long by 25.75-ft-wide canopy. The canopy provides protection from the weather. The concrete pad is bermed by a 1-ft-wide, 6- to 8-inch-high concrete curb. This curbed area is divided into six separate containment cells to segregate wastes with different hazard classes. The curb prevents run-on of storm water.

Each containment cell consists of a recessed sump covered with a grate flooring on which containers are stored (see Figure G-6 in LANL, 2003); this prevents contact with liquids that may have accumulated in the sumps. The cells are separated by metal partitions above the flooring. The concrete sumps are treated with chemical-resistant epoxy filler-sealer and protective coating, providing an impervious seal to contain any potential leaks, spills, or

accumulation of precipitation (see Supplement G-1 in LANL, 2003). Cells 1 and 6 are approximately 26.5 ft long by 13.5 ft wide by 1 ft deep, with a sump capacity of 2,675 gallons each. Cells 3 and 5 are approximately 16.8 ft long by 13.5 ft wide by 1 ft deep, with a sump capacity of 1,700 gallons each. Cells 2 and 4 are approximately 13.5 ft long by 11.2 ft wide by 1 ft deep, with a sump capacity of approximately 1,130 gallons each. These sump capacities exceed the amount necessary to hold 10% of the maximum storage capacity for TA-54-32 (see Supplement 2-1 in LANL, 2003). Potential liquids that might accumulate within the containment cells (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Part 3, section 3.7.

TA-54-35

TA-54-35 (see Figure G-7 in LANL, 2003) consists of a concrete pad that measures 31.5 ft long by 31.5 ft wide. The area is covered by a 136-ft-long, 48-ft-wide canopy that provides protection from the weather. The pad has a 6-inch-high concrete berm that prevents run-on and runoff of liquids. The bermed area has an elevated ramp on one side to allow access for equipment to move waste containers. The ramp also helps to prevent run-on of precipitation and runoff of any accumulated liquids.

The bermed secondary containment area of the pad is approximately 29.5 ft long by 24.5 ft wide by 8 inches deep (see Figure G-8, LANL, 2003). Stored waste containers are elevated on pallets to prevent contact with any potential accumulated liquids. The concrete berms and the base of the concrete pad are treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003). This provides an impervious seal that will contain any leaks, spills, or accumulation of precipitation. The secondary containment capacity of the bermed area is approximately 3,570 gallons, which exceeds the amount necessary to hold 10% of the maximum storage capacity for TA-54-35 (15,840 gallons; see Supplement 2-1 in LANL, 2003). Potential liquids that might accumulate within the bermed area (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Part 3, section 3.7.

TA-54-36

TA-54-36 (see Figure G-7 in LANL, 2003) is a 33-ft-long by 31.5-ft-wide concrete pad. It is covered by a 136-ft-long, 48-ft-wide canopy that provides protection from the weather. The pad is surrounded by a 1-ft-wide berm that varies from 6 inches to 1 ft in height. The berm prevents run-on and runoff of liquids.

The bermed secondary containment area of the pad is approximately 30.5 ft long by 30 ft wide by 9 inches deep (see Figure G-8 in LANL, 2003). The berm and the base of the concrete pad are treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003). This provides an impervious seal that will contain any leaks, spills, or accumulation of precipitation. The secondary containment capacity of the bermed area is approximately 4,595 gallons, which exceeds the amount necessary to hold 10% of the maximum storage capacity for TA-54-36 (13,200 gallons; see Supplement 2-1 in LANL, 2003).

The pad also contains a Perma-Con® structure. The Perma-Con® is constructed of 4-ft-wide, 8- or 4-ft-long, 22-gauge stainless-steel panels that interlock in a self-supporting structural steel framework. The Perma-Con® system can be assembled into multiple configurations (see Supplement G-1 in LANL, 2003). The Perma-Con® is 28 ft wide by 28 ft long by 12 ft high. It is equipped with a 20-ft-long observation room that attaches to the main enclosure. The main enclosure has two personnel doors and an 8-ft-wide roll-up door. The floor in the main enclosure is the concrete pad covered with multiple layers of heavy duty plastic sheeting that are taped together and are extended approximately 1 ft up the sides of the Perma-Con®. The Perma-Con® has a tarp covering its roof to provide additional protection from the elements, thereby preventing the influx of precipitation, including melting snow.

All waste containers at TA-54-36 are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Potential liquids that might accumulate within the bermed area or the Perma-Con® (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

TA-54-58

TA-54-58 (see Figure G-7 in LANL, 2003) measures 33 ft long by 31.5 ft wide. It is covered by a 136-ft-long, 48-ft-wide canopy that provides protection from the weather. The pad has a 1-ft-wide berm that varies from 6 inches to 1 ft in height. The berm prevents run-on and runoff of liquids. The bermed area has an elevated ramp on one side to allow access for equipment to move waste containers. The ramp also helps to prevent run-on of precipitation and runoff of any accumulated liquids.

The bermed secondary containment area of the pad is approximately 30.5 ft long by 25 ft wide by 6 inches deep (see Figure G-8 in LANL, 2003). Stored waste containers are elevated on

pallets to prevent contact with any potential accumulated liquids. The berm and the base of the concrete pad are treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003). This provides an impervious seal that will contain any leaks, spills, or accumulation of precipitation. The secondary containment capacity of the bermed area is approximately 2,850 gallons, which exceeds the amount necessary to hold 10% of the maximum storage capacity for TA-54-58 (15,840 gallons; see Supplement 2-1 in LANL, 2003). Potential liquids that might accumulate within the bermed area (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Permit Part 3, Section 3.7

TA-54-39 and Containment Pad

TA-54-39 measures 40 ft long by 40 ft wide (see Figure G-9 in LANL, 2003). It is a metal panel building set on a concrete foundation with a metal canopy attached to the south side of the building. The rectangular metal canopy measures 83 ft long by 46 ft wide.

There are two areas associated with TA-54-39 that provide secondary containment. These areas include Room 101, located inside the building, and a containment pad located at the south end of the building.

Room 101 (see Figure G-10 in LANL, 2003) inside TA-54-39 has a 6-inch-high concrete curb that surrounds the room. The curb and floor of this 878 square foot (ft2) room are treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003). This provides an impervious seal that will contain any potential leaks, spills, or accumulation of precipitation. The secondary containment capacity for Room 101 is approximately 3,280 gallons, which exceeds the amount necessary to hold 10% of the maximum storage capacity of the room (9,900 gallons; see Supplement 2-1 in LANL, 2003).

The containment pad at the south end of TA-54-39 consists of two sections. The pad is covered by a metal canopy, which provides protection from the weather. The eastern section of the containment pad is constructed of asphaltic concrete and measures 83 ft long by 23 ft wide. The western section of the containment pad is approximately 58 ft long by 16 ft wide (see Figure G-10 in LANL, 2003) and is surrounded by a 1-ft-high concrete curb, which prevents run-on and runoff of liquids. The concrete floor and curb are treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003). This provides an impervious seal that will contain any potential leaks, spills, or accumulation of precipitation. The

curbed area slopes toward a sump for collection of any accumulated liquids. The secondary containment capacity for the western section of the TA-54-39 containment pad is approximately 7,120 gallons, which exceeds the amount necessary to hold 10% of the maximum storage capacity of this section of the containment pad (15,180 gallons; see Supplement 2-1 in LANL, 2003).

All waste containers stored at TA-54-39 are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Potential liquids that might accumulate within Room 101 or within the western section of the containment pad (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

Asphaltic Concrete-Covered Areas

The asphaltic concrete-covered areas consist of a 4- to 6-inch-thick asphaltic concrete over a base course. Asphaltic concrete-covered areas are typically sloped 1 to 1.5% to facilitate drainage (see Figure 2-1 in LANL, 2003). Some areas include a 6-inch-high, 8-inch-wide asphaltic-concrete berm to prevent run-on and runoff.

All waste containers on the asphaltic concrete-covered areas are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. All liquid wastes are stored on secondary containment pallets that have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any accumulated liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.2.4.2 Storage Shafts CSU

The Storage Shafts CSU is comprised of two retrievable storage shafts, Shafts 36 and 37. This CSU is located in the northwest corner of Area L. It stores highly radioactive mixed waste lead stringers that were used to hold targets in the particle beam operated at TA-53. Shaft 36 is constructed of 30-inch-diameter corrugated metal pipe (CMP); Shaft 37 is constructed of 48-inch-diameter CMP (see Figures G-11 and G-12 in LANL, 2003). Each shaft has a welded metal plate and a 1-ft-deep concrete plug at the base. Shaft 36 is 27.25 ft deep; Shaft 37 is 35.75 ft deep. The annular space in the ground surrounding the CMP is filled with crushed tuff to 48 inches from the surface and concrete to the surface. Each shaft has a steel cover. At the

surface, the CMP is raised above a concrete pad, which extends from the edge of the pipe to prevent infiltration of precipitation. The shafts are also covered with one or two 4-ft-long, 4-ft-wide concrete blocks that rest on railroad ties for stability.

The Storage Shafts CSU stores only solid-form wastes and, as stated above, a concrete pad extends outward from each shaft to prevent infiltration of precipitation. Therefore, in accordance with 20.4.1 NMAC § 264.175(c)(1), a containment system for this CSU is not required. The CMP is compatible with the lead stringer wastes; thus, the requirements of 20.4.1 NMAC § 264.172 are met. The shafts are kept closed during storage and the wastes are not stored in a manner that may rupture the shafts or cause them to leak, which meets the requirements of 20.4.1 NMAC § 264.173. Weekly inspections are conducted at this CSU, as described in Section E.2 of the Inspection Plan in Appendix E. This satisfies the requirements of 20.4.1 NMAC § 264.174.

G.3 AREA G CONTAINER STORAGE UNITS [20.4.1 NMAC, Subpart V, Part 264, Subpart I]

The following provides specific information on current facility operations and waste management practices at the Area G CSUs. This includes a discussion of security and access control, preparedness and prevention, hazards prevention, and design information for the Area G CSUs. This information is submitted to fulfill the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart I [6-14-00]. Detailed information is subject to change.

G.3.1 Security and Access Control [20.4.1 NMAC §§ 270.14(b)(4) and 270.14(b)(19)(viii); 20.4.1 NMAC § 264.14]

Security at the Area G CSUs is maintained with both artificial and natural barriers. These barriers prevent unauthorized entry of persons or livestock into Area G and satisfy the requirements of 20.4.1 NMAC §§ 264.14(a) and 264.14(b)(2) [6-14-00]. An 8-ft-high chain-link security fence with razor wire at the top surrounds the entire perimeter of Area G. Bilingual (i.e., English and Spanish) warning signs are posted on the fence at approximately 50- to 75-ft intervals and can be seen from any approach to this area. The legends on the signs indicate "Danger—Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of 25 ft. Two entry gates are located on Mesita del Buey Road at the west end of Area G, and an entry station is located adjacent to the inner gate. TA-54 is patrolled by PTLA security personnel during non-operational hours to ensure that the gates are locked and that unauthorized entry has not occurred. The security fence is also inspected by

on-site personnel and repairs are made, as necessary. In accordance with 20.4.1 NMAC § 270.14(b)(19)(viii) [6-14-00], the locations of the security fence, entry gates, and entry stations are shown on Figure 2-4 (Permit Part 2). In addition to the fence and entry station, cliffs on the north and south sides outside of Area G provide natural barriers to discourage unauthorized entry.

Access to the Area G CSUs is controlled by a gate. Authorized resident personnel must badge in/out at the magnetic badge reader to enter or leave through the gate. Individuals who do not have a DOE-issued badge must be escorted after signing the visitor's log located in the administrative area's access control building. These procedures limit access to the Area G CSUs and provide a means of tracking personnel on site, should there be an emergency or evacuation.

G.3.2 Preparedness and Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; and 20.4.1 NMAC § 270.14(b)(8)]

The following describes the emergency equipment available at the Area G CSUs to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. This includes the approximate locations of fire extinguishers, shower/eyewash stations, spill kits, windsocks, and communication/alarm systems.

Required Equipment [20.4.1 NMAC § 264.32]

PPE and emergency equipment supplies are stored at various locations throughout Area G. All personnel who may be required to use PPE and emergency equipment are trained in its use. In addition, essential information for emergency personnel is located at the main gate to Area G in the event of an emergency after normal working hours, or if Area G personnel are unavailable Area G is equipped with an audible alarm system to alert personnel of a fire or the need to evacuate the area. The alarms can be activated by pulling a fire alarm or by pushing the evacuation alarm button. Fire alarms, evacuation alarms, and strobe lights are in place at strategic locations to alert personnel of emergency conditions. These alarms are located throughout Area G and are connected to the LACFD through LANL's central alarm system at all times. Personnel working in Area G also carry pagers, cellular telephones, or two-way radios. Emergency paging telephones are in place so that information can be announced throughout the area. This equipment ensures that personnel can contact on-site and LANL emergency personnel at all times. Windsocks are at strategic locations to indicate wind direction and

strength. There are different types of monitoring equipment located at the Area G CSUs that are used to qualitatively and/or quantitatively evaluate airborne contaminants. Alarms and strobe lights warn personnel when airborne concentrations exceed preset limits.

Fire control equipment is located throughout Area G. This equipment includes halon, water, and/or carbon dioxide fire extinguishers, dry-chemical fire suppression systems, fire blankets, and several fire hydrants. Trained personnel can use the fire extinguishers and fire blankets to extinguish small, non-chemical fires. For larger fires, PTLA and the LACFD are alerted. The fire hydrants supply water at adequate volume and pressure to satisfy the requirements of 20.4.1 NMAC § 264.32 [6-14-00].

Eyewash stations, showers, and other first aid/decontamination equipment are maintained at various locations within Area G. They are for use by personnel in emergencies involving chemical and/or radiological materials. Waste characterization documentation and/or MSDSs are available in the event of a chemical exposure. First aid equipment can be used to treat injuries until trained medical personnel arrive at the scene.

Spill control equipment is maintained at various structures within Area G. Trained personnel use this equipment to mitigate small, containable spills if they know what has been spilled and are sure their actions will not put themselves or others at risk. PPE is also maintained at various structures within Area G and is available for use during routine and non-routine operations to protect personnel from exposure to chemical and radiological contaminants. Warning tapes and barricades are used to post areas and prevent unauthorized entry into restricted areas. Heavy equipment is also available at Area G to move heavy objects.

G.3.3 Hazards Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; 20.4.1 NMAC § 270.14(b)(8)]

In accordance with 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00], the Area G CSUs have been or will be designed and operated to minimize the possibility of a fire, explosion, or any unplanned releases of hazardous wastes or hazardous waste constituents which could threaten human health or the environment. The following discusses the procedures, equipment, and structures used at Area G to mitigate the effects of power outages. Prevention of run-on and runoff at Area G is discussed in Section 2.10.2 of the permit renewal application (LANL, 2003).

Mitigating Effects of Power Outages [20.4.1 NMAC § 270.14(b)(8)(iv)]

Electrical power is supplied to the Area G CSUs to operate lighting and other electrical and monitoring equipment. Evacuation alarms located throughout Area G are equipped with a battery backup and will continue to operate for eight hours during a power failure. Operations in Area G are discontinued temporarily if electrical power is not restored quickly or if container handling equipment fails. However, neither a power nor an equipment failure would affect containment at the Area G CSUs.

Although not needed during daytime operations, emergency lighting for Area G consists of individual battery-pack halogen units located in TA-54-33 and TA-54-412. These lights are actuated by a loss of line voltage and are reset upon resumption of line voltage. A trickle charger keeps the self-contained battery pack at full charge and allows these lighting units a minimum of 30 minutes operability.

G.3.4 Area G CSUs [20.4.1 NMAC § 270.15]

The following describes the nine CSUs at Area G. The nine CSUs include the following:

- Storage Domes 229, 230, 231, and 232, and Pad 9;
- TA-54-412, Storage Dome 226, and Pad 1;
- Storage Dome 48 and Pad 3;
- Pad 10 (former Pads 2 and 4) and transuranic waste characterization facilities;
- Storage Domes 49 and 224; Storage Sheds 144, 145, 146, 177, 1027, 1028, 1030, and 1041; and Pads 5, 8, and 7;
- Storage Domes 153 and 283, and Pad 6;
- Storage Shed 8;
- TA-54-33, and;
- Storage Dome 375 and Pad 11.

General dimensions, containment features, and materials of construction are provided to fulfill the requirements of 20.4.1 NMAC §§ 270.15(a)(1) and (2) [6-14-00].

The CSUs at TA-54 are used to store containers of hazardous waste, MLLW, and MTRUW in solid and liquid form. Liquid wastes are stored primarily in structures that are designed for secondary containment; however, secondary containment pallets are also used. Secondary containment pallets are typically constructed of polyethylene or metal painted with a chemical-resistant coating (see Supplement G-1 in LANL, 2003). Polyethylene secondary containment

pallets used at TA-54 are generally 50 inches long by 50 inches wide by 17 inches deep, with a designed capacity of 83 gallons. Two sizes of metal secondary containment pallets are typically used at TA-54. One is 52 inches long by 52 inches wide by 6.5 inches deep, with a designed capacity of 57 gallons; the other is 60 inches long by 60 inches wide by 6.5 inches deep, with a designed capacity of 77 gallons. The metal secondary containment pallets are coated with chemically-resistant urethane.

G.3.4.1 Storage Domes 229, 230, 231, and 232, and Pad 9 CSU

Storage Domes 229, 230, 231, and 232 are located on Pad 9 at the east end of Area G. The irregularly-shaped, asphaltic-concrete pad is approximately 570 ft long and 275 ft wide (see Figure 2-3 in LANL, 2003). The asphaltic concrete is 4 to 6 inches thick. Each dome is approximately 246 ft long and 88 ft, 7 inches wide (see Figures G-13a, G-13b, G-14a, and G-14b in LANL, 2003). The domes consist of a rigid aluminum frame that supports a tensioned-membrane (see Supplement G-1 in LANL, 2003). A series of aluminum I-beam trusses spanning the width of the structures comprise the dome framework. The membrane material is a polyester fabric coated with UV-stabilized plasticized PVC. The material is fungus-resistant and fire-retardant (i.e., self-extinguishing). The membrane is integrally connected to the frame to provide a fully tensioned fit. Each dome is equipped with personnel doors and a roll-up door for vehicle access. The domes are anchored to a concrete ring-wall with anchor bolts.

The interior floor perimeter of each dome is surrounded with a minimum 6-inch-high, 6-inch-wide asphaltic-concrete curb. A ramp is located at the vehicle entrance to each dome, which allows vehicles and container handling equipment to pass safely over the curbs and prevents run-on into the domes. The asphaltic-concrete pad is sloped 1 to 1.5% towards one end to allow any accumulated liquids to be contained within the curbed area at one end of the dome.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons.

The floor of Dome 230 is designed for secondary containment of liquids. The asphaltic-concrete floor is sloped (1%) towards a concrete sump at the east end of the dome (see Figure G-15 in LANL, 2003). The asphaltic-concrete floor and curbs in Dome 230 are lined with a double layer of 40 mil high-density polyethylene (HDPE), and the sump is lined with a single layer of 40 mil HDPE, creating an impervious layer to contain any liquids that might accumulate (see Supplement G-1 in LANL, 2003). The secondary containment capacity for Dome 230, which includes the sump and curbed area, is approximately 48,255 gallons, which exceeds the amount necessary to hold 10% of the total storage capacity of the dome (330,000 gallons; see Supplement 2-1 in LANL, 2003). Any liquid that might accumulate within these storage domes (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the secondary containment pallets or curbed area or, at Dome 230, in the sump and curbed area. These liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.2 TA-54-412, Storage Dome 226, and Pad 1 CSU

TA-54-412 and Storage Dome 226 are located on Pad 1 in the northeastern portion of Area G (see Figure 2-3 in LANL, 2003). The irregularly-shaped, asphaltic-concrete pad is approximately 358 ft long and 213 ft wide, and is 4 to 6 inches thick.

TA-54-412 (see Figure G-16 in LANL, 2003) is a one story building that is approximately 220 ft long by 60 ft wide (13,200 ft^2). It consists of two structures: an internal primary confinement structure that houses the DVRS processing operations; and an external secondary confinement structure, which surrounds the primary confinement structure. The external secondary confinement structure (hereinafter referred to as "building") provides protection from the elements and a temperature-controlled space for the internal structures and associated process equipment. A 16-ft by 16-ft roll-up vehicle-access door is located on the north end of the building. The roll-up vehicle access door opens to the secondary confinement structure area and serves as a pass-through for moving DVRS feed-stock waste into the primary confinement structure. There is also vehicle access on the south end of the building for removal of compacted waste from DVRS operations.

The floor and foundation of the building are concrete and the floor is painted with an epoxy sealant (see Supplement G-1 (LANL, 2003) for details). The concrete slab provides a structural foundation for the building and the shearer/baler system, and provides a direct working surface for movement of FRP boxes and processing equipment. The concrete slab is above grade to

direct potential run-on away from the building. The floor in the building is sloped to a sump that has a grating cover to provide traction and a level working surface. The sump is treated with chemical-resistant epoxy filler-sealer and protective coating (see Supplement G-1 in LANL, 2003).

The primary confinement structure is housed entirely within the building and consists of five interconnected enclosures or cells. The system is approximately 150 ft long by 50 ft wide by 16 ft high and sits directly on the sealed concrete floor. The primary confinement structure is constructed of 6-inch-thick, two-hour fire-rated sandwich panels made of 16-gauge steel and gypsum wallboard, measuring 40 ft wide by 4 or 8 ft long. The structure interlocks in a self-supporting steel framework that can be assembled into multiple configurations. The primary confinement structure has five cells, each of which is used for a specific function of the DVRS process. The cells are equipped with both personnel and large roll-up doors so that personnel, equipment, and material can access the structure and move from one cell to the next.

A cell is used to sort and segregate transuranic (TRU) waste and MTRUW, and contains various tools used to dismantle the FRP boxes; other cells are used for decontamination and packaging; and a final cell contains the shearer and baler used to compact waste items. The shearing and baling process takes place within a tightly sealed compartment. Waste containers that need to be dismantled are processed using circular saws, reciprocating saws, hammers, pry bars, and other tools, as needed. Waste containers are moved with trucks, forklifts, air pallets, and hand dollies.

The primary and secondary confinement structures are built to meet criteria specified in DOE-STD-1020-92, "*Natural Phenomena Hazards Design and Evaluation Criteria for DOE Facilities*" (DOE, 1992), for Performance Criteria 2 structures. Performance Criteria 2 structures include active fire suppression, emergency communications, and confinement systems that provide important safety functions related to emergency handling or hazard recovery, and are designed to protect the health and safety of workers and visitors during active operations. The building contains fire protection piping and heating, ventilation, and air conditioning ducting, and is a two-hour code-compliant fire-rated building. Panels in the primary confinement structure are the same material as the two-hour fire-rated wall construction with additional supports. A dry-pipe fire-protection system provides coverage for the primary confinement structure. A water collection area in the south end of the building provides for containment of any potential leaks, spills, or accumulated water resulting from the activation of the fire protection system. Liquids

that potentially accumulate within the sump area (e.g., liquids resulting from fire-suppression activities) are collected for characterization, as described in Part 3, section 3.7. Negative ventilation air pressure is maintained throughout the building and primary confinement structure, with discharge through a multi-stage HEPA-filtered stack.

Storage Dome 226 is approximately 286 ft long and 88 ft, 7 inches wide (see Figures G-17a and G-17b in LANL, 2003). The design and materials of construction for Dome 226 are the same as for domes described in Section G.3.4.1 of this TA-54 Container Management section. The dome is equipped with personnel doors and a roll-up door for vehicle access. It is anchored to the concrete ring wall with anchor bolts.

The interior floor perimeter of Dome 226 is surrounded with a minimum 6-inch-high, 6-inch-wide asphaltic-concrete curb. A ramp is located at the vehicle entrance to the dome, which allows vehicles and container handling equipment to pass safely over the curb and prevents run-on into the dome. The asphaltic-concrete pad is sloped 1 to 1.5% towards one end to allow any accumulated liquids to be contained within the curbed area at one end of the dome.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate within this dome (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the secondary containment pallets or curbed area. These liquids are removed and collected for characterization, as described in Section 2.6 (LANL, 2003).

G.3.4.3 Storage Dome 48 and Pad 3 CSU

Storage Dome 48 is located at the eastern end of Area G on Pad 3. Pad 3 is constructed of asphaltic concrete to a thickness of four inches, and is approximately 339 ft long and 50 ft wide. Storage Dome 48 is 285 ft long and 50 ft wide, and has a peak height of 24 ft (see Figure G-18 in LANL, 2003). The design and materials of construction for Dome 48 are the same as for the domes described in Section G.3.4.1 of this TA-54 Container Management section. The dome is equipped with a double-panel rolling door at the south end of the dome and eight personnel

doors, located approximately every 80 ft along the dome's length, allow for adequate access both by vehicles and by personnel. The interior perimeter of the dome is surrounded by a 6-inch-high, 8-inch-wide asphaltic-concrete curb, which helps prevent run-on into and runoff from the dome. An asphaltic-concrete ramp located at the vehicle entrance allows vehicles and container handling equipment to pass safely over the curb. The dome is anchored to Pad 3 with standard drift pins.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate within this dome (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the secondary containment pallets or curbed area. These liquids are removed and collected for characterization, as described in Section 2.6 (LANL, 2003).

G.3.4.4 Pad 10 (former Pads 2 and 4) and Transuranic Waste Characterization Facilities CSU

Pad 10 will be constructed at the location of former Pads 2 and 4. The irregularly-shaped pad is planned to measure approximately 350 ft long by 250 ft wide and will be constructed of asphaltic concrete (see Figures 2-3 and 2-8 in LANL, 2003). The transuranic waste characterization facilities and container storage will be located on this pad.

The transuranic waste characterization facilities will consist of mobile and/or modular units equipped with instruments and equipment for waste characterization and repackaging. The transuranic waste characterization facilities may include the following: drum-loading or receiving unit(s); equilibration units(s); gas mobile characterization unit(s); mobile repack units; and nondestructive radioassay unit(s).

All waste containers at this CSU will be stored on pallets or otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes will have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83

gallons. Any liquid that might accumulate (e.g., precipitation, liquids resulting from fire-suppression activities) will be contained within the secondary containment pallets. These liquids will be removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.5 Storage Domes 49 and 224; Storage Sheds 144, 145, 146, 177, 1027, 1028, 1030, and 1041; and Pads 5, 8, and 7 CSU

This CSU is located in the south-central portion of Area G, and consists of three pads, two domes, and eight sheds (see Figure 2-3 in LANL, 2003). Storage Dome 49 is located on Pad 5, and Storage Dome 224 is located on Pad 8. The storage sheds are located on Pad 7. The pads are constructed of asphaltic concrete. Pad 5 is approximately 500 ft long, 65 ft wide, and 4 inches thick. It is sloped approximately 2% from north to south. Pad 8 is approximately 150 ft long, 95 ft wide, and 3 inches thick. It is sloped approximately 1% from west to east. Pad 7 is approximately 200 ft long, 64 ft wide, and 4 inches thick. It is sloped approximately 1% from west to east.

Storage Dome 49 is 440 ft long and 60 ft wide, and has a peak height of approximately 26 ft (see Figure G-19 in LANL, 2003). The design and materials of construction for Dome 49 are the same as for the domes described in Section G.3.4.1 of this TA-54 Container Management section. The dome is equipped with a double-panel rolling door at the north end of the dome and six personnel doors to allow for adequate access both by vehicles and by personnel. The interior perimeter of the dome is surrounded by a 6-inch-high, 8-inch-wide asphaltic-concrete curb, which helps prevent run-on into and runoff from the dome. An asphaltic-concrete ramp located at the vehicle entrance to Dome 49 allows vehicles and container handling equipment to pass safely over the curb. The dome is anchored to Pad 5 with standard drift pins.

Storage Dome 224 is approximately 110 ft long and 60 ft wide, with a peak height of 26 ft (see Figure G-20 in LANL, 2003). The design and materials of construction for Dome 224 are essentially the same as for the domes described in Section G.3.4.1 of this Attachment Section. This dome is anchored to Pad 8 with anchor bolts. It is equipped with a single-panel roll-up door at the north end and four personnel doors to allow adequate access by vehicles and by personnel. A 1-ft, 8-inch wide by 2-ft, 4-inch deep concrete ring wall surrounds the interior of Dome 224.

Storage Sheds 144, 145, 146, and 177 are prefabricated sheds constructed of steel. Each shed measures 6 ft long, 5 ft wide, and 9 ft high (see Supplement G-1 in LANL, 2003). Access to each shed is obtained through a single door. The sheds are elevated by design, which prevents run-on. Each shed is constructed with a liquid-tight sump to ensure containment of any potential leaks or spills and to prevent runoff. The floor of each shed is constructed of steel and has a metal grate that covers the entire sump area. Containers are placed directly on the metal grates, which prevent contact with liquids that may have accumulated in the sumps. The interior of each shed and sump is coated with chemically-resistant epoxy paint. The designed sump storage capacity of each shed is 120 gallons (see Supplement G-1 in LANL, 2003), which exceeds the amount necessary to hold 10% of the total storage capacity of each shed (330 gallons; see Supplement 2-1). Additional engineering details and technical specifications for these sheds are provided in Supplement G-1 (LANL, 2003).

Storage Sheds 1027, 1028, 1029, and 1041 have the same basic design specifications as Sheds 68, 69, and 70 described in Section G.2.4.1 of this TA-54 Container Management section. Each shed is equipped with three sets of double doors on one side of the shed for ease of access. Sheds 1027, 1028, 1030, and 1041 contain a single compartment and sump within each shed (see Figure G-21 in LANL, 2003). The designed storage capacity of each sump is 750 gallons, which exceeds the amount necessary to hold 10% of the total capacity of each shed (1,760 gallons; see Supplement 2-1 in LANL, 2003). Additional engineering details and technical specifications for these sheds are provided in Supplement G-1 (LANL, 2003).

Dome 224 is designed for secondary containment of liquids (see Figure G-22 in LANL, 2003). The asphaltic-concrete floor is sloped 0.5% towards a concrete sump in the center of the dome. A ramp at the entrance to the dome allows movement of waste containers and prevents run-on. The floor, sump, and curbs are lined with a double layer of HDPE (80 mil and 40 mil) creating an impervious layer to contain any liquids that might accumulate (see Supplement G-1 in LANL, 2003). The secondary containment capacity for Dome 224 is approximately 19,150 gallons, which exceeds the amount necessary to hold 10% of the total storage capacity of the dome (95,040 gallons; see Supplement 2-1 in LANL, 2003).

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of

containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate within the domes and sheds (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the secondary containment pallets, curbed areas, or sumps (where present). These liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.6 Storage Domes 153 and 283 and Pad 6 CSU

This CSU is located in the north-central portion of Area G, and consists of two domes on a pad (see Figure 2-3 in LANL, 2003). Storage Domes 153 and 283 are located on Pad 6. The design and materials of construction for Domes 153 and 283 are the same as for domes described in Section G.3.4.1 of this Attachment Section. Pad 6 is constructed of asphaltic concrete, and is approximately 633 ft long, 99 ft wide, and 4 inches thick. It is sloped approximately 1.2% from west to east.

Dome 153 is approximately 326 ft long and 60 ft wide, with a peak height of 26 ft (see Figure G-23 in LANL, 2003). A double-panel rolling door is located at the west end of the dome, and 10 personnel doors are located approximately every 40 to 125 ft along the dome's length. Dome 283 is approximately 250 ft long and 60 ft wide, with a peak height of 26 ft (see Figure G-24 in LANL, 2003). A double-panel rolling door is located at the east end of the dome, and 10 personnel doors are located approximately every 50 ft along the dome's length. These accesses allow adequate traffic flow of vehicles and personnel into and out of the dome. A 6-inch-high, 8-inch-wide asphaltic-concrete curb surrounds the interior perimeter of both domes to help prevent run-on and runoff. An asphaltic-concrete ramp is located at the vehicle entrance of each dome to allow vehicles and container-handling equipment to pass safely over the curb. Domes 153 and 283 are anchored to Pad 6 with standard drift pins.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate within the domes (e.g., precipitation, liquids resulting

from fire-suppression activities) is contained within the secondary containment pallets and curbed areas. These liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.7 Storage Shed 8 CSU

Storage Shed 8 is located in the north-central portion of Area G (see Figure G-25 in LANL, 2003). The shed is 40 ft long and 16 ft wide, and has a 14-ft-high galvanized steel roof that slopes to the north. The siding of Storage Shed 8 is constructed of galvanized steel and the foundation is constructed of concrete. Two overhead doors and one personnel door on the south side of the shed allow both vehicles and personnel to access the shed. The shed also has a 6-inch high, 8-inch-wide asphaltic-concrete curb to prevent runoff. A concrete slab on the south side of the shed is sloped away from the shed's foundation to prevent run-on.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the secondary containment pallets and curbed area. These liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.8 TA-54-33 CSU

TA-54-33 is located in the north-central portion of Area G and consists of a dome attached to a concrete-block building (see Figure G-26 in LANL, 2003). This CSU is used for waste storage and potential or future waste characterization activities. The dome and building are located on a concrete foundation surrounded by an asphaltic-concrete pad. The concrete slab is 8 inches thick and overlies 6 inches of base course. The concrete-block building attached to the dome is approximately 40 ft long and 34 ft wide. The dome is 157 ft long and 50 ft wide, with a peak height of 24 ft. A double-panel rolling door is located at the west end of the dome for vehicle access. A single-panel rolling door is located at the southeast end of the dome for container-handling access. Two personnel doors are located approximately 40 ft apart along the north

wall of the dome. Two additional personnel doors are located in the concrete-block building; one on the west side, and one on the east side. In addition, two overhead doors are located on the north side of the building to allow free movement of personnel and container-handling equipment between the building and the dome. The interior perimeter of the dome is surrounded with a 6-inch-high, 8-inch-wide concrete curb to prevent run-on and runoff. The concrete floors of Rooms 100, 100A, 100B, 100C, and 105 also slope inward to prevent runoff.

The design and materials of construction for the TA-54-33 dome are the same as for domes described in Section G.3.4.1 in this TA-54 Container Management section. The dome's aluminum frame is directly connected to the building, which extends approximately 5 ft into the dome. Inside the dome, the concrete foundation is sloped to a 6-inch-wide centralized concrete drainage trench that is covered with 12-inch-wide steel grating. The trench slopes toward a steel sump located at the east end of the dome. Two additional trenches, located in Rooms 100A and 100B, are perpendicular to and feed into the main trench. A floor drain in Room 105 connects with the trench in Room 100A.

The steel sump is located within a concrete basin that has 8-inch-thick walls, a 9-inch-thick base, and measures approximately 15 ft long by 7 ft wide by 6 ft deep. The sump is approximately 14 ft long by 6.5 ft wide by 5 ft deep and has a capacity of 3,473 gallons. A primary holding tank associated with the sump is located in a concrete basin that is 15 ft long by 12 ft wide by 5.5 ft deep and has a capacity of approximately 7,405 gallons. A secondary holding tank associated with the sump is located in a separate concrete basin that is 12 ft long by 12 ft wide by 5.5 ft deep and has a capacity of approximately 5,924 gallons. These basins have the capacity to contain any spills or leaks resulting from a potential overflow or breach of the holding tanks.

The discussions of the trench and holding tank system at TA-54-33 are provided for completeness and informational purposes only. The trench and tank system, including all associated structures and systems (e.g., basins, piping) do not require a Resource Conservation and Recovery Act (RCRA) permit.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the curbed area of the dome, within the sump, within the building, or within secondary containment pallets. These liquids are removed and collected for characterization, as described in Permit Part 3, Section 3.7.

G.3.4.9 Storage Dome 375 and Pad 11 CSU

Storage Dome 375 is located in the western portion of Area G and is used for storage of hazardous waste, MLLW, and MTRUW. It measures approximately 300 ft long by 100 ft wide (see Figure G-27 in LANL, 2003). The building is an aluminum A-frame truss design that is anchored to a concrete ring wall. The dome is of modular construction utilizing a membrane/fabric covering. It is equipped with 14 personnel doors and two roll-up doors, one each at the east and west ends of the building. Ramped entrances allow for safe movement of container handling equipment and vehicle access. The storage dome is located on Pad 11, which is constructed of asphaltic-concrete and measures approximately 478 ft long by 137 ft wide. Pad 11 is approximately 4 inches thick and slopes approximately 1 to 2% to the southeast.

All waste containers at this CSU are stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers) to prevent contact with accumulated liquids. Secondary containment pallets used to store liquid wastes have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container stored on them, whichever is greater. Secondary containment pallets typically used at TA-54 have a capacity ranging from 57 to 83 gallons. Any liquid that might accumulate (e.g., precipitation, liquids resulting from fire-suppression activities) is contained within the building and/or within secondary containment pallets. These liquids are removed and collected for characterization, as described in Section 2.6 (LANL, 2003).

G.4 TA-54 WEST CONTAINER STORAGE UNITS [20.4.1 NMAC, Subpart V, Part 264, Subpart I]

The following provides specific information on current facility operations and waste management practices at the TA-54 West CSUs. This includes a discussion of security and access control, preparedness and prevention, hazards prevention, and design information for the TA-54 West CSUs. This information is submitted to fulfill the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart I [6-14-00]. Detailed information is subject to change.

G.4.1 Security and Access Control [20.4.1 NMAC §§ 270.14(b)(4) and 270.14(b)(19)(viii); 20.4.1 NMAC § 264.14]

Security at TA-54 West is maintained by both artificial and natural barriers. These barriers prevent unauthorized entry of persons or livestock into TA-54 West and satisfy the requirements of 20.4.1 NMAC §§ 264.14(a) and 264.14(b)(2) [6-14-00]. An 8-ft-high chain-link security fence with barbed wire at the top surrounds the entire perimeter of TA-54 West. Bilingual (i.e., English and Spanish) warning signs are posted on the fence at 50- to 75-ft intervals and can be seen from any approach to this area. The legends on the signs indicate "Danger—Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of 25 ft. TA-54 West is patrolled by PTLA security personnel during non-operational hours to ensure that the gates are locked and that unauthorized entry has not occurred. The entire security fence is also inspected by on-site personnel and repairs are made, as necessary. In accordance with 20.4.1 NMAC § 270.14(b)(19)(viii) [6-14-00], the locations of the security fence, entry gates, and entry stations are shown on Figure 2-14 in Section 2.0 (LANL, 2003). In addition to the fence and entry station, cliffs on the north side of TA-54 West provide a natural barrier to discourage unauthorized entry.

Authorized individuals are permitted access to the Indoor CSU at TA-54-38 through the badge reader at the west entrance to the building. Visitors, subcontractors, and other personnel that do not have a badge must gain access to the building by contacting an authorized person, and must sign the visitor logbook. When leaving TA-54-38 to go to the adjacent building (TA-54-34) or the Outdoor CSU, it is not necessary for authorized personnel to use the badge reader to exit TA-54-38. If leaving TA-54 West completely, however, authorized personnel must badge out at the badge reader. Visitors must always sign out on the visitor logbook when leaving the building.

G.4.2 Preparedness and Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; 20.4.1 NMAC § 270.14(b)(8)]

The following presents information on the emergency equipment available at the TA-54 West CSUs to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00]. This includes the approximate locations of the fire extinguishers, shower/eyewash stations, spill center, and communication systems.

Required Equipment [20.4.1 NMAC § 264.32]

TA-54-38 is equipped with an audible alarm system to alert personnel of fire or the need to evacuate the area. Fire alarm pull stations are located throughout the building and can be activated in the event of a fire. Strobe lights mounted at the fire alarms and at TA-54-34, just north of TA-54-38, flash upon activation of the fire alarms to visually alert personnel. The alarm system can also be activated by using evacuation alarm buttons located near the entrances to the building. Upon activation of the evacuation alarm system, horns sound to alert personnel of emergency conditions. The building's manual fire alarm pull stations at TA-54 West are connected to the LACFD through LANL's central alarm system at all times. The evacuation alarm system is a local system that notifies occupants in TA-54-38 and TA-54-34 of a local emergency. Additionally, a roll-up door between the high and low bays has heat sensitive links attached to a safety chain that melt at a certain temperature and cause the door to close.

TA-54-38 is also equipped with telephones to provide adequate communication and to summon external emergency assistance, if necessary. Paging telephones are located throughout the building and are used to contact on-site personnel. Paging telephones are also used in the event of an emergency to communicate the nature and location of hazardous conditions to personnel in the area. The alarm system is interrupted when the paging telephone system is activated to allow personnel to hear the announcement. Additionally, an emergency telephone is located outside the main entry area. Personnel working within the building can also use these telephones to summon assistance from local emergency response teams in case of emergency.

Fire control equipment is available for use within TA-54-38 and at the Outdoor CSU. Portable halon fire extinguishers are located in the high bay, low bay, and at the Outdoor CSU. The fire extinguisher located by the east personnel entrance door in the low bay can also be used at the loading dock. Depending on the size of the fire and the fuel source, fire extinguishers can be

used by on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. TA-54-38 is equipped with a smoke-activated dry-pipe sprinkler system in the low bay and with heat-activated dry-pipe fire suppression systems in the high bay and at the loading dock. A fire hydrant installed according to National Fire Protection Association standards is located approximately 220 ft west of TA-54-38 near the west entrance to TA-54 West. Water is supplied to the fire hydrant by a municipal water system through 8-inch pipes at an adequate volume and pressure to satisfy the requirements of 20.4.1 NMAC § 264.32 [6-14-00].

A portable chemical spill center is maintained within TA-54-38. It contains sorbents and PPE. Personnel working anywhere within the building have access to this spill center. Trained personnel use this equipment to mitigate small containable spills when they are certain their actions will not put themselves or others at risk. Personnel decontamination equipment available includes a safety shower and eyewash located in the high bay and a safety shower and eyewash on the loading dock.

G.4.3 Hazards Prevention [20.4.1 NMAC, Subpart V, Part 264, Subpart C; 20.4.1 NMAC § 270.14(b)(8)]

In accordance with 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00], the TA-54 West CSUs are designed and operated to minimize the possibility of a fire, explosion, or any unplanned releases of hazardous wastes or hazardous waste constituents which could threaten human health or the environment. The following discusses the specific procedures, equipment, and structures used at TA-54 West to mitigate the effects of power outages. Prevention of run-on and runoff at TA-54 West is discussed in Section 2.10.3 of the permit renewal application (LANL, 2003).

<u>Mitigating Effects of Power Outages [20.4.1 NMAC § 270.14(b)(8)(ii)]</u>

Electrical power is supplied to TA-54-38 through a transformer located north of the building. In the event of a power failure, operations in the building cease. If electrical power is not restored quickly or if container handling equipment fails, containment at the TA-54 West CSUs is not affected. Monitoring equipment alarms are operated by supplied power, but will continue to operate on a backup battery. Emergency lighting is equipped with backup batteries.

G.4.4 TA-54 West CSUs [20.4.1 NMAC § 270.15]

The following describes the two CSUs at TA-54 West. The two CSUs include the Indoor CSU and the Outdoor CSU. The Indoor CSU is comprised of the low bay and the high bay at TA-54-38. The Outdoor CSU is comprised of the storage pad surrounding the north, east, and south sides of TA-54-38 and the loading dock at TA-54-38. The CSUs at TA-54 West are used to store MLLW and MTRUW in solid form. General dimensions, containment features, and materials of construction are discussed in this section to fulfill the requirements of 20.4.1 NMAC §§ 270.15(a)(1) and (2) [6-14-00].

G.4.4.1 Indoor CSU

TA-54-38 is constructed of 36-ft-high pre-cast concrete panel walls topped by pre-stressed double-T concrete roof sections. Its foundation consists of a 6-inch reinforced concrete slab on compacted fill. The building is divided into several offices and houses the Indoor CSU, which includes the low bay and the high bay (see Figure G-28 in LANL, 2003).

The low bay is approximately 40 ft wide and 34 ft long. An 8-ft-wide by 12-ft-high roll-up door is located at the east end and opens to an outdoor loading dock. A second 8-ft-wide by 12-ft-high roll-up door is located in the southeast corner and opens into the high bay. The walls and floor of the low bay are coated with industrial grade enamel paint.

The high bay is approximately 40 ft wide and 80 ft long. The high bay is used for loading TRU waste and MTRUW into Transuranic Package Transporter-II containers. It is equipped with 14-ft-wide by 18-ft-high roll-up doors on the east and west ends to allow convenient, indoor loading of the tractor-trailers that transport shipments of waste to the Waste Isolation Pilot Plant. The high bay floor is unpainted and slopes at an angle of 1.5 degrees toward a central trench and sump. The trench is 5 inches wide, 6 inches deep, and 50 ft long. The entire length of the trench is covered with a metal grate and is designed to hold precipitation and snow melt from tractor-trailers. The sump is locked out. Potential liquids that accumulate within the sump area (e.g., precipitation, liquids resulting from fire-suppression activities) are removed and collected for characterization, as described in Section 2.6 (LANL, 2003).

G.4.4.2 Outdoor CSU

The Outdoor CSU consists of the loading dock at TA-54-38 and the storage pad located on the north, east, and south sides of TA-54-38. The loading dock is 16 ft wide by 38 ft, 10 inches long and is covered by a metal awning. The platform is constructed of 6-inch cast-in-place concrete and is located approximately 4 inches above grade.

The boundary of the storage pad is delineated by the fence surrounding the pad. The approximate dimensions of the pad at the Outdoor CSU are shown on Figure 2-14 (LANL, 2003). The pad is constructed of asphaltic concrete to a thickness of approximately 4 inches and slopes toward the curbed edges (see Figure 2-14 in LANL, 2003). This slope allows for storm water to run off the pad. Storage containers on this pad are elevated either by design or on a pallet.Mobile radioassay trailers and storage sheds for supplies and equipment are also stored on the pad at the Outdoor CSU.

G.5 REFERENCES

LANL, 2003, "Los Alamos National Laboratory Technical Area 54 Part B Permit Renewal Application", Revision 3.0, June 2003, LA-UR-03-3579, Los Alamos National Laboratory, Los Alamos, New Mexico.

Ball, T., M. Everett, P. Longmire, D. Vaniman, W. Stone, D. Larssen, K. Greene, N. Clayton, and S. McLin, 2002, "Characterization Well R-22 Completion Report," Los Alamos National Laboratory report LA-13893-MS, Los Alamos New Mexico.

LANL, 1998, "Hydrogeologic Workplan," May 1998, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1995, "Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area," LA-12883-MS, January 1995.

DOE, 1992, "Natural Phenomena Hazards Design and Evaluation Criteria for DOE Facilities," DOE-STD-1020-92.

TA-55

CONTAINER STORAGE

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CSU	container storage unit(s)
DOT	U.S. Department of Transportation
ft	feet/foot
gal	gallon
in.	inches
LANL	Los Alamos National Laboratory
m^3	cubic meters
ppmw	parts per million by weight
SWB	standard waste box
TA	technical area

TA-55
ATTACHMENT G
CONTAINER STORAGE

The information in this Attachment Section addresses the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.15 and 20.4.1 NMAC, Subpart V, Part 264, Subpart I, revised June 14, 2000 [6-14-00]. This Section provides detailed descriptions of the seven container storage units (CSU) located at Technical Area (TA) 55. Detailed engineering drawings are provided as Figures G-1 through G-3 (LANL, 2003).

G.1 CONTAINER STORAGE AT TA-55

TA-55 is located in the north central portion of Los Alamos National Laboratory on a mesa between a branch of Mortandad Canyon on the north and Two Mile Canyon on the south. TA-55 is a plutonium processing facility, which began operating in 1978. Hazardous and mixed waste container storage at TA-55 is conducted at seven CSUs. These CSUs are identified as B40, B05, K13, B45, the Vault, the Container Storage Pad, and TA-55-185. The following sections provide general dimensions, containment features, and materials of construction for each CSU to satisfy the requirements of 20.4.1 NMAC §270.15(a)(1) and (2) [6-14-00].

G.1.1 B40

The B40 CSU is used to store containers of hazardous and mixed waste that may contain liquids. (B40 was described as Area 1 in previous permitting applications.) B40 is located in the southwest section of the TA-55-4 basement, as shown on Figure G-1 (LANL, 2003). The CSU is L-shaped and has long dimensions of 61.5 by 55 feet (ft). The maximum storage capacity of this unit is 21,500 gallons (gal), the equivalent of 391 55-gal drums. The types of waste containers holding hazardous or mixed waste that are stored in B40 include 5-, 10-, 12-, 15-, 30-, 55-, and 85-gal drums; large waste boxes; special order waste boxes; and standard waste boxes (SWB).

G.1.2 B05

The B05 CSU is used to store containers of hazardous and mixed waste that do not contain liquids. (B05 was described as Area 3 in previous permitting applications.) B05 is located in the southwest section of the TA-55-4 basement, as shown in Figure G-1 (LANL, 2003). The CSU is

rectangular shaped and is 26 ft long by 10 ft wide. The maximum storage capacity of this unit is 3,600 gal, the equivalent of 66 55-gal drums. The types of waste containers holding hazardous or mixed waste that will be stored in B05 include 30-, 55-, and 85-gal drums, large waste boxes; and SWBs.

G.1.3 K13

The K13 CSU is used to store containers of hazardous and mixed waste that may contain liquids. (K13 was described as Area 4 in previous permitting applications.) K13 is located in the northwest section of the TA-55-4 basement, as shown on Figure G-1 (LANL, 2003). The CSU is rectangular shaped and is 16 ft long by 13 ft wide. The maximum storage capacity of this unit is 2,500 gal, the equivalent of 46 55-gal drums. The types of waste containers holding hazardous or mixed waste that will be stored in K13 include 0.25-, 0.5-, 0.75-, 1-, 2-, 4-, and 6-liter/quart containers; 5-, 10-, 12-, and 15-gal containers; 30-, 55-, and 85-gal drums; and large waste boxes.

G.1.4 B45

The B45 CSU is used to store containers of hazardous and mixed waste that do not contain liquids. (B45 was described as Area 5 in previous permitting applications.) B45 is located in the northeast section of the TA-55-4 basement, as shown on Figure G-1 (LANL, 2003). The CSU is rectangular shaped and is 45 ft long by 17.5 ft wide. The maximum storage capacity of this unit is 11,000 gal, the equivalent of 200 55-gal drums. The types of waste containers holding hazardous or mixed waste that will be stored in B45 include 5-, 10-, 12-, and 15-gal containers; 55- and 85-gal drums; large waste boxes; and SWBs.

G.1.5 Vault

The Vault CSU is used to store containers of mixed waste that may contain liquids. (The Vault was described as Area 6 in previous permitting applications.) The Vault is located along the eastern wall of the basement at TA-55-4, as shown on Figure G-1 (LANL, 2003), and is approximately 79.5 ft long by 50.5 ft wide. The maximum storage capacity of this unit is 4,000 gal, the equivalent of approximately 73 55-gal drums. The types of waste containers holding mixed waste that will be stored in the Vault include 0.25-, 0.5-, 0.75-, 1-, 2-, 4-, and 6-liter/quart containers; and 5-, 10-, 12-, 15-, 30- and 55-gal drums.

G.1.6 Container Storage Pad

The Container Storage Pad is used to store containers of hazardous and mixed waste that may contain liquids. The pad is located outside and northwest of TA-55-4, as shown on Figure G-2 (LANL, 2003). It was installed in the mid-1980s and is constructed of asphaltic-concrete with a variable thickness of 4 to 6 inches (in.). The Container Storage Pad CSU is shaped like a trapezoid and measures 102 ft, 86 ft, 156 ft, and 105 ft. It also includes a rectangular strip measuring 70 ft by 10 ft on the southeast side. The pad is sloped, is elevated 2 to 4 in. above ground level, and has a culvert beneath the pad running from the northwest side to the southeast corner to minimize run-on of precipitation. The storage capacity of this area is 135,000 gal, the equivalent of approximately 2,455 55-gal drums. The types of waste containers holding hazardous or mixed waste that will be stored on the container storage pad include 0.25-, 0.5-, 0.75-, 1-, 2-, 4-, and 6-liter/quart containers; 30-, 55-, and 85-gal drums; SWBs; large waste boxes; and 5-, 10-, 12-, and 15-gal containers.

G.1.7 TA-55-185

TA-55-185 will be used to store containers of hazardous and mixed waste that do not contain liquids. TA-55-185 is located west of TA-55-4, as shown on Figure G-3 (LANL, 2003). The building was constructed in 1991 and consists of a steel frame with fiberglass insulation, metal walls, and a concrete floor. The TA-55-185 CSU will be approximately 60 ft long by 40 ft wide, and will have a maximum storage capacity of 30,000 gal, the equivalent of 546 55-gal drums. The types of waste containers holding hazardous or mixed waste that will be stored at TA-55-185 include 30-, 55-, and 85-gal drums; large waste boxes; and SWBs.

G.2 CONTAINMENT SYSTEMS [20.4.1 NMAC §§270.15(a)(1-5) and 270.15(b)(1-2)]

The B40, K13, Vault, and Container Storage Pad CSUs will be used to store liquid and/or potentially liquid-bearing wastes; therefore, the requirements of 20.4.1 NMAC §264.175(b) [6-14-00] are applicable for these CSUs. Table G-2 provides the secondary capacity associated with each of these CSUs (LANL, 2003).

Secondary containment at B40, K13, and the Vault CSUs is primarily provided by self-containment pallets, covered self-containment pallet, single-drum pallets, or storage cabinets. Secondary containment at the Container Storage Pad CSU is provided by covered self-containment pallets. Each containment system is described below.

- Self-Containment Pallet: Molded high-density polyethylene base with a fiberglass grating that elevates the containers over a reservoir that is capable of containing leaks and spills from the containers.
- Covered Self-Containment Pallet: Molded, chemical-resistant, high density polyethylene with a removable polyethylene grating and a hinged two-part cover, which is impervious to precipitation. Supplement G-1 (LANL, 2003) provides detailed information on the covered self-containment pallets.
- Single-Drum Containment Pallet: An 85-gal container made of heavy-duty polyethylene designed to hold one 55-gal drum.
- Cabinet: An epoxy-enamel-coated steel frame with a base that has a raised, leakproof sill. Each shelf is lined with a high-density polyethylene tray that is capable of containing leaks and spills from containers.

The B40, K13, and Vault CSUs are located in the basement of TA-55-4. This basement has a recessed floor that provides another level of containment for the liquid wastes stored there. The floor consists of a 10-in.-thick reinforced concrete slab that is free of cracks and gaps, is compatible with the wastes stored in the area, will effectively prevent the migration of waste to the environment, and is capable of collecting releases and accumulated liquids until the material is removed. Each of these containment systems will hold, at a minimum, 10 percent of the volume of the potential liquid-bearing containers or the volume of the largest potential liquid-bearing container stored, whichever is greater, pursuant to the requirements of 20.4.1 NMAC §264.175(b)(3) [6-14-00]. Containers holding hazardous or mixed waste in each CSU will be protected from potential contact with accumulated liquids by either being elevated or stored in an area that is designed and operated to remove accumulated liquids.

The B05, B45, and TA-55-185 CSUs will be used to store containers with only non-liquid bearing waste (i.e., solid form). These CSUs all reside in a building; therefore, run-on and run-off from storm events are not applicable. In the event of a water leak from facility systems, the TA-55-4 basement has sumps to contain the liquid. Drummed waste containers are placed on pallets or stored in self-containment structures. SWBs will be placed on pallets. Large waste boxes are elevated by design. All waste items in TA-55-185 will either be placed on pallets or are elevated by design.

G.3 SPECIAL REQUIREMENTS FOR IGNITIBLE, REACTIVE, AND INCOMPATIBLE WASTES [20.4.1 NMAC §270.14(b)(9), §270.15(c) and (d) and 20.4.1 NMAC §§264.17, 264.176, and 264.177]

Ignitable or reactive waste is stored at the K13 and B40 CSUs and on the Container Storage Pad. Pursuant to 20.4.1 NMAC §264.17 [6-14-00], LANL will follow specific waste management procedures for ignitable and reactive waste as discussed in Permit Part 2, Section 2.8.

Ignitable, reactive, and incompatible wastes will not be stored at B05, B45, and the Vault or at TA-55-185; therefore, the requirements of 20.4.1 NMAC §264.17, and 20.4.1 NMAC §270.15(c) and (d) [6-14-00] do not apply at these CSUs.

G.4 AIR EMISSION STANDARDS FOR CONTAINERS

This section addresses potential applicability of 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers" to containers at TA-55, based on applicability criteria specified in 20.4.1 NMAC §264.1080 [6-14-00]. Subpart CC standards for containers require that containers of hazardous waste be covered or controlled so that there are no detectable emissions. These standards are not applicable to containers of radioactive mixed waste. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers that have received waste prior to the effective date of regulation (December 6, 1996), or containers of less than 0.1 cubic meters (m^3) (approximately 26 gal) capacity. LANL requires that Subpart CC requirements be met by the generator as part of the waste characterization process. The generator determines the concentration of volatile organics in a waste stream at the point of generation. The generator documents this determination for that waste stream, as described in Attachment C (*Waste Analysis Plan*).

Containers of less than 0.46 m^3 (approximately 119 gal) capacity and that meet U.S. Department of Transportation (DOT) specifications under the Code of Federal Regulations, Title 49, Part 178, will be kept closed during storage pursuant to 20.4.1 NMAC §264.1086(b)(1)(ii) [6-14-00]. Containers undergoing waste characterization activities may be open for access for the purposes described in 20.4.1 NMAC §264.1086(c) [6-14-00]. Containers of greater than 0.46 m^3 capacity that contain waste with greater than 500 ppmw volatile organics or those that are greater than 0.1 m^3 capacity, do not meet DOT specifications, and contain wastes of greater

than 500 ppmw volatile organic will be subject to a visual inspection and monitoring program as required by 20.4.1 NMAC §264.1088(b) [6-14-00].

G.5 REFERENCES

LANL, 2003, "Los Alamos National Laboratory Technical Area 55 Part B Permit Renewal Application", Revision 2.0, September 2003, LA-UR-03-6303, Los Alamos National Laboratory, Los Alamos, New Mexico.

ATTACHMENT H

TANK MANAGEMENT

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ATTACHMENT H

STORAGE TANK SYSTEM

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ATTACHMENT H
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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ACI	American Concrete Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BPVC	Boiler and Pressure Vessel Code
CAM	continuous air monitor
ft	feet/foot
gal	gallon(s)
in.	inch(es)
L	liter(s)
LANL	Los Alamos National Laboratory
TA	technical area

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ATTACHMENT H
STORAGE TANK SYSTEM

The information provided in this Attachment addresses the applicable tank system requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.16, and 20.4.1 NMAC, Subpart V, Part 264, Subpart J, revised June 14, 2000 [6-14-00]. This Attachment provides a description of the storage tank system that is used to store mixed waste solutions at Los Alamos National Laboratory (LANL) Technical Area (TA) 55. It includes detailed descriptions of the storage tank system components and associated ancillary equipment.

There is one storage tank system at TA-55 that is comprised of 3 tank components that share a common piping and pumping system. The storage tank system consists of both new and existing components as summarized in Table H-1.

The evaporator glovebox tank was constructed in 1986 and is an existing tank; therefore, this component of the tank system is addressed in this permit application in accordance with the requirements of 20.4.1 NMAC §264.191 [6-14-00]. The cementation unit pencil tanks were constructed in 1985 and were considered existing tanks until new components were installed in 1996. These new components were determined to be a major, non-routine modification; therefore, the cementation unit pencil tanks are subject to the new tank system regulations and are addressed in this permit application as new tanks in accordance with the requirements of 20.4.1 NMAC §264.192 [6-14-00]. The pencil tanks will be constructed and, thus, are subject to new tank system regulations in accordance with the requirements of 20.4.1 NMAC §264.192 [6-14-00].

The written engineering assessments and certifications for the tanks, as required by 20.4.1 NMAC §§264.191 and 264.192(a) [6-14-00], are in Supplements H.1, H.2A, H.2B, H.2C, and H.3 (LANL, 2003), respectively. Detailed drawings and information are at Figures H-1 through H-13 (LANL, 2003). Table H-2 summarizes applicable regulatory references for tank systems and the corresponding location where the requirement is addressed in this Attachment.

H.1 DESIGN, CONSTRUCTION, MATERIALS, AND OPERATION [20.4.1 NMAC §270.16(b), (c), (d) and (l); 20.4.1 NMAC §§264.191(b)(1) and (3), and 264.192(a)(1)]

The TA-55 storage tank system is located at TA-55, Building 4, in Room 401 (Figure H-1 of LANL, 2003) and has a maximum capacity of 1,270 Liters (L) (336 gallons [gal]). The storage tank system consists of 3 components, with 16 tanks, that are used to store evaporator bottoms solutions prior to stabilization in the cementation unit.

The evaporator bottoms solutions are initially stored in the evaporator glovebox tank component, where they are sampled for radionuclides, oxides, and metals. They remain in the evaporator glovebox tank component until the radionuclide content is known. If the sampling results show radionuclide concentrations below the discard limit, the solutions are transferred to the cementation unit pencil tanks component or the pencil tanks component for storage pending the remaining analytical results. Upon completion of the remaining analyses, the solutions are transferred directly to the cementation unit for treatment. If the sampling results show concentrations above the discard limit, the solutions are recirculated. Figures H-1 and H-2 (LANL, 2003) provide a general arrangement diagram and a process flow diagram for the TA-55 storage tank system.

The storage tank system is connected to three main piping systems, which include the solution feed, ventilation, and vacuum piping systems. Each tank component has a separate header that connects to each of the piping systems. The wet-vacuum piping system is used for all transfers; and the vent-piping system is used to break vacuum. The wet-vacuum and vent-piping systems use vacuum traps to capture carryover liquid and prevent contamination of the lines downstream. One vacuum pump serves the storage tank system for liquid transfers and for vacuum sparging. The following sections provide descriptions of each of the tank system components and associated ancillary equipment. The information meets the requirements of 20.4.1 NMAC §270.16(b), (c), (d) and (l); 20.4.1 NMAC §§264.191(b)(1) and (3); and 264.192(a)(1) [6-14-00].

H.1.1 Evaporator Glovebox Tank Component

The evaporator glovebox tank component is located in the northwest corner of TA-55-4, Room 401, as shown in Figure H-1 (LANL, 2003). It is approximately 8 feet (ft) high, 4-ft wide, and 13-ft long and consists of two welded-steel trays, eight glass columns, and associated ancillary equipment. The overall capacity of the evaporator glovebox tank component is approximately

270 L (71 gal). The evaporator glovebox tank component is fabricated from 0.1875-inch (in.), 316 stainless steel with a 2B finish conforming to the American Society for Testing and Materials (ASTM) "A240-Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels," hereinafter referred to as ASTM A240 (ASTM, 1998). The lower half of the tank is fabricated with additional layers of materials welded to the outside of the 0.1875-in.-thick stainless-steel enclosure. These materials consist of 0.25-in.-thick lead shielding, conforming to ASTM "B29-Standard Specification for Refined Lead" (ASTM, 1997a), and an outer layer of 0.0625-in. 316 stainless steel cladding. The tank component is of welded construction with all welds blended, ground, and polished to blend with adjacent material. All joints are vacuum tight.

The support frame and legs of the evaporator glovebox tank component are constructed of carbon steel and conform to ASTM "A36-Standard Specification for Structural Steel for Welding" (ASTM, 1987). The support frame is bolted to the base of the tank component for stabilization. In addition, the legs of the tank component are bolted to the support frame and secured to the 10-in.-thick concrete floor of Room 401 with anchor bolts. The 10-in.-thick concrete floor was constructed to conform to the reinforced concrete building code requirements of the American Concrete Institute (ACI) "318-71-Building Code Requirements for Structural Concrete and Commentary," hereinafter referred to as ACI 318-71 (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI "315-Details and Detailing of Concrete Reinforcement," hereinafter referred to as ACI 315 (ACI, 1992). The design construction and tolerance of the framework around the concrete is in accordance with ACI "347-Guide to Formwork for Concrete," hereinafter referred to as ACI 347 (ACI, 1994). Figure H-3 (LANL, 2003) shows the dimensions of the evaporator glovebox tank component and its support structure.

The window portions of the evaporator glovebox tank component are constructed of 0.25-in. leaded glass, laminated on both sides with 0.125-in. clear glass, and installed with a neoprene gasket. Additionally, each window is backed with 0.25-in. safety glass installed with a neoprene gasket/seal that provides airtight containment. The dual glass configuration is secured to the tank component with a welded frame consisting of a 0.25-in.-thick lead shielding and a 0.0625-in. 316 stainless steel cladding similar to the additional layers of materials welded to the outside of the lower half of the tank component. The welded window frames are bolted to the tank

component. Replacement windows and gaskets, if and when needed, will be made of the same or similar materials.

The glove portions of the evaporator glovebox tank component are constructed of neoprene and Hypalon®. Each glove is tested for material continuity by the manufacturer before acceptance and installation in the evaporator glovebox tank component. Each glove is selected for its resistance to nitric acid. Replacement gloves, when needed, will be made of the same or similar materials.

The evaporator bottoms solutions are vacuum-transferred from the steel trays to the glass columns. Each glass column is individually filled and visually monitored during transfer from the steel trays to a glass column. To prevent overfill, the evaporator bottoms are automatically directed to a vacuum trap when the maximum capacity of a column is reached. The maximum capacity of the vacuum trap is approximately 5.5 L. The glass columns and the vacuum trap are constructed of PYREX® glass, manufactured by Corning, with stainless steel end plates. Replacement parts for the columns and vacuum trap will be of the same or similar materials. The glass columns are equipped with an air-sparging system designed to homogeneously mix the evaporator bottoms prior to sampling or transfer.

The piping associated with the evaporator glovebox tank component includes the transfer line from the evaporator, the wet-vacuum line, the lean-residue transfer line, and the ventilation lines entering and exiting the evaporator glovebox tank component. Figures H-4 and H-5 (LANL, 2003) provide a legend and a piping and instrumentation diagram for the evaporator glovebox tank component. All piping and associated valves are constructed of single-walled, 316 stainless steel. The transfer line from the evaporator is 1.0-in. pipe, the wet-vacuum line and the lean-residue transfer line are 0.75-in. pipe, and the ventilation lines are 2.0-in. pipe. Pipe diameters may change in the event that a portion of the piping requires replacement. The evaporator glovebox tank component's ancillary equipment is supported by a steel channel Uni-strut® support frame. The Uni-strut® support frame is secured to the concrete ceiling with anchor bolts and provides the component's ancillary equipment with support and protection against physical damage and excessive stress that could potentially result from settlement, vibration, expansion, or contraction. Replacement supports will be made of the same or similar materials.

The evaporator glovebox tank component does not operate under pressure; therefore, excessive stress due to expansion and contraction is not anticipated. The evaporation glovebox component is not located within a saturated zone or seismic fault zone; therefore, floatation or dislodgment is unlikely. The component is located within a building, so frost effects are not expected.

All of the materials within the evaporator glovebox tank component are corrosion-resistant and are compatible with the evaporator bottoms stored in the tank component. No external portions of the tank component are in contact with soil or water.

H.1.2 Cementation Unit Pencil Tanks Component

The cementation unit pencil tanks component consists of five vertical tanks located perpendicular to the west wall of TA-55-4 in Room 401, as shown on Figure H-1 (LANL, 2003). Each of the pencil tanks has a working capacity of 50 L (13 gal), an outside diameter of 6.625 in., a straight side height of 10 ft, a wall thickness of 0.28 in., and a conical bottom, as shown on Figure H-6 (LANL, 2003). The pencil tanks are constructed of 316 stainless steel. The stainless steel materials are corrosion-resistant and are compatible with the liquid waste stored in the tanks, as confirmed by corrosion testing conducted in 1993 by TA-55 facility engineers. The vent trap and the vacuum trap operating within the cementation unit pencil tanks component have an outside diameter of 6.625 in. The vent trap has a straight side height of 9 in. and a maximum capacity of approximately 4 L. The vacuum trap has a straight side height of 37 in., a conical bottom, and a maximum capacity of approximately 17 L. The vent trap and the vacuum trap are constructed of 316 stainless steel for corrosion resistance and materials compatibility with the waste. All of the pencil tanks were designed in accordance with the latest applicable standards, including American Society of Mechanical Engineers (ASME) "Boiler and Pressure Vessel Code" (BPVC) (ASME, 1998), hereinafter referred to as ASME BPVC, Section VIII, Division 1. The pencil tanks are installed such that, if necessary, they can be replaced.

H.1.2.1 Piping and Ancillary Equipment

The piping associated with the cementation unit pencil tanks component includes the header/manifold, vacuum manifold, and lower manifold for the cementation unit pencil tanks component; the vent trap, vent line, and drain line; the transfer line from the evaporator glovebox tank component to the cementation unit pencil tanks component header/manifold; and the transfer line from the lower manifold to the cementation unit. Figures H-4 and H-7 (LANL,

2003) provide a legend and piping and instrumentation diagram for the cementation unit pencil tanks component. All intertank piping and transfer piping is single-walled 0.75-in., Schedule 40, stainless steel pipe. Pipe diameters may change in the event that a portion of the piping requires replacement. All tank-to-piping connections are flanged.

The cementation unit pencil tanks component is equipped with a vacuum trap that is designed to collect any mists or carryover liquid that might accumulate in the vacuum or vent lines. The vacuum trap is equipped with a sight glass for local level indication and is normally empty. Each cementation unit pencil tank is equipped with three sight glasses located on the side of each tank for overfill protection.

H.1.2.2 Foundation and Support

The cementation unit pencil tanks component is erected upon a 10-in.-thick concrete floor in TA-55-4, Room 401. The 10-in.-thick concrete floor provides a foundation that will maintain the load of the tank component when full. The concrete floor and ceiling were constructed to conform to the building code requirements of ACI 318-71 for reinforced concrete (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI 315 (ACI, 1992). The design, construction and tolerance of the framework around the concrete is in accordance with ACI 347 (ACI, 1994). The cementation unit pencil tanks component and its ancillary equipment are elevated and supported by a steel channel, Uni-strut® support frame. The Uni-strut® support frame is secured to the concrete floor with anchor bolts and provides the ancillary equipment with support and protection against physical damage and excessive stress due to settlement and vibration.

The cementation unit pencil tanks component does not operate under pressure; therefore, physical damage and excessive stress due to expansion and contraction is not anticipated. Furthermore, the cementation unit pencil tanks component is not within a saturated zone or seismic fault zone; therefore, flotation or dislodgment is not likely. The component is located within a building, so frost heave effects are not expected.

H.1.3 Pencil Tanks Component

The following information for the pencil tanks component is based upon a completed drawing package prepared by Johnson Controls of Northern New Mexico, dated July 2001. The pencil tanks component will consist of ten vertical tanks located perpendicular to the west wall of

TA-55-4, Room 401, as shown on Figure H-1 (LANL, 2003). Each pencil tank will have a capacity of 50 L (13 gal), a 6.625-in. outer diameter, a straight side height of 10 ft, a wall thickness of 0.28 in., and a conical bottom, as shown on Figure H-8 (LANL, 2003). The pencil tanks will be constructed of seamless Schedule 40, 316 stainless steel pipe. These materials meet the chemical and physical characteristics given in ASTM "A312-Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes," hereinafter referred to as ASTM A312 (ASTM, 1995). The tanks will be corrosion-resistant and compatible with the liquid waste to be stored in them. Each tank will be equipped with three sight glasses for local level indication and will have a high-level switch for prevention of spills or overfilling. The primary containment welds for each tank will be vacuum tight in accordance with the ASME BPVC Section VIII, Division 1, Subsection B, Part UW (ASME, 1998). All penetrations into the shells of the tanks will be designed and fabricated to ensure vacuum tightness and will comply with ASME BPVC Section VIII, Division 1 (ASME, 1998). However, an ASME stamp will not be required for the pencil tanks component because they will not be operated as pressure vessels. Each pencil tank will be installed such that, if necessary, they can be replaced.

H.1.3.1 Piping and Ancillary Equipment

The pencil tanks component will be connected to system headers (for feed, ventilation, and vacuum) by a manifold that will be constructed of seamless stainless steel and that meets the chemical and physical characteristics given in ASTM A312 (ASTM, 1995). Figure H-9 (LANL, 2003) provides a piping and instrumentation diagram for the pencil tanks component. The piping will be connected to the existing tank system intertank and transfer piping of 0.75 in., Schedule 40 pipe. It will meet the requirements of ASME "B31.3-Process Piping," hereinafter referred to as ASME B31.3 (ASME, 1996a), for normal fluid service, with a maximum design pressure of 15 pounds per square inch and design temperature of 10 degrees Fahrenheit. All piping connections will be via flanged and gasketed connections and will be provided in accordance with ASME "B16.5-Pipe Flanges and Flanged Fittings," hereinafter referred to as ASME B16.5 (ASME, 1996b). The flanges will be forged from stainless steel and will meet the Grade F316L requirements of ASTM "A182-Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves, and Parts for High-Temperature Service," hereinafter referred to as ASTM A182 (ASTM, 1997b).

The pencil tanks component will be equipped with a vacuum trap that will be designed to collect any mists or carryover liquid that might accumulate in the vacuum or vent lines. The vacuum

trap will be constructed of 6.25-in. outer diameter, Schedule 40, 316 seamless stainless steel. The vacuum trap will be equipped with a sight glass for local level indication will have a high-level switch for prevention of spills or overflowing and will normally be empty.

H.1.3.2 Foundation and Tank Support

The pencil tanks component and associated ancillary equipment will be integrated within a support stand assembly. The support stand assembly will be approximately 3-ft, 10-in. wide by 7-ft, 8-in. long, as shown on Figures H-10 and H-11 (LANL, 2003), and will be bolted to the 10-in.-thick concrete floor of TA-55-4, Room 401. The floor provides a foundation that will maintain the load of the pencil tanks component when full. The concrete floor and ceiling were constructed to conform to the building code requirements of ACI 318-71 for reinforced concrete (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI 315 (ACI, 1992). The design construction and tolerance of the framework around the concrete is in accordance with ACI 347 (ACI, 1994).

The support stand assembly superstructure will consist of braced frames that extend approximately 9 ft, 11 in. from the floor. The superstructure will be fabricated entirely from carbon steel. Connections will be welded, except where bolting is required for erection of subassemblies within Room 401. All carbon steel used for the superstructure will be painted in accordance with the Steel Structures Painting Council with a high build-up epoxy primer and finish coat.

The pencil tanks component will not operate under pressure; therefore, excessive stress due to expansion and contraction is not anticipated. The pencil tanks component will not be located within a saturated zone or seismic fault zone; therefore, floatation or dislodgment is unlikely. The component will be located within a building, so frost heave effects are not expected.

H.2 INSTALLATION, TESTING, AND CERTIFICATION [20.4.1 NMAC §270.16(a) and (f); 20.4.1 NMAC §264.191(b); §264.192(a),(b), and (d); and §264.193(l)]

H.2.1 Evaporator Glovebox Tank Component

The evaporator glovebox tank component is considered an existing tank component in accordance with 20.4.1 NMAC §264.191 [6-14-00], and has secondary containment that meets the requirements of 20.4.1 NMAC §264.193 [6-14-00]. Therefore, pursuant to 20.4.1 NMAC §264.191(a) [6-14-00], the requirement that the owner or operator of the tank determine that the tank is not leaking or is unfit for use is not applicable. In addition, the requirement that the

owner or operator obtain and keep on file a written assessment attesting to the tank's integrity is also not applicable. However, for the purpose of demonstrating that the evaporator glovebox tank component will function as a completely leak-proof system and would meet the assessment requirements if they were applicable, a written assessment has been prepared in accordance with 20.4.1 NMAC §264.191(b), and 20.4.1 NMAC §270.16(a) [6-14-00], attesting that the tank component is adequately designed and has sufficient structural integrity and compatibility with the waste stored to ensure that it will not collapse, rupture, or fail. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.1 (LANL, 2003).

A helium leak-test using a mass spectrometer was performed on the evaporator glovebox tank component upon fabrication at Silver Engineering and again after it was installed and made operational at its present location in TA-55-4, Room 401. Because secondary containment (see Section H.3 (LANL, 2003)) is provided for this tank, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.2.2 Cementation Unit Pencil Tanks Component

In accordance with 20.4.1 NMAC §264.192(a) [6-14-00], a written assessment has been prepared attesting that the cementation unit pencil tanks component has sufficient structural integrity and is acceptable for handling mixed waste. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.2A (LANL, 2003).

In accordance with 20.4.1 NMAC §264.192(d) [6-14-00], owners or operators of new tanks and ancillary equipment must ensure that the system is tested for tightness. The cementation unit pencil tanks component was tightness tested on May 30, 1996, at operating pressure (i.e., under a vacuum of 10 to 20 in. of mercury) and determined to be tight. The signed certification attesting to the tank's tightness, the detailed tightness-testing procedure adhered to during the tightness tests, and the results of the tightness tests are included as Supplement H.2B (LANL, 2003).

In accordance with 20.4.1 NMAC §264.192(b) [6-14-00], owners or operators of new tank systems or tank components must ensure that proper handling procedures are adhered to during installation in order to prevent damage to the system. The new portions of this

component (i.e., the transfer line from the evaporator glovebox tank component to the cementation unit pencil tanks component header/manifold and the cementation unit header/manifold) have been inspected by a qualified inspector for weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, and other structural damage or inadequate construction or installation. The signed certification attesting to the proper installation of the new components and a copy of the inspection checklist is included as Supplement H.2C (LANL, 2003). Secondary containment (see Section H.3 (LANL, 2003)) for the cementation unit pencil tanks component is provided by Room 401; therefore, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.2.3 Pencil Tanks Component

In accordance with 20.4.1 NMAC §264.192(a) [6-14-00], a written assessment has been prepared attesting that the pencil tanks component is designed to have sufficient structural integrity and is acceptable for handling mixed waste. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.3 (LANL, 2003).

In accordance with 20.4.1 NMAC §264.192(d) [6-14-00], owners or operators of new tanks and ancillary equipment must ensure that the system is tested for tightness. The pencil tanks component will be tightness tested at operating pressure (i.e., under a vacuum of 10 to 20 in. of mercury) upon completion of installation and prior to use. A signed certification will be prepared and will include the tightness-testing procedures adhered to during the tightness tests and the results of the tightness tests.

In accordance with 20.4.1 NMAC §264.192(b) [6-14-00], owners or operators of new tank systems or components must ensure that proper handling procedures are adhered to during installation in order to prevent damage to the system. To ensure proper installation, the pencil tanks component and ancillary equipment (i.e., transfer piping, manifolds) will be inspected by a qualified inspector for weld breaks, punctures, scratches in the protective coatings, cracks, corrosion, and other structural damage or inadequate construction or installation. A signed certification attesting to the proper installation of the pencil tanks component and a copy of the inspection checklist will be prepared. Secondary containment (see Section H.3) for the pencil tanks component will be provided by Room 401; therefore, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.3 SECONDARY CONTAINMENT [20.4.1 NMAC §270.16(g), 20.4.1 NMAC §264.193]

The following provides a detailed description of the secondary containment provided for the storage tank system in accordance with 20.4.1 NMAC §270.16(g), and 20.4.1 NMAC §264.193(a), (b), (c), (d), and (e)(1) [6-14-00]. The storage tank system is located at TA-55-4, inside Room 401. This room has a floor and walls that completely surround the tank system and serve as secondary containment, therefore, the secondary containment meets the requirements of 20.4.1 NMAC §264.193(1)(iv) for an external liner system. The walls and floor of Room 401 will prevent the migration of wastes or accumulated liquids to any soil, groundwater, or surface water and are capable of collecting releases and accumulated liquids until the material is removed. Because the storage tank system and secondary containment are inside a building, run-on or precipitation will not affect the containment capacity. The capacity of the containment area is sufficient to contain 100 percent of the capacity of the largest liquid-bearing tank within its boundary. The secondary containment capacity for the storage tank system is identified in Table H-3.

The floor of Room 401 consists of 10-in.-thick reinforced concrete slab that is compatible with the wastes stored in the storage tank system and will effectively prevent migration of waste. The concrete in Room 401 is sealed with an epoxy or similar coating to aid in decontamination should a spill occur. In addition, tertiary containment is provided by the floor of the basement level of TA-55-4, which also consists of 10 in. of concrete. The construction joints in the floor slab and exterior walls are all constructed with chemical-resistant water stops in place. The conduit piping penetrating the floor of the room is secured with rubber boots, bushings, and flanges. All penetrations (i.e., holes for conduit) in the floor have been sealed to prevent liquids from entering the penetrations. Figures H-12 and H-13 (LANL, 2003) provide structural drawings illustrating the first floor construction and the locations of floor penetrations.

The storage tank system components and the secondary containment will be inspected daily (during operation) to detect leaks, in accordance with 20.4.1 NMAC §264.195(b) [6-14-00]. Additional leak detection will be provided by continuous air monitors (CAM) at various locations throughout Room 401. CAMs will detect any airborne alpha contamination that would be present if a leak were to occur at any point in the system. Additionally, radiological control technicians periodically monitor for radioactive contamination and would detect any leaks during monitoring. Leaks or spills would be detected within 24 hours, as required by 20.4.1 NMAC §264.193(c)(3) [6-14-00]. The secondary containment will be operated to remove leaks and

spills. In the event of a leak or spill into the secondary containment system, the liquids will be removed as quickly as possible with sorbents or vacuum-transferred, using the existing wet vacuum, into an available storage tank component. The collected materials will then be sampled as necessary. If the accumulated liquids are from an identifiable source, the resulting material can 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 source. If the accumulated liquids are from other than an identifiable source, the resulting material will be analyzed for the appropriate potential parameters listed in Table D-3 of Attachment D (*Contingency Plan*). Containers of collected liquids will be stored with secondary containment, pending analytical results, which determine how the waste liquids will be managed. This method of removal and analysis of accumulated liquids fulfills the requirements of 20.4.1 NMAC §270.15(a)(5) [6-14-00], for responses to leaks or spills.

If it is determined that there has been a leak or spill from any of the storage tank components into the secondary containment, all free liquids will be removed within 24 hours unless "as low as reasonably achievable" concerns prevent accessibility. The affected component or portion thereof will be removed from service immediately and the requirements of 20.4.1 NMAC §264.196 [6-14-00], will be initiated.

H.4 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [20.4.1 NMAC §270.16 (j); 20.4.1 NMAC §§264.17, 264.198, and 264.199(a)]

No ignitable, reactive, or incompatible mixed wastes will be stored in the storage tank system.

H.5 AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS [20.4.1 NMAC §264.1064(k), and 20.4.1 NMAC, Subpart V, Part 264, Subpart BB]

The storage tank system is not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart BB [6-14-00], "Air Emission Standards for Equipment Leaks," with the exception of the reporting requirements specified in 20.4.1 NMAC §264.1064(k) [6-14-00]. None of the components or ancillary equipment associated with the storage tank system will contain or contact mixed waste with organic concentrations of at least 10 percent by weight.

In accordance with 20.4.1 NMAC §264.1064(k) [6-14-00], TA-55 personnel will use knowledge of the nature of the mixed waste stream(s) or knowledge of the process by which the mixed waste was produced to document exemptions to these standards. Production process information documenting that no organic compounds are contained or contacted by the

components and ancillary equipment associated with the storage tank system will be recorded in TA-55's facility operating record.

A new determination will be made whenever there is a change in a process at TA-55 that produces mixed waste that could result in an increase in the total organic content of waste contained in or contacted by equipment currently determined not to be subject to these requirements.

H.6 ORGANIC AIR EMISSION STANDARDS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

Tanks which store only mixed waste are not subject to the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers." Only mixed waste will be managed in the storage tank system; therefore, the storage tank system is not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00].

H.7 REFERENCES

ACI, 1995 and all approved updates, "318-71-Building Code Requirements for Structural Concrete and Commentary," American Concrete Institute, Detroit, Michigan.

ACI, 1994 and all approved updates, "347-Guide to Formwork for Concrete," American Concrete Institute, Detroit, Michigan.

ACI, 1992 and all approved updates, "315-Details and Detailing of Concrete Reinforcement," American Concrete Institute, Detroit, Michigan.

ASME, 1998 and all approved updates, "Boiler and Pressure Vessel Codes, Section VIII," American Society of Mechanical Engineers, New York, New York.

ASME, 1996a and all approved updates, "B31.3-Process Piping," American Society of Mechanical Engineers, New York, New York.

ASME, 1996b and all approved updates, "B16.5-Pipe Flanges and Flanged Fittings," American Society of Mechanical Engineers, New York, New York.

ASTM, 1998 and all approved updates, "A240-Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels," American Society for Testing and Materials, Philadelphia, Pennsylvania.
ASTM, 1997a and all approved updates, "B29-Standard Specification for Refined Lead," American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1997b and all approved updates, "A182-Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves, and Parts for High-Temperature Service," American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1995 and all approved updates, "A312-Standard Specification for Seamless and Welded Austentic Stainless Steel Pipes," American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1987 and all approved updates, "A36-Standard Specification for Structural Steel for Welding," American Society for Testing and Materials, Philadelphia, Pennsylvania.

LANL, 2003, "Los Alamos National Laboratory Technical Area 55 Part B Permit Renewal Application," Revision 2.0, September 2003, LA-UR-03-6303, Los Alamos National Laboratory, Los Alamos, New Mexico

Table H-1

Storage Tank System Components at Technical Area 55[a]

Tank Component	Location	Number of Tanks	Tank Capacity[b] (liters)	Tank Capacity[b] (gallons)	Tank Component Status
Evaporator Glovebox Tank	TA-55-4, Room 401	1	270	71	Constructed in 1986. Existing tank component.
Cementation Unit Pencil Tanks	TA-55-4, Room 401	5	50	13	Constructed in 1985. New tank component due to an equipment modification in 1996.
Pencil Tanks	TA-55-4, Room 401	10	50	13	To be constructed. New tank component.

a The storage tank system consists of 3 components that store the same waste matrix and share a common piping network. The overall capacity of the unit is 1,020 liters [~266 gallons].

b The tank capacity listed is for each individual tank associated with the component.

TA = technical area

Table H-2
Tank System Regulatory References and Corresponding Permit Attachment Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§270.16	Information requirements for tank systems	Attachment H
§264.13	General waste analysis	Attachment B[a]
§264.191	Assessment of existing tank system's integrity	H.1.1, H.2.1
§270.16	Tank systems	Attachment H
§270.16(a)	Written assessment and certification	Supplements H.1, H.2A, H.2B, H.2C, and H.3
§270.16(b)	Dimensions and capacity	H.1
§270.16(c)	Feed systems, safety cutoff, bypass systems, and pressure controls	H.1
§270.16(d)	Piping, instrumentation, and process flow diagrams	Attachment H
§270.16(e)	External corrosion protection	Supplements H.1, H.2A, H.3, and H.4
§270.16(f)	Installation of new tank systems	H.2.2 and H.2.3
§264.191(a)	Existing tank system w/o secondary containment	NA[a]
§264.191(b)	Written assessment of structural integrity	H.2.1, Supplement H.1
§264.191(b)(1)	Design standards	Supplement H.1
§264.191(b)(2)	Hazardous characteristics of waste	Supplement H.1
§264.191(b)(3)	Existing corrosion protection measures	Supplement H.1
§264.191(b)(4)	Documentation of tank age	Supplement H.1
§264.191(b)(5)	Results of leak test, internal inspection, or other tank integrity exam	Supplement H.1
§264.192	Design and installation of new tank systems or components	H.2.2 and H.2.3
§264.191(d)	Assessment reveals leaking	NA
§264.192(a)	Written assessment of structural integrity	Supplements H.2A, H.3, and H.4
§264.192(a)(1)	Design standards	Supplements H.2A, H.3, and H.4
§264.192(a)(2)	Hazardous characteristics of waste	Supplements H.2A, H.3, and H.4
§264.192(a)(3)(i)	Factors affecting the potential for corrosion	Supplements H.2A, H.3, and H.4
§264.192(a)(3)(ii)	Corrosion protection measures	Supplements H.2A, H.3, and H.4
§264.192(a)(4)	Determination of protection measures for underground tank system components	Supplements H.2A, H.3, and H.4
§264.192(a)(5)	Design considerations	H.1.2 and H.1.3
§264.192(b)	Precautions to prevent damage during installation	H.2.2 and H.2.3

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
		Supplement H.2C
§264.192(c)	Backfill requirements	NA
§264.192(d)	Tightness testing	H.2.2 and H.2.3 Supplement H.2B
§264.192(e)	Protection of ancillary equipment	H.1, Supplement H.2A and H.3
§264.192(f)	Independent corrosion expert recommendations	NA
§264.192(g)	Certification of proper design and installation	H.2, Supplement H.2C
§270.16(g)	Secondary containment systems	H.3
§264.193	Containment and detection of releases	H.3
§264.193(a)	Preventing the release of hazardous constituents to the environment	H.3
§264.193(a)(1)	Secondary containment of new tank systems	H.3
§264.193(a)(2)	Tank systems used to store or treat EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027, within two years after January 12, 1987	NA
§264.193(a)(3)	Existing tank systems of known and documented age, within two years after January 12, 1987 or when the tank system has reached 15 years of age	H.3
§264.193(a)(4)	Existing tank systems for which the age cannot be documented, within eight years of January 12, 1987	NA
§264.193(b)	Secondary containment system requirements	H.3
§264.193(b)(1)	Design, installation, and operation to prevent migration of waste or accumulated liquid out of system to the environment	H.3
§264.193(b)(2)	Detection and collection of releases and accumulated liquids	H.3
§264.193©	Secondary containment construction requirements	H.3
§264.193©(1)	Compatible construction materials of sufficient strength and thickness	H.3
§264.193©(2)	Foundation	H.1
§264.193©(3)	Leak detection system	H.3
§264.193©(4)	Sloped or designed to remove liquids from leaks, spills, or precipitation	H.3
§264.193(d)	Secondary containment devices	H.3
§264.193(e)	Additional construction requirements	H.3
§264.193(e)(1)	External liner	H.3
§264.193(e)(2)	Vault systems	NA
§264.193(e)(3)	Double-walled tanks	NA
§264.193(f)	Ancillary equipment	H.3
§270.16(h)	Tank systems with a variance	NA
§264.193(g)	Variance from the requirements of §264.193	NA
§264.193(h)	Secondary containment variance request procedures	NA

See footnotes at end of table.

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§264.193(i)	Requirements pending provision of adequate secondary containment	NA
§264.194	General operating requirements	H.1, H.3
§264.194(a)	Prohibition of hazardous waste that could cause the tank or equipment to rupture, leak, corrode, or otherwise fail	H.1, Supplements H.1, H.2A and H.3
§270.16(i)	Description of controls and practices to prevent spills and overflows	H.1
§264.194(b)	Controls and practices to prevent spills and overflows	H.1
§264.194(b)(1)	Spill prevention controls	H.1
§264.194(b)(2)	Overfill prevention controls	H.1
§264.194(b)(3)	Maintenance of sufficient freeboard	NA
§264.195	Inspections	Attachment C[a]
§264.195(a)	Overfill control inspection schedule	Attachment C[a]
§264.195(b)	Inspection of tank system for corrosion or releases, data from monitoring and leak detection equipment, construction materials, and immediately surrounding area	Attachment C[a]
§264.195(c)	Inspection of cathodic protection system	NA
§264.196	Response to leaks or spills and disposition of leaking or unfit-for-use tank systems	H.3
§264.197	Closure and post-closure care	Attachment F.2
§264.197(a)	Removal and decontamination of all hazardous waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment	Attachment F.2
§264.197(b)	Demonstration that not all contaminated soils can be practicably removed or decontaminated	Attachment F.2
§264.197(c)	Tank system not having secondary containment that meets the requirements of §264.193(b) through (f) and has not been granted a variance from the secondary containment requirements	NA
§264.197(c)(1)	Plan for complying with removal and decontamination requirements	Attachment F.2
§264.197(c)(2)	A contingent post-closure plan	Attachment F.2
§264.197(c)(3)	Cost estimates calculated for closure and post-closure care	Attachment F.2
§264.197(c)(4)	Financial assurance based on cost estimates	Attachment F.2
§264.197(c)(5)	Contingent closure and post-closure plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills	Attachment F.2
§270.16(j)	Special requirements for ignitable, reactive, or incompatible wastes	H.4
§264.198	Special requirements for ignitable or reactive wastes.	H.4

See footnotes at end of table.

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§264.198(a)	Circumstances allowing ignitable or reactive waste in tanks	NA
§264.198(a)(1)	The waste is treated, rendered, or mixed before or immediately after placement in the tank system	NA
§264.198(a)(1)(I)	The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste	NA
§264.198(a)(1)(ii)	Compliance with §264.17(b)	NA
§264.198(a)(2)	The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react	H.4
§264.198(a)(3)	The tank system is used solely for emergencies	NA
§264.198(b)	Compliance with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line	H.4[a]
§264.199	Special requirements for incompatible wastes	H.4[a]
§264.199(a)	Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless §264.17(b) is complied with	H.4[a]
§264.199(b)	Hazardous waste must not be placed in a tank system that has not been decontaminated and that previously held an incompatible waste or material, unless §264.17(b) is complied with	H.4[a]
§270.16(k)	Air emission control equipment	H.6
§270.27	Information requirements for air emission controls	H.6
§264.200	Air emission standards	H.5, H.6

[a] Requirement or information is also addressed in the most recent version of the "Los Alamos National Laboratory General Part B Permit Application."

NA = not applicable.
EPA = U.S. Environmental Protection Agency

Table H-3

Secondary Containment Capacities for the Storage Tank System

Storage Tank System Component	No. of Tanks	Tank Capacity (gallons)	Location	Secondary Containment	Capacity of Secondary Containment (gallons)
Evaporator Glovebox Tank	1	71	TA-55-4, Room 401	TA-55-4, Room 401	10,773[b]
Cementation Unit Pencil Tanks	5	13			
Pencil Tanks	10	13			

a The tank capacity listed is for each individual tank associated with the component.
b Secondary containment capacity based on Room 401, which is recessed 2.5 inches and has dimensions of 60-ft-long by 75-ft-wide

TA = technical area

ATTACHMENT I

OPEN BURNING UNITS MANAGEMENT

TA-16

OPEN BURNING UNITS MANAGEMENT

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AEHA	U.S. Army Environmental Hygiene Agency
BTU/hr	British thermal units per hour
°C	degrees centigrade
DOE	U.S. Department of Energy
ESA	Engineering Science and Applications
Ft/ft	feet/foot
HE	high explosives
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
OB	open burning
PPE	personal protective equipment
PTLA	Protection Technology Los Alamos
SOP	standard operating procedure
TA	technical area
WMM	Weapon Materials and Manufacturing

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ATTACHMENT I
OPEN BURNING UNITS MANAGEMENT

The information in this Attachment addresses the applicable miscellaneous unit requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 270.23, and 20.4.1 NMAC, Subpart V, Part 264, Subpart X, revised June 14, 2000 [6-14-00], as well as thermal treatment requirements in 20.4.1 NMAC, Subpart VI, Part 265, Subpart P [6-14-00]. This Attachment provides an overview of current facility operations and waste management practices for the open burning (OB) units at the Technical Area (TA) 16 Burn Ground and complements the information provided in Section 2.0 of the permit renewal application (LANL, 2003). It includes detailed descriptions of the OB treatment units, their locations within the Burn Ground, and the current operational and waste management practices associated with them. Requirements for treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; preparedness and prevention; and volatile organic air emission standards are also discussed. Table G-1 (LANL, 2003) summarizes applicable regulatory references for miscellaneous units and the corresponding location where the requirement is addressed in this Attachment.

The TA-16 Burn Ground and the OB units (Figures G-1 and G-2 of LANL, 2003) are managed by Los Alamos National Laboratory's (LANL's) Engineering Science and Applications (ESA)-Weapon Materials and Manufacturing (WMM) Group, which is responsible for the safe treatment, storage, and handling of high explosives (HE)-contaminated waste material generated by the HE production facilities.

I.1 TA-16 OPEN BURNING UNITS

TA-16 is located in the southwestern quadrant of LANL at the west end of the Pajarito Plateau, near the foothills of the Jemez Mountains (Figure A-1 of LANL, 2003). The TA-16 OB units are described below.

I.1.1 TA-16-388 Flash Pad

In 1998, the New Mexico Environment Department (NMED) granted LANL Temporary Authorization to upgrade the TA-16-388 HE Burn Tray to a propane-fueled flash pad and burn tray. The upgrade began shortly thereafter. The new designation for TA-16-388 was reflected in

the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998), submitted to the NMED in April 1998. The TA-16-388 conversion was subsequently approved by the NMED on May 12, 1999, as a Change During Interim Status, pursuant to 20.4.1 NMAC § 270.72 [6-14-00].

The TA-16-388 Flash Pad (Figures G-3 and G-4 of LANL, 2003) consists of a 22-foot (ft) by 22-ft concrete pad set on a secondary containment area. The base of the flash pad is 12 inches thick. The entire flash pad is contained in a 45-mil Hypalon liner, which is 6 inches below the bottom of the pad and curved up to ground level on all 4 sides, extending out 2 ft from the pad perimeter. Inset one ft from the edge of the concrete pad along the two sides and back is a 3-ft-high, 8-inch-thick, integrally-poured concrete wall. The pad is slanted down toward the back concrete wall, thus providing secondary containment for any spills or run-on/runoff of stormwater. These are collected in the rear of the pad where they either evaporate or can be collected by one of the Burn Ground HE wastewater tank trucks.

Between burns, the unit shall be covered with a retractable steel roof, tarps, or other types of covers, unless ash sampling, ash removal, or waste staging requires that the cover be retracted. When waste is being staged or if burning is delayed, the retractable roof, tarps, or other types of covers shall be used to cover the waste and prevent it from becoming wind-blown.

Liquids are also treated on the flash pad, using steel trays. Face shields or other suitable eye protection are worn while liquid is discharged and during cleanup operations when airborne particles constitute an eye hazard. Respirators may be worn when highly hazardous volatile solvents are being handled. Occasionally, the wet HE may also contain small amounts of solvents or acids and bases. The propane burners are used to dry the explosives, which burn as they dry. In the event that TA-16-399 is not operational, dry explosives may also be treated at TA-16-388.

The configuration of the flash pad and burners is shown on Figure G-4, (LANL, 2003). The heat sources for the flash pad consist of three 5-ft-long forced-air propane burners with adjustable mounts. A burner is mounted outside the wall on each side and the back of the pad. One to three burners can be used depending on the amount and configuration of the material to be flashed. The total capacity of the propane supply system is approximately 7 million British

thermal units per hour (BTU/hr). Therefore, the output of each burner is dependent on how many are used for a burn. Usually, they are operated at approximately 2 million BTU/hr. This provides adequate heat to bring the material being flashed to a temperature sufficient to destroy HE, typically to a temperature above 400 degrees centigrade (°C) (see Section I.2.1). To accommodate burning of wet explosives on the TA-16-388 Flash Pad, the propane burners will be modified to remotely pan and tilt. The burners and other components will be maintained, modified, and/or replaced, as needed.

Television cameras mounted above the front of TA-16-388 monitor operations at the flash pad, and Burn Ground personnel observe the operations on the monitor in the Control Building (TA-16-389). Lockout keys for the power that operates the flash pad are also located in the Control Building. The lockout keys are removed and carried by personnel working at the flash pad. Once the flash pad has been set up for a treatment and has been barricaded to prevent traffic from approaching the pad, personnel return to the Control Building and monitor the burners using a computer display.

Movable steel equipment is used on the TA-16-388 Flash Pad to stage the many types of HE-contaminated waste to be treated at the pad. This equipment is constructed to be moved with a forklift and will be stored at the unit. One type of waste treated is large, metallic equipment that has been used for HE machining, handling, transportation, and storage. Several steel pallets are positioned in the middle of the flash pad and the equipment to be treated is set on the steel pallets. The pallets protect the integrity of the concrete pad, preventing deterioration caused by the heat and by mechanical impacts. Thermocouples can be placed on and within the equipment being flashed to measure temperatures and document that the materials reached and maintained the required temperature levels for the necessary time (see Section I.2.1).

Much of the noncombustible waste consists of smaller metal items that can be moved by hand. These items are treated in a steel tray, which is lined on the bottom with sand and on the sides with firebrick. The smaller metal items are positioned in this tray for treatment. After cooling, the items can be reoriented for additional treatment. Thermocouples can be used to determine treatment durations for specific waste streams (see Section I.2.1).

Steel trays are also used in treating combustible solids. Cardboard HE storage containers, cloth and paper used to clean HE, packing material for HE, wooden HE packing crates, and rags

used to absorb oil from around HE-processing machines are some of the common combustible materials that must be treated. These materials are stacked on the steel tray and covered with a steel screen. The burners are used to thoroughly ignite the material and may be turned off if the burn is self-sustaining. Before removing the residues, the material is inspected for thorough combustion and burned again, if necessary.

A steel tray, combined with a smaller steel tray, is used to destroy HE contamination in small batches of water-solvent solutions, acids, bases, or oils. These wastes are received in small polyethylene jars packed in a secondary container. These liquids are placed in the smaller tray and the propane-fired burners are used to ignite combustible gases and heat HE to the temperatures necessary for its destruction (see Section I.2.1).

Soil contaminated with explosives, residues from the TA-16-399 HE Burn Tray that require further treatment, and similar contaminated noncombustible particulate matter are also treated at the flash pad. These waste types are placed in a tray that is set on an open frame and covered with a steel plate. This assembly is set in the middle of another tray. Thermocouples can be set in the middle of the particulate matter to monitor the temperature (see Section I.2.1).

I.1.2 TA-16-399 HE Burn Tray

The TA-16-399 HE Burn Tray is a 4-ft-wide, 16-ft-long steel tray, supported on 1.5-ft-high legs, and lined with firebricks (LANL, 2003, Section G-5). Explosives to be burned, usually rejects from pressing and machining operations and also HE pieces that are no longer useful, are transported to the HE burn tray packed in cardboard and wooden boxes. Padding is placed on the tray and the explosives are removed from the boxes and set on the padding. The padding is then dampened with kerosene, electric matches (squibs) are connected to the firing cables and a train of excelsior saturated with kerosene is run from the squibs to the padding. All personnel then go to the Control Building and the squibs are fired remotely. The burn is observed by Burn Ground personnel located in the Control Building, using a television camera located near TA-16-388 and a monitor and a periscope located in the Control Building. The ash is inspected for unburned HE or other residues that do not appear to be fully treated. The cover of the TA-16-399 HE Burn Tray is placed over the burn tray after treatment and while it is not in use. During inspection after treatment, if any untreated HE remain in the residue, it will either be treated again on the burn tray or on the TA-16-388 Flash Pad within the appropriate timeframe.

Between burns, the TA-16-399 HE Burn Tray is covered unless waste is being staged. The portable cover or a tarp is used to cover the unit.

I.2 OPERATIONAL AND WASTE MANAGEMENT PRACTICES

The OB units at TA-16 treat only hazardous solid and liquid wastes that are either pure HE or contaminated with HE. This section describes the operational and waste management practices used to stage and treat the waste, as well as the disposition of residues. Information on treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; preparedness and prevention; and volatile organic air emissions standards are also presented herein. The waste streams treated at these units are described in Table C-6 of Attachment C (*Waste Analysis Plan*).

I.2.1 General Burning Procedures

Treatment of hazardous waste at the TA-16 OB units is conducted using a non-continuous [batch] thermal treatment process, in accordance with the requirements specified in 20.4.1 NMAC § 265.373 [6-14-00]. Open burning of wastes at the TA-16 OB units is conducted in a manner that does not threaten human health or the environment. Prior to OB operations at the TA-16 Burn Ground, the area is cleared of all but authorized Burn Ground personnel. A barrier is placed across the road to prevent entry.

The closest property not owned by LANL is at a distance greater than one mile from the TA-16 OB units. Therefore, a safe distance is maintained between the HE burn sites and the property of others, as required in 20.4.1 NMAC § 265.382 [6-14-00].

The master controls for each of the TA-16 OB unit's firing circuits are located inside the Control Building. The Control Building is no less than 300 ft from all OB operations. Operational procedures require that OB not be undertaken at a time of impending electrical storms and during high wind conditions. OB may also be restricted during periods of high fire danger and adverse atmospheric conditions. All OB operations are conducted in accordance with appropriate LANL standard operating procedures (SOP). Adherence to the SOPs ensures safe and efficient HE destruction and decontamination of flashed materials. The TA-16 OB units will not be operated concurrently.

A minimum temperature of 400 °C has been determined as the temperature needed to thermally degrade the types of HE-contaminated wastes generated at LANL and treated at the

TA-16 OB units. For incombustible solid HE-contaminated wastes, thermocouples can be placed on the wastes to be treated and temperatures monitored to determine the treatment duration for various waste streams. For liquids, heat is applied until the liquids are consumed. In the unlikely event that complete destruction of HE cannot be achieved, any incompletely treated wastes are treated again.

I.2.2 Waste Staging

Waste staging varies by treatment process. The factors influencing how wastes are staged are safety, the degree of difficulty in placing or removing wastes from an OB unit, and the influence of weather conditions. The staging procedures by unit are described below.

Bulk HE treated at the TA-16-399 HE Burn Tray and at the TA-16-388 Flash Pad are initially accumulated in less-than-90-day storage areas and satellite accumulation areas until the day of treatment. Safety concerns dictate that HE be immediately burned after arriving at the Burn Ground. These wastes are not staged unless they can be burned immediately.

Because the amount of liquid waste treated at the TA-16-388 Flash Pad is small and staging of this waste does not involve complicated collection and transport procedures, the waste to be treated is transported from less-than-90-day storage areas and satellite accumulation areas just before a planned burn. The environmental conditions (e.g., wind speed, fire conditions) required by the NMED Air Quality Bureau will be met before the waste is staged. In the event of an unforeseen delay, the waste is covered until it can be burned.

The most difficult wastes to stage are the solids treated at the TA-16-388 Flash Pad. The wastes are accumulated in less-than-90-day storage areas and satellite accumulation areas until several days before flashing. Depending on the size and amount of waste to be flashed, it may take several days to stage the waste on the pad. The waste material to be treated may include relatively large quantities that involve extensive scheduling of collection and transport resources, may require equipment such as cranes or additional procedures for lifting large pieces, and require complicated stacking arrangements on removable steel supports. Because the staging of this material is complex, it may not always be possible to ensure that the meteorological conditions required for good dispersion will exist at the scheduled burn time. If burning is delayed, a cover is placed over the waste.

I.2.3 Waste Management Practices [20.4.1 NMAC, Subpart V, Part 264, Subpart X]

The wastes treated are both homogeneous (e.g., solid explosives, scrap explosives) and heterogeneous (e.g., excess equipment, remediation debris). The waste streams are described in Attachment C (*Waste Analysis Plan*). The wastes are treated to remove the characteristic of reactivity and ignitibility, although other characteristic and listed hazardous waste may be present in the wastes being treated. Burning will treat a number of waste constituents (e.g., HE, solvents) but metals (if present) will not be destroyed; they can remain in the residues which are sampled and analyzed for appropriate Toxicity Characteristic Leaching Procedure metals and other metallic underlying hazardous constituents. If hazardous, the residues are sent to an appropriate permitted facility for treatment/disposal. HE-contaminated wastes may be treated at the TA-16 OB units to desensitize or declassify the waste. Components of the OB units (e.g., burn trays, steel plates) consist of nonhazardous materials only (e.g., steel).

Waste containers for small pieces of explosives-contaminated waste and explosive material generally consist of plastic bags, 55-gallon drums, 30-gallon carboys, or paper-lined cardboard boxes. The waste is placed within a container, sealed, and labeled appropriately. These waste containers are then stored in a less-than-90-day storage area or a satellite accumulation area. Pieces of waste that cannot fit into boxes or drums (e.g., large equipment and debris) are stored in movable storage bins, such as covered roll-off bins. These bins are designated as less-than-90-day accumulation areas. They can be transported directly to the TA-16 OB units for staging and subsequent treatment of the waste.

Waste to be treated is collected from various less-than-90-day storage areas and satellite accumulation areas at the facility. When loading waste, the cargo compartment of the transport vehicle(s) is checked to ensure that it is clean and contains no loose items such as tools or pieces of metal. For transport, the wastes are placed in an enclosed compartment or secured with tie-downs. The load limit for transporting explosives is determined by the capacity of the transport vehicle(s). Wastes are transported by appropriately trained personnel in a designated vehicle(s) to the TA-16 Burn Ground. The waste is unloaded from the vehicle(s) and placed at the OB unit by qualified technicians/specialists. A visual examination is conducted after unloading to ensure that no explosive material remains in the transport vehicle(s). All vegetation around the urn ground will be removed to reduce potential fire danger.

For safety reasons, the U.S. Department of Energy (DOE) Explosives Safety Manual (DOEM 440.1-1; DOE, 1996) requires that no entry should be allowed into the treatment area until 8 hours have elapsed. The manual also requires that no ash be collected or removed for 24 hours following a burn. In accordance with this requirement, ash will be removed, drummed, and sampled (if necessary) immediately after the 24-hour period, unless a visual inspection and/or HE Spot Test indicates that the waste must be treated again, or if the ash is heterogeneous and requires special sampling. In the first case, the waste is left on the structure, covered, and treated again at the earliest treatment time weather permitting. In the second case, the ash will be sampled and drummed immediately after the cool down time allotted. Drums containing the ash are stored in a less-than-90-day storage area. The ash is then sent off site for disposal or for further treatment, based on the analytical results and on the original U.S. Environmental Protection Agency Hazardous Waste Numbers assigned to the waste before treatment. Scrap metal that can be certified as free of HE is sent off site for recycling. Other residues are disposed as New Mexico Special Waste in accordance with 20.9.1 NMAC in a landfill licensed to accept these wastes.

LANL minimizes the impact to the environment by conducting treatment operations in a strictly controlled remote area within the LANL boundaries. Treatment operations are not conducted during adverse conditions to minimize wind dispersal of ash and particulate matter to the environment. Wind dispersal of ash is minimized by prohibiting burns during periods of high winds, removing ash immediately after the cooling down process of the unit, and for waste types likely to generate ash (e.g., cardboard boxes, wipes), covering the waste with a screen prior to burning. Ash production has also been minimized through the use of propane burners instead of wood as fuel.

I.2.4 Treatment Effectiveness [20.4.1 NMAC § 270.23(d)]

To address the applicable miscellaneous unit requirement specified in 20.4.1 NMAC § 270.23(d) [6-14-00], a demonstration of treatment effectiveness must be included for the TA-16 OB units. As indicated in the U.S. Army Environmental Hygiene Agency (AEHA) guidance document titled "RCRA Part B Permit Writer's Guidance Manual for Department of Defense Open Burning/Open Detonation Units" (AEHA, 1987), a demonstration of treatment effectiveness can be based on laboratory or field data. For wastes treated by OB, information demonstrating that any residues remaining after burning are not reactive (i.e., as defined by the

Resource Conservation and Recovery Act) or ignitable will be provided. At the TA-16 OB units, this is accomplished by testing the residue for HE. If HE is present in the residue, it is treated again.

I.2.5 Ignitable, Reactive, and Incompatible Wastes [20.4.1 NMAC § 264.17(a)]

Applicable requirements for the management of ignitable, reactive, and incompatible wastes at the TA-16 OB units are addressed in Permit Part 2, Section 2.8.

I.2.6 Security and Access [20.4.1 NMAC §§ 270.14(b)(4) and 270.14(b)(19)(viii); 20.4.1 NMAC § 264.14]

The following describes the security features in place at the TA-16 Burn Ground in accordance with the requirements of 20.4.1 NMAC §§ 270.14(b)(4) and 270.14(b)(19)(viii), and 20.4.1 NMAC § 264.14 [6-14-00].

After clearing non-authorized personnel from the OB unit area, a barrier is placed across the road before OB operations are conducted to reduce the possibility of entry into this area. In accordance with 20.4.1 NMAC § 270.14(b)(19)(viii) [6-14-00], the locations of the security fence and access gates at TA-16 are shown on Figure 2-2 of Permit Part 2. Collectively, these security procedures and the security features discussed below prevent the unknowing entry and minimize the possibility for unauthorized entry of persons into the units, in accordance with the requirements of 20.4.1 NMAC § 264.14(b)(2) [6-14-00].

The TA-16 OB units are located within a secured area at which security is maintained through both administrative controls and physical barriers. Access to the area can only be gained through controlled entry stations by persons possessing appropriate security clearance and site-specific training. The access stations are controlled by Protection Technology Los Alamos (PTLA) security personnel or by badge and palm readers 24 hours a day. In addition, entry into the Burn Ground is through an industrial fence with access granted through an ESA-controlled station. PTLA security personnel inspect security fences on a regular basis, and repairs are made as necessary. Warning signs are posted near the entrance to the area and can be seen by personnel approaching the area. The legends on the signs indicate "Danger--Authorized Personnel Only" or "Danger--Unauthorized Personnel Keep Out." Warning signs are legible from a distance of 25 ft and are written in English and Spanish.

I.2.7 Preparedness and Prevention Requirements [20.4.1 NMAC, Subpart V, Part 264,

Subpart C]

The following sections present how operations at the TA-16 OB units comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [6-14-00].

I.2.7.1 Required Equipment [20.4.1 NMAC § 264.32]

In accordance with the requirements of 20.4.1 NMAC § 264.32 [6-14-00], the TA-16 Burn Ground is equipped with adequate emergency equipment, which includes internal and external communication equipment, alarm systems, fire extinguishers, and fire control and decontamination equipment. Emergency equipment at the Burn Ground is discussed in the following sections and is summarized in Table D-1 in Attachment D (*Contingency Plan*), the TA-16-specific Section. LANL-wide emergency equipment available for use at any of the LANL waste management units is presented in Attachment D, General Section.

I.2.7.2 Testing and Maintenance of Equipment [20.4.1 NMAC § 264.33]

Communications and alarm systems and fire protection and decontamination equipment associated with the OB units are tested and maintained according to the inspection schedule detailed in Attachment E (*Inspection Plan*). The frequency of inspection is adequate to assure proper operation in the event of an emergency. Repair and replacement of emergency equipment are performed, as needed.

I.2.7.3 Access to Communications or Alarm Systems [20.4.1 NMAC § 264.34]

Whenever treatment operations are being conducted at the OB units, personnel have immediate access to an emergency communication device, either directly or through visual or voice contact with another individual. In the event of an emergency, two-way radios, pagers, and/or telephones allow personnel to contact the operating group management, the Emergency Management and Response Office, and/or the Central Alarm Station operator (see Attachment D, *Contingency Plan*).

I.2.7.4 Space Requirements [20.4.1 NMAC § 264.35]

Adequate space is maintained at the TA-16 OB units to allow the unobstructed movement of personnel and fire protection, spill control, and decontamination equipment in the event of an emergency.

I.2.7.5 Support Agreements with Outside Agencies [20.4.1 NMAC § 264.37]

Information on support agreements with outside agencies, as required by 20.4.1 NMAC § 264.37 [6-14-00], is presented in Section 2.0 of the LANL General Part B.

I.2.7.6 Preventive Procedures, Structures, and Equipment [20.4.1 NMAC § 270.14(b)(8)]

Descriptions of the preventive procedures, structures, and equipment at the TA-16 OB units are presented below. This information is provided in accordance with the requirements of 20.4.1 NMAC § 270.14(b)(8) [6-14-00]. Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards, prevent undue exposure of personnel to hazardous waste, and prevent releases to the environment.

At the TA-16 OB units, large pieces of explosives-contaminated waste or explosive materials are typically handled using mechanical equipment such as a truck-mounted crane or a hydraulic lift gate. Small containers of waste are handled manually or with a dolly. The use of proper handling equipment, appropriate to the size and weight of the waste item, helps to prevent hazards while moving waste at the units. Additionally, personnel involved in waste-handling and container-handling operations at the units are knowledgeable about the physical and chemical properties of the waste managed at the site and take additional precautions, as necessary, to ensure that wastes are handled safely.

Pursuant to the requirements of 20.4.1 NMAC § 270.14(b)(19)(xi) [6-14-00], Figure A-5 (LANL, 2003) shows surface contours and drainage around the units. Engineering controls are in place to prevent runoff of wastes from the units to other areas of the facility or to the environment (Figure A-9 of LANL, 2003).

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of treatment operations at the units because engineering and operational controls ensure that run-on and runoff are minimized. The TA-16-388 Flash Pad is equipped with a retractable cover and secondary containment to prevent run-on and runoff. The TA-16-399 HE Burn Tray is equipped with a movable cover to prevent run-on into this structure. Tarps, or other types of covers, may also be used at the TA-16-388 Flash Pad and the TA-16-399 HE Burn Tray.

Electrical power is supplied to the Control Building. Supplied power at this building operates lighting, telephone, alarm, and monitoring systems. Operations at the units would be discontinued temporarily if electrical power was not restored quickly.

Safety shoes, safety glasses, and other personal protective equipment (PPE) required in explosives areas are worn by workers during routine operations at the units. Additional appropriate PPE is available should abnormal or unusual conditions require such equipment.

Releases to the atmosphere resulting from treatment activities at the units cannot be prevented. However, impacts are kept to a minimum through operating practices and burning under appropriate atmospheric conditions. The regulation of air impacts is discussed further in Section H.5 (LANL, 2003).

I.2.7.7 Prevention of Accidental Ignition or Reaction of Ignitable, Reactive, or Incompatible Waste [20.4.1 NMAC §§ 270.14(b)(9) and 270.15(c) and (d); and 20.4.1 NMAC § 264.17]

This section details the precautions taken to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes at the TA-16 OB units.

Ignitable or reactive wastes are located at least 50 ft from the facility's property line at all times and are protected from sources of ignition or reaction. Smoking is not permitted in areas where wastes are managed. Signs indicating "No Smoking" are conspicuously placed near the entrance to the units, as required by 20.4.1 NMAC § 264.17(a) [6-14-00]. Together, these measures meet the requirements of 20.4.1 NMAC §§ 264.17(a) and (b) and 264.176 [6-14-00].

Incompatible wastes, if managed at the units, will be segregated to prevent adverse reactions from occurring through commingling of the wastes. In addition, no incompatible wastes will be mixed, and no waste will be placed in a container that previously held an incompatible waste, as required by 20.4.1 NMAC § 264.177(a) and (b), and 20.4.1 NMAC § 270.15(d) [6-14-00]. If incompatible wastes are managed at the units, the requirements of 20.4.1 NMAC § 264.177(c) [6-14-00], will also be met. Only containers made of or lined with materials that will not react with and are otherwise compatible with the waste to be managed will be used at the units.

I.2.8 Volatile Organic Air Emission Standards [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

The TA-16 OB units are not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on the applicability criteria specified in 20.4.1 NMAC § 264.1080(b)(2) [6-14-00]. The hazardous wastes accepted in containers for treatment at the OB units have a design capacity less than or

equal to 0.1 cubic meters (approximately 26 gallons); therefore, the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart CC are not applicable to the TA-16 OB units.

I.3 REFERENCES

AEHA, 1987, "RCRA Part B Permit Writers' Guidance Manual for Department of Defense Open Burning/Open Detonation Units," U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland.

DOE, 1996, "DOE Explosives Safety Manual," DOE M 440.1-1, Revision 8.0, with changes approved by the DOE Explosives Safety Committee.

LANL, 2003, "Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Application," Revision 4.0, June 2003, LA-UR-03-3903, Los Alamos National Laboratory, Los Alamos, New Mexico

LANL, 1998, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

ATTACHMENT J

STABILIZATION UNIT MANAGEMENT

TA-55

CEMENTATION UNIT

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
DOE	U.S. Department of Energy
ft	feet/foot
gal	gallon(s)
in.	inch(es)
L	liter(s)
LANL	Los Alamos National Laboratory
TA	technical area
TC	toxicity characteristic
TCLP	Toxicity Characteristic Leaching Procedure
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

TA-55
CEMENTATION UNIT

The information in this Attachment addresses the applicable miscellaneous unit requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subparts X and BB, revised June 14, 2000 [6-14-00], for the cementation unit. The Attachment provides a description of the cementation unit that is used to cement or stabilize mixed waste generated at Technical Area (TA) 55 and the Chemistry and Metallurgy Research Building at TA-3. It includes detailed descriptions of the cementation unit and associated ancillary equipment. Detailed drawings are provided as Figures I-1 through I-7 (LANL, 2003).

J.1 DESIGN, CONSTRUCTION, MATERIALS, AND OPERATION [20.4.1 NMAC §270.23(a) and 20.4.1 NMAC §264.601]

The cementation unit is located in Glovebox GB-454 along the west wall of TA-55-4, Room 401 (Figure I -1 of LANL, 2003). The unit has been in operation since 1991 and has a maximum capacity of 568 liters (L) (approximately 150 gallons [gal]). It consists of a pH adjustment column, a vacuum trap, two motor-driven mixers, four impellers, associated support structures, a glovebox, and piping (Figure I-2 of LANL, 2003).

The pH column has a straight side height of 5 feet (ft) and an outside diameter of 6.66 inches (in.). The maximum capacity of the column is approximately 27 L. The column is raised above the glovebox floor approximately 3 in. by three steel legs and is secured to one wall of the glovebox with a steel bracket that binds the column approximately 3 ft up from the base of the column. The vacuum trap associated with the column has a straight side height of 2 ft and an inside diameter of 6 in. The maximum capacity of the vacuum trap is approximately 11 L. Both the pH column and the vacuum trap are constructed of PYREX® glass with stainless steel end plates similar to the glass columns in the evaporator glovebox tank component described in Attachment H. The glass and stainless steel materials are corrosion-resistant and compatible with the waste received in the column. The pH column is used to adjust the pH of approximately 5 L of waste to ensure compatibility with the cement used for solidification. A compressed-air line enters the glovebox and is connected to two pressurized air tanks outside of the glovebox. The compressed-air line is used for remote valve operation.

The two mixers within the unit are high-flow, gear-driven, fixed-mount mixers. (Manufacturer's information on the fixed-mount mixers is included in Supplement I.1 (LANL, 2003)). All

couplings, shafts, and impellers are constructed of 316 stainless steel. The shafts are 5 ft long. Two impellers are mounted to each shaft. Each impeller has a diameter of approximately 11 in. The mixers are driven by 3.5-horsepower motors encased within the mixer housing. The mixer housing is approximately 2.5 ft long. The maximum weight of each mixer is 225 pounds. Each mixer is mounted on steel plates and supported by two steel guides on either side of each mixer. Each guide is bolted to a 6-in. steel flange at either end and is secured to the glovebox floor and ceiling. Each motor is mounted to a center screw drive that allows the mixers to be independently raised and lowered within the glovebox (Figures I-3 and I-4 of LANL, 2003).

The glovebox is constructed of a section of 0.75 in. lead between two sections of approximately 0.188-in.-thick low-carbon grade, 316 stainless steel. The floor of the glovebox contains two circular openings with removable covers that allow the shafts and impellers of each mixer to be lowered into drums attached beneath the glovebox.

During cementation operations, two 55-gal steel drums are positioned under the glovebox directly under the openings in the floor of the glovebox. A "bag-out" bag extends from the glovebox into each drum between the drum and the drum liner. This liner is fastened at the bottom of the glovebox with an elastic cord and clamped into place to prevent hazardous constituents from escaping the confinement of the glovebox and the drums during treatment operations. The cement and the waste to be solidified are transferred into the drums and homogeneously mixed inside the drums. Each drum is positioned on a steel platform/scale that is secured in a steel track. The platform allows the drums to be safely and easily removed from the unit after the cement has hardened.

The majority of the piping associated with the cementation unit is 316 stainless steel. Tygon® tubing is used to transfer sodium hydroxide and the contents of the pH column to the drums. The cement is transferred into the glovebox and drums from a hopper/screw feeder through rubber tubing. Figures I-5 and I-6 (LANL, 2003) present a legend and piping and instrumentation diagram for the cementation unit.

Waste analysis and inspection procedures for the cementation unit are provided in Attachments B and E (*Waste Analysis Plan* and *Inspection Plan* respectively).

J.2 CEMENTATION UNIT DEMONSTRATION OF TREATMENT EFFECTIVENESS [20.4.1 NMAC §270.23(d)]

The cementation unit at TA-55, Building 4 (TA-55-4), Room 401 is considered a Subpart X miscellaneous unit and, as such, is subject to the miscellaneous unit requirements in 20.4.1 NMAC §270.23(d) [6-14-00] for "a report on the demonstration of treatment effectiveness of the treatment based on laboratory or field data." Supplement I.2 (LANL, 2003) provides a technical paper entitled "Waste Form Development for Conversion to Portland Cement at Los Alamos National Laboratory (LANL) Technical Area 55 (TA-55)" (Veazey et. al., 1996). This technical paper contains detailed information that demonstrates that the cementation unit at TA-55 effectively treats the mixed waste based on the treatment objectives described below:

- Stabilize mixed waste solutions that contain various radionuclides and toxicity characteristic (TC) metals in a cement matrix so that the metals are not leachable as determined by the Toxicity Characteristic Leaching Procedure (TCLP) and thus no longer exhibit the TC following treatment. The TC metals of primary concern are chromium, arsenic, cadmium, mercury, and lead.
- Stabilize mixed waste solids that contain various radionuclides and TC metals in a cement matrix so that metals are not leachable as determined by TCLP.
- Produce solidified cement monoliths that meet Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC), which prohibit free liquids (U.S. Department of Energy [DOE], 1999).

The technical paper in Supplement I.2 (LANL, 2003) describes bench- and full-scale testing that was performed to evaluate the effectiveness of using Portland cement in the cementation unit to stabilize mixed waste. The goal of the project was to develop a Portland cement-based waste form that meets the WIPP WAC and reliably passes TCLP. The results discussed in this technical paper demonstrate that the use of Portland cement in the TA-55 cementation unit under the prescribed conditions produces a cement monolith that meets all of the performance standards devised for the project. These performance standards include no free liquids, passing TCLP, and meeting minimum compressive strength criteria. The use of these results in demonstrating the treatment effectiveness of the cementation unit is appropriate for the following reasons:

- The waste streams used in the testing are very similar or the same as those actually treated in the cementation unit;
- TA-55 uses Portland cement in their cementation process, as was done in the testing; and

- The testing conditions described in the technical paper were modeled to the actual cementation process at TA-55, to the extent practicable.
- Additional constituents, in addition to those described in Supplement I.2 (LANL, 2003), may be treated in the cementation unit to meet the physical criteria discussed above.

J.3 ENVIRONMENTAL PERFORMANCE STANDARDS [20.4.1 NMAC, Subpart V, Part 264, Subpart X]

The following information is provided to address the applicable hydrologic, geologic, and meteorological requirements of 20.4.1 NMAC §270.23(b) and (c) and 20.4.1 NMAC §264.601 [6-14-00] for the cementation unit at TA-55. The cementation unit is located within glovebox GB-454 in TA-55-4, Room 401. The location of the unit, the waste management practices outlined in Attachment J (LANL, 2003), and the containment features described in the following sections prevent the deposition or migration of hazardous constituents into the groundwater, surface water, soil surface, or the atmosphere and ensure that the cementation unit is in compliance with the environmental performance standards of 20.4.1 NMAC §264.601 [6-14-00]. Waste analysis requirements for the cementation unit are addressed in Attachment C (*Waste Analysis Plan*). Contingency measures applicable to the cementation unit are addressed in Attachment D (*Contingency Plan*).

J.3.1 Protection of the Groundwater/Vadose Zone [20.4.1 NMAC §264.601(a)]

In accordance with 20.4.1 NMAC §264.601(a) [6-14-00], the cementation unit is operated in a manner that prevents releases that may have adverse effects on human health or the environment due to migration of hazardous waste or hazardous constituents through the vadose zone to the groundwater. The cementation unit is located in a vacuum-pressurized glovebox at TA-55-4 inside Room 401. Room 401 provides secondary containment for the cementation unit. The floor of the room is recessed approximately 2.5 in. The room itself is approximately 60 ft long by 75 ft wide. The capacity of the secondary containment area is greater than 100 percent of the volume of waste that is treated in the cementation unit at any one time. The entire floor is constructed of a 10-in.-thick reinforced concrete slab. Certified operators inspect the cementation unit each working day to detect leaks. Eight continuous air monitors installed at various locations throughout TA-55-4, Room 401 detect any airborne alpha contamination that would be present if a leak were to occur resulting in a release outside of glovebox GB-454. In the event of a release, the materials in question are removed as quickly as possible and are packaged in an appropriate container.

The cementation unit is located, designed, constructed, operated, and maintained, and will be closed in a manner that ensures protection of human health and the environment. The conditions outlined in 20.4.1 NMAC §264.601(a) [6-14-00] were considered and there is little or no potential for deposition or migration of waste constituents into the groundwater or subsurface environment. The cementation unit is located inside a building, provided with secondary containment, designed and constructed as described in Section J.1 (LANL, 2003), operated and maintained in accordance with waste management procedures described in Attachment J (LANL, 2003), and will be closed in accordance with the procedures described in Attachment F.3 (LANL, 2003); therefore, adverse effects on human health or the environment due to the treatment operations conducted in the cementation unit are unlikely.

J.3.2 Protection of Surface Water/Wetlands/Soil Surface [20.4.1 NMAC §264.601(b)]

In accordance with 20.4.1 NMAC §264.601(b) [6-14-00], the cementation unit is operated in a manner that prevents releases that may have adverse effects on human health or the environment due to the deposition or migration of waste constituents into surface water, wetlands, or onto the soil surface. Section J.3.1 (LANL, 2003) provides a detailed description of the effectiveness and reliability of the containment features to be utilized by the cementation unit to prevent releases.

The cementation unit is located, designed, constructed, operated, and maintained, and will be closed in a manner that will ensure protection of human health and the environment. The conditions outlined in 20.4.1 NMAC §264.601(b) [6-14-00] were considered and there is little or no potential for deposition or migration of waste constituents into surface water, wetlands, or soil surface. The cementation unit is located inside a building, provided with secondary containment, designed and constructed as described in Section J.1 (LANL, 2003), operated and maintained in accordance with waste management procedures described in Attachment J (LANL, 2003).

J.3.3 Protection of the Atmosphere [20.4.1 NMAC §264.601(c)]

In accordance with 20.4.1 NMAC §264.601(c) [6-14-00], the cementation unit is operated in a manner that prevents releases that may have adverse effects on human health or the environment due to the deposition or migration of waste constituents into the atmosphere. The cementation unit is located within a negative pressure glovebox that is connected to the TA-55-4 facility ventilation system. The high-efficiency particulate air filters on the glovebox are on the air intake side of the ventilation and are designed to prevent escape of contamination from the glovebox in the event of a power failure. TA-55-4 is equipped with a backup generator that re-establishes power to all vital systems, providing exhaust to the glovebox. The unit is a batch waste treatment system. If a power failure occurs, all operations cease inside the glovebox until power is restored. In addition, the glovebox is located within three succeedingly greater pressure zones. These zones are (in order of increasing pressure) the glovebox, Room 401, and the main corridor outside of Room 401. These pressure zones are designed to create an airflow into Room 401 and the glovebox and limit the potential for hazardous constituents to migrate to the atmosphere.

Operation of the cementation unit does not impact air quality at LANL. The cementation unit is operated within a negative pressure environment and, therefore, adverse affects on human health or the environment due to migration of hazardous constituents to the atmosphere as a result of treatment operations conducted in the cementation unit are unlikely. The conditions outlined in 20.4.1 NMAC §264.601(c) [6-14-00] were considered and there is little or no potential for health risks caused by human exposure to waste constituents or for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

J.4 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE [20.4.1 NMAC §270.14(b)(9) and §264.19]

No ignitable, reactive, or incompatible mixed wastes are treated in the cementation unit.

J.5 AIR EMISSIONS STANDARDS FOR EQUIPMENT LEAKS [20.4.1 NMAC, Subpart V, Part 264, Subpart BB]

The cementation unit addressed in this permit application is not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart BB [6-14-00], "Air Emission Standards for Equipment Leaks," with the exception of the reporting requirements specified in 20.4.1 NMAC §264.1064(k) [6-14-00].

None of the equipment associated with the cementation unit at TA-55 contains or contacts mixed waste with organic concentrations of at least 10 percent by weight.

In accordance with 20.4.1 NMAC §264.1064(k) [6-14-00], TA-55 uses knowledge of the nature of the mixed waste stream(s) or knowledge of the process by which the mixed waste was produced to document their exemptions to these standards. Production process information documenting that no organic compounds are contained in or contacted by equipment associated with the cementation unit is recorded in TA-55's facility operating record.

J.6 REFERENCES

DOE, 1999, "Waste Acceptance Criteria for the Waste Isolation Pilot Plant," DOE/WIPP-069, REV 7, U.S. Department of Energy, Carlsbad Area Office, Carlsbad, New Mexico.

LANL, 2003, "Los Alamos National Laboratory Technical Area 55 Part B Permit Renewal Application," Revision 2.0, September 2003, LA-UR-03-6303, Los Alamos National Laboratory, Los Alamos, New Mexico

Veazey, G.W., Schake, A.R., Shalek, P.D., Romero, D.A., Smith, C.A., 1996, "Waste Form Development for Conversion to Portland Cement at Los Alamos National Laboratory (LANL) Technical Area 55 (TA-55)," Los Alamos National Laboratory, Los Alamos, New Mexico.

ATTACHMENT K

CLOSURE PLAN

(reserved)

ATTACHMENT L

POST-CLOSURE CARE PLAN

(reserved)

ATTACHMENT M

(reserved)

ATTACHMENT N

COMPLIANCE SCHEDULE

Compliance Schedule

This Compliance Schedule briefly lists particular requirements specified in the Permit and their associated due dates. The complete requirements are found in the referenced Permit Sections.

Permit Section	Requirement	Due date
Submittals Due After Permit Issuance		
2.11.3	Contingency Plan distribution	Within 5 days of the effective date of this Permit
2.5	Figures for TA-54, Areas G and L identifying security fences, entry gates, and entry stations	within 30 days of the effective date of this Permit
9.2.1	Closure plans for TA-54 permitted units	Within 90 days of the effective date of this Permit
9.2.1	Closure plans for TA-3 and TA-16 permitted units	Within 180 days of the effective date of this Permit
9.2.1	Closure plans for TA-50 and TA-55 permitted units	Within 270 days of the effective date of this Permit
1.12	Community Relations Plan	Post on LANL's web site within 180 days of the effective date of this Permit
1.10	Information Repository	Within 180 days of the effective date of this Permit.
2.14	Initial Financial Assurance Document	Within 180 days after the initial closure cost estimate is approved by the Department
Annual Submittals		
2.9	Annual report regarding the waste minimization program	Every December 1st
2.13	Annual closure cost estimate	Every July 31st
12.1.6	Annual report on the TA-16 OB unit soil sampling results	Every August 31st

Permit Section	Requirement	Due date
2.14	Financial assurance documentation	60 days after the anniversary date of establishment of the mechanism
1.12	Interested parties quire and compilation of comments and responses	Post on LANL's web site every September 1st
Other Submittals		
1.9.15 and 2.12.5	Biennial Report	March 1st of each even numbered year

ATTACHMENT O

HAZARDOUS WASTE MANAGEMENT UNITS

TABLE O-1

Permitted Units Actively Managing Hazardous Waste

Includes units permitted to store and treat hazardous waste.

Process codes and associated process descriptions:

- S01-storage in containers
- S02-storage in tanks
- T01-treatment in tanks
- X01*-open burning
- X01**-open detonation

Unit Identifier	Process Codes	Operating Capacity	General Information
TA-3-29 Room 9010	S01	18,500 gal	Building TA-3-29 Basement Room 9010 in Wing 9 Contains Actinide Source Term Waste Test Program (STTP)
TA-3-29 Room 9020	S01	18, 500 gal	Building TA-3-29 Basement Room 9020 in Wing 9
TA-3-29 Room 9030	S01	18, 500 gal	Building TA-3-29 Basement Room 9030 in Wing 9
TA-16-388	X01*		Flash Pad
TA-16-399	X01*		Burn Tray
TA-50-69 Indoor Area	S01	1,500 gal	Includes Rooms 102 and 103. Non-liquid wastes only
TA-50-69 Outdoor Area	S01	30,000 gal	None Non-liquid wastes only
TA-54 Area G Pad 1	S01	502,920 gal	Includes TA-54-412 (DVRS), and Storage Dome 226
TA-54 Area G Pad 3	S01	213,840 gal	Includes Storage Dome 48 (TA-54-48)
TA-54 Area G Pad 5	S01	623,480 gal	Includes Storage Domes 49 and 224; Storage Sheds 144, 145, 146, 177, 1027, 1028, 1030, and 1041 Pad 5 is a consolidation of former Pads 5, 7, and 8.
TA-54 Area G Pad 6	S01	597,300 gal	Includes Storage Domes 153 and 283
TA-54 Area G Pad 9	S01	1,446,720 gal	Includes Storage Domes 229, 230, 231, and 232
TA-54 Area G Pad 10	S01	159,770 gal	Transuranic (TRU) Waste Characterization Facilities Pad 10 is a consolidation of former Pads 2

Unit Identifier	Process Codes	Operating Capacity	General Information
			and 4.
TA-54 Area G Pad 11	S01	682,440 gal	Includes Storage Dome 375
TA-54 Area G Storage Shed 8	S01	11,880 gal	Also referred to as TA-54-8
TA-54 Area G TA-54-33	S01	108,240 gal	Also referred to as Drum Prep Facility
TA-54 Area L Container Storage Unit (above-ground)	S01	407,880 gal	Includes all area within fence except limited administrative areas. Includes Structures 31, 32, 35, 36, 39, 58, 68, 69, 70, 215 (former Area 1), and 216 (former Area 7).
TA-54 West, Indoor CSU	S01	3,740 gal	Also referred to as TA-54-38 CSU includes High Bay and Low Bay Non-liquid wastes only
TA-54 West, Outdoor CSU	S01	7,920 gal	Also referred to as loading dock TA-54-38 and Outdoor Pad surrounding TA-54-38 Non-liquid wastes only
TA-55-4, B40	S01	21,500 gal	Located in basement Referred to as Area 1
TA-55-4, K13	S01	3,400 gal	Located in basement Referred to as Area 4
TA-55-4, B05	S01	3,600 gal	Located in basement Referred to as Area 5 Non-liquid wastes only
TA-55-4, B45	S01	11,000 gal	Located in basement Non-liquid wastes only
TA-55-4, Vault	S01	4,000 gal	Located in basement Referred to as Area 6
TA-55-4 Mixed Waste Storage/Treatment Tanks	S02, T04	Storage - 137 gal Treatment - 150 gal / day	TA-55-4, Room 401 Unit divided into two units (Evaporator Glovebox Storage Tank System and Cementation Storage Tank System)
TA-55-185	S01	30,000 gal	
TA-55-4, Outdoor Storage Pad	S01	135,000 gal	Located outside and west of TA-54-4

TABLE O-2

Permitted Units Undergoing Post-Closure Care

At the time of Permit Issuance (XX-XX-XXXX) there are no units in post-closure care.

Unit Identifier	Process Codes	Regulatory Status	Operating Capacity	General Information
(none)				

TABLE O-3

Closed Units not in Post-Closure Care

Process codes and associated process descriptions:

- D80-disposal trench
- D83-surface impoundment disposal
- S01-storage in containers
- S02-storage in tanks
- S99-storage in shafts
- T01-treatment in tanks
- T03-incinerator
- T04-other treatment
- X01*-open burning
- X01**-open detonation

Unit Identifier	Process Codes	General Information
TA-3-102	S01	(High Explosives Storage Unit)
TA 9-39	S01	
TA 09-43	T04	Hydrothermal Processing Unit (HPU) unit never managed hazardous waste
TA-15-184,	T04, X01**	OD site (Phermix)) Site was never used to treat hazardous waste
TA-16-88	S01	unit never stored hazardous waste
TA-16-387	X01** T04	Flash Pad 387 Underwent RCRA closure in conjunction with Material Disposal Area (MDA) P in 2002.
TA-16-394	X01* and X01** T04	
TA-16-401	X01* and X01**	(Pressure Vessel - sand filter tank)
TA-16-406	X01* and X01**	(Pressure Vessel - sand filter tank)
TA-16 Surface Impoundment	S04 -D83	
TA-16 Incinerator	T03	(TA-16-1409)
TA-16, Material Disposal Area P	D80	
TA-21-61	S01	

Unit Identifier	Process Codes	General Information
TA-22-24	S01	(High Explosive Storage Unit)
TA-33-90	S01	Application was withdrawn and that the unit never stored hazardous waste.
TA-33-92	S01	Application was withdrawn and that the unit never stored hazardous waste.
TA-35-85, Surface Impoundment	S04 - D83	
TA-35-125, Surface Impoundment	S04 - D83	Closure by removal.
TA 35-128	T03	Packed Bed Reactor/Silent Discharge Plasma Research
TA-39, MDA-Y	D80	
TA-40, Scrap Detonation Unit	X01** T04	
TA-40-DF2 (magazine)	S01	Converted to a <90 day storage unit
TA-50-1, Batch Waste Treatment Unit (BWTU)	T01	
TA-50-1, Container Storage Unit(s) associated with BWTU	S01	
TA-50-1, Room 34B	S01	unit never managed hazardous waste
TA-50-1, Room 34C	S01	unit never managed hazardous waste
TA-50-1, Room 35	S01	unit never managed hazardous waste
TA-50-1, Room 36	S01	unit never managed hazardous waste
TA-50-1, Room 38	S01	unit never managed hazardous waste
TA-50-1, Room 38A	S01	unit never managed hazardous waste
TA-50-1, Room 59	S01	Radioactive Liquid Waste Treatment Facility (RLWTF)
TA-50-1, Room 60A	T04	Cementation Treatment Unit Proposed treatment process was revised to generator treatment in a < 90 day storage area.
TA-50-37	T03	Controlled Air Incinerator (CAI)
TA-50-37 RAMROD	T04	Radioactive Materials Research, Operations and Demonstration Facility (RAMROD). LANL withdraws permit request. Convert unit(s) to <90 day storage.

Unit Identifier	Process Codes	General Information
TA-50-37, Storage Tanks	S02	Located in Room 115
TA 50-37-112	S01, T03	Location of Controlled Air Incinerator (CAI), part of RAMROD Facility
TA-50-37-114	S01	Part of RAMROD
TA-50-37, Room 115	S01 - S02	Location of storage tanks and waste feed tanks Part of RAMROD
TA-50-37, Room 117	S01	Room used for container storage. Part of RAMROD
TA-50-37, Room 118	S01	Room used for container storage. Part of RAMROD
TA-50-114	S01	Storage shed
TA-50-137	S01	Storage Bldg Unit was never built
TA-50-138	S01	Storage Bldg Unit was never built
TA-50-139	S01	Storage pad Unit was never built
TA-50-140	S01	Storage pad Unit was never built
TA 53-166	S04	South Surface Impoundment Change from closure as a TSD to cleanup under HSWA
TA 53-166	S04	NE Surface Impoundment Change from closure as a TSD to cleanup under HSWA
TA 53-166	S04	NW Surface Impoundment Change from closure as a TSD to cleanup under HSWA
TA-54-L, Waste Oil Storage Tank (WOST)	S02	
TA-54-L, Truck Mounted Container Treatment System	T01	Unit was proposed in a 1993 permit modification and was withdrawn in a 1998 Part A.
TA-54-L, Bldg. 35, Storage/ Treatment Tanks (4)	S02 and (T01)	Pad below the tanks remains operational for waste storage.

Unit Identifier	Process Codes	General Information
TA-55-4, Oxygen Sparging Treatment Furnace	T04	
TA-55-4, B38	S01	
TA-55-4, basement, Area 2	S01	
TA-55-4, basement. Area 7 North end of basement CSA	S01	Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-55-4-401 Mixed waste Monitoring CSA (Area 8 also called FLO-1)	S01	Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-55-4-401 Sphere Material Removal CSA (Area 9)	S01	Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-55-4-401 CSA for Evaporator Salt Precipitate (Area 10)	S01	This unit was included as part of the evaporator glovebox storage tank system in the June 1996 TA-55 Part B
TA-55-4-433 Mixed Waste Monitoring CSA	S01	(Area 11 – referenced as Area 10 in June 1996) Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-55-4-432 CSA Glovebox Process Waste	S01	(Area 12 - referenced as Area 11 in June 1996) Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-55-41 CSA Vault	S01	Unit was never used for hazardous waste storage and was withdrawn in the 1998 Part A.
TA-63 Chemical Waste Treatment Skid	T01	This unit was never constructed and was withdrawn in the 1998 Part A application.
TA-63 Liquid Waste Storage Tanks (6)	S02	These tanks were never constructed and were withdrawn in the 1998 Part A application.

TABLE O-4

Permitted Units Undergoing Closure

Process codes and associated process descriptions:

- D99-other disposal

Unit Identifier	Process Codes	Regulatory Status	General Information
TA-54 Material Disposal Area G	D99	Permitted	Unit includes entirety of MDA-G Includes "60 Shafts", Shafts 124, 145, 146 , Shafts 147, 148, and 149, and Pit 29
TA-54 Material Disposal Area H	D99	Permitted	Unit includes entirety of MDA-H Includes Shaft 9.
TA-54, Material Disposal Area L,	D99	Permitted	Unit includes entirety of MDA-L Includes "Shafts 1, 13-17, and 19-34 and Impoundments B and D.

TABLE O-5

Interim Status Units Actively Managing Hazardous Waste

Hazardous waste management units at TAs 14, 36, and 39 are, at the time of draft permit issuance (August 2007), operating and regulated under interim status.

Process codes and associated process descriptions:

- X01*-open burning
- X01**-open detonation

Unit Identifier	Process Codes	Operating Capacity	General Information
TA-14-23	X01*	50 lbs HE/burn	Near Structure TA-14-23
TA-14-23	X01**	20 lbs HE/ detonation	Near Structure TA-14-23
TA-36-8	X01**	2000 lbs/ detonation	Near Structure TA-36-8
TA-39-6	X01**	1000 lbs/ detonation	Near Structure TA-39-6
TA-39-57	X01**	1000 lbs/ detonation	Near Structure TA-39-57

ATTACHMENT P

LISTING OF SWMUs AND AOCs

Table P-1

SWMUs and AOCs Requiring Corrective Action

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU/AOC	Unit #	Unit Type
	TA-0	
SWMU	00-001	Sediment traps in Mortandad Canyon
SWMU	00-002	Used Oil Container Storage Area
AOC	00-010(b)	Surface Disposal Site, 6th Street Warehouses
SWMU	00-011(a)	Mortar impact area
SWMU	00-011(c)	Mortar impact area
SWMU	00-011(d)	Mortar impact area
SWMU	00-011(e)	Mortar impact area
AOC	00-015	Firing Range-Rendija Canyon
SWMU	00-017	Waste lines
SWMU	00-018(a)	Sludge bed wastewater treatment plant, Pueblo Canyon
AOC	00-018(b)	Sludge bed wastewater treatment plant, Bayo Canyon
SWMU	00-019	Wastewater treatment plant, central
AOC	00-027	Storage Area-DP Road
SWMU	00-030(a)	Septic system, DP Road
SWMU	00-030(b)	Former structures, 6th Street warehouse (SWMU Rpt: near intersection w/ Trinity)
AOC	00-030(d)	Septic System
AOC	00-030(eN)	Septic System
AOC	00-030(eS)	Septic System
AOC	00-030(f)	Septic System
SWMU	00-030(g)	Septic system (near old Catholic Church parking lot)
AOC	00-030(h)	Septic System (near new Catholic Church)
AOC	00-030(j)	Septic System
AOC	00-030(k)	Septic System
SWMU	00-030(l)	Former structures, 6th Street warehouse (Zia Warehouses)
SWMU	00-030(m)	Former structures, 6th Street warehouse (Zia Warehouses)
SWMU	00-030(n)	Septic System
SWMU	00-030(o)	Septic System
SWMU	00-030(p)	Septic System
AOC	00-031(a)	Soil Contamination beneath former Service Station
AOC	00-031(b)	Soil Contamination beneath former motorpool (2 USTs)
SWMU	00-033(a)	Former UST, 6th Street Warehouses (as 0-033 on old permit)
SWMU	00-033(b)	Former structures, 6th Street warehouse (as 0-033 on old permit)
AOC	00-034(a)	Landfill, eastern area
AOC	00-034(b)	Landfill, western area
SWMU	00-039	Underground tanks
AOC	C-00-001	Guaje Canyon
AOC	C-00-002	Rendija Canyon
AOC	C-00-003	Barrancas Canyon
AOC	C-00-004	Bayo Canyon

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	C-00-005	Pueblo Canyon
AOC	C-00-006	Los Alamos Canyon
AOC	C-00-007	Sandia Canyon
AOC	C-00-008	Mortandad Canyon
AOC	C-00-009	Canada del Buey Canyon
AOC	C-00-010	TwoMile Canyon
AOC	C-00-011	Pajarito Canyon
AOC	C-00-012	Three Mile Canyon
AOC	C-00-013	Potrillo Canyon
AOC	C-00-014	Canon de Valle Canyon
AOC	C-00-015	Fence Canyon
AOC	C-00-016	Water Canyon
AOC	C-00-017	Indio Canyon
AOC	C-00-018	Ancho Canyon
AOC	C-00-019	Chaquehui Canyon
AOC	C-00-020	Mortar impact area
AOC	C-00-021	DP Canyon
AOC	C-00-037	Landfill, Bandelier, NM
AOC	C-00-038	Surface Disposal, Bandelier, NM
AOC	C-00-041	Asphalt and tar remnant site
AOC	C-00-042	Tank
AOC	C-00-043	Manhole (removed)
AOC	C-00-044	Lead contaminated area
TA-1		
SWMU	01-001(a)	Septic Tank 134
SWMU	01-001(b)	Septic Tank 135
SWMU	01-001(c)	Septic Tank 137
SWMU	01-001(d)	Septic Tank 138(hillside)
SWMU	01-001(e)	Septic Tank 139
SWMU	01-001(f)	Septic Tank 140(hillside)
SWMU	01-001(g)	Septic Tank 141
SWMU	01-001(o)	Ind. Or San. Wastewater Treatment
SWMU	01-001(s)	Septic System Wasteline
SWMU	01-001(t)	Septic System
SWMU	01-001(u)	Septic System Wasteline
SWMU	01-002	Outfall
SWMU	01-002(a)-00	Waste Water Treatment Plant
SWMU	01-002(b)-00	Waste Water Treatment Plant
SWMU	01-003(a)	Bailey Bridge Landfill
AOC	01-003(b)	Surface Disposal Site
AOC	01-003(c)	Surface Disposal Site
SWMU	01-003(d)	Surface Disposal Site
SWMU	01-003(e)	Surface Disposal Site

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	01-006(a)	Drainlines and Outfall
SWMU	01-006(b)	Drainlines and Outfall
SWMU	01-006(c)	Drainlines and Outfall
SWMU	01-006(d)	Drainlines and Outfall
AOC	01-006(e)	Drainlines and Outfall
AOC	01-006(g)	Drainlines and Outfall
SWMU	01-006(h)	Drainlines and Outfall
SWMU	01-006(n)	Drainlines and Outfall
SWMU	01-006(o)	Drainlines and Outfall
SWMU	01-007(a)	Soil Contamination Area
SWMU	01-007(b)	Soil Contamination Area
SWMU	01-007(c)	Soil Contamination Area
SWMU	01-007(d)	Soil Contamination Area
SWMU	01-007(e)	Soil Contamination Area
SWMU	01-007(j)	Soil Contamination Area
AOC	01-007(k)	Soil Contamination Area
SWMU	01-007(l)	Soil Contamination Area
TA-2		
AOC	02-003(a)	Reactor facility
AOC	02-003(b)	Condensate trap
AOC	02-003(c)	Delay system
AOC	02-003(d)	Gaseous effluent line
AOC	02-003(e)	Holding tank (near reactor water boiler)
AOC	02-004(a)	Omega West reactor facility
AOC	02-004(b)	Reactor facility effluent storage tank TA-2-54
AOC	02-004(c)	Reactor facility effluent storage tank TA-2-55
AOC	02-004(d)	Reactor facility effluent storage tank TA-2-56
AOC	02-004(e)	Reactor facility acid pit TA-2-53
AOC	02-004(f)	Reactor facility equipment building
AOC	02-004(g)	Aboveground tank
SWMU	02-005	Drift loss, cooling tower blowdown
SWMU	02-006(a)	French drain
SWMU	02-006(b)	Acid waste line
AOC	02-006(c)	Drainline
AOC	02-006(d)	Drainline
AOC	02-006(e)	Waste line
SWMU	02-007	Former structures, Omega West Reactor
SWMU	02-008(a)	Outfall (Same as 02-011(e))
AOC	02-008(c)	Outfall
SWMU	02-009(a)	Former structures, Omega West Reactor
SWMU	02-009(b)	Former structures, Omega West Reactor
SWMU	02-009(c)	Former structures, Omega West Reactor (Same as 02-003(e))
AOC	02-009(d)	Non-intentional release (Same as 02-003(b))

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	02-009(e)	Non-intentional release
AOC	02-010	Former building location
AOC	02-011(a)	Storm drain and outfall
AOC	02-011(b)	Storm drain and outfall
AOC	02-011(c)	Storm drain and outfall
AOC	02-011(d)	Storm drain and outfall
AOC	02-011(e)	Storm drain and outfall (Same as 02-008(a))
AOC	02-012	Underground tanks
TA-3		
AOC	03-001(e)	Less-than-90-day storage
AOC	03-001(i)	Satellite accumulation area
SWMU	03-001(k)	Less-than-90-day-storage area
SWMU	03-002(c)	Storage area
SWMU	03-003(a)	Storage area
SWMU	03-003(b)	Storage area
SWMU	03-003(c)	Equipment storage area - PCB only site
AOC	03-003(d)	Storage area - transformers
AOC	03-003(e)	Storage area - transformers
AOC	03-003(f)	Storage area - transformers
AOC	03-003(g)	One-time spill - transformers
AOC	03-003(h)	Storage area - transformers
AOC	03-003(i)	Storage area - transformers
AOC	03-003(j)	Storage area - transformers
AOC	03-003(k)	Storage area - transformers
AOC	03-003(l)	Storage area
AOC	03-003(n)	Storage area
AOC	03-003(o)	Storage area - capacitor banks
AOC	03-003(p)	Storage area
AOC	03-004(c)	Storage area
AOC	03-004(d)	Storage area
AOC	03-007	Firing site
AOC	03-008(a)	Firing site
SWMU	03-009(a)	Asphalt batch plant
SWMU	03-009(i)	Surface disposal site
SWMU	03-009(j)	Surface disposal site
SWMU	03-010(a)	Vacuum repair shop (former location)- systematic release site
SWMU	03-011	Systematic product release
SWMU	03-012(b)	Miscellaneous - TA-03 power plant
SWMU	03-013(a)	Drainlines and outfalls
AOC	03-013(b)	Operational release
SWMU	03-013(i)	Operational release
SWMU	03-014(a)	Wastewater treatment plant
AOC	03-014(a2)	Wastewater treatment facility

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	03-014(b)	Wastewater treatment plant
AOC	03-014(b2)	outfall
SWMU	03-014(c)	Wastewater treatment plant
AOC	03-014(c2)	outfall
SWMU	03-014(d)	Wastewater treatment plant
SWMU	03-014(e)	Wastewater treatment plant
SWMU	03-014(f)	Wastewater treatment plant
SWMU	03-014(g)	Wastewater treatment plant
SWMU	03-014(h)	Wastewater treatment plant
SWMU	03-014(i)	Wastewater treatment plant
SWMU	03-014(j)	Wastewater treatment plant
SWMU	03-014(k)	Wastewater treatment plant
SWMU	03-014(l)	Wastewater treatment plant
SWMU	03-014(m)	Wastewater treatment plant
SWMU	03-014(n)	Wastewater treatment plant
SWMU	03-014(o)	Wastewater treatment plant
SWMU	03-014(p)	Wastewater treatment plant
SWMU	03-014(q)	Miscellaneous - TA-03 power plant
SWMU	03-014(r)	Wastewater treatment facility
SWMU	03-014(s)	Wastewater treatment facility
SWMU	03-014(t)	Wastewater treatment facility
SWMU	03-014(u)	Wastewater treatment plant
AOC	03-014(v)	Wastewater treatment plant
AOC	03-014(w)	Wastewater treatment plant
AOC	03-014(x)	Wastewater treatment plant
AOC	03-014(y)	Wastewater treatment plant
AOC	03-104(z)	Wastewater treatment plant
SWMU	03-015	Drainlines and outfalls
SWMU	03-021	Surface disposal site
AOC	03-022	Sump
SWMU	03-025(b)	Sumps (two, inactive and active)
AOC	03-025(c)	Tank and/or associated equipment
AOC	03-026(a)	Sump
SWMU	03-026(c)	Tank and/or associated equipment
SWMU	03-026(d)	Tank and/or associated equipment
AOC	03-027	Separation Site
SWMU	03-028	Asphalt batch plant
SWMU	03-031	Tank and/or associated equipment
SWMU	03-032	Tank and associated equipment
SWMU	03-033	Sump
SWMU	03-034(a)	Tank and/or associated equipment, radioactive liquid waste tanks
SWMU	03-034(b)	Tank and/or associated equipment
SWMU	03-036(a)	Asphalt batch plant

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	03-036(b)	Aboveground tanks
SWMU	03-036(c)	Asphalt batch plant
SWMU	03-036(d)	Asphalt batch plant
SWMU	03-037	Underground tank
SWMU	03-038(a)	Tanks and/or associated equipment
SWMU	03-038(b)	Tanks and/or associated equipment
AOC	03-038(c)	Waste lines
AOC	03-038(d)	Waste lines
AOC	03-038(f)	Waste lines
AOC	03-041	Underground tank
AOC	03-042	Sump
AOC	03-043(a)	Aboveground Tank
AOC	03-043(b)	Aboveground Tank
SWMU	03-043(c)	Tank and/or associated equipment
AOC	03-043(d)	Aboveground Tank
AOC	03-043(f)	Aboveground Tank
AOC	03-043(g)	Aboveground Tank
AOC	03-043(h)	Aboveground Tank
SWMU	03-045(a)	Outfall (industrial or sanitary wastewater treatment)
SWMU	03-045(b)	Miscellaneous - TA-03 power plant
SWMU	03-045(c)	Miscellaneous - TA-03 power plant
SWMU	03-045(e)	Outfall (industrial or sanitary wastewater treatment)
SWMU	03-045(f)	Outfall from drain (industrial or sanitary wastewater treatment)
SWMU	03-045(g)	Asphalt batch plant
SWMU	03-045(h)	Drainlines and outfalls
SWMU	03-045(i)	Outfall
SWMU	03-046	Above ground wastewater treatment tank
AOC	03-047(d)	Storage area
AOC	03-047(g)	Drum storage
SWMU	03-049(a)	Drainlines and outfalls
SWMU	03-049(b)	Miscellaneous
SWMU	03-049(e)	Outfall
SWMU	03-050(a)	Soil contamination
SWMU	03-050(d)	Soil contamination
SWMU	03-050(f)	Soil contamination
SWMU	03-050(g)	Soil contamination
AOC	03-051(a)	Soil contamination-oil from leaking compressor
AOC	03-051(b)	Soil contamination-oil from leaking compressor
AOC	03-051(c)	Soil contamination (vacuum pump leaking)
SWMU	03-052(a)	Drainlines and outfalls
AOC	03-052(b)	Storm drainage
SWMU	03-052(e)	Drainlines and outfalls
AOC	03-052(f)	Drainlines and outfalls

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	03-053	Operational facility
SWMU	03-054(a)	Drainlines and outfalls
SWMU	03-054(b)	Drainlines and outfalls
SWMU	03-054(c)	Outfall
SWMU	03-054(d)	Drainlines and outfalls
SWMU	03-054(e)	Outfall
SWMU	03-055(a)	Outfall
SWMU	03-055(c)	Outfall
SWMU	03-056(a)	Storage area
SWMU	03-056(c)	Transformer storage area - PCB only site
SWMU	03-056(d)	Wastewater treatment plant
AOC	03-056(h)	Transformer storage area
AOC	03-056(k)	Container storage area
SWMU	03-056(l)	Drum Storage
SWMU	03-059	Storage area
AOC	C-03-006	One-time spill
AOC	C-03-014	Storage area
AOC	C-03-016	Oil metal bin
AOC	C-03-022	Kerosene tanker trailer
TA-4		
SWMU	04-001	Firing site - Alpha Site
SWMU	04-002	Firing site - Alpha Site
SWMU	04-003(a)	Alpha Site Photoprocessing Building, drainlines, and outfall
SWMU	04-003(b)	Firing site - Alpha Site
AOC	04-004	Soil contamination beneath buildings
TA-5		
SWMU	05-001(a)	Firing site - Beta Site
SWMU	05-001(b)	Firing site - Beta Site
AOC	05-001(c)	Former firing site
SWMU	05-002	Firing site - Beta Site
SWMU	05-003	Calibration Chamber
SWMU	05-004	Septic System
SWMU	05-005(a)	French Drain
SWMU	05-005(b)	Outfall
SWMU	05-006(b)	Soil Contamination
SWMU	05-006(c)	Soil Contamination
SWMU	05-006(e)	Soil Contamination
SWMU	05-006(h)	Soil contamination
TA-6		
SWMU	06-001(a)	Septic system
SWMU	06-001(b)	Septic system
SWMU	06-002	Firing site - eastern aggregate
SWMU	06-003(a)	Former firing site

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	06-003(c)	Firing site - eastern aggregate
SWMU	06-003(d)	Firing site (inactive)
SWMU	06-003(e)	Firing site (inactive)
SWMU	06-003(f)	Firing site (inactive)
SWMU	06-003(h)	Firing site (inactive)
SWMU	06-005	MDA F
SWMU	06-006	Storage area
SWMU	06-007(a)	Material disposal area (MDA F)
SWMU	06-007(b)	Material disposal area (MDA F)
SWMU	06-007(c)	Material disposal area (MDA F)
SWMU	06-007(d)	Material disposal area (MDA F)
SWMU	06-007(e)	Material disposal area (MDA F)
SWMU	06-007(f)	Surface disposal
SWMU	06-007(g)	Building and surface disposal
AOC	06-008	Underground tank
AOC	C-06-001	Building
AOC	C-06-005	Building TA-6-13 - chemistry laboratory, assembly, and storage
AOC	C-06-019	Building
TA-7		
SWMU	07-001(a)	Former firing sites
SWMU	07-001(b)	Former firing sites
SWMU	07-001(c)	Former firing sites
SWMU	07-001(d)	Former firing sites
TA-8		
AOC	08-001(a)	Buildings
AOC	08-001(b)	Buildings
SWMU	08-002	Firing site
SWMU	08-003(a)	Septic system, drainlines, and outfall
SWMU	08-004(a)	Septic system, drainlines, and outfall
SWMU	08-004(b)	Septic system, drainlines, and outfall
SWMU	08-004(c)	Floor drain
SWMU	08-004(d)	Drain
SWMU	08-005	Container storage area
SWMU	08-006(a)	Material disposal area (MDA Q)
SWMU	08-009(a)	Septic system, drainlines, and outfall
AOC	08-009(c)	Storm drain and outfall
SWMU	08-009(d)	Industrial or sanitary wastewater treatment
SWMU	08-009(e)	Industrial or sanitary wastewater treatment
AOC	08-009(f)	Outfall
AOC	C-08-014	Laboratory
TA-9		
SWMU	09-001(a)	Former firing site structures
SWMU	09-001(b)	Former firing site structures

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	09-001(c)	Firing sites (inactive)
SWMU	09-001(d)	Firing sites (inactive)
SWMU	09-002	Burn pit
SWMU	09-003(a)	Settling tanks and basket pit associated with 9-14
SWMU	09-003(b)	Settling tanks and basket pit associated with 9-14
SWMU	09-003(d)	Settling tank
SWMU	09-003(e)	Settling tanks and basket pit associated with 9-14
SWMU	09-003(g)	Sumps and pipes
SWMU	09-003(h)	Sumps and pipes
SWMU	09-003(i)	Sumps and pipes
SWMU	09-004(a)	Settling tanks
SWMU	09-004(b)	Settling tanks
SWMU	09-004(c)	Settling tanks
SWMU	09-004(d)	Settling tanks
SWMU	09-004(e)	Settling tanks
SWMU	09-004(f)	Settling tanks
SWMU	09-004(g)	Settling tank
SWMU	09-004(h)	Settling tanks
SWMU	09-004(i)	Settling tanks
SWMU	09-004(j)	Settling tanks
SWMU	09-004(k)	Settling tanks
SWMU	09-004(l)	Settling tanks
SWMU	09-004(m)	Settling tanks
SWMU	09-004(n)	Settling tanks
SWMU	09-004(o)	Settling tank
SWMU	09-005(a)	Septic tank and sewage oxidation pond
SWMU	09-005(d)	Septic tank and sewage oxidation pond
SWMU	09-005(g)	Septic system
SWMU	09-006	Septic system
SWMU	09-008(b)	Septic tank and sewage oxidation pond
SWMU	09-009	Surface impoundment
AOC	09-010(a)	Storage Area
AOC	09-010(b)	Storage Area
AOC	09-011(b)	Storage area
AOC	09-011(c)	Storage area
AOC	09-012	Disposal Pit
SWMU	09-013	Material disposal area (MDA M)
AOC	09-014	Firing site (formerly 23-001)
SWMU	C-09-001	Soil contamination
TA-10		
SWMU	10-001(a)	Firing sites (inactive)
SWMU	10-001(b)	Firing sites (inactive)
SWMU	10-001(c)	Firing sites (inactive)

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	10-001(d)	Firing sites (inactive)
SWMU	10-002(a)	Former liquid disposal complex
SWMU	10-002(b)	Former liquid disposal complex
SWMU	10-003(a)	Former liquid disposal complex
SWMU	10-003(b)	Former liquid disposal complex
SWMU	10-003(c)	Former liquid disposal complex
SWMU	10-003(d)	Former liquid disposal complex
SWMU	10-003(e)	Former liquid disposal complex
SWMU	10-003(f)	Former liquid disposal complex
SWMU	10-003(g)	Former liquid disposal complex
SWMU	10-003(h)	Former liquid disposal complex
SWMU	10-003(i)	Former liquid disposal complex
SWMU	10-003(j)	Former liquid disposal complex
SWMU	10-003(k)	Former liquid disposal complex
SWMU	10-003(l)	Former liquid disposal complex
SWMU	10-003(m)	Former liquid disposal complex
SWMU	10-003(n)	Former liquid disposal complex
SWMU	10-003(o)	Former liquid disposal complex
SWMU	10-004(a)	Septic tank
SWMU	10-004(b)	Former liquid disposal complex
SWMU	10-005	Firing sites (inactive)
SWMU	10-006	Burn site
SWMU	10-007	Former liquid disposal complex
SWMU	10-008	Firing sites (inactive)-New SWMU
SWMU	10-009	Former Bayo Landfill-New SWMU
AOC	C-10-001	Burn Site
TA-11		
SWMU	11-001(a)	Firing site (inactive)
SWMU	11-001(b)	Firing site (inactive)
SWMU	11-001(c)	Firing site (inactive)
SWMU	11-002	Former firing site
AOC	11-003(b)	Firing range
SWMU	11-004(a)	Drop test tower and related structures
SWMU	11-004(b)	Drop test tower and related structures
SWMU	11-004(c)	Drop test tower and related structures
SWMU	11-004(d)	Drop test tower and related structures
SWMU	11-004(e)	Drop test tower and related structures
AOC	11-004(f)	Drop test tower and related structures
SWMU	11-005(a)	Septic system
SWMU	11-005(b)	Septic system
SWMU	11-005(c)	Industrial or sanitary wastewater treatment
SWMU	11-006(a)	Former firing site
SWMU	11-006(b)	Former firing site

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	11-006(c)	Former firing site
SWMU	11-006(d)	Former firing site
SWMU	11-009	Material disposal area (MDA S)
SWMU	11-011(a)	Industrial or sanitary wastewater treatment
SWMU	11-011(b)	Industrial or sanitary wastewater treatment
SWMU	11-011(d)	Industrial or sanitary wastewater treatment
AOC	11-012(a)	Building
AOC	11-012(b)	Building
AOC	11-012(c)	Building
AOC	11-012(d)	Building
AOC	C-11-001	Laboratory
AOC	C-11-002	Laboratory
TA-12		
SWMU	12-001(a)	Former firing site
SWMU	12-001(b)	Former firing site
SWMU	12-002	Former firing site
AOC	12-004(a)	Radiation test facility
AOC	12-004(b)	Pipe
AOC	C-12-001	Trim Building
AOC	C-12-002	Control Building
AOC	C-12-003	Storage Magazine
AOC	C-12-004	Generator Building
AOC	C-12-005	Junction box
TA-13		
SWMU	13-001	Firing site, landfill, and soil contamination
SWMU	13-002	Firing site, landfill, and soil contamination
SWMU	13-003(a)	TA-13 septic system (inactive)
AOC	13-003(b)	Septic System
SWMU	13-004	Disposal pit - existence not determined
TA-14		
AOC	14-001(a)	Firing site - active
AOC	14_001(b)	Firing site - active
AOC	14-001(c)	Firing site - active
AOC	14-001(d)	Firing site - active
AOC	14-001(e)	Firing site - active
AOC	14-001(f)	Firing site
AOC	14-001(g)	Firing site - open burn/open detonation (active)
SWMU	14-002(a)	Former firing site
SWMU	14-002(b)	Former firing site
SWMU	14-002(c)	Former firing site
SWMU	14-002(d)	Former firing site
SWMU	14-002(e)	Former firing site
SWMU	14-002(f)	Former firing site

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	14-003	Open burning ground
AOC	14-004(a)	Storage area (still active)
SWMU	14-005	Incinerator (active)
SWMU	14-006	Tank and/or associated equipment
SWMU	14-007	Septic system
SWMU	14-009	Former firing site
SWMU	14-010	Former firing site
AOC	C-14-001	Magazine
AOC	C-14-002	Control Building
AOC	C-14-003	HE-Preparation Building
AOC	C-14-004	Electronics Shop
AOC	C-14-005	Storage Building
AOC	C-14-006	Magazine
AOC	C-14-007	Storage Building
AOC	C-14-008	Magazine
AOC	C-14-009	Magazine
TA-15		
AOC	15-001	Surface disposal
SWMU	15-002	Firing site - R40
SWMU	15-003	Phermex firing site
SWMU	15-004(a)	Firing Site C (inactive)
SWMU	15-004(b)	Firing sites A and B (inactive)
SWMU	15-004(c)	Firing sites A and B (inactive)
AOC	15-004(d)	Firing site C (inactive)
SWMU	15-004(f)	Firing site E-F (inactive)
SWMU	15-004(g)	Firing site G (inactive)
AOC	15-004(h)	Firing site H (inactive)
SWMU	15-004(i)	The Gulch firing site (inactive)
AOC	15-005(b)	Container storage area
AOC	15-005(c)	Container storage area (R-41)
SWMU	15-006(a)	Phermex firing site
SWMU	15-006(b)	Firing Site Ector (active)
SWMU	15-006(c)	R-44 firing site (inactive)
SWMU	15-006(d)	R-45 firing site
AOC	15-006(e)	I-J Firing Site at TA-36 (not TA-15), part of 36-004(e)
SWMU	15-007(a)	Firing site - R40
SWMU	15-007(b)	Material disposal area (MDA Z) landfill
SWMU	15-007(c)	Shafts
SWMU	15-007(d)	Shafts
SWMU	15-008(a)	Firing site E-F (inactive)
SWMU	15-008(b)	R-44 firing site (inactive)
SWMU	15-008(c)	Firing site G (inactive)
SWMU	15-008(d)	Surface disposal

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	15-008(f)	I-J Firing site mounds
AOC	15-008(g)	Surface disposal
SWMU	15-009(a)	Former structures - the Hollow
SWMU	15-009(b)	Septic system
SWMU	15-009(c)	Septic tank
SWMU	15-009(e)	Septic system, E/F Site
SWMU	15-009(f)	Firing site and septic systems
SWMU	15-009(g)	Septic tank (active)
SWMU	15-009(h)	Septic tank
SWMU	15-009(i)	Septic tank
SWMU	15-009(k)	Firing site and septic systems
AOC	15-009(l)	Septic system TA-15-00
SWMU	15-010(a)	Septic system
SWMU	15-010(b)	Septic system
SWMU	15-011(a)	Former structures - the Hollow
SWMU	15-011(b)	Former structures - the Hollow
SWMU	15-011(c)	Former structures - the Hollow
SWMU	15-012(c)	Surface Disposal
SWMU	15-012(d)	Surface Disposal
SWMU	15-012(e)	Surface Disposal
SWMU	15-012(f)	Surface Disposal
SWMU	15-012(g)	Surface Disposal
SWMU	15-014(a)	Outfalls
SWMU	15-014(b)	Outfalls
AOC	15-014(d)	Ind. or san. wastewater treatment
AOC	15-014(g)	Industrial or sanitary wastewater treatment
AOC	15-014(h)	Outfall
SWMU	15-014(i)	Former structures - the Hollow
SWMU	15-014(j)	Former structures - the Hollow
SWMU	15-014(k)	Former structures - the Hollow
SWMU	15-014(l)	NPDES-permitted outfall (active)
AOC	C-15-001	Surface disposal
AOC	C-15-004	Transformers
AOC	C-15-005	Former laboratory and building
AOC	C-15-006	Building
AOC	C-15-007	Non-intentional release
AOC	C-15-010	Former underground tank
AOC	C-15-011	Former underground tank
TA-16		
SWMU	16-001(a)	Former steam plant
SWMU	16-001(b)	Former steam plant
SWMU	16-001(c)	Former steam plant
SWMU	16-001(d)	Dry well

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-001(e)	Sumps and associated dry well
SWMU	16-002	SWMU has been deleted b/c the facility has not become operational
SWMU	16-003(a)	Sump
SWMU	16-003(b)	Sump
SWMU	16-003(c)	Sump, associated drainline, and outfall
SWMU	16-003(d)	Sumps and associated dry well
SWMU	16-003(e)	Sumps and associated dry well
SWMU	16-003(f)	Sumps and associated dry well
SWMU	16-003(g)	Sumps and associated dry well
SWMU	16-003(h)	Inactive sump, drainline, and outfall
SWMU	16-003(i)	Sump 16-265
SWMU	16-003(j)	Sump 16-267
SWMU	16-003(k)	16-260 Sumps, drainlines, and outfall
SWMU	16-003(l)	Sumps, drainlines, and outfalls (inactive)
SWMU	16-003(m)	Sump, outfall, and septic system
SWMU	16-003(n)	HE sump
SWMU	16-003(o)	Sump- fish ladder
AOC	16-003(p)	Sump, drainlines, and outfall
AOC	16-003(q)	Sump and drainlines
SWMU	16-004(a)	Wastewater treatment plant
SWMU	16-004(b)	Wastewater treatment plant
SWMU	16-004(c)	Wastewater treatment plant
SWMU	16-004(d)	Wastewater treatment plant
SWMU	16-004(e)	Wastewater treatment plant
SWMU	16-004(f)	Wastewater treatment plant
AOC	16-005(a)	Septic tank
AOC	16-005(c)	Former structures, 40s-Line
AOC	16-005(d)	Septic tank
AOC	16-005(e)	Septic tank
AOC	16-005(g)	Former burn ground structures
AOC	16-005(h)	Septic tank
AOC	16-005(j)	Former structures, T-Site (formerly 24-001)
AOC	16-005(k)	Septic tank
AOC	16-005(l)	Grease trap
AOC	16-005(m)	Former structures, T-Site (formerly 24-001)
AOC	16-005(n)	Septic system
SWMU	16-006(a)	Septic system
SWMU	16-006(c)	Septic system
SWMU	16-006(d)	Sump, outfall, and septic system
SWMU	16-006(e)	Burn ground
SWMU	16-006(g)	V-Site: Buildings 16-100, 16-515 and associated structures (formerly 25-002)

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-006(h)	V-Site courtyard (formerly 25-002)
SWMU	16-007(a)	Machining buildings and settling ponds
SWMU	16-008(a)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-008(b)	Surface Impoundment
SWMU	16-009(a)	Burn site
SWMU	16-009(b)	Former burn area
SWMU	16-010(a)	Burn ground
SWMU	16-010(b)	Flash pad
SWMU	16-010(c)	Burn site 16-388 - RCRA Unit (active)
SWMU	16-010(d)	Burn site 16-389 - RCRA Unit (active)
SWMU	16-010(e)	HE filter vessel (active)
SWMU	16-010(f)	Burn site - RCRA Unit
SWMU	16-010(h)	Former burn ground structures
SWMU	16-010(i)	Former burn ground structures
SWMU	16-010(j)	Former burn ground structures
SWMU	16-010(k)	Former burn ground structures
SWMU	16-010(l)	Former burn ground structures
SWMU	16-010(m)	Former burn ground structures
SWMU	16-010(n)	Former burn ground structures
AOC	16-011	Incinerator
SWMU	16-013	V-Site courtyard
SWMU	16-014	Deleted SWMU: b/c Tritium Facility is not currently operational & doesn't generate waste
SWMU	16-015(a)	Men's locker room and laundry facility
SWMU	16-015(b)	Steam-washing facility
AOC	16-015(c)	Operation facility
AOC	16-015(d)	Building footprints, drainlines, and sumps
SWMU	16-016(a)	Landfill - buried metal site
SWMU	16-016(b)	Landfill
SWMU	16-016(c)	Burn ground
SWMU	16-016(d)	Surface disposal site
SWMU	16-016(e)	Surface disposal site
AOC	16-016(f)	Landfill
SWMU	16-016(g)	Surface disposal site
SWMU	16-017	Former HE machining bldg. 16-92 (Consoildated)
SWMU	16-017(a)-99	Former structures
SWMU	16-017(b)-99	Former structures
SWMU	16-017(c)-99	Former structures
SWMU	16-017(d)-99	Former structures
SWMU	16-017(e)-99	Former structures
SWMU	16-017(f)-99	Former structures
SWMU	16-017(g)-99	Former structures
SWMU	16-017(h)-99	Former structures

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-017(i)-99	Former structures
SWMU	16-017(j)-99	Former structures
SWMU	16-017(k)-99	Former structures
SWMU	16-017(l)-99	Former structures
SWMU	16-017(m)-99	Former structures
SWMU	16-017(n)-99	Former structures
SWMU	16-017(o)-99	Former structures
SWMU	16-017(p)-99	Former structures
SWMU	16-017(q)-99	Former structures
SWMU	16-017(r)-99	Former structures
SWMU	16-017(s)-99	Former structures
SWMU	16-017(t)-99	Former structures
SWMU	16-017(u)-99	Former structures
SWMU	16-017(v)-99	Former structures
SWMU	16-017(w)-99	Former structures
SWMU	16-017(x)-99	Former structures
SWMU	16-018	Material disposal area (MDA P) - currently undergoing RCRA closure
SWMU	16-019	Material disposal area (MDA R)
SWMU	16-020	Silver recovery unit
SWMU	16-021(a)	Sump and Outfall, 16-450
AOC	16-021(b)	Systematic leak
SWMU	16-021(c)	16-260 Sumps, drainlines, and outfall
AOC	16-022(a)	Underground Tank
AOC	16-022(b)	Underground Tank
AOC	16-023(b)	Incinerator
AOC	16-024(a)	Magazine
AOC	16-024(b)	Magazine
AOC	16-024(c)	Magazine
AOC	16-024(d)	Magazine
AOC	16-024(e)	Machining buildings and settling ponds
AOC	16-024(f)	Magazine
AOC	16-024(g)	Magazine
AOC	16-024(h)	Magazine
AOC	16-024(i)	Magazine
AOC	16-024(j)	Magazine
AOC	16-024(k)	Magazine
AOC	16-024(l)	Magazine
AOC	16-024(m)	Magazine
AOC	16-024(n)	Magazine
AOC	16-024(o)	Magazine
AOC	16-024(p)	Magazine
AOC	16-024(q)	Magazine

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	16-024(r)	Magazine
AOC	16-024(s)	Magazine
AOC	16-024(t)	Operation facility
AOC	16-024(u)	Magazine
AOC	16-024(v)	Magazine
SWMU	16-025(a)	Abandoned radiograhy building, 16-39
SWMU	16-025(a2)	Building footprints, drainlines, and sumps
SWMU	16-025(b)	Abandoned radiography building, 16-40
SWMU	16-025(b2)	Building footprints, drainlines, and sumps
SWMU	16-025(c2)	Abandoned building, 16-56
SWMU	16-025(d)	HE machining line buildings and associated structures
SWMU	16-025(d2)	Abandoned building, 16-480
SWMU	16-025(e)	Machining buildings and settling ponds
SWMU	16-025(f)	Machining buildings and settling ponds
SWMU	16-025(g)	HE machining line buildings and associated structures
SWMU	16-025(h)	HE machining line buildings and associated structures
SWMU	16-025(i)	HE machining line buildings and associated structures
SWMU	16-025(j)	HE machining line buildings and associated structures
SWMU	16-025(k)	20s-Line and associated structures
SWMU	16-025(l)	20s-Line and associated structures
SWMU	16-025(m)	Former structures, T-Site
SWMU	16-025(n)	Former structures, T-Site
SWMU	16-025(o)	Former structures, T-Site
SWMU	16-025(p)	Former structures, 40s-Line
SWMU	16-025(q)	Former structures, 40s-Line
SWMU	16-025(r)	Former structures, 40s-Line
SWMU	16-025(s)	Former structures, 40s-Line
SWMU	16-025(t)	Experimental casting building, associated drainlines and sumps
SWMU	16-025(u)	Former structures, 40s-Line
SWMU	16-025(v)	Former structures, 40s-Line
SWMU	16-025(w)	Abandoned building, 16-81
SWMU	16-025(x)	V-Site: Buildings 16-100, 16-515 and associated structures
SWMU	16-025(y)	Former building
SWMU	16-025(z)	Former structures
SWMU	16-026(a)	Outfall
SWMU	16-026(b)	300s-Line (west side) sumps and outfalls
SWMU	16-026(b2)	Outfalls
SWMU	16-026(c)	300s-Line (west side) sumps and outfalls
SWMU	16-026(c2)	Outfall, 16-462
SWMU	16-026(d)	300s-Line (west side) sumps and outfalls
SWMU	16-026(e)	300s-Line (west side) sumps and outfalls
SWMU	16-026(f)	Outfall
SWMU	16-026(g)	Outfall

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-026(h2)	Sump and outfall, 16-360
SWMU	16-026(i)	Outfall
SWMU	16-026(j)	Outfall, 16-226
SWMU	16-026(j2)	Outfall
SWMU	16-026(k2)	16-260 Bay 25 outfalls
SWMU	16-026(l)	Drainlines and outfall
SWMU	16-026(m)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-026(n)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-026(o)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-026(p)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-026(q)	20s-Line and associated structures
SWMU	16-026(r)	Outfall, 16-180
SWMU	16-026(s)	Outfall, 16-5
SWMU	16-026(u)	Outfall, 16-195
SWMU	16-026(v)	Sump, associated drainline, and outfall
SWMU	16-026(w)	Former structures, 40s-Line
SWMU	16-026(y)	Outfall
SWMU	16-026(z)	Outfall
AOC	16-027(a)	Transformer
AOC	16-027(b)	Transformer
AOC	16-027(c)	Transformer
AOC	16-027(d)	Transformer
SWMU	16-028(a)	South drainage channel
SWMU	16-028(b)	Industrial or sanitary wastewater treatment, 16-370
SWMU	16-028(c)	Drainlines and outfall
SWMU	16-028(d)	Outfalls
SWMU	16-028(e)	Sump and Outfall, 16-450
SWMU	16-029(a)	300s-Line (west side) sumps and outfalls
SWMU	16-029(a2)	Former building
SWMU	16-029(b)	300s-Line (west side) sumps and outfalls
SWMU	16-029(b2)	Former structures (GMX-2 HE processing building)
SWMU	16-029(c)	300s-Line (west side) sumps and outfalls
SWMU	16-029(c2)	Former structures
SWMU	16-029(d)	300s-Line (west side) sumps and outfalls
SWMU	16-029(d2)	Building footprints, drainlines, and sumps
SWMU	16-029(e)	Sump and outfall, 16-360
SWMU	16-029(e2)	Building footprints, drainlines, and sumps
SWMU	16-029(f)	Sump from building 16-345
SWMU	16-029(f2)	20s-Line and associated structures
SWMU	16-029(g)	Sump and Outfall, 16-450
SWMU	16-029(g2)	V-Site courtyard
SWMU	16-029(h)	Sump, drainlines, and outfall
SWMU	16-029(h2)	HE machining line buildings and associated structures

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-029(i)	HE sump
SWMU	16-029(j)	16-260 Bay 25 outfalls
SWMU	16-029(k)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-029(l)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-029(m)	HE machining line buildings and associated structures
SWMU	16-029(n)	HE machining line buildings and associated structures
SWMU	16-029(o)	HE machining line buildings and associated structures
SWMU	16-029(p)	HE machining line buildings and associated structures
SWMU	16-029(q)	HE machining building and associated structures
SWMU	16-029(r)	20s-Line and associated structures
SWMU	16-029(s)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-029(t)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-029(u)	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
SWMU	16-029(v)	Building footprints, drainlines, and sumps
SWMU	16-029(w)	V-Site: Buildings 16-100, 16-515 and associated structures
SWMU	16-029(x)	V-Site: Buildings 16-100, 16-515 and associated structures
SWMU	16-029(y)	Experimental casting building, associated drainlines and sumps
SWMU	16-029(z)	Former structures, 40s-Line
SWMU	16-030(a)	Outfall from 16-344, chemical storage building
SWMU	16-030(c)	16-222 outfall
AOC	16-030(d)	Outfall
AOC	16-030(g)	Outfall
SWMU	16-030(h)	Outfall
SWMU	16-031(a)	Industrial or sanitary wastewater treatment, 16-372
SWMU	16-031(b)	Industrial or sanitary wastewater treatment, 16-262
SWMU	16-031(c)	V-Site: Buildings 16-100, 16-515 and associated structures
SWMU	16-031(d)	20s-Line and associated structures
SWMU	16-031(e)	Outfall, industrial or sanitary wastewater treatment
SWMU	16-031(f)	Outfall, industrial or sanitary wastewater treatment
SWMU	16-031(h)	Industrial or sanitary wastewater treatment at P-Site
SWMU	16-032(a)	Former structures, 40s-Line
AOC	16-033(a)	Underground tank
AOC	16-033(b)	Underground tank
AOC	16-033(c)	Underground tank
AOC	16-033(d)	Tank and/or associated equipment
AOC	16-033(e)	Underground tank
AOC	16-033(f)	Underground tank
AOC	16-033(g)	Underground tank
AOC	16-033(h)	Underground tank
AOC	16-033(i)	Underground tank
AOC	16-033(j)	Underground tank
AOC	16-033(k)	Underground storage tank <100 gallons
SWMU	16-034(a)	20s-Line and associated structures

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	16-034(b)	Former structures, T-Site
SWMU	16-034(c)	Former structures, T-Site
SWMU	16-034(d)	Former structures, T-Site
SWMU	16-034(e)	Former structures, T-Site
SWMU	16-034(f)	Former structures, T-Site
SWMU	16-034(h)	Soil contamination area, 16-137
SWMU	16-034(i)	Soil contamination area
SWMU	16-034(j)	Soil contamination area
SWMU	16-034(k)	Soil contamination area
SWMU	16-034(l)	Former structures, 40s-Line
SWMU	16-034(m)	Soil contamination area
SWMU	16-034(n)	Soil contamination area
SWMU	16-034(o)	Building footprints, drainlines, and sumps
SWMU	16-034(p)	Former structures, 40s-Line
SWMU	16-035	Firing site, landfill, and soil contamination
SWMU	16-036	Firing site, landfill, and soil contamination
AOC	16-037	Aboveground Tank
AOC	C-16-001	Building
AOC	C-16-002	Building 16-262
AOC	C-16-005	Building
AOC	C-16-006	Building
AOC	C-16-008	Building
AOC	C-16-009	Building
AOC	C-16-010	Building
AOC	C-16-011	Building TA-16-132
AOC	C-16-012	Building
AOC	C-16-013	Storage area
AOC	C-16-014	Building
AOC	C-16-015	Building
AOC	C-16-016	Building
AOC	C-16-017	Building
AOC	C-16-018	Aboveground tank
AOC	C-16-019	Building
AOC	C-16-020	Building
SWMU	C-16-025	Storage building
SWMU	C-16-026	Storage building
AOC	C-16-028	Former structure
AOC	C-16-030	Former structure
AOC	C-16-031	Building
AOC	C-16-034	Aboveground tank
AOC	C-16-035	Aboveground tank
AOC	C-16-036	Septic system
AOC	C-16-041	Building

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	C-16-044	Manhole
AOC	C-16-046	Manhole
AOC	C-16-047	Transport area
AOC	C-16-049	Building
AOC	C-16-050	Building
AOC	C-16-051	Transport area
AOC	C-16-058	Transport area
AOC	C-16-060	Building
AOC	C-16-061	Building
AOC	C-16-062	Generation area
AOC	C-16-063	Generation area
AOC	C-16-064	Drum storage area
AOC	C-16-065	Drum storage area
AOC	C-16-067	Storage area
AOC	C-16-068	Building 16-522
AOC	C-16-069	Building
AOC	C-16-070	Underground tank
AOC	C-16-071	One-time spill
AOC	C-16-072	Tank
AOC	C-16-073	Underground tank
AOC	C-16-074	Storage
AOC	C-16-075	Spill location near Building 16-340
TA-18		
SWMU	18-001(a)	Industrial or sanitary wastewater treatment
SWMU	18-001(b)	Industrial or sanitary wastewater treatment
SWMU	18-001(c)	Tanks, sumps, outfalls
SWMU	18-002(a)	Firing site (inactive)
SWMU	18-002(b)	Firing site (inactive)
AOC	18-002(c)	Drop Tower
SWMU	18-003(a)	Tanks, sumps,and outfalls
SWMU	18-003(b)	Tanks, sumps,and outfalls
SWMU	18-003(c)	Septic system
SWMU	18-003(d)	Septic system
SWMU	18-003(e)	Septic system
SWMU	18-003(f)	Septic system
SWMU	18-003(g)	Septic system
SWMU	18-003(h)	Septic system
SWMU	18-004(a)	Tanks, sumps, outfalls
SWMU	18-004(b)	Tanks, sumps, outfalls
SWMU	18-005(a)	Storage area
AOC	18-006	Storage Pipe
AOC	18-008	Underground tank, TA 18-26
AOC	18-010(b)	Outfall

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	18-010(c)	Outfall
AOC	18-010(d)	Outfall
AOC	18-010(e)	Outfall
AOC	18-010(f)	Outfall
AOC	18-011	Soil containment
SWMU	18-012(a)	Outfall
SWMU	18-012(b)	Tanks, sumps, outfalls
AOC	18-012(c)	Sump and drainlines
AOC	18-013	Waste Tank
TA-19		
SWMU	19-001	Former East Gate Laboratory and septic system
SWMU	19-002	Former East Gate Laboratory and septic system
SWMU	19-003	Former East Gate Laboratory and septic system
AOC	C-19-001	Soil contamination
TA-20		
SWMU	20-001(a)	Landfill
SWMU	20-001(b)	Firing site
SWMU	20-001(c)	Landfill
SWMU	20-002(a)	Landfill
SWMU	20-002(b)	Landfill
SWMU	20-002(c)	Firing site
SWMU	20-002(d)	Firing site
AOC	20-003(b)	Firing site
AOC	20-003(c)	Firing site
AOC	20-004	Septic system
SWMU	20-005	Septic tank
AOC	C-20-001	Storage building
AOC	C-20-002	Storage building
AOC	C-20-003	Building
TA-21		
AOC	21-001	Material disposal area (MDA T)
SWMU	21-002(a)	Container storage areas located throughout TA-21
AOC	21-002(b)	Container Storage
SWMU	21-003	PCB container storage and surface disposal area
AOC	21-004(a)	Aboveground tank
SWMU	21-004(b)	Aboveground tanks and outfall area
SWMU	21-004(c)	Aboveground tanks and outfall area
SWMU	21-006(a)	Disposal pit bldg 21-2
SWMU	21-006(b)	Seepage pit
SWMU	21-006(c)	Seepage pit
SWMU	21-006(d)	Stone pit
SWMU	21-006(e)	Underground seepage pits
AOC	21-006(f)	Disposal Pit

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	21-007	Material disposal area (MDA T)
AOC	21-009	Waste treatment laboratory
SWMU	21-010(a)	Material disposal area (MDA T)
SWMU	21-010(b)	Material disposal area (MDA T)
SWMU	21-010(c)	Material disposal area (MDA T)
SWMU	21-010(d)	Material disposal area (MDA T)
SWMU	21-010(e)	Material disposal area (MDA T)
SWMU	21-010(f)	Material disposal area (MDA T)
SWMU	21-010(g)	Material disposal area (MDA T)
SWMU	21-010(h)	Material disposal area (MDA T)
SWMU	21-011(a)	Material disposal area (MDA T)
SWMU	21-011(b)	Sump
SWMU	21-011(c)	Material disposal area (MDA T)
SWMU	21-011(d)	Material disposal area (MDA T)
SWMU	21-011(e)	Material disposal area (MDA T)
SWMU	21-011(f)	Material disposal area (MDA T)
SWMU	21-011(g)	Material disposal area (MDA T)
AOC	21-011(h)	Aboveground Tank (MDA T)
SWMU	21-011(i)	Material disposal area (MDA T)
SWMU	21-011(j)	Material disposal area (MDA T)
SWMU	21-011(k)	Outfall
SWMU	21-012(b)	Dry well
SWMU	21-013(a)	Former sewage treatment plant
SWMU	21-013(b)	Material disposal area (MDA V)
SWMU	21-013(c)	Surface disposal site
SWMU	21-013(d)	Surface disposal areas
SWMU	21-013(e)	Surface disposal areas
AOC	21-013(f)	Surface disposal site and PCB container storage
AOC	21-013(g)	Surface disposal site (MDA V)
SWMU	21-014	Material disposal area (MDA A)
SWMU	21-015	Material disposal area (MDA B)
SWMU	21-016(a)	Material disposal area (MDA T)
SWMU	21-016(b)	Material disposal area (MDA T)
SWMU	21-016(c)	Material disposal area (MDA T)
SWMU	21-016(d)	Sump
SWMU	21-016(e)	Sump
SWMU	21-017(a)	Material disposal area (MDA U)
SWMU	21-017(b)	Material disposal area (MDA U)
SWMU	21-017(c)	Material disposal area (MDA U)
SWMU	21-018(a)	Material disposal area (MDA V)
SWMU	21-018(b)	Material disposal area (MDA V)
SWMU	21-021	Surface soil contamination area
SWMU	21-022(a)	Tank, sump, and outfall

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	21-022(b)	Industrial waste lines and sumps
SWMU	21-022(c)	Industrial waste lines and sumps
SWMU	21-022(d)	Industrial waste lines and sumps
SWMU	21-022(e)	Industrial waste lines and sumps
SWMU	21-022(f)	Sump and drainlines
SWMU	21-022(g)	Industrial waste lines and sumps
SWMU	21-022(h)	Drainline and outfall
SWMU	21-022(i)	Drainline and outfall
SWMU	21-022(j)	Drainline and outfall
SWMU	21-023(a)	Septic tanks and distriion lines
SWMU	21-023(b)	Septic tanks and distriion lines
SWMU	21-023(c)	Material disposal area (MDA V)
SWMU	21-023(d)	Septic tanks and distriion lines
SWMU	21-024(a)	Septic system
SWMU	21-024(b)	Septic system
SWMU	21-024(c)	Septic system
SWMU	21-024(d)	Septic system
SWMU	21-024(e)	Septic system
SWMU	21-024(f)	Septic system
SWMU	21-024(g)	Septic system
SWMU	21-024(h)	Septic system
SWMU	21-024(i)	Septic system
SWMU	21-024(j)	Septic system
SWMU	21-024(k)	Septic system
SWMU	21-024(l)	Tank, sump, and outfall
SWMU	21-024(n)	Drainline
SWMU	21-024(o)	Drainline
SWMU	21-026(a)	Former sewage treatment plant
SWMU	21-026(b)	Former sewage treatment plant
AOC	21-026(c)	Wastewater treatment facility
AOC	21-026(d)	Outfall
SWMU	21-027(a)	Industrial or sanitary wastewater treatment
SWMU	21-027(c)	Industrial or sanitary wastewater treatment
SWMU	21-027(d)	Aboveground storage tank and outfall
AOC	21-028(a)	Container storage (MDA T)
AOC	21-028(c)	Container storage building 21-3
AOC	21-028(d)	Container storage
SWMU	21-029	Soil contamination area
SWMU	21-030	Sump
SWMU	C-21-001	One-time spill
AOC	C-21-005	One-time spill
AOC	C-21-006	Non-intentional release area Building 21-2
AOC	C-21-007	Non-intentional release area

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	C-21-009	One-time spill (MDA T)
AOC	C-21-012	One-time spill (MDA T)
AOC	C-21-027	Machinery
AOC	C-21-033	One-time spill
AOC	C-21-034	Tank
AOC	C-21-035	Aboveground tank
AOC	C-21-036	Aboveground tank
AOC	C-21-037	Aboveground tank
TA-22		
SWMU	22-010(a)	Septic system
SWMU	22-010(b)	Septic system
SWMU	22-011	Disposal pit
SWMU	22-012	Septic system
SWMU	22-014(a)	Industrial or sanitary wastewater treatment
SWMU	22-014(b)	Sump
SWMU	22-015(a)	Drainlines and dry wells
SWMU	22-015(b)	Sump and outfall
SWMU	22-015(c)	Outfall
SWMU	22-015(d)	Septic system
SWMU	22-015(e)	Septic system
SWMU	22-016	Septic system
TA-26		
SWMU	26-001	Surface disposal site
SWMU	26-002(a)	Former acid sump system
SWMU	26-002(b)	Former drainage system
SWMU	26-003	Septic tank
TA-27		
SWMU	27-002	Firing sites (abandoned)
SWMU	27-003	Bazooka impact area
TA-31		
SWMU	31-001	Outfall from sanitary septic system
TA-32		
SWMU	32-001	Incinerator (former location)
SWMU	32-002(a)	Septic tank (former location); drainlines
SWMU	32-002(b)	Septic system
SWMU	32-003	Transformer site (former location)-New SWMU
SWMU	32-004	Drainline and outfall_New SWMU
TA-33		
SWMU	33-001(a)	Material disposal area (MDA E)
SWMU	33-001(b)	Material disposal area (MDA E)
SWMU	33-001(c)	Material disposal area (MDA E)
SWMU	33-001(d)	Material disposal area (MDA E)
SWMU	33-001(e)	Material disposal area (MDA E)

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	33-002(a)	Material disposal area (MDA K)
SWMU	33-002(b)	Material disposal area (MDA K)
SWMU	33-002(c)	Material disposal area (MDA K)
SWMU	33-002(d)	Material disposal area (MDA K)
SWMU	33-002(e)	Material disposal area (MDA K)
SWMU	33-003(a)	Material Disposal Area (MDA D)
SWMU	33-003(b)	Material Disposal Area (MDA D)
SWMU	33-004(a)	Firing site - Main Site
SWMU	33-004(b)	Septic system
SWMU	33-004(c)	Septic system
SWMU	33-004(d)	Septic system
SWMU	33-004(g)	Firing site - Area 6
SWMU	33-004(h)	Firing site - Main Site
SWMU	33-004(i)	Firing site - Main Site
SWMU	33-004(j)	Firing site - South Site
SWMU	33-004(k)	Outfall
SWMU	33-004(m)	Septic system
SWMU	33-005(a)	Former structures - Main Site
SWMU	33-005(b)	Former structures - Main Site
SWMU	33-005(c)	Former structures - Main Site
SWMU	33-006(a)	Firing site - South Site
SWMU	33-006(b)	Firing site - East Site
SWMU	33-007(a)	Firing site - East Site
SWMU	33-007(b)	Firing site - South Site
SWMU	33-007(c)	Firing site - Area 6
SWMU	33-008(a)	Firing site - South Site
SWMU	33-008(b)	Firing site - East Site
SWMU	33-008(c)	Landfill-New SWMU
SWMU	33-009	Surface disposal - PCB only site
SWMU	33-010(a)	Firing site - East Site
SWMU	33-010(b)	Surface disposal
SWMU	33-010(c)	Firing site - South Site
SWMU	33-010(d)	Surface disposal
SWMU	33-010(f)	Material disposal area (MDA K)
SWMU	33-010(g)	Surface disposal
SWMU	33-010(h)	Firing site - South Site
SWMU	33-011(a)	Former structures - Main Site
AOC	33-011(b)	Storage Area
SWMU	33-011(c)	Firing site - South Site
SWMU	33-011(d)	Firing site - Main Site
SWMU	33-011(e)	Drum storage
SWMU	33-012(a)	Drum storage - PCB only site
SWMU	33-013	Storage area

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	33-014	Firing site - South Site
SWMU	33-015	Firing site - Main Site
SWMU	33-016	Sump
SWMU	33-017	Firing site - Main Site
AOC	C-33-001	Transformer
AOC	C-33-002	Transformer
AOC	C-33-003	Soil contamination area
TA-35		
SWMU	35-002	Material disposal area (MDA X)
SWMU	35-003(a)	Wastewater treatment plant
SWMU	35-003(b)	Wastewater treatment plant
SWMU	35-003(c)	Wastewater treatment plant
SWMU	35-003(d)	Wastewater treatment plant - Pratt Canyon
SWMU	35-003(e)	Wastewater treatment plant
SWMU	35-003(f)	Wastewater treatment plant
SWMU	35-003(g)	Wastewater treatment plant
SWMU	35-003(h)	Wastewater treatment plant
SWMU	35-003(j)	Former structures
SWMU	35-003(k)	Former structures
SWMU	35-003(l)	Wastewater treatment plant - Pratt Canyon
SWMU	35-003(m)	Wastewater treatment plant
SWMU	35-003(n)	Wastewater treatment plant
SWMU	35-003(o)	Wastewater treatment plant
SWMU	35-003(p)	Wastewater treatment plant
SWMU	35-003(q)	Wastewater treatment plant - Pratt Canyon
AOC	35-003(r)	Outfall
AOC	35-003(misc)	Ind. Waste lines
SWMU	35-004(a)	Storage areas
SWMU	35-004(b)	Storage areas
SWMU	35-004(g)	Septic system
SWMU	35-004(h)	Container storage area
AOC	35-004(m)	Container storage area
SWMU	35-008	Surface disposal
SWMU	35-009(a)	Septic system
SWMU	35-009(b)	Septic system
SWMU	35-009(c)	Septic system
SWMU	35-009(d)	Septic system
SWMU	35-009(e)	Septic system
SWMU	35-010(a)	Former surface impoundment
SWMU	35-010(b)	Former surface impoundment
SWMU	35-010(c)	Former surface impoundment
SWMU	35-010(d)	Former surface impoundment
AOC	35-010(e)	Discharge from sand filter

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	35-010(misc)	unknown
SWMU	35-013(a)	Sump
SWMU	35-013(b)	Sump
SWMU	35-013(c)	Sump
SWMU	35-014(a)	Operational release
SWMU	35-014(b)	Former structures
AOC	35-014(d)	Operational release
SWMU	35-014(e)	Former Oil Spill
AOC	35-014(e2)	Oil spill
AOC	35-014(f)	Soil contamination
SWMU	35-014(g)	Soil contamination area
AOC	35-014(g2)	Soil contamination
AOC	35-014(g3)	Soil contamination
SWMU	35-015(a)	Soil contamination
SWMU	35-015(b)	Former structures
SWMU	35-016(a)	Drains and outfalls
AOC	35-016(b)	Outfall
SWMU	35-016(c)	Drainlines and outfall
SWMU	35-016(d)	Drainlines and outfall
AOC	35-016(e)	Outfall
AOC	35-016(f)	Storm drain
AOC	35-016(g)	Outfall
AOC	35-016(h)	Storm drain
SWMU	35-016(i)	Drainlines and outfalls
AOC	35-016(j)	Storm drain
SWMU	35-016(k)	Drainlines and outfalls
AOC	35-016(l)	Storm drain
SWMU	35-016(m)	Drains and outfalls
AOC	35-016(n)	Storm drain
SWMU	35-016(o)	Drains and outfalls
SWMU	35-016(p)	Outfall
SWMU	35-016(q)	Drains and outfalls
SWMU	35-018(a)	Transformer
AOC	C-35-007	Soil contamination
TA-36		
SWMU	36-001	Material disposal area (MDA AA)
SWMU	36-002	Sump
SWMU	36-003(a)	Septic system
SWMU	36-003(b)	Septic system, I-J Site
AOC	36-004(a)	Former firing site
AOC	36-004(b)	Firing site (active)
AOC	36-004(c)	Firing site - open detonation (active)
SWMU	36-004(d)	Firing site (Lower Slobbovia, skunk works, burn pit) (active)

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	36-004(e)	I-J Firing site (active)
SWMU	36-005	Surface disposal site
SWMU	36-008	New SWMU-Surface disposal Area/Waste Explosive Treatment
AOC	36-009	Open detonation area (previously 0-011(g))
AOC	C-36-001	Containment vessel
SWMU	C-36-003	Storm drainages
AOC	C-36-006(e)	I-J Firing Site, projectile test area
TA-39		
SWMU	39-001(a)	Landfill
SWMU	39-001(b)	Material disposal area (MDA Y)
AOC	39-002(a)	Storage area
AOC	39-002(b)	Storage area
AOC	39-002(c)	Storage area
AOC	39-002(d)	Storage area
AOC	39-002(e)	Storage area
AOC	39-002(f)	Storage area
SWMU	39-004(a)	Firing site
SWMU	39-004(b)	Firing site
SWMU	39-004(c)	Firing site TA-39-6 (open detonation) - RCRA Unit (active)
SWMU	39-004(d)	Firing site TA-39-57 (open detonation) - RCRA Unit (active)
SWMU	39-004(e)	Firing site (active)
SWMU	39-005	Seepage pit
SWMU	39-006(a)	Septic system
SWMU	39-007(a)	Storage area
AOC	39-007(d)	Storage area
SWMU	39-008	Firing range (inactive)
SWMU	39-010	Excavated soil dump-New SWMU
TA-40		
SWMU	40-001(b)	Septic system
SWMU	40-001(c)	Septic system
SWMU	40-003(a)	Scrap burn site - completed RCRA closure
AOC	40-003(b)	Burning area/open detonation
SWMU	40-004	Operational release
SWMU	40-005	Sump
SWMU	40-006(a)	Firing site (active)
SWMU	40-006(b)	Firing site (active)
SWMU	40-006(c)	Firing site (active)
AOC	40-007(a)	Storage area
AOC	40-007(b)	Storage area
AOC	40-007(c)	Storage area
AOC	40-007(d)	Storage area
AOC	40-007(e)	Storage area
SWMU	40-009	Landfill

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	40-010	Surface disposal site
	TA-41	
SWMU	41-001	Septic system
SWMU	41-002(a)	TA-41 Sewage Treatment Plant
SWMU	41-002(b)	TA-41 Sewage Treatment Plant
SWMU	41-002(c)	TA-41 Sewage Treatment Plant
AOC	41-003	Sump
AOC	C-41-004	Storm drains
	TA-42	
SWMU	42-001(a)	TA-42 incinerator complex
SWMU	42-001(b)	TA-42 incinerator complex
SWMU	42-001(c)	TA-42 incinerator complex
AOC	42-002(a)	Former structures
SWMU	42-002(b)	TA-42 incinerator complex
SWMU	42-003	TA-42 incinerator complex
	TA-43	
SWMU	43-001(a)	Waste lines (pre-1981)
SWMU	43-001(a2)	Waste lines (post-1981)
SWMU	43-001(b)	Waste lines
AOC	43-001(b2)	Outfall
SWMU	43-002	Incinerator
AOC	C-43-001	Outfall
	TA-45	
SWMU	45-001	Wastewater treatment plant - TA-45
SWMU	45-002	Wastewater treatment plant - TA-45
SWMU	45-003	Wastewater treatment plant - TA-45
SWMU	45-004	Wastewater treatment plant - TA-45
AOC	C-45-001	Parking lot of former treatment plant
	TA-46	
SWMU	46-002	Surface impoundment
SWMU	46-003(a)	Septic system
SWMU	46-003(b)	Septic system
SWMU	46-003(c)	Septic system
SWMU	46-003(d)	Septic system
SWMU	46-003(e)	Septic system
SWMU	46-003(f)	Septic system
SWMU	46-003(g)	Septic system
SWMU	46-003(h)	Operational release
SWMU	46-004(a)	Waste line
SWMU	46-004(a2)	Outfall
SWMU	46-004(b)	Operational release
SWMU	46-004(b2)	Operational release
SWMU	46-004(c)	Sump

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	46-004(c2)	Outfall
SWMU	46-004(d)	Dry wells
SWMU	46-004(d2)	Stack emissions/outfalls
SWMU	46-004(e)	Dry wells
AOC	46-004(e2)	Outfall
SWMU	46-004(f)	Outfall
AOC	46-004(f2)	Outfall
SWMU	46-004(g)	Stack emissions/outfalls
SWMU	46-004(h)	Stack emissions/outfalls
SWMU	46-004(m)	Outfall
SWMU	46-004(p)	Sump
SWMU	46-004(q)	Outfall
SWMU	46-004(r)	Outfall
SWMU	46-004(s)	Outfall
SWMU	46-004(t)	Outfall
SWMU	46-004(u)	Outfall
SWMU	46-004(v)	Outfall
SWMU	46-004(w)	Outfall
SWMU	46-004(x)	Outfall
SWMU	46-004(y)	Outfall
SWMU	46-004(z)	Outfall
SWMU	46-005	Surface impoundment
SWMU	46-006(a)	Operational release
SWMU	46-006(b)	Operational release
SWMU	46-006(c)	Operational release
SWMU	46-006(d)	Operational release
SWMU	46-006(f)	Storage area
SWMU	46-006(g)	Operational release
SWMU	46-007	Operational release
SWMU	46-008(a)	Storage area
SWMU	46-008(b)	Storage area
SWMU	46-008(d)	Storage area
SWMU	46-008(e)	Storage area
SWMU	46-008(f)	Storage area
SWMU	46-008(g)	Storage area
SWMU	46-009(a)	Surface disposal
SWMU	46-009(b)	Surface disposal
SWMU	46-010(d)	Operational release SAA
AOC	C-46-001	One-time spill
AOC	C-46-002	Stack emmisions
AOC	C-46-003	Stack emmisions
TA-48		
AOC	48-001	Air exhaust system

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	48-002(a)	Container storage area
SWMU	48-002(b)	Container storage area
AOC	48-002(e)	Container storage
SWMU	48-003	Septic system
SWMU	48-004(a)	Sumps and tanks
SWMU	48-004(b)	Sumps and tanks
SWMU	48-004(c)	Sumps and tanks
SWMU	48-005	Waste lines
SWMU	48-007(a)	Drainlines and outfalls
SWMU	48-007(b)	Drains and outfalls
SWMU	48-007(c)	Drains and outfalls
SWMU	48-007(d)	Drainlines and outfalls
SWMU	48-007(f)	Drains and outfalls
SWMU	48-010	Drainlines and outfalls
AOC	48-011	Disposal shaft
SWMU	48-012	Soil Contamination
TA-49		
SWMU	49-001(a)	Material disposal area (MDA AB)
SWMU	49-001(b)	Material disposal area (MDA AB)
SWMU	49-001(c)	Material disposal area (MDA AB)
SWMU	49-001(d)	Material disposal area (MDA AB)
SWMU	49-001(e)	Material disposal area (MDA AB)
SWMU	49-001(f)	Material disposal area (MDA AB)
SWMU	49-001(g)	Material disposal area (MDA AB)
SWMU	49-001(misc)	Material disposal area (MDA AB)
AOC	49-002	Operational facility (Area 10 underground chamber)
SWMU	49-003	Leach field (Area 11 rad/chem and small shot area)
SWMU	49-004	Burn site and landfill (Area 6)
SWMU	49-005(a)	Landfill (east of Area 10)
AOC	49-005(b)	Landfill - Area 5
SWMU	49-006	Sump (Area 5)
AOC	49-008(a)	Soil contamination (Area 5)
AOC	49-008(b)	Soil contamination (Area 6)
AOC	49-008(c)	Soil contamination (Area 11)
AOC	49-008(d)	Firing sites (Bottle House area) soil contamination and underground chamber (inactive)
TA-50		
SWMU	50-001(a)	Waste treatment facility TA-50-1 - RCRA Unit (active)
AOC	50-001(b)	Waste lines and manholes
SWMU	50-002(a)	Underground tanks
SWMU	50-002(b)	Vaulted underground tanks for TA-55 wastes
SWMU	50-002(c)	Vaulted underground tanks for TA-55 wastes
AOC	50-002(d)	Underground tank

Table P-1

SWMUs and AOCs Requiring Corrective Action

AOC	50-003(a)	Container storage area
SWMU	50-004(a)	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
SWMU	50-004(b)	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
SWMU	50-004(c)	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
SWMU	50-006(a)	Operational release
SWMU	50-006(c)	Operational release
SWMU	50-006(d)	Effluent discharge
AOC	50-007	Incinerator
AOC	50-008	Reduction site
SWMU	50-009	Material disposal area (MDA C)
AOC	50-010	Decontamination facility
SWMU	50-011(a)	Septic system
AOC	50-011(b)	Lift stations
SWMU	50-011(misc)	Septic System
AOC	C-50-001	Transformer
	TA-51	
AOC	51-001	Septic system
AOC	C-51-001	Storage area
AOC	C-51-002	HE Storage Magazines (formerly 18-005(a,b))
	TA-52	
SWMU	52-001(d)	UHTREX equipment
SWMU	52-002(a)	Septic system
AOC	52-002(g)	Septic system
	TA-53	
SWMU	53-001(a)	Storage area - PCB only site
SWMU	53-001(b)	Storage area
SWMU	53-002(a)	Former surface impoundment
SWMU	53-002(b)	Former surface impoundment
SWMU	53-005	Disposal pit
SWMU	53-006(b)	Underground tank
SWMU	53-006(c)	Underground tank
SWMU	53-006(d)	Underground tank
SWMU	53-006(e)	Underground tank
SWMU	53-006(f)	Underground tank
SWMU	53-007(a)	Aboveground neutralizer tank
AOC	53-008	Storage area, Boneyard
AOC	53-009	Aboveground tanks (3)
AOC	53-010	Container storage
AOC	53-012(e)	Outfall
SWMU	53-013	Lead Shot Site I_New SWMU
SWMU	53-014	Lead Shot Site II_New SWMU

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	53-015	Radioactive Liquid Waste Treatment System_New SWMU
	TA-54	
SWMU	54-001(a)	Storage area
AOC	54-001(b)	Storage area
AOC	54-001(d)	Storage area
AOC	54-001(e)	Storage area
AOC	54-002	Storage area (gas cylinder storage area)
SWMU	54-004	Material disposal area (MDA H) (except shaft 9)
SWMU	54-005	Material disposal area (MDA J) (Pits 1-5, Shafts 1-4)
SWMU	54-006	Material disposal area (MDA L) (all subsurface units such as Pit A, SI B,C,D, Shafts 1-28, 29-34)
SWMU	54-007(a)	Septic system
AOC	54-007(d)	Septic system
SWMU	54-007(misc)	Septic system
AOC	54-009	Aboveground tanks (treatment tanks)
AOC	54-012(a)	Former Reduction site (drum compactor)
SWMU	54-012(b)	Reduction site
SWMU	54-013(b)	Material disposal area (MDA G) subsurface waste management units
AOC	54-014(a)	Material disposal area (MDA L) storage shafts (Pb stringer shafts)
SWMU	54-014(b)	Material disposal area (MDA G) subsurface waste management units
SWMU	54-014(c)	Material disposal area (MDA G) subsurface waste management units
SWMU	54-014(d)	Material disposal area (MDA G) subsurface waste management units
SWMU	54-014(misc)	unknown
AOC	54-015(a)	Storage area (surface corrosive inhibitor)
AOC	54-015(b)	Pit 39- LLW disposal area (former TRU surface storage)
AOC	54-015(c)	Storage area, TRU Pad 1
AOC	54-015(d)	Storage area, TRU Pad 2
AOC	54-015(e)	Storage area, TRU Pad 3
AOC	54-015(f)	Storage area, TRU Pad 4
AOC	54-015(j)	Storage area (Dome #49, mixed waste sludge)
SWMU	54-015(k)	Material disposal area (MDA G) subsurface waste management units
AOC	54-016(b)	Sump
SWMU	54-017	Material disposal area (MDA G) subsurface waste management units
SWMU	54-017(misc)	Uknown
SWMU	54-018	Material disposal area (MDA G) subsurface waste management units
SWMU	54-019	Material disposal area (MDA G) subsurface waste management units
SWMU	54-019(misc)	Uknown
SWMU	54-020	Material disposal area (MDA G) subsurface waste management units

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	54-020(misc)	Uknown
	TA-55	
SWMU	55-008	Sumps and tanks
	TA-57	
AOC	57-001(b)	Settling ponds
AOC	57-001(c)	Settling pond
AOC	57-002	Sludge pit
AOC	57-004(a)	Surface impoundment
AOC	57-004(b)	Surface impoundment
AOC	57-006	Drum and contents, Fenton Hill (removed)
AOC	57-007	Leach field
	TA-59	
AOC	59-004	Outfall
AOC	C-59-001	PCB containing capacitors & transformer
	TA-60	
SWMU	60-002	Storage area
AOC	60-004(b)	Storage area
AOC	60-004(c)	Storage area
AOC	60-004(d)	Storage area
AOC	60-004(e)	Storage area
AOC	60-004(f)	Storage area
SWMU	60-005(a)	Surface impoundment -formerly SWMU 03-029(a)
SWMU	60-006(a)	Septic tank and seepage pit
SWMU	60-007(a)	Systematic or intent. prod. release
SWMU	60-007(b)	Systematic or intent. prod. release
	TA-61	
SWMU	61-002	Transformer storage area - PCB only site
SWMU	61-005	Landfill (Los Alamos municipal)
SWMU	61-006	Waste oil tank
SWMU	61-007	Transformer site - systematic leak - PCB only site
AOC	C-61-002	Subsurface contamination
	TA-62	
SWMU	63-001(a)	Septic system
SWMU	63-001(b)	Septic system
AOC	63-002	Container storage area
	TA-69	
SWMU	69-001	Incinerator and associated equipment
	TA-72	
AOC	72-001	Firing range
	TA-73	
SWMU	73-001(a)	Former landfill
SWMU	73-001(b)	Former landfill
SWMU	73-001(c)	Former landfill

Table P-1

SWMUs and AOCs Requiring Corrective Action

SWMU	73-001(d)	Former landfill
SWMU	73-002	Miscellaneous airport structures
AOC	73-003	Steam cleaning plant
SWMU	73-004(a)	Miscellaneous airport structures
SWMU	73-004(b)	Miscellaneous airport structures
SWMU	73-004(c)	Septic tank
SWMU	73-004(d)	Former landfill
SWMU	73-006	Miscellaneous airport structures
SWMU	73-007	Septic Tank and Drainlines-New SWMU

Table P-2

SWMUs and AOCs
Corrective Action Complete With Controls

(At the time of permit issuance (XXXXX), this table has no entries.)

Table P-2

SWMUs and AOCs
Corrective Action Complete With Controls

Unit #	Unit Type	Date Corrective Action Completed	SWMU/AOC
+			

Table P-2

SWMUs and AOCs
Corrective Action Complete With Controls

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

Unit #	Unit Description	Date Corrective Action Completed	SWMU/AOC
	TA-0		
00-003	Western Steam Plant	9/5/2003	SWMU
00-004	Container Storage, 6th street warehouses, C27	2/23/2006	AOC
00-005	Landfill	12/23/1998	SWMU
00-008	Surface disposal site	1/26/2005	AOC
00-010(a)	Surface disposal site	2/23/2006	AOC
00-010(b)	Surface disposal site, 6th street warehouses	2/23/2006	AOC
00-012	Western Steam Plant	9/5/2003	SWMU
00-016	Former small-arms Firing Range	11/9/2001	SWMU
00-024	Cistern	01/26/05	AOC
00-025	Landfill	01/26/05	AOC
00-026	Landfill	01/26/05	AOC
00-028(a)	Effluent discharge, golf course	9/5/2003	SWMU
00-028(b)	Effluent discharge, golf course	9/5/2003	SWMU
00-029(a)	Transformer	2/23/2006	AOC
00-029(b)	Transformer	2/23/2006	AOC
00-029(c)	Transformer	2/23/2006	AOC
00-030(c)	Septic system	1/26/2005	AOC
00-030(i)	Septic system		AOC
00-030(q)	Septic system	1/26/2005	AOC
00-032	Soil contamination beneath former motorpool (UST)	1/26/2005	AOC
00-035(a)	Surface disposal	1/26/2005	AOC
00-040	Underground storage tank (new AOC)	1/26/2005	AOC
C-00-036(a)	Borrow pit 1, Bandelier NM	1/26/2005	AOC
C-00-036(b)	Borrow pit 2, Bandelier NM	1/26/2005	AOC
C-00-036(c)	Borrow pit 3, Bandelier NM	1/26/2005	AOC
C-00-036(d)	Borrow pit 4, Bandelier NM	1/26/2005	AOC
	TA-1		
01-001(h)	Septic Tank	12/23/1998	SWMU
01-001(i)	Septic Tank	12/23/1998	SWMU
01-001(j)	Septic Tank	12/23/1998	SWMU
01-001(k)	Septic Tank	12/23/1998	SWMU
01-001(l)	Septic Tank	12/23/1998	SWMU
01-001(m)	Septic Tank 275	9/5/2003	SWMU
01-001(n)	Septic Tank	12/23/1998	SWMU
01-001(p)	Septic sytem, C23	1/26/2005	AOC
01-001(q)	Septic sytem	1/26/2005	AOC
01-001(r)	Septic sytem	1/26/2005	AOC
01-001(v)	Septic sytem	1/26/2005	AOC
01-001(w)	Septic sytem	1/26/2005	AOC
01-004(a)	Incinerator	1/26/2005	AOC
01-004(b)	Incinerator	1/26/2005	AOC
01-005	Incinerator	1/26/2005	AOC
01-006(f)	Drainlines and outfall	1/26/2005	AOC
01-006(i)	Drainlines and outfall	1/26/2005	AOC

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

01-006(j)	Drainlines and outfall	1/26/2005	AOC
01-006(k)	Drainlines and outfall	1/26/2005	AOC
01-006(l)	Drainlines and outfall	1/26/2005	AOC
01-006(m)	Drainlines and outfall	1/26/2005	AOC
01-006(p)	Drainlines and outfall	1/26/2005	AOC
01-006(q)	Drainlines and outfall	1/26/2005	AOC
01-006(r)	Drainlines and outfall	1/26/2005	AOC
01-006(s)	Drainlines and outfall	1/26/2005	AOC
01-006(t)	Drainlines and outfall	1/26/2005	AOC
01-007(f)	Soil contamination area	1/26/2005	AOC
01-007(g)	Soil contamination area	1/26/2005	AOC
01-007(h)	Soil contamination area	1/26/2005	AOC
01-007(i)	Soil contamination area	1/26/2005	AOC
01-007(m)	Soil contamination area	1/26/2005	AOC
01-007(n)	Soil contamination area	1/26/2005	AOC
01-007(o)	Soil contamination area	1/26/2005	AOC
01-007(p)	Soil contamination area	1/26/2005	AOC
TA-2			
02-001	Open burning ground	1/26/2005	AOC
02-002	Storage area, PCB site	1/26/2005	AOC
02-008(b)	Inactive Outfall	11/9/2001	SWMU
02-013	Storage area	1/26/2005	AOC
C-02-001	Metal nugget pile	1/26/2005	AOC
TA-3			
03-001(a)	Less than 90-day Storage	12/23/1998	SWMU
03-001(b)	Satellite Accumulation Area	12/23/1998	SWMU
03-001(c)	Less than 90-day Storage	12/23/1998	SWMU
03-001(d)	Satellite Accumulation Area	1/26/2005	AOC
03-001(f)	Less-than-90-day storage	1/26/2005	AOC
03-001(g)	Satellite accumulation area	1/26/2005	AOC
03-001 (h)	Satellite accumulation area	1/26/2005	AOC
03-001(i)	Satellite accumulation area	10/13/2006	AOC
03-001 (j)	Satellite Accumulation Area	1/26/2005	AOC
03-001(l)	Less-than-90-day storage	1/26/2005	AOC
03-001(m)	Satellite Accumulation Area	1/26/2005	AOC
03-001(n)	Satellite Accumulation Area	1/26/2005	AOC
03-001(o)	Satellite Accumulation Area	1/26/2005	AOC
03-001(p)	Satellite Accumulation Area	1/26/2005	AOC
03-001(q)	Satellite Accumulation Area	1/26/2005	AOC
03-001(r)	Satellite Accumulation Area	1/26/2005	AOC
03-001(s)	Satellite Accumulation Area	1/26/2005	AOC
03-001(t)	Satellite Accumulation Area	1/26/2005	AOC
03-001(u)	Satellite Accumulation Area	1/26/2005	AOC
03-001(v)	Satellite Accumulation Area	1/26/2005	AOC
03-001(w)	Satellite Accumulation Area	1/26/2005	AOC
03-001(x)	Satellite Accumulation Area	1/26/2005	AOC
03-001(y)	Satellite Accumulation Area	1/26/2005	AOC
03-002(a)	Less than 90 day Storage	5/2/2001	SWMU

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

03-002(b)	Satellite Accumulation Area	12/23/1998	SWMU
03-002(d)	Former storage Area	5/2/2001	SWMU
03-003(m)	Storage area - capacitor banks, PCB site	1/26/2005	AOC
03-004(a)	Container storage	1/26/2005	AOC
03-004(b)	Container storage	1/26/2005	AOC
03-004(e)	Storage area	1/26/2005	AOC
03-004(f)	Storage area	1/26/2005	AOC
03-005	Renumbered to 60-0049a-f)	1/26/2005	AOC
03-006	Burn Site (duplicate of 61-003)	1/26/2005	AOC
03-008(b)	Firing site	1/26/2005	AOC
03-009(b)	Surface Disposal	12/23/1998	SWMU
03-009(c)	Construction Debris Area	5/2/2001	SWMU
03-009(d)	Surface Disposal	4/22/2007	SWMU
03-009(e)	Surface Disposal Area	12/23/1998	SWMU
03-009(f)	Surface Disposal	12/23/1998	SWMU
03-009(g)	Soil Fill Area	5/2/2001	SWMU
03-009(h)	Surface Disposal Area	12/23/1998	SWMU
03-010(b)	Operational release	1/26/2005	AOC
03-010(c)	Operational release	1/26/2005	AOC
03-010(d)	Operational release	1/26/2005	AOC
03-012(a)	Controlled Operational Release	12/23/1998	SWMU
03-013(c)	Operational release	1/26/2005	AOC
03-013(d)	Operational release	1/26/2005	AOC
03-013(e)	Operational release	1/26/2005	AOC
03-013(f)	Operational release	1/26/2005	AOC
03-013(g)	Operational release	1/26/2005	AOC
03-013(h)	Operational release	1/26/2005	AOC
03-016(a)	Septic system	1/26/2005	AOC
03-016(b)	Septic system	1/26/2005	AOC
03-016(c)	Septic system	1/26/2005	AOC
03-016(d)	Septic system	1/26/2005	AOC
03-016(e)	Septic system	1/26/2005	AOC
03-016(f)	Septic system	1/26/2005	AOC
03-018	Septic System	12/23/1998	SWMU
03-019	Septic Tank	5/2/2001	SWMU
03-020(a)	Disposal pit	12/23/1998	SWMU
03-020(b)	Surface disposal site	1/26/2005	AOC
03-023	Sump	1/26/2005	AOC
03-024	Tank and Associated Equipment	12/8/1997	SWMU
03-025(a)	Oil Trap Sump	5/2/2001	SWMU
03-026(b)	Active Sumps	5/2/2001	SWMU
03-030	Surface impoundment	1/26/2005	AOC
03-032	Tank and Associated Equipment	5/2/2001	SWMU
03-035(a)	Underground Storage Tank	12/23/1998	SWMU
03-035(b)	Underground Storage Tank	12/23/1998	SWMU
03-036(e)	Aboveground tanks	1/26/2005	AOC
03-036(f)	Aboveground tanks	1/26/2005	AOC
03-036(g)	Aboveground tanks	1/26/2005	AOC
03-036(h)	Aboveground tanks	1/26/2005	AOC

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

03-036(i)	Aboveground tanks	1/26/2005	AOC
03-036(j)	Aboveground tanks	1/26/2005	AOC
03-038(e)	Waste lines	1/26/2005	AOC
03-039(a)	Silver Recovery unit	12/23/1998	SWMU
03-039(b)	Silver recovery unit	1/26/2005	AOC
03-039(c)	Silver recovery unit	1/26/2005	AOC
03-039(d)	Silver recovery unit	1/26/2005	AOC
03-039(e)	Silver recovery unit	1/26/2005	AOC
03-040(a)	Storage area	1/26/2005	AOC
03-040(b)	Storage area	1/26/2005	AOC
03-043(e)	Underground Storage Tan	5/2/2001	SWMU
03-043(i)	Aboveground tank	1/26/2005	AOC
03-044(a)	Container Storage Area	5/2/2001	SWMU
03-044(b)	Container storage	1/26/2005	AOC
03-045(d)	Aboveground Storage tank	12/8/1997	SWMU
03-045(i)	Outfall	5/2/2001	SWMU
03-047(a)	Storage area	1/26/2005	AOC
03-047(b)	Storage area	1/26/2005	AOC
03-047(c)	Drum storage	1/26/2005	AOC
03-047(e)	Storage area	1/26/2005	AOC
03-047(f)	Storage area	1/26/2005	AOC
03-047(h)	Storage area	1/26/2005	AOC
03-047(i)	Satellite accumulation area	1/26/2005	AOC
03-047(j)	Drum storage	1/26/2005	AOC
03-047(k)	Drum storage	1/26/2005	AOC
03-048	Satellite accumulation area	1/26/2005	AOC
03-049(c)	Outfall	5/2/2001	SWMU
03-049(d)	Outfall	5/2/2001	SWMU
03-050(b)	Exhaust emissions, off-gas scrubber of HEPA filter system	1/26/2005	AOC
03-050(c)	Exhaust emissions, off-gas scrubber of HEPA filter system	1/26/2005	AOC
03-050(e)	Inactive Filter Unit	5/2/2001	SWMU
03-051(d)	Soil contamination-oil from leaking compressor	1/26/2005	AOC
03-052(c)	One time Release	5/2/2001	AOC
03-052(d)	Storm drainage - non-PCB transformers/capacitors, PCB site	6/26/2003	AOC
03-055(b)	Outfall	1/26/2005	AOC
03-055(d)	Active Storm Drain	5/2/2001	SWMU
03-056(b)	Container storage area, PCB site	6/26/2003	AOC
03-056(e)	Satellite accumulation area	1/26/2005	AOC
03-056(f)	Drum storage	1/26/2005	AOC
03-056(g)	Satellite accumulation area	1/26/2005	AOC
03-056(i)	Drum storage	1/26/2005	AOC
03-056(j)	Storage area	1/26/2005	AOC
03-056(m)	Inactive Drum Storage Area	5/2/2001	SWMU
03-056(n)	Container Storage Area	5/2/2001	SWMU
03-057	Sump/grease trap	1/26/2005	AOC
03-058	Container Storage	1/26/2005	AOC
C-03-001	Gas trap	1/26/2005	AOC
C-03-002	One-time spill - leak from asphalt machine	1/26/2005	AOC
C-03-003	One time spill - stained asphalt	1/26/2005	AOC

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

C-03-004	Miscellaneous debris	1/26/2005	AOC
C-03-005	Oil spill	1/26/2005	AOC
C-03-007	Storage area	1/26/2005	AOC
C-03-008	Storage area/rad contaminated	1/26/2005	AOC
C-03-009	Storage area	1/26/2005	AOC
C-03-010	Outfall	1/26/2005	AOC
C-03-011	Waste oil tank	1/26/2005	AOC
C-03-012	Satellite accumulation area	1/26/2005	AOC
C-03-015	Underground storage tank	1/26/2005	AOC
C-03-017	Underground storage tank	1/26/2005	AOC
C-03-018	Underground storage tank	1/26/2005	AOC
C-03-019	Underground storage tank	1/26/2005	AOC
C-03-020	Storage tanks	1/26/2005	AOC
C-03-021	Underground storage tanks	1/26/2005	AOC
TA-4			
C-04-001	Former building location	1/26/2005	AOC
TA-5			
05-006(a)	Former building location	1/26/2005	AOC
05-006(d)	Former building location	1/26/2005	AOC
05-006(f)	Former building location	1/26/2005	AOC
05-006(g)	Former building location	1/26/2005	AOC
C-05-001	Former building location	1/26/2005	AOC
TA-6			
06-003(g)	Former Detonation Site	11/9/2001	SWMU
06-003(b)	Firing site	1/26/2005	AOC
06-004	Sump	1/26/2005	AOC
C-06-003	Building TA-6-11 - control building for explosive shots		AOC
C-06-006	Building TA-6-14 - explosive pressing & storage		AOC
C-06-007	Building TA-6-15 - boiler for steam generaiton		AOC
C-06-008	Building TA-6-16 - magazine for explosives		AOC
C-06-009	Building TA-6-17 - magazine		AOC
C-06-010	Building TA-6-21 - magazines for explosives storage		AOC
C-06-011	Building TA-6-22 - magazine		AOC
C-06-012	Building TA-6-23 - magazine		AOC
C-06-013	Building TA-6-24 - magazine for explosives storage		AOC
C-06-014	Building TA-6-25 - magazine for explosives storage		AOC
C-06-015	Building TA-6-27 - magazine for explosives storage		AOC
C-06-016	Building TA-6-28 - magazine used for explosives storage		AOC
C-06-017	Building TA-6-29 - magazine for explosive storage		AOC
C-06-018	Building TA-6-30 - magazine for explosive storage		AOC
C-06-020	Building TA-6-19 - former rest house		AOC
C-06-021	Building TA-6-26 - magazine used for explosives storage		AOC
TA-7			
07-003(c)	Typographical Error	12/23/1998	SWMU
07-003(d)	Typographical Error	12/23/1998	SWMU
TA-8			
08-003(b)	Septic System	12/23/1998	SWMU

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

08-003(c)	Septic System	12/23/1998	SWMU
08-006(b)	Landfill	12/23/1998	SWMU
08-007	Silver Recovery unit	12/23/1998	SWMU
08-008(a)	Storage area	1/26/2005	AOC
08-008(b)	Storage area	1/26/2005	AOC
08-008(c)	Storage area	1/26/2005	AOC
08-008(d)	Storage area	1/26/2005	AOC
08-009(b)	Ind. or san. wastewater treatment	1/26/2005	AOC
08-010(a)	Storage area	1/26/2005	AOC
08-010(b)	Storage area	1/26/2005	AOC
08-010(c)	Storage area	1/26/2005	AOC
08-011(a)	Underground tank	1/26/2005	AOC
08-011(b)	Underground tank	1/26/2005	AOC
C-08-001	Building	1/26/2005	AOC
C-08-002	Building	1/26/2005	AOC
C-08-003	Building	1/26/2005	AOC
C-08-004	Building	1/26/2005	AOC
C-08-005	Building	1/26/2005	AOC
C-08-006	Building	1/26/2005	AOC
C-08-007	Building	1/26/2005	AOC
C-08-008	Building	1/26/2005	AOC
C-08-009	Building	1/26/2005	AOC
C-08-010	Building	4/22/2007	SWMU
C-08-011	Building	1/26/2005	AOC
C-08-012	Building	1/26/2005	AOC
C-08-013	Building	1/26/2005	AOC
C-08-015	Building	1/26/2005	AOC
C-08-016	Building	1/26/2005	AOC
C-08-017	Storage area	1/26/2005	AOC
C-08-018	Storage area	1/26/2005	AOC
C-08-019	Storage area	1/26/2005	AOC
C-08-020	Disposal area	1/26/2005	AOC
TA-9			
09-003(c)	Manhole	12/23/1998	SWMU
09-003(f)	Settling Tank	12/23/1998	SWMU
09-005(b)	Septic System	12/23/1998	SWMU
09-005(c)	Septic System	12/23/1998	SWMU
09-005(e)	Septic System	12/23/1998	SWMU
09-005(f)	Septic System	12/23/1998	SWMU
09-005(h)	Septic System	12/23/1998	SWMU
09-007	Basket Pit	12/23/1998	SWMU
09-008(a)	Surface impoundment	1/26/2005	AOC
09-010(c)	Storage area	1/26/2005	AOC
09-011(a)	Storage area	1/26/2005	AOC
09-015	Manhole	1/26/2005	AOC
09-016	Underground tank	1/26/2005	AOC
C-09-002	Buildings	1/26/2005	AOC
C-09-003	Buildings	1/26/2005	AOC

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

C-09-004	Buildings	1/26/2005	AOC
C-09-005	Buildings	1/26/2005	AOC
C-09-006	Buildings	1/26/2005	AOC
C-09-007	Buildings	1/26/2005	AOC
C-09-008	Underground tank	1/26/2005	AOC
C-09-009	Non-intentional release	1/26/2005	AOC
C-09-010	Burn site	1/26/2005	AOC
C-09-011	Burn site	1/26/2005	AOC
TA-10			
10-001(e)	Detonatioin test area	1/26/2005	AOC
TA-11			
11-003(a)	Mortar impact area	1/26/2005	AOC
11-007	Surface Disposal	12/23/1998	SWMU
11-008	Surface disposal	1/26/2005	AOC
11-010(a)	Container storage area	1/26/2005	AOC
11-010(b)	Container storage	1/26/2005	AOC
11-011(c)	Boiler Discharge/Outfall	5/2/2001	SWMU
C-11-003	One-time release site (never located)	1/26/2005	AOC
TA-12			
12-003	Storage area	1/26/2005	AOC
C-12-006	Pole	1/26/2005	AOC
TA-14			
14-004(b)	Satellite Accumulation Area	12/23/1998	SWMU
14-004(c)	Storage area	1/26/2005	AOC
14-008	Landfill and surface disposal	1/26/2005	AOC
TA-15			
15-004(e)	Mistakenly called firing site (actually manhole bunker)	1/26/2005	AOC
15-005(a)	Storage area	1/26/2005	AOC
15-005(d)	Storage area	1/26/2005	AOC
15-008(e)	Surface disposal	1/26/2005	AOC
15-009(d)	Septic tank	1/26/2005	AOC
15-009(j)	Former Septic System	11/9/2001	SWMU
15-010(c)	Drainline	4/22/2007	SWMU
15-012(a)	Operational Release	11/9/2001	SWMU
15-012(b)	Former Wash Area	11/9/2001	SWMU
15-013(a)	Underground tank	1/26/2005	AOC
15-013(b)	Underground tank	1/26/2005	AOC
15-014(c)	Ind. or san. wastewater treatment	1/26/2005	AOC
15-014(e)	Ind. or san. wastewater treatment	1/26/2005	AOC
15-014(f)	Ind. or san. wastewater treatment	1/26/2005	AOC
15-014(m)	Active Drainline and Outfall	12/23/1998	SWMU
C-15-002	Surface disposal	1/26/2005	AOC
C-15-003	Surface disposal	1/26/2005	AOC
C-15-008	Non-intentional release	1/26/2005	AOC
C-15-009	Underground tank	1/26/2005	AOC
C-15-012	Underground tank (still active)	1/26/2005	AOC
C-15-013	Underground tank	1/26/2005	AOC

Table P-3

SWMUs and AOCs
Corrective Action Complete Without Controls

TA-16			
16-005(b)	Former Septic System	5/2/2001	SWMU
16-005(f)	Former Septic System	12/23/1998	SWMU
16-005(i)	Septic Tank	12/23/1998	SWMU
16-005(o)	Septic System	12/23/1998	SWMU
16-006(b)	Septic System	12/23/1998	SWMU
16-006(f)	Septic System	12/23/1998	SWMU
16-006(i)	Septic Tank	12/23/1998	SWMU
16-007(b)	Surface disposal site	1/26/2005	AOC
16-008(b)	Surface impoundment	1/26/2005	AOC
16-010(g)	Wastewater Treatment Facility	12/23/1998	SWMU
16-012(a)	Container Storage-Rest House	12/23/1998	SWMU
16-012(a2)	Container storage	1/26/2005	AOC
16-012(b)	Container Storage-Rest House	12/23/1998	SWMU
16-012(c)	Container Storage-Rest House	12/23/1998	SWMU
16-012(d)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(e)	Container Storage-Rest House	12/23/1998	SWMU
16-012(f)	Container Storage-Rest House	12/23/1998	SWMU
16-012(g)	Container Storage-Rest House	12/23/1998	SWMU
16-012(h)	Container Storage-Rest House	12/23/1998	SWMU
16-012(i)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(j)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(k)	Container Storage-Rest House	12/23/1998	SWMU
16-012(l)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(m)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(n)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(o)	Container Storage-Rest House	12/23/1998	SWMU
16-012(p)	Less Than 90-day Storage	12/23/1998	SWMU
16-012(q)	Container Storage-Rest House	12/23/1998	SWMU
16-012(r)	Container Storage-Rest House	12/23/1998	SWMU
16-012(s)	Container Storage-Rest House	12/23/1998	SWMU
16-012(t)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(u)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(v)	Container Storage-Rest House	12/23/1998	SWMU
16-012(w)	Container Storage-Rest House	12/23/1998	SWMU
16-012(x)	Satellite Accumulation Area	12/23/1998	SWMU
16-012(y)	Container Storage-Rest House	12/23/1998	SWMU
16-012(z)	Container Storage-Rest House	12/23/1998	SWMU
16-023(a)	Incinerator	1/26/2005	AOC
16-025(c)	Abandoned Utility Building	12/23/1998	SWMU
16-025(e2)	Abandoned building, 16-106	4/22/2007	SWMU
16-025(f2)	Abandoned building, 16-107	4/22/2007	SWMU
16-025(g2)	Magazine	12/23/1998	SWMU
16-025(h2)	Abandoned building, 16-109	4/22/2007	SWMU
16-026(a2)	Outfall from 16-200	4/22/2007	SWMU
16-026(d2)	Outfall from 16-435	4/22/2007	SWMU
16-026(e2)	Outfall from 16-415	4/22/2007	SWMU
16-026(f2)	Outfall and associated drainline	4/22/2007	SWMU

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SWMUs and AOCs
Corrective Action Complete Without Controls

16-026(g2)	Outfall from 16-285	4/22/2007	SWMU
16-026(i2)	Outfall	12/23/1998	SWMU
16-026(h)	Outfall from 16-281	4/22/2007	SWMU
16-026(k)	Outfall and associated drainline	4/22/2007	SWMU
16-026(t)	Outfall and associated drainline	4/22/2007	SWMU
16-026(x)	Outfall and associated drainline	4/22/2007	SWMU
16-030(b)	Outfall and associated drainline	4/22/2007	SWMU
16-030(e)	Outfall and associated drainline	4/22/2007	SWMU
16-030(f)	Outfall and associated drainline	4/22/2007	SWMU
16-031(g)	Cooling Tower Outfall	12/23/1998	SWMU
16-032(b)	Decommissioned HE sump	1/26/2005	AOC
16-032(d)	Decommissioned HE Sump	12/23/1998	SWMU
16-032(e)	Decommissioned HE Sump	12/23/1998	SWMU
16-034(g)	Soil Contamination	12/23/1998	SWMU
C-16-003	Septic system [see 16-005(n)]	1/26/2005	AOC
C-16-004	Building	1/26/2005	AOC
C-16-007	Tank stand	1/26/2005	AOC
C-16-021	Building	1/26/2005	AOC
C-16-022	Building	1/26/2005	AOC
C-16-023	Warehouse	1/26/2005	AOC
C-16-024	Building	1/26/2005	AOC
C-16-027	Building	1/26/2005	AOC
C-16-029	Building	1/26/2005	AOC
C-16-032	Building	1/26/2005	AOC
C-16-033	Warehouse	1/26/2005	AOC
C-16-037	Storage area	1/26/2005	AOC
C-16-038	Storage area	1/26/2005	AOC
C-16-039	Building	1/26/2005	AOC
C-16-040	Building	1/26/2005	AOC
C-16-042	Steam manhole	1/26/2005	AOC
C-16-043	Steam manhole	1/26/2005	AOC
C-16-045	Manhole	1/26/2005	AOC
C-16-048	Steam manhole	1/26/2005	AOC
C-16-052	Steam manhole	1/26/2005	AOC
C-16-053	Water manhole	1/26/2005	AOC
C-16-054	Steam manhole	1/26/2005	AOC
C-16-055	Switch box	1/26/2005	AOC
C-16-056	Steam manhole	1/26/2005	AOC
C-16-057	Steam manhole	1/26/2005	AOC
C-16-059	Electrical pit	1/26/2005	AOC
C-16-066	Storage area	1/26/2005	AOC
TA-18			
18-007	Buried Armored Vehicle	5/2/2001	SWMU
18-009(a)	Transformer, PCB site	1/26/2005	AOC
18-009(b)	Transformer	1/26/2005	AOC
18-009(c)	Transformer	1/26/2005	AOC
18-009(d)	Transformer	1/26/2005	AOC
18-009(e)	Transformer, PCB site	1/26/2005	AOC

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18-010(a)	Outfall	1/26/2005	AOC
18-012(d)	Drainline	1/26/2005	AOC
C-18-001	Laboratory	1/26/2005	AOC
C-18-002	Building	1/26/2005	AOC
C-18-003	Storage area	1/26/2005	AOC
TA-19			
C-19-001	Soil contamination	6/27/2006	AOC
TA-20			
20-003(a)	Control building at a firing site	4/22/2007	SWMU
20-003(d)	Firing site	1/26/2005	AOC
C-20-001	Storage building	1/26/2005	AOC
C-20-002	Storage building	1/26/2005	AOC
C-20-003	Building	1/26/2005	AOC
TA-21			
21-004(d)	Drain line	1/26/2005	AOC
21-005	Former Nitric Acid Pit	11/9/2001	SWMU
21-008	Incinerator	1/26/2005	AOC
21-012(a)	Dry Well	12/23/1998	SWMU
21-019(a)	Surface soil contamination area	1/26/2005	AOC
21-019(b)	Surface soil contamination area	1/26/2005	AOC
21-019(c)	Surface soil contamination area	1/26/2005	AOC
21-019(d)	Surface soil contamination area	1/26/2005	AOC
21-019(e)	Surface soil contamination area	1/26/2005	AOC
21-019(f)	Surface soil contamination area	1/26/2005	AOC
21-019(g)	Surface soil contamination area	1/26/2005	AOC
21-019(h)	Surface soil contamination area	1/26/2005	AOC
21-019(i)	Surface soil contamination area	1/26/2005	AOC
21-019(j)	Surface soil contamination area	1/26/2005	AOC
21-019(k)	Surface soil contamination area	1/26/2005	AOC
21-019(l)	Surface soil contamination area	1/26/2005	AOC
21-019(m)	Surface soil contamination area	1/26/2005	AOC
21-020(a)	Surface soil contamination area	1/26/2005	AOC
21-020(b)	Surface soil contamination area	1/26/2005	AOC
21-024(m)	Drain Line	12/23/1998	SWMU
21-025(a)	Operational facility	1/26/2005	AOC
21-025(b)	Operational facility	1/26/2005	AOC
21-027(b)	Drain Line	12/23/1998	SWMU
21-028(b)	Container storage	1/26/2005	AOC
21-028(e)	Container storage	1/26/2005	AOC
21-030	Sump, Identified as New SWMU	9/30/2005	AOC
C-21-002	Non-intentioinal release area	1/26/2005	AOC
C-21-003	Non-intentioinal release area	1/26/2005	AOC
C-21-004	Non-intentioinal release area	1/26/2005	AOC
C-21-008	One-time spill	1/26/2005	AOC
C-21-010	Systematic leak	1/26/2005	AOC
C-21-011	One-time spill	1/26/2005	AOC
C-21-013	Disposal pit	1/26/2005	AOC
C-21-014	Warehouse	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

C-21-015	Building	9/30/2005	AOC
C-21-016	Storage area	1/26/2005	AOC
C-21-017	Storage area	1/26/2005	AOC
C-21-018	Storage area	1/26/2005	AOC
C-21-019	Storage area	1/26/2005	AOC
C-21-020	Storage area	1/26/2005	AOC
C-21-021	Storage area	1/26/2005	AOC
C-21-022	Laboratory	1/26/2005	AOC
C-21-023	Laboratory	1/26/2005	AOC
C-21-024	Warehouse	1/26/2005	AOC
C-21-025	Building	1/26/2005	AOC
C-21-026	Building	1/26/2005	AOC
C-21-028	Tank	1/26/2005	AOC
C-21-029	Aboveground tank	1/26/2005	AOC
C-21-030	Aboveground tank	1/26/2005	AOC
C-21-031	Tank	1/26/2005	AOC
C-21-032	Machinery and tanks	1/26/2005	AOC
TA-22			
22-001	Building	1/26/2005	AOC
22-003(a)	Satellite accumulation area	1/26/2005	AOC
22-003(b)	Satellite accumulation area	1/26/2005	AOC
22-003(c)	Satellite accumulation area	1/26/2005	AOC
22-003(d)	Satellite accumulation area	1/26/2005	AOC
22-003(e)	Satellite accumulation area	1/26/2005	AOC
22-003(f)	Satellite accumulation area	1/26/2005	AOC
22-003(g)	Satellite accumulation area	1/26/2005	AOC
22-013	Liquid waste treatment/storage	1/26/2005	AOC
22-014(c)	Unit	1/26/2005	AOC
TA-25			
25-001	Pit	1/26/2005	AOC
C-25-001	Building	1/26/2005	AOC
TA-27			
27-001	Buried Naval Guns	5/2/2001	SWMU
27-004	Building	1/26/2005	AOC
TA-30			
30-001	Surface disposal and landfill	1/26/2005	AOC
TA-31			
C-31-001	Buildings	1/26/2005	AOC
TA-32			
C-32-001	Buildings	1/26/2005	AOC
TA-33			
33-004(e)	Seepage Pit	12/23/1998	SWMU
33-004(f)	Septic System	12/23/1998	SWMU
33-004(l)	Outfall	1/26/2005	AOC
33-004(n)	Septic system	1/26/2005	AOC
33-010(e)	Surface disposal (Area 6)	1/26/2005	AOC
33-012(b)	Satellite accumulation area	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

33-012(c)	Satellite accumulation area	1/26/2005	AOC
33-012(d)	Satellite accumulation area	1/26/2005	AOC
TA-35			
35-001	Material disposal area (MDA W)	1/26/2005	AOC
35-003(i)	Wastewater Treatment Facility	12/23/1998	SWMU
35-004(c)	Storage areas	1/26/2005	AOC
35-004(d)	Container storage area	1/26/2005	AOC
35-004(e)	Satellite Accumulation Area	5/2/2001	SWMU
35-004(f)	Container storage area	1/26/2005	AOC
35-004(i)	Container storage area	1/26/2005	AOC
35-004(j)	Container storage area	1/26/2005	AOC
35-004(k)	Container storage area	1/26/2005	AOC
35-004(l)	Container storage area	1/26/2005	AOC
35-004(n)	Container storage area	5/2/2001	SWMU
35-004(o)	Container storage area	5/2/2001	AOC
35-005(a)	Surface impoundment (closure) building 85 duplicate of 35-006	1/26/2005	AOC
35-005(b)	Surface impoundment (closure) building 125	1/26/2005	AOC
35-007	Waste oil treatment	1/26/2005	AOC
35-011(b)	Underground storage tank	1/26/2005	AOC
35-011(c)	Underground storage tank	1/26/2005	AOC
35-011(d)	Underground storage tank	1/26/2005	AOC
35-012(a)	Underground storage tank	1/26/2005	AOC
35-012(b)	Underground storage tank (inactive)	1/26/2005	AOC
35-013(d)	Floor Drains	5/2/2001	SWMU
35-014(c)	Operational release	1/26/2005	AOC
35-014(e3)	Operational release	1/26/2005	AOC
35-017	Soil contamination from reactor	1/26/2005	AOC
35-018(b)	Former transformer site	1/26/2005	AOC
C-35-001	Former UST site	1/26/2005	AOC
C-35-002	Former UST site	1/26/2005	AOC
C-35-003	Former UST site	1/26/2005	AOC
C-35-004	Operational release	1/26/2005	AOC
C-35-005	Operational release	1/26/2005	AOC
C-35-006	Operational release	1/26/2005	AOC
C-35-008	Leaking transformer	1/26/2005	AOC
TA-36			
36-003(c)	Septic System	12/23/1998	SWMU
36-003(d)	Septic system	1/26/2005	AOC
36-004(f)	Firing site (active)	1/26/2005	AOC
36-007(a)	Storage area	1/26/2005	AOC
36-007(b)	Storage area	1/26/2005	AOC
36-007(c)	Storage area	1/26/2005	AOC
36-007(d)	Storage area	1/26/2005	AOC
36-007(e)	Storage area	1/26/2005	AOC
36-007(f)	Storage area	1/26/2005	AOC
C-36-002	Surface disposal	1/26/2005	AOC
TA-37			
37-001	Septic system	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

TA-39			
39-002(g)	Storage area (still active)		AOC
39-003	Incinerator	12/23/1998	SWMU
39-006(b)	Septic System	12/23/1998	AOC
39-007(b)	Storage area, PCB site	1/26/2005	AOC
39-007(c)	Storage area, PCB site	1/26/2005	AOC
39-007(e)	Storage area	1/26/2005	AOC
39-009	Outfall	1/26/2005	AOC
TA-40			
40-001(a)	Septic System	12/23/1998	SWMU
40-002(a)	Container storage area SAA located inside building TA-40-23	1/26/2005	AOC
40-002(b)	Container storage area SAA located inside building TA-40-23	1/26/2005	AOC
40-002(c)	Container storage area SAA located inside building TA-40-05	1/26/2005	AOC
40-008	HE storage area (decommissioned)	1/26/2005	AOC
C-40-001	Usage Site	1/26/2005	AOC
TA-41			
41-004	Container storage	1/26/2005	AOC
C-41-001	Sump	1/26/2005	AOC
C-41-002	Underground tank	1/26/2005	AOC
C-41-003	Underground tank	1/26/2005	AOC
C-41-005	Underground tank	1/26/2005	AOC
TA-42			
42-004	Canyon disposal	1/26/2005	AOC
TA-43			
43-001(b1)	Outfall	1/26/2005	AOC
43-003	Carcass storage	1/26/2005	AOC
43-004	Waste storage	1/26/2005	AOC
43-005	Radioactive liquid storage	1/26/2005	AOC
TA-46			
46-001	Aboveground tank	1/26/2005	AOC
46-004(i)	Outfall	1/26/2005	AOC
46-004(j)	Outfall	1/26/2005	AOC
46-004(k)	Outfall	1/26/2005	AOC
46-004(l)	Outfall	1/26/2005	AOC
46-004(n)	Outfall	1/26/2005	AOC
46-004(o)	Outfall	1/26/2005	AOC
46-006(e)	Surface disposal	1/26/2005	AOC
46-008(c)	Storage Area	12/23/1998	SWMU
46-008(misc)	Storage area	1/26/2005	AOC
46-010(a)	Storage area	1/26/2005	AOC
46-010(b)	Storage area	1/26/2005	AOC
46-010(c)	Storage area	1/26/2005	AOC
46-010(e)	Storage area	1/26/2005	AOC
46-010(f)	Storage area	1/26/2005	AOC
46-010(misc)	Storage area	1/26/2005	AOC
TA-48			
48-002(c)	Container storage area	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

48-002(d)	Container storage area	1/26/2005	AOC
48-004(d)	Sumps and tanks	1/26/2005	AOC
48-006	Septic system	1/26/2005	AOC
48-007(e)	Outfall	1/26/2005	AOC
48-008	Transformer leak, PCB site	1/26/2005	AOC
48-009	Soil contamination, PCB site	1/26/2005	AOC
TA-49			
49-007(a)	Septic system - Area 6	1/26/2005	AOC
49-007(b)	Septic system - HDT area	1/26/2005	AOC
49-009	Aboveground tank	1/26/2005	AOC
TA-50			
50-003(b)	Storage area	1/26/2005	AOC
50-003(c)	Storage area	1/26/2005	AOC
50-003(d)	Storage area	1/26/2005	AOC
50-003(e)	Storage area	1/26/2005	AOC
50-005	Waste treatment facility	1/26/2005	AOC
50-006(b)	Operational release	1/26/2005	AOC
50-006(e)	Aboveground tank	1/26/2005	AOC
TA-51			
51-002(a)	usage site (Environmental research caisson)	1/26/2005	AOC
51-002(b)	usage site (Environmental research caisson)	1/26/2005	AOC
C-51-001	Storage area	1/26/2005	AOC
C-51-002	Buildings	1/26/2005	AOC
TA-52			
52-001(a)	UHTREX Equipment	12/23/1998	SWMU
52-001(b)	UHTREX Equipment	12/23/1998	SWMU
52-001(c)	UHTREX Equipment	12/23/1998	SWMU
52-002(b)	Septic System	12/23/1998	SWMU
52-002(c)	Septic System	12/23/1998	SWMU
52-002(d)	Septic System	12/23/1998	SWMU
52-002(e)	Septic System	12/8/1997	SWMU
52-002(f)	Septic System	12/23/1998	SWMU
52-003(a)	Waste treatment facility	1/26/2005	AOC
52-003(b)	Industrial waste line	1/26/2005	AOC
52-004	Evaporator	1/26/2005	AOC
C-52-001	Former transformer site, PCB site	1/26/2005	AOC
C-52-002	Former transformer site, PCB site	1/26/2005	AOC
TA-53			
53-001(c)	Storage area	1/26/2005	AOC
53-001(d)	Storage area	1/26/2005	AOC
53-001(e)	Storage area	1/26/2005	AOC
53-001(f)	Storage area	1/26/2005	AOC
53-001(g)	Storage area	1/26/2005	AOC
53-001(h)	Storage area	1/26/2005	AOC
53-001(i)	Storage area	1/26/2005	AOC
53-001(j)	Storage area	1/26/2005	AOC
53-001(k)	Storage area	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

53-001(l)	Storage area	1/26/2005	AOC
53-001(m)	Storage area	1/26/2005	AOC
53-001(n)	Storage area	1/26/2005	AOC
53-001(o)	Storage area	1/26/2005	AOC
53-003	Septic tank	1/26/2005	AOC
53-004	Operational facility	1/26/2005	AOC
53-006(a)	Underground tank	1/26/2005	AOC
53-007(b)	Aboveground storage Tanks	12/23/1998	SWMU
53-011(a)	Transformer, PCB site	1/26/2005	AOC
53-011(b)	Transformer, PCB site	1/26/2005	AOC
53-011(c)	Transformer, PCB site	1/26/2005	AOC
53-011(d)	Transformer, PCB site	1/26/2005	AOC
53-011(e)	Transformer, PCB site	1/26/2005	AOC
53-012(a)	Outfall	1/26/2005	AOC
53-012(b)	Outfall	1/26/2005	AOC
53-012(c)	Outfall	1/26/2005	AOC
53-012(d)	Outfall	1/26/2005	AOC
53-012(f)	Outfall	1/26/2005	AOC
53-012(g)	Outfall	1/26/2005	AOC
53-012(h)	Outfall	1/26/2005	AOC
C-53-001	Transformer	1/26/2005	AOC
C-53-002	Transformer	1/26/2005	AOC
C-53-003	Transformer	1/26/2005	AOC
C-53-004	Transformer	1/26/2005	AOC
C-53-005	Transformer	1/26/2005	AOC
C-53-006	Transformer	1/26/2005	AOC
C-53-007	Transformer	1/26/2005	AOC
C-53-008	Transformer	1/26/2005	AOC
C-53-009	Transformer	1/26/2005	AOC
C-53-010	Transformer	1/26/2005	AOC
C-53-011	Transformer	1/26/2005	AOC
C-53-012	Transformer	1/26/2005	AOC
C-53-013	Transformer	1/26/2005	AOC
C-53-014	Transformer	1/26/2005	AOC
C-53-015	Transformer	1/26/2005	AOC
C-53-016	Transformer	1/26/2005	AOC
C-53-017	One-time spill, PCB site	1/26/2005	AOC
C-53-018	One-time spill, PCB site	1/26/2005	AOC
C-53-019	One-time spill	1/26/2005	AOC
TA-54			
54-001(c)	Storage Area	12/23/1998	SWMU
54-001(f)	Storage area	1/26/2005	
54-007(b)	Inactive Septic system	5/2/2001	SWMU
54-007(c)	Former septic systems	9/5/2003	
54-007(e)	Septic system		AOC
54-008	Underground tank	1/26/2005	AOC
54-010	Underground tank - supply wash-water tank	1/26/2005	AOC
54-013(a)	Decontamination Facility	12/23/1998	SWMU

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SWMUs and AOCs
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54-015(h)	Drum Storage Area	5/2/2001	SWMU
54-015(g)	Storage area - Pb casks near shaft 4	1/26/2005	AOC
54-015(i)	Storage area - forklift battery	1/26/2005	AOC
54-016(a)	Sump	1/26/2005	AOC
54-021	Aboveground oil storage tanks (6) (inactive)	1/26/2005	AOC
54-022	Transformer spill (PCB), PCB site	1/26/2005	AOC
TA-55			
55-001	Cement plant	1/26/2005	AOC
55-002(a)	Rad waste storage area	1/26/2005	AOC
55-002(b)	Rad waste storage area	1/26/2005	AOC
55-002(c)	Container storage area	1/26/2005	AOC
55-003	Containment area	1/26/2005	AOC
55-004	Evaporator	1/26/2005	AOC
55-005	Filtration Unit	1/26/2005	AOC
55-006	Glass breaker	1/26/2005	AOC
55-007	Thermal combustion unit	1/26/2005	AOC
55-009	Sumps and Tanks	4/22/2007	SWMU
55-010	Solvent spills	1/26/2005	AOC
55-011(a)	Storm drain	1/26/2005	AOC
55-011(b)	Storm drain	1/26/2005	AOC
55-011(c)	Storm drain	1/26/2005	AOC
55-011(d)	Storm drain	1/26/2005	AOC
55-011(e)	Storm drain	1/26/2005	AOC
55-012	Container storage area	1/26/2005	AOC
55-013(a)	Storage area	1/26/2005	AOC
55-013(b)	Storage area	1/26/2005	AOC
TA-57			
57-001(a)	Drilling mud pits	1/26/2005	AOC
57-003	Container storage facility	1/26/2005	AOC
57-005	Pond filtration unit	1/26/2005	AOC
TA-59			
59-001	Former Septic System	5/2/2001	SWMU
59-002	Container storage area	1/26/2005	AOC
59-003	Sump	1/26/2005	AOC
TA-60			
60-001(a)	Storage area (active), PCB site	6/26/2003	AOC
60-001(b)	Storage area (active)	1/26/2005	AOC
60-001(c)	Storage area (active)	1/26/2005	AOC
60-001(d)	Storage area - pesticide shed	1/26/2005	AOC
60-003	Oil-water separator	1/26/2005	AOC
60-004(a)	Storage area	1/26/2005	AOC
60-005(b)	Drilling mud pits	1/26/2005	AOC
60-006(b)	Septic system	1/26/2005	AOC
60-006(c)	Septic tank	1/26/2005	AOC
C-60-001	Underground tank	1/26/2005	AOC
C-60-002	Underground tank	1/26/2005	AOC
C-60-003	One-time spill at pesticide shed	1/26/2005	AOC
C-60-004	Underground tank	1/26/2005	AOC

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SWMUs and AOCs
Corrective Action Complete Without Controls

TA-61			
61-001	Storage area	1/26/2005	AOC
61-003	Burn sites	1/26/2005	AOC
61-004(a)	Former Septic Tank	5/2/2001	SWMU
61-004(b)	Septic tank	1/26/2005	AOC
61-004(c)	Septic tank	1/26/2005	AOC
C-61-001	Transformer storage area-PCB leak	1/26/2005	AOC
TA-63			
63-002	Container storage area	1/26/2005	AOC
TA-64			
64-001	Storage area	1/26/2005	AOC
TA-69			
69-002(a)	Septic system	1/26/2005	AOC
69-002(b)	Septic system	1/26/2005	AOC
TA-72			
72-002	Firing site	1/26/2005	AOC
72-003(a)	Septic system	1/26/2005	AOC
72-003(b)	Septic system	1/26/2005	AOC
TA-73			
73-005	Surface disposal area, septic tanks, and septic pits	9/5/2003	SWMU
73-007	Septic tank and pipelines		AOC
C-73-001	Underground tank	1/26/2005	AOC
C-73-002	Underground tank	1/26/2005	AOC
C-73-003	Underground tank	1/26/2005	AOC
C-73-004	Underground tank	1/26/2005	AOC
C-73-005(a)	Excavation-septic tank/outhouse trench		AOC
C-73-005(b)	Excavation-septic tank/outhouse trench		AOC
C-73-005(c)	Excavation-septic tank/outhouse trench		AOC
C-73-005(d)	Excavation-septic tank/outhouse trench		AOC
C-73-005(e)	Excavation-septic tank/outhouse trench		AOC
C-73-005(f)	Excavation-septic tank/outhouse trench		AOC

ATTACHMENT Q

LISTING OF OFF-SITE FACILITIES

TABLE Q-1

List of Off-Site Waste Management Facilities that May Return Treatment-Derived Waste or Waste Residuals to the Los Alamos National Laboratory

Off-Site Facility	EPA Identification Number
Argonne National Laboratory, Argonne, IL	IL38900089
Catholic University, Washington, D.C.	DCD980204879
Consolidated Incineration Facility, Savannah River Site, S.C.	SC1890008989
Diversified Scientific Services, Inc., Kingston, TN	TND982109142
Envirocare, Clive, UT	UTI982598898
Waste Experimental Reduction Facility, Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID	ID4890008952
M4 Environmental Management, Inc., Oak Ridge, TN	RD&D Permit
Nuclear Fuel Services, Erwin, TN	TND003095635
Nuclear Sources & Services, Inc., Houston, TX	TXD982560294
Toxic Substances Control Act Incinerator, Oak Ridge National Laboratory, Oak Ridge, TN	TN0890090004
International Technology Corporation, Technology Center, Knoxville, TN	TND000770479
International Technology Corporation, Biotech Applications Center, Knoxville, TN	TND987782521
International Technology Corporation, Environmental Technology Development Center, Oak Ridge, TN	TND981933120
Perma-Fix, Albuquerque, NM	NM0000182121
Perma-Fix, Gainesville, FL	FLG980711071
EG&G Mound Applied Technologies, Miamisburg, OH	OH6890008984
Waste Control Specialists, Andrews, TX	TXD988088464
Colorado Minerals Research Institute, Golden, CO	COD17944308
Allied Technology Group, Richland, WA East Tennessee Waste Treatment Center, Oak Ridge, TN Materials and Energy Corporation, Oak Ridge, TN Clean Harbors Environmental Service Corporation, Aragonite, UT Superior Special Services, Inc., Phoenix, AZ Clean Harbors Grassy Mountain, Grassy Mountain, UT Onyx Environmental Services, Henderson, CO	WAR000010355 TNR000005397 TNR000005397 UTD381552177 AZ000033960 UTD991301748 COD980591184

TABLE Q-2

List of Off-Site Waste Management Facilities that May Send Waste to Los Alamos National Laboratory

Off-Site Facility	EPA Identification Number
Sandia National Laboratories/New Mexico, Albuquerque, NM	NM5890110518

ATTACHMENT R

COST ESTIMATES FOR FINANCIAL ASSURANCE

A summary of the estimated closure costs is provided in the following table.

Area	Unit	Estimated Closure Cost	Pad Subtotals	TA Subtotals
TA-3	TA-3-29, Rm 9010 Indoor Container Storage Unit (CSU)	$23,536		
	TA-3-29, Rm 9020 CSU	$12,105		
	TA-3-29, Rm 9030 CSU	$12,105		
TA-3 Subtotal				$47,746
TA-16	TA-16-388 Flash Pad	$56,462		
	TA-16-399 HE Burn Tray	$31,055		
TA-16 Subtotal				$87,517
TA-50	TA-50-69 Indoor CSU	$32,091		
	TA-50-69 Outdoor CSU	$36,604		
TA-50 Subtotal				$68,695
TA-54 Area L Asphalt Pads	TA-54-215	$104,658		
	TA-54-216 Canopy	$40,682		
	Area L Within Fence Line	$347,540		
Area L Buildings	TA-54-31 Room 101	$21,247		
	TA-54-39 Room 101	$12,105		
	TA-54-68	$12,874		
	TA-54-69	$11,775		
	TA-54-70	$11,775		
Area L Outside CSUs	TA-54-32	$50,042		
	TA-54-35	$27,915		
	TA-54-36	$29,789		
	TA-54-58	$29,789		
	TA-54-39 Outside CSU	$69,385		
Area L Subtotal			$769,576	
Area G	TA-54-226 and Pad 1	$255,601		
	TA-54-412	$92,223		
Pad 1 Subtotal			$347,824	
	TA-54-48 Pad 3	$95,094		
Pad 3 Subtotal			$95,094	
	TA-54-49 and Pad 5	$212,351		
	TA-54-144	$7,330		
	TA-54-145	$7,330		
	TA-54-146	$7,330		
	TA-54-177	$7,330		
	TA-54-1027	$10,590		
	TA-54-1028	$10,590		

	TA-54-1029	$10,590		
	TA-54-1041	$10,590		
	TA-54-224	$53,743		
Pad 5 Subtotal			$337,774	
	TA-54-153 and Pad 6	$185,577.		
	TA-54-283 Pad 6	$89,478		
Pad 6 Subtotal			$275,055	
	TA-54-229 and Pad 9	$310,882		
	TA-54-230	$144,904		
	TA-54-231	$134,319		
	TA-54-232	$134,319		
Pad 9 Subtotal			$724,424	
	TA-54 Pad 10	$414,158		
Pad 10 Subtotal			$414,158	
	TA-54-375 Pad 11	$235,651		
Pad 11 Subtotal			$235,651	
	TA-54-8	$10,885		
	TA-54-33	$141,001		
54 West (TA-54-38)	High Bay	$53,997		
	Low Bay	$25,968		
	Outside Storage Pad and Loading Dock	$310,210	$542,061	
TA-54 Subtotal				$3,741,618
TA-55	TA-55-4 B40	$23,869		
	TA-55-4 B05	$19,413		
	TA-55-4 K13	$14,545		
	TA-55-4 B45	$14,308		
	TA-55-4 Vault	$23,272		
	TA-55 Outside Storage Pad NW of TA-55-4	$75,149		
	TA-55-185	$20,960		
	TA-55 Cementation Unit	$33,890		
	TA-55 Storage Tank System	$45,141		
TA-55 Subtotal				$270,547
	Total all units			$4,216,123

TA-3 BUILDING 29 ROOM 9030

Facility Name: Los Alamos National Laboratory TA-3 Building 29 Room 9030

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Building 29 Room 9030 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5562.48
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process		3-A, 3-B and 3-	
4	Decontamination Waste Management	TS-3	C	1257.12
5	Decontamination Verification Samples	TS-3	3-E	390.78
6	Analyses	TS-4	4-A	2499.74
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**11227.16**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification to closure costs)**			**13755.56**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**12104.89**

TA-3 BUILDING 29 ROOM 9030

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-3 Building 29 was built in 1952 and is located on South Mesa on the northern side of LANL. It contains 3 interior storage areas in Rooms 9010, 9020 and 9030. The rooms store solid and liquid hazardous and mixed waste containers on self containment pallets. Room 9030 is is located in the basement of Wing 9 of the CMR Building.

1-A	Maximum permitted capacity (gallons) all 3 rooms			18,500
	Known Releases?			N/A
1-B	Dimensions of storage area in Room 9030	30	8	240
1-C	Materials	Concrete floor with epoxy coating		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5562.48**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6573.84**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floor.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination	24	See crew above			
3-C	Demolition		NA			

TOTAL FOR STEP 3-A, 3-B, 3-C & 3-D	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	2	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	2	1	43.42	43.42	3	130.26
	Soil Samples	None- assume no contamination found					

TOTAL FOR STEP 3-E	**390.78**
TOTAL FOR STEP 3	**1647.90**

TOTAL FOR TS-3 WORKSHEET	**8221.74**

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for closure are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals, SVOCs, VOCs	Water/Wipe	2	747.85	1495.70	NA	1495.70
	Radioactive elements	Wipe	2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**4**				**2499.74**

		Labor Category	cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 4-B, 4-C and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**5533.82**

Facility Name: Los Alamos National Laboratory TA-16-388 Flash Pad

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	TA-16-388 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	8090.88
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	3556.32
5	Decontamination Verification Samples	TS-3	3-E	6638.64
6	Analyses	TS-4	4-A	25951.42
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	3254.37
9	**Subtotal of Closure Costs**			**53559.79**
10	Certification of Closure	TS-4	4-D	5056.80
11	Compressor and Jackhammer	TS-4	4-E	5545.20
12	**Subtotal (Add certification report to closure costs)**			**64161.79**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**56462.38**

TA-16-388 FLASH PAD

TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-16-388 Flash Pad is located at TA-16. TA-16 is located in the southwestern portion of LANL. It was stated in the Closure Plan (CP) that no waste needed to be removed from this area.

1-A	Maximum permitted capacity of the Flash Pad	N/A		
	Known Releases?			N/A
1-B	Dimensions of Flash Pad			
	Concrete pad (length ft x width ft)	22	22	484
1-C	Materials	12" thick concrete pad contained in a 45 mil Hypalon liner		
1-D	Maximum volume of waste to be removed from the Flash Pad	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.8	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80
TOTAL FOR STEP 2A							**8090.88**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80

TOTAL FOR STEP 2	**13147.68**

3. DECONTAMINATION

The decontamination process will include pads and walls being pressure washed or steam cleaned. A portable berm will collect excess water and samples will be collected and analyzed. Equipment will be decontaminated as well. Drilling through the concrete pad and soil sampling around and below the pad will be required. Five wipe samples, and 21 soil verification samples will be collected around and under the Pad.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	8	32.94	263.52	3	790.56
Wash		Staff Engineer	8	28.40	227.2	3	681.60
		Project Scientist	8	24.29	194.32	3	582.96
		Staff Scientist	8	19.13	153.04	3	459.12
TOTAL FOR STEP 3-A			**8**	**104.76**	**838.08**	**3**	**2514.24**

3-B	Flash or Burn Treatment for Equipment	8	43.42	347.36	3	1042.08
	TOTAL FOR STEP 3-B	**8**	**43.42**	**347.36**	**3**	**1042.08**

TOTAL FOR STEPS 3-A and 3-B	**3556.32**

	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-E	Wipe	5	4	43.42	173.68	3	521.04
	Concrete Drill	5	6	224.08	1344.48	3	4033.44
	Soil Sampling 3 and 5' Around Concrete Pad	16	16	43.42	694.72	3	2084.16
TOTAL FOR STEP 3-E							**6638.64**
TOTAL FOR STEP 3							**10194.96**

TOTAL FOR TS-3 WORKSHEET	**18285.84**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. The Closure Plan assumes clean closure, but demolition of the concrete pad and debris disposal is assumed to be required.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	TCLP/Total Metals, Mercury, VOCs and SVOCs, Explosives	Wipe	5	1101.29	5506.45	NA	5506.45
	TCLP/Total Metals, Mercury, VOCs and SVOCs, Explosives	Verification Soil	21	973.57	20444.97	NA	20444.97
TOTAL FOR STEP 4-A							**25951.42**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	Front end loader and truck: remove 18 cy concrete	18	47.43	853.74	3	2561.22
4-D	Certification Report		40	42.14	1685.6	3	5056.80
4-E	Compressor and Jackhammer		8	231.05	1848.4	3	5545.20
TOTAL FOR STEP 4-B, 4-C, 4-D and 4-E							**14174.58**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**40126.00**

TA-16-399 High Explosives Burn Tray

Facility Name: Los Alamos National Laboratory TA-16-399 High Explosives Burn Tray

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**TA-16-399 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	8090.88
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A	1257.12
5	Decontamination Verification Samples	TS-3	3-E	2605.20
6	Analyses	TS-4	4-A	9366.20
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	2845.80
9	**Subtotal of Closure Costs**			**30233.36**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add certification report to closure costs)**			**35290.16**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**31055.34**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

The TA-16-399 Burn Tray Unit is located at TA-16 in the southwestern portion of LANL.

1-A	Maximum permitted capacity of Burn tray	N/A		
	Known Releases?			N/A
1-B	Dimensions of Burn tray (length ft x width ft)	16	4	64
	Total Area of Burn tray (sf)			64
1-C	Materials	The Burn Tray Unit is supported on 1.5 ft high legs and is lined with firebrick		
1-D	Maximum volume of waste to be removed from the Burn tray (bricks, sand, ash)	2 cy		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded costs
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**8090.88**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**13147.68**

3. DECONTAMINATION
The surfaces, structures and liners will be decontaminated and/or removed while the tray will be pressure washed or steam cleaned.

3-A	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.40	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**4**	**104.76**	**419.04**	**3**	**1257.12**

TOTAL FOR STEPS 3-A	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
	Wipe	4	4	43.42	173.68	3	521.04
	Soil Verification	16	8	43.42	347.36	3	1042.08
	Confirmatory Soil Verification Sample	8	8	43.42	347.36	3	1042.08
TOTAL FOR STEP 3-E							**2605.20**
TOTAL FOR STEP 3							**3862.32**
TOTAL FOR TS-3 WORKSHEET							**17010.00**

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. For demolition and debris disposal, this cost estimate assumes removal of the Burn Tray and 20 cy of contaminated soil from the TA-16-399 Burn Tray Area.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
	TCLP/Total Metals, VOCs, SVOCs, Explosives, Mercury	Wipe	4	1101.29	4405.16	NA	4405.16
	TCLP/Total Metals, VOCs, SVOCs, Explosives, Mercury	Verification Soil	16	973.57	15577.12	NA	4961.04
	TCLP/Total Metals, VOCs, SVOCs, Explosives, Mercury	Confirmatory Soil	8	973.57	7788.56	NA	7788.56
TOTAL FOR STEP 4-A							**9366.20**

		Labor Category and Description	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	Front End Loader and Truck: 20 cy	20	47.43	948.60	3	2845.80
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C and 4-D							**8913.96**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**18280.16**

Facility Name: Los Alamos National Laboratory TA-50-69 Indoor CSU

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	TA-50-69 Indoor CSU Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	8090.88
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process	TS-3	3-A, 3-B AND 3-C	5028.48
4	Decontamination Waste Management			
5	Decontamination Verification Samples	TS-3	3-D	4252.08
6	Analyses	TS-4	4-A	7970.91
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**31410.51**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add cost of certification report to closure costs)**			**36467.31**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**32091.23**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-50-69 Indoor CSU is located in two areas: Room 102 is the Main Process Area and Room 103 is the Unloading Area.

1-A	Maximum permitted capacity of CSU			
	Known Releases?			N/A
1-B	Dimensions of CSU			
	Room 102 (length ft x width ft and total area)	45	52	2340
	Room 103 (length ft x width ft)	18	19	342
	Total Area of CSU (sf)			2682
1-C	Materials	Epoxy painted reinforced concrete floor		
1-D	Maximum volume of waste to be removed from the CSU	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.8	3	2528.4
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.6	3	5056.8
TOTAL FOR STEP 2A							**8090.88**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.8

TOTAL FOR STEP 2	**13147.68**

3. DECONTAMINATION

The decontamination process will include floor and walls pressure washed or steam cleaned. A portable berm will collect excess water and samples will be collected and analyzed. Open drains flow to RLWTF in both rooms of this unit. Confirmatory samples will be collected beneath the two drains which will require drilling through the concrete floor.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	16	32.94	527.04	3	1581.12
		Staff Engineer	16	28.4	454.4	3	1363.2
		Project Scientist	16	24.29	388.64	3	1165.92
		Staff Scientist	16	19.13	306.08	3	918.24
TOTAL FOR STEP 3-A			**64**	**104.76**	**1676.16**	**3**	**5028.48**

TOTAL FOR STEPS 3-A AND 3-B	64	104.76	1676.16		5028.48

	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-E	Wipe	9	8	43.42	347.36	3	1042.08
	Soil (Below Drains)	2	4	43.42	173.68	3	521.04
Concrete Drill			4	224.08	896.32	3	2688.96
TOTAL FOR STEP 3-E							**4252.08**

TOTAL FOR STEP 3	**9280.56**

TOTAL FOR TS-3 WORKSHEET AND TOTAL FOR STEPS 2 & 3	**22428.24**

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. The Closure Plan assumes clean closure and therefore no demolition and debris disposal is estimated.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals, VOCs, SVOCs	Wipe	9	747.85	6730.65	NA	6730.65
	Metals, VOCs, SVOCs	Confirmatory Soil	2	620.13	1240.26	NA	1240.26
TOTAL FOR STEP 4-A							**7970.91**

		Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal						NA
4-C	Certification Report	Sr. Engineer/Tech	40	42.14	1685.6	3	5056.8
TOTAL FOR STEP 4-B AND 4-D			**48**	**84.28**	**2022.72**		**6068.16**

TOTAL FOR TS-4 WORKSHEET AND TOTAL FOR STEP 4	**14039.07**

TA-50-69 OUTDOOR CSU

Facility Name: Los Alamos National Laboratory TA-50-69 Outdoor CSU

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**TA-50-69 Outdoor CSU Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	8090.88
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A	5028.48
5	Decontamination Verification Samples	TS-3	3-E	2084.16
6	Analyses	TS-4	4-A	9575.86
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	5691.60
9	**Subtotal of Closure Costs**			**36539.14**
10	Certification of Closure	TS-4	4D	5056.80
11				
12	**Subtotal (Add cost of certification report to closure costs)**			**41595.94**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**36604.43**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
Unit TA-50-69 Outdoor CSU is located at the southwest corner of TA-50.

1-A	Maximum permitted capacity of CSU			528,000 gallons
	Known Releases?			N/A
1-B	Dimensions of CSU			
	Asphalt and concrete (length ft x width ft)	24	90	2160
	Asphalt (length ft x width ft)	12	90	1080
	Total Area of CSU (sf)			3240
1-C	Materials	Asphalt and Concrete: 4 inches thick, Volume=1080 cf = 40 cy		
1-D	Maximum volume of waste to be removed from the CSU	None. Demolition of pad accounted for in worksheet TS-4		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.8	3	2528.4
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.6	3	5056.8
TOTAL FOR STEP 2-A							**8090.88**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.8

TOTAL FOR STEP 2	**13147.68**

3. DECONTAMINATION
The decontamination process will include sampling.

3-A	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	4	Project Engineer	16	32.94	527.04	3	1581.12
		Staff Engineer	16	28.4	454.4	3	1363.2
		Project Scientist	16	24.29	388.64	3	1165.92
		Staff Scientist	16	19.13	306.08	3	918.24
TOTAL FOR STEP 3-A			**64**	**104.76**	**1676.16**	**3**	**5028.48**

	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-E	Wipe (1 per 500 sf)	7	8	43.42	347.36	3	1042.08
	Confirmatory Samples	7	8	43.42	347.36	3	1042.08
TOTAL FOR STEP 3-E			**16**	**86.84**	**694.72**	**3**	**2084.16**

TOTAL FOR STEP 3	**7112.64**

TOTAL FOR TS-3 WORKSHEET	**20260.32**

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. For demolition and debris disposal, this cost estimate assumes removal of the entire pad.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
	TCLP Metals, VOCs, SVOCs	Water/Wipe	7	747.85	5234.95	NA	5234.95
	TCLP Metals, VOCs, SVOCs	Confirmatory Soil	7	620.13	4340.91	NA	4340.91
TOTAL FOR STEP 4-A			**14**				**9575.86**

		Labor Category and Description	Hours or Cubic Yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded Costs
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	Front End Loader and Truck: remove 40 cy	40	47.43	1897.20	3	5691.60
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C and 4-D			**88**				**11759.76**

TOTAL FOR TS-4 WORKSHEET AND TOTAL FOR STEP 4	**21335.62**

TA-54 AREA G STORAGE SHED 8 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Storage Shed 8

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Shed 8 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	4045.44
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A	1257.12
5	Decontamination Verification Samples	TS-3	3-E	521.04
6	Analyses	TS-4	4-A	2499.74
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0
9	**Subtotal of Closure Costs**			**9840.38**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification report to closure costs)**			**12368.78**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**10884.53**

TA-54 AREA G STORAGE SHED 8 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area G Storage Shed 8 is located on the north-central side of Area G and was constructed in 1979. The steel shed includes a concrete foundation and stores solid type mixed waste. The shed has a 6-inch high curb around the perimeter that provides secondary containment.

	Maximum permitted capacity for Shed 8 (gallons)	11,880		
	Known Releases?	N/A		
	Dimensions of the Shed 8 length (ft) x width (ft) and sf	40	16	640
1-C	Materials	Constructed with steel beams and galvanized siding on a concrete foundation		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.8	3	2528.4
TOTAL FOR STEP 2A							**4045.44**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**5056.8**

3. DECONTAMINATION

The decontamination process includes the decontamination of equipment as well as the decontamination of the floors and walls of the shed. The walls of this unit will be washed up to a height of two feet above the highest level of waste previously stored. The wash water will be transferred to clean containers for further characterization and review. Several wash cycles may be prescribed for the surfaces of the unit.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.6	3	340.8
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

TOTAL FOR STEP 3-A	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	2	2	43.42	86.84	3	260.52
	Radioactive Wipe Sample	2	2	43.42	86.84	3	260.52
TOTAL FOR STEP 3-E							**521.04**
TOTAL FOR STEP 3							**1778.16**

TOTAL FOR TS-3 WORKSHEET	**6834.96**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. Analysis for this unit will include both stages of sampling: determination and verification.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals	Water/Wipe	2	747.85	1495.70	NA	1495.70
	SVOCs	Water/Wipe					
	VOCs	Water/Wipe					
	Radionuclides		2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**4**				**2499.74**

		Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-E							
TOTAL FOR STEP 4-B and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**5533.82**

TA-54 Area G Building TA-54-33 TS-1

Facility Name: Los Alamos National Laboratory (LANL) TA-54 Area G Building 33

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	TA-54 Building 33 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	19721.52
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	7542.72
5	Decontamination Verification Samples	TS-3	3-E	3517.02
6	Analyses	TS-4	4-A	19229.35
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	95047.50
9	**Subtotal of Closure Costs**			**152643.31**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add cost of certification report to closure costs)**			**160228.51**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**141001.09**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit Building TA-54-33 is located in the north-central portion of Area G and consists of a dome attached to a concrete-block building with a concrete foundation and sump. The structure was built in 1994 and stores solid and liquid type mixed waste.

1-A	Maximum permitted capacity for Building TA-54-33 (gallons)				108,240
	Known Releases?				N/A
1-B	Dimensions of the Building TA-54-33 length (ft) x width (ft) and sf	Dome	157	50	7,850
		Building	40	34	1,360
1-C	Materials		Dome is constructed with aluminum beams and tensioned fabric. A concrete floor 8 inches thick underlies both the dome and block building. A 6 inch curb surrounds the dome floor. A central drainage trench in the dome collects liquids, with 2 branch trenches and a pipe drain from the building. A steel sump at the east end of the dome is 14 feet by 6.5 feet and 5 feet deep, within a concrete basin. Two tanks in concrete basins are associated with the sump.		
1-D	Maximum volume of waste to be removed		None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)		Will depend upon the physical hazards and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	60	42.14	2528.4	3	7585.2
	Inspection	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Report	Sr Engineer/Tech	80	42.14	3371.2	3	10113.6
TOTAL FOR STEP 2A							**19721.52**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.8

TOTAL FOR STEP 2	**24778.32**

3. DECONTAMINATION

The decontamination process includes the decontamination of equipment as well as the decontamination of the floors and walls of the shed. The walls of this unit will be washed up to a height of two feet above the highest level of waste previously stored. The wash water will be transferred to clean containers for further characterization and review. Several wash cycles may be prescribed for the surfaces of the unit.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.4	681.6	3	2044.8
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12	3	1377.36
TOTAL FOR STEP 3-A			**96**	**104.76**	**2514.24**	**3**	**7542.72**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Decontamination	24	See crew above			

TOTAL FOR STEP 3-A - 3B	**7542.72**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipes	19	12	43.42	521.04	3	1563.12
	Radioactive Wipe	10	5	43.42	217.1	3	651.3
	Soil beneath drain trench, pipe, sump	10	10	43.42	434.2	3	1302.6
TOTAL FOR STEP 3-E							**3517.02**
TOTAL FOR STEP 3							**11059.74**

TOTAL FOR TS-3 WORKSHEET	**35838.06**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals SVOCs VOCs	Wipe	19	747.85	14209.15	NA	14209.15
	Metals, SVOC, VOCs	Soil	10	620.13	6201.3	NA	6201.30
	Radionuclides	Wipe	10	167.34	1673.4	3	5020.20
TOTAL FOR STEP 4-A			**39**				**19229.35**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.8	3	2528.40
4-C	Unreinforced dome floor concrete demolition and debris removal (Building not demolished)	Demolition crew, air and heavy equipment. Est 250 cy	250	126.73	31682.5	3	95047.50
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.4	3	7585.20
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**105161.10**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**124390.45**

TA-54 AREA G PAD 1 AND STORAGE DOME 226 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 1 and Storage Dome 226

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 1 and Dome 226 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	26700.24
5	Decontamination Verification Samples	TS-3	3-E	9639.24
6	Analyses	TS-4	4-A	91255.21
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	134037.18
9	**Subtotal of Closure Costs**			**282870.43**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add cost of certification to closure costs)**			**290455.63**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**255600.95**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Pad 1 includes TA-54-412 and Storage Dome 226 in the northeastern portion of Area G. The dome was erected in 1995 and is used to store solid type mixed waste which include corrosive liquids, sludge, debris, equipment and chemical waste containing metals and volatile and semi-volatile organic hazardous constituents.

1-A	Maximum permitted capacity (gallons)			411,840
	Known Releases?			N/A
1-B	Dimensions of the Dome 226 length (ft) x width (ft) and sf (demolition included in this cost estimate)	286	89	25454
	Dimensions of Pad 1 length (ft) x width (ft) and sf	358	213	76254
1-C	Materials	Dome is constructed of tensioned-fabric membranes and aluminum beams. The interior floor is surrounded with a mimumum six inch high ring wall. The asphaltic concrete pad is four to six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

Pad 1	76254	
Dome 226	25454	51 soil samples
TA-54-412	13200	
Pad 1 outside structures	37600	Divide by 500 = 75.2 or 76 samples

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16181.76**

3. DECONTAMINATION

The decontamination process will involve inspection and sampling soil below the pad, and pressure washing or steam cleaning equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	60	32.94	1976.40	3	5929.20
		Staff Engineer	60	28.4	1704.00	3	5112.00
		Project Scientist	60	24.29	1457.40	3	4372.20
		Staff Scientist	60	19.13	1147.80	3	3443.40
TOTAL FOR STEP 3-A			**240**	**104.76**	**6285.60**	**3**	**18856.80**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs, VOCs	Soil	127	620.13	78756.51	NA	78756.51
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**147**	**1535.32**	**87908.41**	**3**	**91255.21**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and Debris Disposal (entire Pad 1)	Remove 942 cy asphalt	942	47.43	44679.06	3	134037.18
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 4-B, 4-C and 4-D							**146679.18**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**237934.39**

TA-54 Area G Building TA-54-412 TS-1

Facility Name: Los Alamos National Laboratory (LANL) TA-54 Area G Building 412

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	22249.92
2	Sampling and Analysis Plan	TS-3	2-B	10113.6
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A	12571.2
5	Decontamination Verification Samples	TS-3	3-E	4689.36
6	Analyses	TS-4	4-A	26228.05
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	0
9	**Subtotal of Closure Costs**			**80908.93**
10	Certification of Closure	TS-4	4-D	10113.60
11	Concrete drill rig and sample collection	TS-4	4-E	13776.00
12	**Subtotal (Add cost of certification report and drill rig to closure costs)**			**104798.53**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**92222.71**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Building TA-54-412 is located on Pad 1 in the northeastern portion of Area G and stores solid and liquid type mixed waste. It was constructed in 1999. The building encloses the primary containment structure for the DVRS. All waste handling occurs inside the primary containment structure.

1-A	Maximum permitted capacity for Building TA-54-412 (gallons)			91,080
	Known Releases?	N/A		
1-B	Dimensions of the Building TA-54-412 length (ft) x width (ft) and sf	220	60	13,200
1-C	Materials	Primary containment dimensions 150 x 50 ft, constructed with steel and gypsum board panels on a concrete foundation. Exterior unknown.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	80	42.14	3371.2	3	10113.60
	Inspection	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Report	Sr Engineer/Tech	80	42.14	3371.2	3	10113.60
TOTAL FOR STEP 2A							**22249.92**

***Assumption: The time estimated for this unit was based on the total acreage of the Unit and was porportioned to previous closure cost estimates.**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	80	42.14	3371.2	3	10113.60

TOTAL FOR STEP 2	**32363.52**

3. DECONTAMINATION
The decontamination process includes pressure washing or steam cleaning equipment, floors and walls.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	40	32.94	1317.6	3	3952.80
		Staff Engineer	40	28.4	1136	3	3408.00
		Project Scientist	40	24.29	971.6	3	2914.80
		Staff Scientist	40	19.13	765.2	3	2295.60
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.4**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Floor, wall and equipment decontamination	40	See crew above			

TOTAL FOR STEP 3-A	**12571.20**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Wipes	19	16	43.42	694.72	3	2084.16
	Radioactive Sample (includes equipment and surfaces)	19	12	43.42	521.04	3	1563.12
	Verification Soil Sample below sump and drainage path	4	8	43.42	347.36	3	1042.08
TOTAL FOR STEP 3-E							**4689.36**
TOTAL FOR STEP 3							**17260.56**

TOTAL FOR TS-3 WORKSHEET	**49624.08**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals	Wipe	19	747.85	14209.15	NA	14209.15
	SVOCs	Wipe					
	VOCs	Wipe					
	Metals, SVOCs, VOCs	Soil	4	620.13	2480.52	NA	2480.52
	Radionuclides	Wipe	19	167.34	3179.46	3	9538.38
TOTAL FOR STEP 4-A			**42**				**26228.05**

		Labor Category	Hours or days	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and Debris Disposal	NA	Assume no demolition				
4-D	Certification Report	Sr. Engineer/Tech	80	42.14	3371.20	3	10113.60
4-E	Concrete drilling and soil core samples	Drill rig and crew, 2 days	2	2296.00	4592.00	3	13776.00
TOTAL FOR STEP 4-B, 4-D and 4-E							**28946.40**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**55174.45**

TA-54 AREA G PAD 3 including STORAGE DOME 48 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 3 including Storage Dome 48

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 3 and Dome 48 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	11267.58
5	Decontamination Verification Samples	TS-3	3-E	7034.04
6	Analyses	TS-4	4-A	33583.12
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	29880.90
9	**Subtotal of Closure Costs**			**100475.80**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**108061.00**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**95093.68**

TA-54 AREA G PAD 3 including STORAGE DOME 48 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Pad 3 including Storage Dome 48 are located in the eastern end of Area G. The dome has been in operation since 1980. The dome is used to store solid type mixed waste on pallets and liquid waste containers in secondary containment pallets.

1-A	Maximum permitted capacity (gallons)			213,840
	Known Releases?			N/A
1-B	Dimensions of the dome length (ft) x width (ft) and sf (underlying and surrounding pad demolition included in estimate)	285	50	14250
	Dimensions of Pad 3 length (ft) x width (ft) and sf	339	50	16950
1-C	Materials	Dome is constructed with tensioned-fabric membranes and aluminum beams. The interior floor perimeter is surrounded with a six inch high asphalt curb or ring wall. The asphalt pad is four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and levels of radiological and chemical contamination detected- assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16181.76**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning adjacent dome walls and equipment, inspection of the pad, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	16	32.94	527.04	3	1581.12
		Staff Engineer	16	28.4	454.40	3	1363.20
		Project Scientist	16	24.29	388.64	3	1165.92
		Staff Scientist	16	19.13	306.08	3	918.24
TOTAL FOR STEP 3-A			**64**	**104.76**	**1676.16**	**3**	**5028.48**

	Activity	Hours days	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Dome wall and equipment decontamination	16	See crew above			
3-C	Mechanical removal of asphalt under dome and surrounding pad		See worksheet TS-4			
3-D	Direct-push sampling rig and crew, $594 mobe and demobe plus $178 per day	5	178	2079.70	3	6239.10

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	**11267.58**

TA-54 AREA G PAD 3 including STORAGE DOME 48 TS-3

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	10	8	43.42	347.36	3	1042.08
	Radioactive Swipe Sample	10	6	43.42	260.52	3	781.56
	Soil verification	34	40	43.42	1736.80	3	5210.40
TOTAL FOR STEP 3-E							**7034.04**
TOTAL FOR STEP 3							**18301.62**

TOTAL FOR TS-3 WORKSHEET	**34483.38**

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	10	747.85	7478.50	NA	7478.50
	Metals SVOCs	Soil	34	620.13	21084.42	NA	21084.42
	VOCs						
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**54**	**1535.32**	**30236.32**	**3**	**33583.12**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal- 210 cy	Front end loader and truck	210	47.43	9960.30	3	29880.90
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 4-B, 4-C and 4-D							**39994.50**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**73577.62**

TA-54 AREA G PAD 5 AND STORAGE DOME 49 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 5 including Storage Dome 49

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 5 and Dome 49 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	11630.64
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C and 3-D	
4	Decontamination Waste Management	TS-3		20414.64
5	Decontamination Verification Samples	TS-3	3-E	11593.14
6	Analyses	TS-4	4-A	86913.30
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	93057.66
9	**Subtotal of Closure Costs**			**233722.98**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**241308.18**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**212351.20**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area G Pad 5 including Storage Dome 49 are located in the south-central portion of Area G. The dome was built in 1986, and is located on Pad 5. Dome 49 stores solid type mixed waste and liquid mixed waste on secondary containment pallets. Pad 5 also includes Dome 224 (on former Pad 8) and Sheds 144, 145, 146, 177, 1027, 1028, 1029 and 1041 (on former Pad 7). Costs for closure at each of these units was estimated separately, but the overall Pad 5 assessment, sampling and demolition costs are included in this worksheet.

1-A	Maximum permitted capacity for Dome 49 (gallons)			520,080
	Known Releases?			N/A
1-B	Dimensions of Dome 49 length (ft) x width (ft) and sf (pad demolition assumed- see worksheet TS-4)	440	60	26400
	Dimensions of Pad 5 length (ft) x width (ft) and sf	500	65	32500
	Dimensions of Pad 7 length (ft) x width (ft) and sf	200	64	12,800
	Dimensions of Pad 8 length (ft) x width (ft) and sf	150	95	14,250
1-C	Materials	The domes are constructed with tensioned-fabric membranes and aluminum beams. The floor is surrounded with a mimumum six-inch high curb or ring wall. The asphalt pad is approximately four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80
	Inspection	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Report	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80
TOTAL FOR STEP 2A							**11630.64**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80

TOTAL FOR STEP 2	**16687.44**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning equipment and structures, inspection of the pad, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	40	32.94	1317.6	3	3952.80
		Staff Engineer	40	28.4	1136	3	3408.00
		Project Scientist	40	24.29	971.6	3	2914.80
		Staff Scientist	40	19.13	765.2	3	2295.60
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.4**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment & structure decontamination	40	See above crew			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig and crew- $594 mobe and demobe plus $178 per day	64	178	2614.48	3	7843.44
TOTAL FOR STEP 3-B, 3-C and 3-D						**20414.64**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Verification Water/Wipe Dome 49 and surrounding Pad 5 (including former Pads 7 and 8) except 224	10	24	43.42	1042.08	3	3126.24
	Soil Verification	120	60	43.42	2605.2	3	7815.60
	Radioactive Swipe Dome 49	10	5	43.42	217.1	3	651.30
TOTAL FOR STEP 3-E							**11593.14**

TOTAL FOR TS-3 WORKSHEET	**40851.78**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
	Metals, SVOCs VOCs	Soil	120	620.13	74415.60	NA	74414.60
	Toxic Metals, SVOCs, VOCs	Water/Wipe	10	747.85	7478.50	NA	7478.50
TOTAL FOR STEP 4-A			**140**	**1535.32**	**83567.5**	**3**	**86913.30**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and Debris removal	FE loader & trucks for asphalt removal 654 cy	654	47.43	31019.22	3	93057.66
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**105699.66**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**192612.96**

TA-54 AREA G PAD 5 AND STORAGE DOME 224 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 5 and Storage Dome 224

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 5 and Dome 224 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	11630.64
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-C and 3	
4	Decontamination Waste Management	TS-3	D	6614.22
5	Decontamination Verification Samples	TS-3	3-E	2214.42
6	Analyses	TS-4	4-A	17313.55
7	Sample Logbook	TS-4	4-B	1517.04
8	Demolition and Debris Disposal	TS-4	4-C	11667.78
9	**Subtotal of Closure Costs**			**56014.45**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**61071.25**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**53742.70**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area G Storage Dome 224 is located in the south-central portion of Area G on Pad 5. The pad unit consists of three adjacent smaller pads; Pads 5, 8 and 7, now consolidated as Pad 5. Dome 224 was constructed in 1989, and is designed for secondary containment of liquids with a concrete collection sump in the center of the dome and a plastic liner underneath the asphalt pad. Costs for inspection, sampling and demolition of Pad 5 are in the worksheet for Dome 49.

1-A	Maximum permitted capacity for Dome 224 (gallons)			95,040
	Known Releases?			N/A
1-B	Dimensions of Dome 224 length (ft) x width (ft) and sf (pad demolition assumed- see worksheet TS-4)	110	60	6600
	Dimensions of Pad 5 length (ft) x width (ft) and sf	150	95	14250
1-C	Materials	The dome is constructed with tensioned-fabric membranes and aluminum beams. The floor is surrounded with a mimumum six inch high curb or ring wall. The asphalt pad is approximately four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11630.64**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16687.44**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment and walls, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	8	32.94	263.52	3	790.56
		Staff Engineer	8	28.40	227.20	3	681.60
		Project Scientist	8	24.29	194.32	3	582.96
		Staff Scientist	8	19.13	153.04	3	459.12
TOTAL FOR STEP 3-A			**32**	**104.76**	**838.08**	**3**	**2514.24**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, inspection and sampling	8	See above crew			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig and crew $594 mobe and demobe plus $178 per day	1	178	1366.66	3	4099.98
TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D						**6614.22**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Soil below sump	1	1	43.42	43.42	3	130.26
	Verification Water/Wipe	4	4	43.42	173.68	3	521.04
	Soil below asphalt	14	8	43.42	347.36	3	1042.08
	Radioactive Swipe Dome 224	10	5	43.42	217.10	3	651.30
TOTAL FOR STEP 3-E							**2214.42**
TOTAL FOR STEP 3							**8828.64**

TOTAL FOR TS-3 WORKSHEET	**25516.08**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
	Toxic Metals, SVOCs, VOCs	Wipe	4	747.85	2991.40	NA	2991.40
	Metals, SVOCs, VOCs	Soil	15	620.13	9301.95	NA	9301.95
TOTAL FOR STEP 4-A			**29**	**1535.32**	**13966.75**	**3**	**17313.55**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	12	42.14	505.68	3	1517.04
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt removal 82 cy	82	47.43	3889.26	3	11667.78
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**18241.62**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**35555.17**

TA-54 AREA G PAD 6 AND STORAGE DOME 153 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 6 and Storage Dome 153

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 6 and Dome 153 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	11630.64
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	18810.30
5	Decontamination Verification Samples	TS-3	3-E	6903.78
6	Analyses	TS-4	4-A	72031.18
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	83808.81
9	**Subtotal of Closure Costs**			**203298.31**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add certification of closure to closure costs)**			**210883.51**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**185577.49**

TA-54 AREA G PAD 6 AND STORAGE DOME 153 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Pad 6 including Storage Dome153 are located in the north-central portion of Area G. Dome 153 stores solid type mixed waste, including large fiberglass-reinforced boxes containing contaminated equipment. Liquid mixed wastes are also stored on secondary containment pallets. This worksheet includes sampling and demolition of the surrounding pad.

1-A	Maximum permitted capacity for Dome 153 of Pad 6 (gallons)			316,140
	Known Releases?			N/A
1-B	Dimensions of the Dome 153 length (ft) x width (ft) and sf	326	60	19,560
	Dimensions of Pad 6 length (ft) x width (ft) and sf	633	99	62,667
1-C	Materials	The dome is manufactured with tensioned-fabric membranes and aluminum beams. The interior floor perimeter of the dome is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is approximately four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D.		

Note: Demolition of pad under Dome 283 is accounted separately

Total area minus Dome 283 (15,000 sf) = 47,667 sf

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11630.64**

***Assumption: The time estimated for this unit was based on the total acreage of the Unit and was porportioned to previous closure cost estimates.**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16687.44**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
3-A	4	Project Engineer	40	32.94	1317.60	3	3952.80
		Staff Engineer	40	28.4	1136.00	3	3408.00
		Project Scientist	40	24.29	971.60	3	2914.80
		Staff Scientist	40	19.13	765.20	3	2295.60
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.40**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, inspection and sampling	24	See crew above			
3-C	Mechanical removal of asphalt layers		See worksheet TS-4			
3-D	Direct-push sampling rig and crew, $594 mobe and demobe plus $178 per day	40	178	2079.7	3	6239.10

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	**18810.30**

TA-54 AREA G PAD 6 AND STORAGE DOME 153 TS-3

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Wipe	10	8	43.42	347.36	3	1042.08
	Radioactive Sample	10	5	43.42	217.10	3	651.30
	Soil Verification	96	40	43.42	1736.80	3	5210.40
TOTAL FOR STEP 3-E							**6903.78**
TOTAL FOR STEP 3							**25714.08**

TOTAL FOR TS-3 WORKSHEET	**42401.52**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals SVOCs VOCs	Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs VOCs	Soil	96	620.13	59532.48	NA	59532.48
	Radioactive	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**116**	**167.34**	**19411.44**	**3**	**72031.18**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt- 589 cy	589	47.43	27936.27	3	83808.81
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**96450.81**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**168481.99**

TA-54 AREA G PAD 6 AND STORAGE DOME 283 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 6 Storage and Dome 283

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 6 and Dome 283 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	11630.64
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	12712.26
5	Decontamination Verification Samples	TS-3	3-E	5861.70
6	Analyses	TS-4	4-A	31102.60
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	26465.94
9	**Subtotal of Closure Costs**			**95358.34**
10	Certification of Closure	TS-4	4-D	6321.00
11				
12	**Subtotal (Add certification report to closure costs)**			**101679.34**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**89477.82**

TA-54 AREA G PAD 6 AND STORAGE DOME 283 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
Unit TA-54 Area G Pad 6, including Storage Dome 283 is located in the north-central portion of Area G. Dome 283 stores solid type mixed waste, including large fiberglass-reinforced boxes containing contaminated equipment. Liquid mixed wastes are also stored on secondary containment pallets.

1-A	Maximum permitted capacity for Dome 283 of Pad 6 (gallons)			281,160
	Known Releases?			N/A
1-B	Dimensions of the Dome 283 length (ft) x width (ft) and sf	250	60	15,000
	Dimensions of Pad 6 length (ft) x width (ft) and sf	633	99	62,667
	Sampling and demolition costs for surrounding Pad 6 are accounted in Dome 153 worksheet			
1-C	Materials	The dome is constructed with tensioned-fabric membranes and aluminum beams. The interior floor perimeter of the dome is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is approximately four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11630.64**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16687.44**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.4	681.60	3	2044.80
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12		459.12
TOTAL FOR STEP 3-A			**96**	**104.76**	**2514.24**	**3**	**7542.72**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
3-B	Equipment decontamination, inspection	24	See crew above			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig and crew, $594 mobe and demobe plus $178 per day	24	178	1723.18	3	5169.54

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	**12712.26**

TA-54 AREA G PAD 6 AND STORAGE DOME 283 TS-3

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Wipe	10	16	43.42	694.72	3	2084.16
	Radioactive Wipe	10	5	43.42	217.10	3	651.30
	Soil	30	24	43.42	1042.08	3	3126.24
TOTAL FOR STEP 3-E							**5861.70**
TOTAL FOR STEP 3							**18573.96**

TOTAL FOR TS-3 WORKSHEET	**35261.40**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals SVOCs VOCs	Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs VOCs	Soil	30	620.13	18603.90	NA	18603.90
	Radioactive	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**50**	**1535.32**	**27755.80**	**3**	**31102.60**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt- 186 cy	186	47.43	8821.98	3	26465.94
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**35315.34**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**66417.94**

TA-54 AREA G PAD 9 AND STORAGE DOME 229 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 9 and Storage Dome 229

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 9 and Dome 229 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	14664.72
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	18810.30
5	Decontamination Verification Samples	TS-3	3-E	10420.80
6	Analyses	TS-4	4-A	132851.97
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	161356.86
9	**Subtotal of Closure Costs**			**345689.85**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add certification report to closure costs)**			**353275.05**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**310882.04**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Storage Dome 229 is located at the east end of Area G on Pad 9. The dome was built in 1994 and 1995 and stores solid type mixed waste only. This worksheet also includes sampling and demolition of Pad 9, minus the area of 230, 231 and 232.

1-A	Maximum permitted capacity for Dome 229 of Pad 9 (gallons)			330,000
	Known Releases?			N/A
1-B	Dimensions of Dome 229 length (ft) x width (ft) and sf	246	88	21,648
	Dimensions of Pad 9 length (ft) x width (ft) and sf	570	275	156,750
1-C	Materials	Dome is constructed with tensioned-fabric membranes and aluminum beams. The interior floor perimeter of the dome is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is four to six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

Pad 9 Area	156,750
Dome 230	21,648
Dome 231	21,648
Dome 232	21,648
Total area included in this worksheet	91,806

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Report	Sr Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 2A							**14664.72**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**19721.52**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	40	32.94	1317.60	3	3952.80
		Staff Engineer	40	28.4	1136.00	3	3408.00
		Project Scientist	40	24.29	971.60	3	2914.80
		Staff Scientist	40	19.13	765.20	3	2295.60
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.40**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, inspection and sampling of asphalt surface	40	See crew above			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig and crew, $594 mobe and demobe plus $178 per day	40	178	2079.70	3	6239.10

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	**18810.30**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	15	12	43.42	521.04	3	1563.12
	Radioactive Wipe	15	8	43.42	347.36	3	1042.08
	Soil	184	60	43.42	2605.20	3	7815.60
TOTAL FOR STEP 3-E							**10420.80**
TOTAL FOR STEP 3							**29231.10**

TOTAL FOR TS-3 WORKSHEET	**48952.62**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cos ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	15	747.85	11217.75	NA	11217.75
	Metals, SVOCs, VOCs	Soil	184	620.13	114103.92	NA	114103.92
	Radionuclides	Wipe	15	167.34	2510.10	3	7530.30
TOTAL FOR STEP 4-A			**214**	**1535.32**	**127831.77**	**3**	**132851.97**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal	FE loader & trucks to remove asphalt-1,134 cy	1134	47.43	53785.62	3	161356.86
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**171470.46**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**304322.43**

TA-54 AREA G PAD 9 AND STORAGE DOME 230 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 9 and Storage Dome 230

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 9 and Dome 230 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	14664.72
2	Sampling and Analysis Plan	TS-3	2-B	7585.20
3	Decontamination Process		3-A, 3-B, 3-C,	
4	Decontamination Waste Management	TS-3	3-D and 3-E	12712.26
5	Decontamination Verification Samples	TS-3	3-E	6122.22
6	Analyses	TS-4	4-A	49134.42
7	Sample Logbook	TS-4	4-B	2528.40
8	Asphalt Demolition and Debris Removal	TS-4	4-C	57058.29
9	**Subtotal of Closure Costs**			**149805.51**
10	Certification of Closure	TS-4	4-D	6321.00
11	Sump & liner demolition & removal	TS-4	4-E	8537.40
12	**Subtotal (Add certification report to closure costs)**			**164663.91**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**144904.24**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Storage Dome 230 is located at the east end of Area G on Pad 9. The dome was built in 1994 and 1995. Dome 230 stores liquid and solid type mixed waste and has a plastic liner underneath the asphalt portion of the dome floor with an additional concrete sump at the east end of the dome for secondary containment.

1-A	Maximum permitted capacity for Dome 230 of Pad 9 (gallons)			330,000
	Known Releases?			N/A
1-B	Dimensions of Dome 230 length (ft) x width (ft) and sf	246	88	21,648
	Dimensions of Pad 9 length (ft) x width (ft) and sf	570	275	156,750
1-C	Materials	Dome is constructed with tensioned-fabric membranes and aluminum beams. The interior floor perimeter of the dome is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is four to six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Report	Sr Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 2A							**14664.72**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	60	42.14	2528.40	3	7585.20

TOTAL FOR STEP 2	**22249.92**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.4	681.60	3	2044.80
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12	3	1377.36
TOTAL FOR STEP 3-A			**96**	**104.76**	**2514.24**	**3**	**7542.72**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, asphalt inspection and sampling	24	See crew above			
3-C	Mechanical removal of asphalt-		See worksheet TS-4			
3-D	Sump removal		See worksheet TS-4			
3-E	Direct-push sampling rig with crew, $594 mobe and demobe plus $178 per day	24	178	1723.18	3	5169.54

TOTAL FOR STEP 3-A, 3-B, 3-C, 3-D and 3-E	**12712.26**

3-F	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	15	12	43.42	521.04	3	1563.12
	Radioactive Sample	15	8	43.42	347.36	3	1042.08
	Soil below trench and sump	5	3	43.42	130.26	3	390.78
	Soil below asphalt pad	44	24	43.42	1042.08	3	3126.24
TOTAL FOR STEP 3-F							**6122.22**
TOTAL FOR STEP 3							**18834.48**

TOTAL FOR TS-3 WORKSHEET	**41084.40**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Toxic Metals SVOCs VOCs	Wipe	15	747.85	11217.75	NA	11217.75
	Metals SVOCs VOCs	Sump area soil Soil under Pad Total	5 44 49	620.13	30386.37	NA	30386.37
	Radionuclides	Wipe	15	167.34	2510.10	3	7530.30
TOTAL FOR STEP 4-A			**79**	**1535.32**	**44114.22**	**3**	**49134.42**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt- 401 cy	401	47.43	19019.43	3	57058.29
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E	Sump & liner demolition and removal	Concrete demolition- 20 cy Liner-40 cy	60	47.43	2845.80	3	8537.40
TOTAL FOR STEP 4-B, 4-C, 4-D and 4-E							**74445.09**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**123579.51**

TA-54 AREA G PAD 9 AND STORAGE DOME 231 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 9 and Storage Dome 231

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 9 and Dome 231 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	14664.72
2	Sampling and Analysis Plan	TS-3	2-B	7585.20
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	12712.26
5	Decontamination Verification Samples	TS-3	3-E	5731.44
6	Analyses	TS-4	4-A	46033.77
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	57058.29
9	**Subtotal of Closure Costs**			**146314.08**
10	Certification of Closure	TS-4	4-D	6321.00
11				
12	**Subtotal (Add certification report to closure costs)**			**152635.08**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**134318.87**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Storage Dome 231 is located at the east end of Area G on Pad 9. The dome was built in 1994 and 1995 and stores solid mixed waste only.

1-A	Maximum permitted capacity for Dome 231 of Pad 9 (gallons)			393,360
	Known Releases?			N/A
1-B	Dimensions of Dome 231 length (ft) x width (ft) and sf	246	88	21,648
	Dimensions of Pad 9 length (ft) x width (ft) and sf	570	275	156,750
1-C	Materials	Dome is constructed with tensioned-fabric membranes and aluminum beams. The floor is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is four to six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Report	Sr Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 2A							**14664.72**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	60	42.14	2528.40	3	7585.20

TOTAL FOR STEP 2	**22249.92**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection and sampling of the asphalt surface.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.4	681.60	3	2044.80
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12	3	1377.36
TOTAL FOR STEP 3-A			**96**	**104.76**	**2514.24**	**3**	**7542.72**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, inspection	24	See crew above			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig with crew, $594 mobe and demobe plus $178 per day	24	178	1723.18	3	5169.54

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	**12712.26**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	15	12	43.42	521.04	3	1563.12
	Radioactive Wipe	15	8	43.42	347.36	3	1042.08
	Soil	44	24	43.42	1042.08	3	3126.24
TOTAL FOR STEP 3-E							**5731.44**
TOTAL FOR STEP 3							**18443.70**

TOTAL FOR TS-3 WORKSHEET	**40693.62**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. .

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	15	747.85	11217.75	NA	11217.75
	Metals, SVOCs, VOCs	Soil	44	620.13	27285.72	NA	27285.72
	Radionuclides	Wipe	15	167.34	2510.10	3	7530.30
TOTAL FOR STEP 4-A			**74**	**1535.32**	**41013.57**	**3**	**46033.77**

		Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt- 401 cy	401	47.43	19019.43	3	57058.29
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**65907.69**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**111941.46**

TA-54 AREA G PAD 9 AND STORAGE DOME 232 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 9 and Storage Dome 232

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 9 and Dome 232 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	14664.72
2	Sampling and Analysis Plan	TS-3	2-B	7585.20
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	12712.26
5	Decontamination Verification Samples	TS-3	3-E	5731.44
6	Analyses	TS-4	4-A	46033.77
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	57058.29
9	**Subtotal of Closure Costs**			**146314.08**
10	Certification of Closure	TS-4	4-D	6321.00
11				
12	**Subtotal (Add certification report to closure costs)**			**152635.08**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**134318.87**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Storage Dome 232 is located at the east end of Area G on Pad 9. The dome was built in 1994 and 1995 and stores solid mixed waste only.

1-A	Maximum permitted capacity for Dome 232 of Pad 9 (gallons)			393,360
	Known Releases?			N/A
1-B	Dimensions of the Dome 232 length (ft) x width (ft) and sf	246	88	21,648
	Dimensions of Pad 9 length (ft) x width (ft) and sf	570	275	156,750
1-C	Materials	Dome is constructed with tensioned-fabric membranes and aluminum beams. The floor is surrounded with a mimumum six inch high asphalt curb or ring wall. The asphalt pad is four to six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

TOTAL FOR STEP 3-A, 3-B, 3-C and 3-D	12712.26

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Determination Wipe	15	12	43.42	521.04	3	1563.12
	Radioactive Wipe	15	8	43.42	347.36	3	1042.08
	Soil	44	24	43.42	1042.08	3	3126.24
TOTAL FOR STEP 3-E							**5731.44**
TOTAL FOR STEP 3							**18443.70**

TOTAL FOR TS-3 WORKSHEET	**40693.62**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	15	747.85	11217.75	NA	11217.75
	Metals, SVOCs, VOCs	Soil	44	620.13	27285.72	NA	27285.72
	Radionuclides	Wipe	15	167.34	2510.10	3	7530.30
TOTAL FOR STEP 4-A			**74**	**1535.32**	**41013.57**	**3**	**46033.77**

		Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and debris Disposal	FE loader & truck for asphalt- 401 cy	401	47.43	19019.43	3	57058.29
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**65907.69**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**111941.46**

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 10

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Pad 10 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	21997.08
2	Sampling and Analysis Plan	TS-3	2-B	12642.00
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	26700.24
5	Decontamination Verification Samples	TS-3	3-E	12504.96
6	Analyses	TS-4	4-A	148580.75
7	Sample Logbook	TS-4	4-B	7585.20
8	Demolition and Debris Disposal	TS-4	4-C	230509.80
9	**Subtotal of Closure Costs**			**460520.03**
10	Certification of Closure	TS-4	4-D	10113.60
11				
12	**Subtotal (Add certification report to closure costs)**			**470633.63**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**414157.59**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area G Storage Pad 10 is in the eastern portion of Area G and consolidates the units previously identified as Pad 2 and Pad 4. Pad 10 was built in 2002 and does not support any dome structures. The pad is used to store solid type mixed waste containers with liquid waste containers in secondary containment pallets.

1-A	Maximum permitted capacity for Pad 10 (gallons) from 2006 Closure Plan			159,770
	Known Releases?			N/A
1-B	Dimensions of Pad 10 (from 2003 Part B App., Section G.3.4.4)	350	250	87500
1-C	Materials	Asphalt pad thickness unknown, assumed 6 inches thick		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	70	42.14	2949.80	3	8849.40
	Inspection	Sr Engineer/Tech	14	42.14	589.96	3	1769.88
	Report	Sr Engineer/Tech	90	42.14	3792.60	3	11377.80
TOTAL FOR STEP 2A							**21997.08**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	100	42.14	4214.00	3	12642.00

TOTAL FOR STEP 2	**34639.08**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	60	32.94	1976.40	3	5929.20
		Staff Engineer	60	28.40	1704.00	3	5112.00
		Project Scientist	60	24.29	1457.40	3	4372.20
		Staff Scientist	60	19.13	1147.80	3	3443.40
TOTAL FOR STEP 3-A			**240**	**104.76**	**6285.60**	**3**	**18856.80**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment decontamination, inspection and sampling	60	See crew above			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig with crew, $594 mobe and demobe plus $178 per day	60	178	2614.48	3	7843.44

TOTAL FOR STEPS 3-A, 3-B, 3-C AND 3-D	**26700.24**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	20	16	43.42	694.72	3	2084.16
	Radioactive Swipe Sample	50	20	43.42	868.40	3	2605.20
	Soil	175	60	43.42	2605.20	3	7815.60
TOTAL FOR STEP 3-E							**12504.96**
TOTAL FOR STEP 3							**39205.20**

TOTAL FOR TS-3 WORKSHEET	**73844.28**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	20	747.85	14957	NA	14957.00
	Metals, SVOCs, VOCs	Soil	175	620.13	108522.75	NA	108522.75
	Radioactive elements	Wipe	50	167.34	8367.00	3	25101.00
TOTAL FOR STEP 4-A			**245**	**1535.32**	**131846.75**	**3**	**148580.75**

		Labor Category	Hours or cy	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
4-C	Demolition and debris Disposal	FE loader & truck for asphalt removal-1620 cy	1620	47.43	76836.60	3	230509.80
4-D	Certification Report	Sr. Engineer/Tech	80	42.14	3371.20	3	10113.60
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**248208.60**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**396789.35**

TA-54 AREA G PAD 11 AND STORAGE DOME 375 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area G Pad 11 and Storage Dome 375

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 11 and Dome 375 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	18810.30
5	Decontamination Verification Samples	TS-3	3-E	7034.04
6	Analyses	TS-4	4-A	93735.73
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	119381.31
9	**Subtotal of Closure Costs**			**260199.94**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add cost of certification to closure costs)**			**267785.14**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**235650.92**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area G Storage Dome 375 is located on Pad 11 in the western portion of Area G. The dome was erected in 2002 and is used to store hazardous, MLLW and MTRU wastes on pallets or other supports.

1-A	Maximum permitted capacity (gallons)			682,440
	Known Releases?			N/A
1-B	Dimensions of the Dome 375 length (ft) x width (ft) and sf	300	100	30000
	Dimensions of Pad 11 length (ft) x width (ft) and sf	478	137	65486
	(demolition included in this cost estimate)			
1-C	Materials	Dome is constructed of tensioned-fabric membranes and aluminum beams. The interior floor is surrounded with a mimumum six-inch high concrete ring wall. The asphaltic concrete pad is four inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16181.76**

3. DECONTAMINATION
The decontamination process will involve pressure washing or steam cleaning equipment, inspection, and sampling soil below the asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	40	32.94	1317.60	3	3952.80
		Staff Engineer	40	28.4	1136.00	3	3408.00
		Project Scientist	40	24.29	971.60	3	2914.80
		Staff Scientist	40	19.13	765.20	3	2295.60
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.40**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
3-B	Equipment decontamination, inspection and sampling	40	See crew above			
3-C	Mechanical removal of asphalt beneath dome and surrounding pad		See worksheet TS-4			
3-D	Direct-push sampling rig with crew, $594 mobe and demobe plus $178 per day	40	178	2079.70	3	6239.10

TOTAL FOR STEPS 3-A, 3-B, 3-C AND 3-D	**18810.30**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	10	8	43.42	347.36	3	1042.08
	Radioactive Swipe Sample	10	6	43.42	260.52	3	781.56
	Soil Samples	131	40	43.42	1736.80	3	5210.40
TOTAL FOR STEP 3-E							**7034.04**
TOTAL FOR STEP 3							**25844.34**

TOTAL FOR TS-3 WORKSHEET	**42026.10**

TA-54 AREA G PAD 11 including STORAGE DOME 375 TS-4

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs, VOCs	Soil	131	620.13	81237.03	NA	81237.03
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**151**	**1535.32**	**90388.93**	**3**	**93735.73**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and debris Disposal (entire Pad 11)	Remove 809 cy asphalt and 30 cy concrete	839	47.43	39793.77	3	119381.31
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
TOTAL FOR STEP 4-B, 4-C and 4-D							**132023.31**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**225759.04**

TA-54 WEST OUTSIDE STORAGE PAD AND LOADING TS-1 DOCK

Facility Name: Los Alamos National Laboratory TA-54 West Outside Storage Pad and Loading Dock

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	OSP and Dock Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C and	
4	Decontamination Waste Management	TS-3	3-D	18810.30
5	Decontamination Verification Samples	TS-3	3-E	11723.40
6	Analyses	TS-4	4-A	225993.40
7	Sample Logbook	TS-4	4-B	5056.80
8	Demolition and Debris Disposal	TS-4	4-C	67160.88
9	**Subtotal of Closure Costs**			**344926.54**
10	Certification of Closure	TS-4	4-D	7585.20
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**352511.74**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**310210.33**

TA-54 WEST OUTSIDE STORAGE PAD AND LOADING DOCK TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 West Outside Storage Pad (OSP) is located on the north, east and south sides of Building TA-54-38. It stores primarily solid type mixed waste undergoing waste characterization and packaging activities for shipment to the Waste Isolation Pilot Plant (WIPP). The pad became operational in 1998. This unit includes the Loading Dock on the northeast side of TA-54-38. Pending renewal of the LANL Hazardous Waste Facility Permit, this area may be increased to include the entire asphalt area within the fence line of TA-54 West.

1-A	Maximum permitted capacity for OSP (gallons)			7,920
	Known Releases?			N/A
1-B	Dimensions of OSP length (ft) x width (ft) and sf	unknown	unknown	37,248
	(From 2003 Part B Application, Table 2-5)			
	Dimensions of Loading Dock length (ft) x width (ft) and sf	38'-10"	16	616
1-C	Materials	OSP is an asphalt pad four inches thick, loading dock is concrete six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16181.76**

3. DECONTAMINATION
The decontamination process will involve the pressure washing or steam cleaning the Loading Dock, and inspection and sampling of the OSP asphalt.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	40	32.94	1317.60	3	3952.80
		Staff Engineer	40	28.40	1136.00	3	3408.00
		Project Scientist	40	24.29	971.60	3	2914.80
		Staff Scientist	40	19.13	765.20		765.20
TOTAL FOR STEP 3-A			**160**	**104.76**	**4190.40**	**3**	**12571.20**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and loading dock decontamination	40	See crew above			
3-C	Mechanical removal of asphalt		See worksheet TS-4			
3-D	Direct-push sampling rig with crew, $594 mobe and demobe plus $178 per day	40	178	2079.70	3	6239.10

TOTAL FOR STEP 3-A, 3-B, 3-C AND 3-D	**18810.30**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Determination Wipe	10	40	43.42	1736.80	3	5210.40
	Radioactive Sample	10	10	43.42	434.20	3	1302.60
	Soil	75	40	43.42	1736.80	3	5210.40
TOTAL FOR STEP 3-E							**11723.40**
TOTAL FOR STEP 3							**30533.70**

TOTAL FOR TS-3 WORKSHEET	**46715.46**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals SVOCs, VOCs	Water/Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs, VOCs	Soil	75	620.13	46509.75	NA	46509.75
	Radionuclides		10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**95**	**1535.32**	**55661.65**	**3**	**225993.40**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
4-C	Demolition and debris Disposal	FE loader & truck remove 460 cy asphalt, 12 cy concrete	472	47.43	22386.96	3	67160.88
4-D	Certification Report	Sr. Engineer/Tech	60	42.14	2528.40	3	7585.20
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**79802.88**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**305796.28**

Facility Name: Los Alamos National Laboratory TA-54-38 54 West High Bay

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	West High Bay Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	3371.20
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and , 3-B	7542.72
5	Decontamination Verification Samples	TS-3	3-E	2474.94
6	Analyses	TS-4	4-A	14221.01
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**41263.23**
10	Certification of Closure	TS-4	4-D	6321.00
11	Concrete drill and soil sample rig	TS-4	4-E	13776.00
12	**Subtotal (Add cost of certification report to closure costs)**			**61360.23**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**53997.00**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-38 includes two storage areas; High Bay and Low Bay. The building was constructed in 1993. The High Bay stores solid type mixed waste while shipping packages for transport to WIPP are prepared.

1-A	Maximum permitted capacity for High Bay (gallons)			2,200
	Known Releases?			N/A
1-B	Dimensions of the High Bay length (ft) x width (ft) and sf	40	80	3,200
1-C	Materials	Constructed with precast concrete panels on a 6 inch unpainted concrete slab with a central drainage trench and sump.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	2	3371.20

TOTAL FOR STEP 2	**14496.16**

3. DECONTAMINATION
The decontamination process includes pressure washing or steam cleaning of equipment, floors and walls.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.4	681.60	3	2044.80
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12	3	1377.36
TOTAL FOR STEP 3-A			**96**	**104.76**	**2514.24**	**3**	**7542.72**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Decontamination	24	See crew above			0.00

TOTAL FOR STEP 3-A	**7542.72**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Wipes	11	6	43.42	260.52	3	781.56
	Radioactive Sample (includes equipment and surfaces)	7	5	43.42	217.10	3	651.30
	Verification Soil Sample below sump & drain path	4	8	43.42	347.36	3	1042.08
TOTAL FOR STEP 3-E							**2474.94**
TOTAL FOR STEP 3							**10017.66**

TOTAL FOR TS-3 WORKSHEET	**24513.82**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals	Water/Wipe	11	747.85	8226.35	NA	8226.35
	SVOCs	Water/Wipe					
	VOCs	Water/Wipe					
	Metals, SVOC, VOC	Soil	4	620.13	2480.52	NA	2480.52
	Radionuclides		7	167.34	1171.38	3	3514.14
TOTAL FOR STEP 4-A			**22**				**14221.01**

		Labor Category	Hours or days	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E	Concrete drilling and soil samples beneath sump and trench	Drill rig and crew, 2 days	2	2296	4592.00	3	13776.00
TOTAL FOR STEP 4-B, 4-C, 4-D and 4-E							**22625.40**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**36846.41**

Facility Name: Los Alamos National Laboratory TA-54 West Low Bay

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	West Low Bay Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	9102.24
2	Sampling and Analysis Plan	TS-3	2-B	3034.08
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	3771.36
5	Decontamination Verification Samples	TS-3	3-E	781.56
6	Analyses	TS-4	4-A	5993.16
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**23188.08**
10	Certification of Closure	TS-4	4-D	6321.00
11				0.00
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**29509.08**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**25967.99**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-38 West includes two storage areas; High Bay and Low Bay, and several offices. The building was constructed in 1993. The Low Bay is used for storage and staging mixed solid MLLW and MTRUW while radioassay waste characterization activites are performed.

1-A	Maximum permitted capacity for Low Bay (gallons)			880
	Known Releases?			N/A
1-B	Dimensions of the Building TA-54-33 length (ft) x width (ft) and sf	40	34	1,360
1-C	Materials	Constructed with precast concrete panels on an enamel-painted concrete slab.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and radiological and/or chemical contamination detected. Assume D.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**9102.24**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08

TOTAL FOR STEP 2	**12136.32**

3. DECONTAMINATION
The decontamination process includes pressure washing or steam cleaning of equipment, floors and walls.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	12	32.94	395.28	3	1185.84
		Staff Engineer	12	28.4	340.80	3	1022.40
		Project Scientist	12	24.29	291.48	3	874.44
		Staff Scientist	12	19.13	229.56	3	688.68
TOTAL FOR STEP 3-A			**48**	**104.76**	**1257.12**	**3**	**3771.36**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Decontamination	12	See crew above			0.00

TOTAL FOR STEP 3-A	**3771.36**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipes	6	4	43.42	173.68	3	521.04
	Radioactive Sample (includes equipment and surfaces)	3	2	43.42	86.84	3	260.52

TOTAL FOR STEP 3-E	**781.56**
TOTAL FOR STEP 3	**4552.92**

TOTAL FOR TS-3 WORKSHEET	**16689.24**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals SVOCs VOCs	Wipe	6	747.85	4487.10	NA	4487.10
	Radionuclides		3	167.34	502.02	3	1506.06
TOTAL FOR STEP 4-A			**9**				**5993.16**

		Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and debris Disposal	NA					0.00
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E							
TOTAL FOR STEP 4-B, 4-C and 4-D							**6826.68**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**12819.84**

TA-54 AREA L WITHIN FENCE LINE

Facility Name: Los Alamos National Laboratory TA-54 Area L Within Fence Line

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Area L Within Fence Line Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	13147.68
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B,	
4	Decontamination Waste Management	TS-3	and 3-C	15085.44
5	Decontamination Verification Samples	TS-3	3-D	11462.88
6	Analyses	TS-4	4-A	115440.28
7	Sample Logbook	TS-4	4-B	6068.16
8	Demolition and Debris Disposal	TS-4	4-C	218557.44
9	**Subtotal of Closure Costs**			**384818.68**
10	Certification of Closure	TS-4	4-D	10113.60
11				
12	**Subtotal (Add certification report to closure costs)**			**394932.28**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**347540.41**

TA-54 AREA L WITHIN FENCE LINE TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area L Within Fence Line is constructed in a similar fashion as the Domes for Area G. Most of the area was used for storage of solid type hazardous waste with temporary storage of mixed waste in 1995 and 1996 when Dome 215 was erected. Pending renewal of the LANL Hazardous Waste Facility Permit, additional outside storage of solid type hazardous and mixed waste may occur in the area. (NOTE: Area costed for closure in this worksheet is derived by subtracting subunits except portables in Area L from the total 2.58 acres provided in the Part B application.)

1-A	Maximum permitted capacity for Area Within Fence Line (gallons) from 2006 Closure Plan			407,880
	Known Releases?			N/A
1-B	Estimated area of TA-54 Area L (from 2003 Part B) minus other concrete-based units and 215 and 216, within fence	---	---	82,951
1-C	Materials	Asphaltic concrete assumed 6 inches thick		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D.		

Area Determination	Sq Ft
Total Area L 2.58 acres	112,384
Dome 215	15,960
Canopy 216	3,960
TA-54-31 (Prefab shed on concrete foundation)	182
TA-54-32 (concrete pad)	1,856
TA-54-35 (concrete pad)	992
TA-54-36 (concrete pad)	1,023
TA-54-39 Inside (Overall building 40 x 40 ft)	1600
TA-54-39 Outside	2837
TA-54-58 (concrete pad)	1,023
TA-54-68 (prefab shed on pad- asphalt beneath)	0
TA-54-69 (prefab shed)	0
TA-54-70 (prefab shed)	0
Total Area of discrete units except portable structures	29,433
Area L Pad outside discrete units	**82951**

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Review	Sr Engineer/Tech	60	42.14	2528.40	2	5056.80
	Inspection	Sr Engineer/Tech	16	42.14	674.24	2	1348.48
	Report	Sr Engineer/Tech	80	42.14	3371.20	2	6742.40
TOTAL FOR STEP 2A							**13147.68**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	60	42.14	2528.40	2	5056.80

TOTAL FOR STEP 2	**18204.48**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis, demolition, and certification costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	10	747.85	7478.50	NA	7478.50
	Metals, SVOCs, VOCs	Soil	166	620.13	102941.58	NA	102941.58
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
TOTAL FOR STEP 4-A			**186**	**1535.32**	**112093.48**	**3**	**115440.28**

		Labor Category	Hours or cy	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	48	42.14	2022.72	3	6068.16
4-C	Demolition and Debris Disposal	FE loader & truck for asphalt removal-1536 cy	1536	47.43	72852.48	3	218557.44
4-D	Certification Report	Sr. Engineer/Tech	80	42.14	3371.20	3	10113.60
TOTAL FOR STEP 4-B, 4-C and 4-D							**234739.20**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**350179.48**

TA-54 AREA L BUILDING 31

Facility Name: Los Alamos National Laboratory TA-54 Area L Building 31

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Bldg 39 Room 101 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5562.48
2	Sampling and Analysis Plan	TS-3	2-B	1517.04
3	Decontamination Process		3-A, 3-B, and 3-	
4	Decontamination Waste Management	TS-3	C	1257.12
5	Decontamination Verification Samples	TS-3	3-E	781.56
6	Analyses	TS-4	4-A	5610.00
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**15233.88**
10	Certification of Closure	TS-4	4-D	2022.72
11	Concrete drill rig and crew	TS-4	4-E	6888.00
12	**Subtotal (Add cost of certification to closure costs)**			**24144.60**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**21247.25**

TA-54 AREA L BUILDING 31 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area L Building 31 was built in 1979 and is located on the southwest side of Area L. The room will store liquid and solid hazardous waste containers pending renewal of the LANL RCRA Hazardous Waste Facility Permit.

1-A	Maximum permitted capacity (gallons)			1,320
	Known Releases?			N/A
1-B	Dimensions of the building length (ft) x width (ft) and sf (demolition included in this cost estimate)	14	13	182
1-C	Materials	Steel building on concrete floor with a epoxy coating and a 6" high interior curb and 3 recessed sumps for secondary containment		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5562.48**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	12	42.14	505.68	3	1517.04

TOTAL FOR STEP 2	**7079.52**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination with wash water solution	4	See crew above			
3-C	Drilling through concrete sumps to obtain soil samples		See worksheet TS-4			

TOTAL FOR STEP 3-A	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	3	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	3	1	43.42	43.42	3	130.26
	Soil Samples	3 below sumps	3	43.42	130.26	3	390.78

TOTAL FOR STEP 3-E	**781.56**
TOTAL FOR STEP 3	**2038.68**

TOTAL FOR TS-3 WORKSHEET	**9118.20**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	3	747.85	2243.55	NA	2243.55
	Radioactive elements	Wipe	3	167.34	502.02	3	1506.06
	Metals, SVOCs, VOCs	Soil	3	620.13	1860.39	NA	1860.39
TOTAL FOR STEP 4-A			**6**				**5610.00**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					0.00
4-D	Certification Report	Sr. Engineer/Tech	16	42.14	674.24	3	2022.72
4-E	Concrete drilling to obtain samples below sumps	Concrete core drill and crew, 1 day	1	2296	2296.00	3	6888.00
TOTAL FOR STEP 4-B, 4-C, 4-D and 4-E							**9416.40**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**15026.40**

Facility Name: Los Alamos National Laboratory TA-54 Area L TA-54-32 Pad

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**TA-54-32 Pad Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	9102.24
2	Sampling and Analysis Plan	TS-3	2-B	2022.72
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	3771.36
5	Decontamination Verification Samples	TS-3	3-E	1302.60
6	Analyses	TS-4	4-A	6712.18
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	30415.20
9	**Subtotal of Closure Costs**			**53831.98**
10	Certification of Closure	TS-4	4-D	3034.08
11				
12	**Subtotal (Add certification report to closure costs)**			**56866.06**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**50042.13**

TA-54 AREA L TA-54-32 PAD

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-32 Pad is located in the south central part of Area L and was built in 1986. It is covered by a steel canopy and divided into six containment cells by minimum six-inch high concrete curbs. The pad is grated and stores various types of solid and liquid hazardous waste. Each cell has a sump.

1-A	Maximum permitted capacity for TA-54-32 Pad (gallons) from 2006 closure plan			17,160
	Known Releases?			N/A
1-B	Dimensions of Pad 32- length (ft) x width (ft) and sf	116	16	1856
1-C	Materials	Concrete pad thickness is assumed to be 6 inches. Epoxy sealed/painted.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**9102.24**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	24	42.14	1011.36	2	2022.72

TOTAL FOR STEP 2	**11124.96**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning of the pad and equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	12	32.94	395.28	3	1185.84
		Staff Engineer	12	28.4	340.80	3	1022.40
		Project Scientist	12	24.29	291.48	3	874.44
		Staff Scientist	12	19.13	229.56	3	688.68
TOTAL FOR STEP 3-A			**48**	**104.76**	**1257.12**	**3**	**3771.36**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination with wash water solution	12	See crew above			
3-C	Demolition		See worksheet TS-4			

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	4	4	43.42	173.68	3	521.04
	Soil below each sump	6	6	43.42	260.52	3	781.56
TOTAL FOR STEP 3-E							**1302.60**
TOTAL FOR STEP 3							**5073.96**

TOTAL FOR TS-3 WORKSHEET	**16198.92**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	4	747.85	2991.40	NA	2991.40
	Toxic Metals, SVOCs, VOCs	Soil below sumps	6	620.13	3720.78	NA	3720.78
TOTAL FOR STEP 4-A			**10**				**6712.18**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Concrete and steel demolition and debris removal	Crew to remove roof, support beams, partitions, grates (40 cy) and 40 cy concrete	80	126.73	10138.40	3	30415.20
4-D	Certification Report	Sr. Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 4-B, 4-C and 4-D							**33954.96**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**40667.14**

Facility Name: Los Alamos National Laboratory TA-54 Area L Pad 35

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Pad 35 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	2514.24
5	Decontamination Verification Samples	TS-3	3-E	651.30
6	Analyses	TS-4	4-A	3740.00
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	15207.60
9	**Subtotal of Closure Costs**			**28686.98**
10	Certification of Closure	TS-4	4-D	3034.08
11				
12	**Subtotal (Add certification report to closure costs)**			**31721.06**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**27914.53**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area L TA-54-35 is a concrete pad located in the west-central portion of Area L. This pad and Pads 36 and 58 are covered by one large steel canopy. All three pads were constructed in 1986. This unit supported the barium sands treatment and storage waste management tanks.

1-A	Maximum permitted capacity for TA-54-35 (gallons) from 2006 closure plan			15,840
	Known Releases?			N/A
1-B	Dimensions of TA-54-35 (from 2003 Part B app. Section G.2.4.1) length (ft) x width (ft) = sf	31.5	31.5	992.25
1-C	Materials	Concrete pad thickness is assumed to be 6 inches. A concrete containment curb around the perimeter is 8 inches high, 29.5 ft long and 24.5 ft wide.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	2	747.85	1495.70	NA	1495.70
	Metals, SVOCs, VOCs	Soil	2	620.13	1240.26	NA	1240.26
	Radioactive elements	Wipe	2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**6**				**3740.00**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Concrete and steel demolition and debris removal	Air and heavy equipment crew for demolition, including 1/3 of the steel canopy, 40 cy	40	126.73	5069.20	3	15207.60
4-D	Certification Report	Sr. Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 4-B, 4-C and 4-D							**18747.36**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**22487.36**

Facility Name: Los Alamos National Laboratory TA-54 Area L Pad 36

SUMMARY WORKSHEET				
	Activity	Worksheet Number	Step	Area L Pad 36 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	2514.24
5	Decontamination Verification Samples	TS-3	3-E	911.82
6	Analyses	TS-4	4-A	5610.00
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	15207.60
9	**Subtotal of Closure Costs**			**30817.50**
10	Certification of Closure	TS-4	4-D	3034.08
11				
12	**Subtotal (Add certification report to closure costs)**			**33851.58**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**29789.39**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-36 is a concrete pad located in the west-central portion of Area L. This pad and Pads 35 and 58 are covered by one large steel canopy. All three pads were constructed in 1986. This unit stores mixed waste while waste characterization studies are performed in a temporary structure placed on the pad.

1-A	Maximum permitted capacity for TA-54-35 (gallons) from 2006 closure plan			13,200
	Known Releases?			N/A
1-B	Dimensions of TA-54-35 (from 2003 Part B app. Section G.2.4.1)	33	31	1023
1-C	Materials	Concrete pad thickness is assumed to be 6 inches. A concrete containment curb around the perimeter is 6 inches high.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning of the pad and equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	8	32.94	263.52	3	790.56
		Staff Engineer	8	28.4	227.20	3	681.60
		Project Scientist	8	24.29	194.32	3	582.96
		Staff Scientist	8	19.13	153.04	3	459.12
TOTAL FOR STEP 3-A			**32**	**104.76**	**838.08**	**3**	**2514.24**

TA-54 AREA L TA-54-36 TS-3

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination	8	See crew above			0.00
3-C	Mechanical removal of concrete pad and steel canopy		See worksheet TS-4			0.00
3-D						0.00

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	3	2	43.42	86.84	3	260.52
	Soil	3	3	43.42	130.26	3	390.78
	Radioactive Swipe Sample	3	2	43.42	86.84	3	260.52
TOTAL FOR STEP 3-E							**911.82**
TOTAL FOR STEP 3							**3426.06**

TOTAL FOR TS-3 WORKSHEET	**9494.22**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	3	747.85	2243.55	NA	2243.55
	Toxic Metals, SVOCs, VOCs	Soil	3	620.13	1860.39	NA	1860.39
	Radioactive elements	Wipe	3	167.34	502.02	3	1506.06
TOTAL FOR STEP 4-A			**9**				**5610.00**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Concrete and steel demolition and debris removal	Air and heavy equipment crew for demolition, including 1/3 of the steel canopy, 40 cy	40	126.73	5069.20	3	15207.60
4-D	Certification Report	Sr. Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 4-B, 4-C and 4-D							**18747.36**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**24357.36**

TA-54 AREA L BUILDING 39 Room 101c

Facility Name: Los Alamos National Labortory TA-54 Area L Building 39 Room 101

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Bldg 39 Room 101 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5562.48
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process		3-A, 3-B, and 3-	
4	Decontamination Waste Management	TS-3	C	1257.12
5	Decontamination Verification Samples	TS-3	3-E	390.78
6	Analyses	TS-4	4-A	2499.74
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**11227.16**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification to closure costs)**			**13755.56**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**12104.89**

TA-54 AREA L BUILDING 39 Room 101 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area L Building 39 was built in 1979 and is located on the south-east side of Area L. It contains an interior storage area in Room 101. The room will store liquid and solid hazardous waste containers pending renewal of the LANL RCRA Hazardous Waste Facility Permit.

1-A	Maximum permitted capacity (gallons)			9,900
	Known Releases?			N/A
1-B	Dimensions of Room 101 are irregular (Figure G-10 in 2003 Part B) length (ft) x width(ft) and sf	---	---	878
1-C	Materials	Concrete floor with a epoxy coating and a 6-inch high interior curb for secondary containment		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5562.48**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6573.84**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

TA-54 AREA L BUILDING 39 Room 101 TS-3

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination	24	See crew above			
3-C	Demolition		NA			

TOTAL FOR STEP 3-A	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	2	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	2	1	43.42	43.42	3	130.26
	Soil Samples	None- assume no contamination found					

TOTAL FOR STEP 3-E	**390.78**
TOTAL FOR STEP 3	**1647.90**

TOTAL FOR TS-3 WORKSHEET	**8221.74**

TA-54 AREA L BUILDING 39 Room 101 TS-4

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	2	747.85	1495.70	NA	1495.70
	Radioactive elements	Wipe	2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**4**				**2499.74**

		Labor Category	cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 4-B, 4-C and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**5533.82**

TA-54 AREA L BUILDING 39 OUTSIDE CSU TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Building 39 Outside CSU

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Building Outside CSU Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	9102.24
2	Sampling and Analysis Plan	TS-3	2-B	2022.72
3	Decontamination Process		3-A, 3-B, 3-	
4	Decontamination Waste Management	TS-3	C and 3-D	9663.24
5	Decontamination Verification Samples	TS-3	3-E	3256.50
6	Analyses	TS-4	4-A	11220.00
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	38019.00
9	**Subtotal of Closure Costs**			**73789.38**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add certification report to closure costs)**			**78846.18**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**69384.64**

TA-54 AREA L BUILDING 39 OUTSIDE CSU TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-39 Outside CSU is an asphalt (eastern section) and concrete (western section) pad located in the southeast portion of Area L. Pending the renewal opf the LANL Hazardous Waste Facility Permit, this unit will store hazardous waste. The concrete portion of the unit is surrounded by a 12 inch high concrete curb for secondary containment.

1-A	Maximum permitted capacity for TA-54-39 (gallons) from 2006 closure plan				15,180
	Known Releases?				N/A
1-B	Dimensions of TA-54-39 Outside (from 2003 Part B app. Section G.2.4.1)	Concrete	58	16	928
		Asphalt	83	23	1909
1-C	Materials		Concrete and asphalt pad thickness assumed to be 6 inches. A steel canopy covers the entire unit.		
1-D	Maximum volume of waste to be removed		None For demolition costs see TS-4		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)		D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**9102.24**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	16	42.14	674.24	3	2022.72

TOTAL FOR STEP 2	**11124.96**

TA-54 AREA L BUILDING 39 OUTSIDE CSU TS-3

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	6	6	43.42	260.52	3	781.56
	Soil	6	16	43.42	694.72	3	2084.16
	Radioactive Swipe Sample	6	3	43.42	130.26	3	390.78
TOTAL FOR STEP 3-E							**3256.50**
TOTAL FOR STEP 3							**12919.74**

TOTAL FOR TS-3 WORKSHEET	**24044.70**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The costs for documentation and analysis, demolition, and certification are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	6	747.85	4487.10	NA	4487.10
	Metals, SVOCs, VOCs	Soil	6	620.13	3720.78	NA	3720.78
	Radioactive elements	Wipe	6	167.34	1004.04	3	3012.12
TOTAL FOR STEP 4-A			**18**	**1535.32**	**9211.92**	**3**	**11220.00**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	Air and heavy equipment demolition crew, 100 cy	100	126.73	12673.00	3	38019.00
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C and 4-D							**43581.48**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**54801.48**

Facility Name: Los Alamos National Laboratory TA-54 Area L Pad 58

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Area L Pad 58 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process		3-A, 3-B,	
4	Decontamination Waste Management	TS-3	and 3-C	2514.24
5	Decontamination Verification Samples	TS-3	3-E	911.82
6	Analyses	TS-4	4-A	5610.00
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	15207.60
9	**Subtotal of Closure Costs**			**30817.50**
10	Certification of Closure	TS-4	4-D	3034.08
11				
12	**Subtotal (Add certification report to closure costs)**			**33851.58**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**29789.39**

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54-58 is a concrete pad located in the west-central portion of Area L. This pad and Pads 35 and 36 are covered by one large steel canopy. All three pads were constructed in 1986. This unit stores mixed waste.

1-A	Maximum permitted capacity for TA-54-58 (gallons) from 2006 closure plan			15,840
	Known Releases?			N/A
1-B	Dimensions of TA-54-35 (from 2003 Part B app. Section G.2.4.1) length(ft) x width (ft) and sf	33	31	1023
1-C	Materials	Concrete pad thickness is assumed to be 6 inches. A concrete containment curb around the perimeter is 6 inches high.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards and the levels of radiological and/or chemical contamination detected. Assume D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	12	42.14	505.68	3	1517.04
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning of the pad and equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	8	32.94	263.52	3	790.56
		Staff Engineer	8	28.4	227.20	3	681.60
		Project Scientist	8	24.29	194.32	3	582.96
		Staff Scientist	8	19.13	153.04	3	459.12
TOTAL FOR STEP 3-A			**32**	**104.76**	**838.08**	**3**	**2514.24**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination	8	See crew above			
3-C	Mechanical removal of concrete pad and steel canopy		See worksheet TS-4			
3-D						

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe (Determination)	3	2	43.42	86.84	3	260.52
	Soil	3	3	43.42	130.26	3	390.78
	Radioactive Swipe Sample	3	2	43.42	86.84	3	260.52
TOTAL FOR STEP 3-E							**911.82**
TOTAL FOR STEP 3							**3426.06**

TOTAL FOR TS-3 WORKSHEET	**9494.22**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Water/Wipe	3	747.85	2243.55	NA	2243.55
	Toxic Metals, SVOCs, VOCs	Soil	3	620.13	1860.39	NA	1860.39
	Radioactive elements	Wipe	3	167.34	502.02	3	1506.06
TOTAL FOR STEP 4-A			**9**				**5610.00**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Concrete and steel demolition and debris removal	Air and heavy equipment crew for demolition, including 1/3 of the steel canopy, 40 cy	40	126.73	5069.20	3	15207.60
4-D	Certification Report	Sr. Engineer/Tech	24	42.14	1011.36	3	3034.08
TOTAL FOR STEP 4-B, 4-C and 4-D							**18747.36**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**24357.36**

TA-54 AREA L STORAGE DOME 215 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Storage Dome 215

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Dome 215 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	11124.96
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	9663.24
5	Decontamination Verification Samples	TS-3	3-E	4428.84
6	Analyses	TS-4	4-A	35443.51
7	Sample Logbook	TS-4	4-B	2528.40
8	Demolition and Debris Disposal	TS-4	4-C	42117.84
9	**Subtotal of Closure Costs**			**110363.59**
10	Certification of Closure	TS-4	4-D	6321.00
11	Tank Removal	TS-4	4-E	2244.96
12	**Subtotal (Add cost of certification to closure costs)**			**118929.55**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**104658.00**

TA-54 AREA L STORAGE DOME 215 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area L Storage Dome 215, constructed in 1995, is located on the north side of Area L. The dome includes an external double-walled holding tank for any liquid accumulation that exceeds the dome's ring wall capactiy. The dome stores containers wtih both liquid and solid type mixed waste.

1-A	Maximum permitted capacity (gallons)				261,360
	Known Releases?				N/A
1-B	Dimensions of the dome length (ft) x width (ft) and sf (demolition included in this cost estimate)	266	60		15960
1-C	Materials	Dome is constructed of tensioned-fabric membranes and aluminum beams. The interior floor is surrounded with a mimumum six-inch high asphalt curb or ring wall. The asphaltic concrete pad is four to six inches thick.			
1-D	Maximum volume of waste to be removed	None			
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.			

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
	Inspection	Sr Engineer/Tech	8	42.14	337.12	3	1011.36
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**11124.96**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**16181.76**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	10	8	43.42	347.36	3	1042.08
	Soil below asphalt	32	16	43.42	694.72	3	2084.16
	Radioactive Swipe Sample	10	6	43.42	260.52	3	781.56
	Soil Samples @ tank and under drain line	5	4	43.42	173.68	3	521.04
TOTAL FOR STEP 3-E							**4428.84**
TOTAL FOR STEP 3							**14092.08**

TOTAL FOR TS-3 WORKSHEET	**30273.84**

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	10	747.85	7478.50	NA	7478.50
	Radioactive elements	Wipe	10	167.34	1673.40	3	5020.20
	Metals, SVOCs, VOCs	Soil	37	620.13	22944.81	NA	22944.81
TOTAL FOR STEP 4-A			**57**	**1535.32**	**32096.71**	**3**	**35443.51**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
4-C	Demolition and Debris Disposal (under dome only)	Remove 296 cy asphalt under dome	296	47.43	14039.28	3	42117.84
4-D	Certification Report	Sr. Engineer/Tech	50	42.14	2107.00	3	6321.00
4-E	Tank removal	Backhoe and crew (5k gal)		748.32	748.32	3	2244.96
TOTAL FOR STEP 4-B, 4-C, 4-D and 4-E							**53212.20**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**88655.71**

TA-54 AREA L STORAGE DOME 216 CANOPY TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Storage Dome 216 Canopy

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Dome 216 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	8090.88
2	Sampling and Analysis Plan	TS-3	2-B	2528.40
3	Decontamination Process		3-A, 3-B, 3-C	
4	Decontamination Waste Management	TS-3	and 3-D	6614.22
5	Decontamination Verification Samples	TS-3	3-E	1693.38
6	Analyses	TS-4	4-A	11210.39
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	10529.46
9	**Subtotal of Closure Costs**			**41172.41**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add cost of certification to closure costs)**			**46229.21**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**40681.70**

TA-54 AREA L STORAGE DOME 216 CANOPY TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Unit TA-54 Area L Storage Dome 216, constructed in 1993, is located on the southeast side of Area L. The canopy fabric has been rolled up into the aluminum dome framework on three sides. The canopy stores hazardous and mixed waste gas cyclinders in individual containment structures and is anchored directly to the underlying asphalt pad without a ring wall.

1-A	Maximum permitted capacity (gallons)			36,960
	Known Releases?			N/A
1-B	Dimensions of the dome length (ft) x width (ft) and sf (pad demolition included in this cost estimate)	120	33	3960
1-C	Materials	Dome is constructed of tensioned-fabric membranes and aluminum beams. The asphaltic concrete pad is assumed to be six inches thick.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**8090.88**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	20	42.14	842.80	3	2528.40

TOTAL FOR STEP 2	**10619.28**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	5	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	5	3	43.42	130.26	3	390.78
	Soil Samples	8	8	43.42	347.36	3	1042.08
TOTAL FOR STEP 3-E							**1693.38**
TOTAL FOR STEP 3							**8307.60**

TOTAL FOR TS-3 WORKSHEET	**18926.88**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The costs for documentation and analysis for samples collected during the decontamination process, debris removal, and certification are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, SVOCs, VOCs	Wipe	5	747.85	3739.25	NA	3739.25
	Metals, SVOCs, VOCs	Soil	8	620.13	4961.04	NA	4961.04
	Radioactive elements	Wipe	5	167.34	836.70	3	2510.10
TOTAL FOR STEP 4-A			**18**	**1535.32**	**9536.99**	**3**	**11210.39**

		Labor Category	cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal (under dome only)	Remove 74 cy asphalt under dome	74	47.43	3509.82	3	10529.46
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C and 4-D							**16091.94**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**27302.33**

TA-54 AREA L STORAGE SHED 68 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Storage Shed 68

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Storage Shed 68 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	1257.12
5	Decontamination Verification Samples	TS-3	3-E	521.04
6	Analyses	TS-4	4-A	3749.61
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**12101.61**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification to closure costs)**			**14630.01**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**12874.41**

TA-54 AREA L STORAGE SHED 68 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

TA-54 Area L Storage Sheds 68, 69 and 70 are located in the north central area of Area L. Each is constructed with integral liquid containment sumps.

1-A	Maximum permitted capacity (gallons)			1,760
	Known Releases?			N/A
1-B	Dimensions of the building length (ft) x width (ft) and sf	23	9	207
1-C	Materials	Pre-fabricated steel shed with painted 10 gauge steel sumps and grates over 3 sumps.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination with wash water solution	4	See crew above			
3-C	Demolition		NA			

TOTAL FOR STEP 3-A and 3-B	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	3 (3 sumps)	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	3	2	43.42	86.84	3	260.52
	Soil Samples	NA					

TOTAL FOR STEP 3-E	**521.04**
TOTAL FOR STEP 3	**1778.16**

TOTAL FOR TS-3 WORKSHEET	**7846.32**

TA-54 AREA L STORAGE SHED 68 TS-4

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section. Analysis for this unit will include both stages of sampling: determination and verification.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals, SVOCs, VOCs	Wipe	3	747.85	2243.55	NA	2243.55
	Radioactive elements	Wipe	3	167.34	502.02	3	1506.06
TOTAL FOR STEP 4-A			**6**				**3749.61**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 4-B, 4-C and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**6783.69**

TA-54 AREA L STORAGE SHED 69 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Storage Shed 69

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Storage Shed 69 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	1257.12
5	Decontamination Verification Samples	TS-3	3-E	521.04
6	Analyses	TS-4	4-A	2499.74
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**10851.74**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification to closure costs)**			**13380.14**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**11774.52**

TA-54 AREA L STORAGE SHED 69 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
TA-54 Area L Storage Shed 69 is portable and located in the north central area of Area L. It is constructed with 2 integral liquid containment sumps.

1-A	Maximum permitted capacity (gallons)			1,760
	Known Releases?			N/A
1-B	Dimensions of the building length (ft) x width (ft) and sf	23	9	207
1-C	Materials	Pre-fabricated steel shed with painted 10 gauge steel sumps and grates over 2 sumps.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

TA-54 AREA L STORAGE SHED 69 TS-3

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

TA-54 AREA L STORAGE SHED 69 TS-3

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination with wash water solution	4	See crew above			
3-C	Demolition		NA			

TOTAL FOR STEP 3-A and 3-B	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Water/Wipe	2 (2 sumps)	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	2	2	43.42	86.84	3	260.52
	Soil Samples	NA					

TOTAL FOR STEP 3-E	**521.04**
TOTAL FOR STEP 3	**1778.16**

TOTAL FOR TS-3 WORKSHEET	**7846.32**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals, SVOCs, VOCs	Water/Wipe	2	747.85	1495.70	NA	1495.70
	Radioactive elements	Wipe	2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**4**				**2499.74**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 4-B, 4-C and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**5533.82**

TA-54 AREA L STORAGE SHED 70 TS-1

Facility Name: Los Alamos National Laboratory TA-54 Area L Storage Shed 70

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Storage Shed 70 Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5056.80
2	Sampling and Analysis Plan	TS-3	2-B	1011.36
3	Decontamination Process			
4	Decontamination Waste Management	TS-3	3-A and 3-B	1257.12
5	Decontamination Verification Samples	TS-3	3-E	521.04
6	Analyses	TS-4	4-A	2499.74
7	Sample Logbook	TS-4	4-B	505.68
8	Demolition and Debris Disposal	TS-4	4-C	0.00
9	**Subtotal of Closure Costs**			**10851.74**
10	Certification of Closure	TS-4	4-D	2528.40
11				
12	**Subtotal (Add cost of certification to closure costs)**			**13380.14**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**11774.52**

TA-54 AREA L STORAGE SHED 70 TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
TA-54 Area L Storage Shed 70 is portable and located in the south central area of Area L. It is constructed with 2 integral liquid containment sumps.

1-A	Maximum permitted capacity (gallons)			1,760
	Known Releases?			N/A
1-B	Dimensions of the building length (ft) x width (ft) and sf	23	9	207
1-C	Materials	Pre-fabricated steel shed with painted 10 gauge steel sumps and grates over 2 sumps.		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected. Assume D for this estimate.		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 2A							**5056.80**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	8	42.14	337.12	3	1011.36

TOTAL FOR STEP 2	**6068.16**

3. DECONTAMINATION

The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.60	3	340.80
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**419.04**	**3**	**1257.12**

	Activity	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-B	Equipment and pad decontamination with wash water solution	4	\			
3-C	Demolition		NA			

TOTAL FOR STEP 3-A and 3-B	**1257.12**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	2 (2 sumps)	2	43.42	86.84	3	260.52
	Radioactive Swipe Sample	2	2	43.42	86.84	3	260.52
	Soil Samples	NA					

TOTAL FOR STEP 3-E	**521.04**
TOTAL FOR STEP 3	**1778.16**

TOTAL FOR TS-3 WORKSHEET	**7846.32**

TA-54 AREA L STORAGE SHED 70 TS-4

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Metals, SVOCs, VOCs	Water/Wipe	2	747.85	1495.70	NA	1495.70
	Radioactive elements	Wipe	2	167.34	334.68	3	1004.04
TOTAL FOR STEP 4-A			**4**				**2499.74**

		Labor Category	Hours or cubic yards (cy)	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	4	42.14	168.56	3	505.68
4-C	Demolition and Debris Disposal	NA					
4-D	Certification Report	Sr. Engineer/Tech	20	42.14	842.80	3	2528.40
TOTAL FOR STEP 4-B, 4-C and 4-D							**3034.08**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**5533.82**

TA-55 CONTAINER STORAGE UNITS (CSU)

Facility Name: Los Alamos National Laboratory TA-55-4 and 185 Container Storage Units

SUMMARY WORKSHEET									
	Activity	Worksheet Number	Step	B40 Cost ($)	B05 Cost ($)	K13 Cost ($)	B45 Cost ($)	Vault Cost ($)	185 Cost ($)
1	Pre-Closure and Structural Assessment	TS-3	2-A	5393.92	5393.92	5393.92	5393.92	5393.92	5393.92
2	Sampling and Analysis Plan	TS-3	2-B	3371.20	3371.2	3371.2	3371.2	3371.2	3371.2
3	Decontamination Process		3-A, 3-B						
4	Decontamination Waste Management	TS-3	AND 3-C	5028.48	5028.48	5028.48	5028.48	5028.48	5028.48
5	Decontamination Verification Samples	TS-3	3-D	521.04	130.26	130.26	260.52	1042.08	521.04
6	Analyses	TS-4	4-A	11003.00	6730.65	1199.22	669.36	9292.03	7707.00
7	Sample Logbook	TS-4	4-B	1011.36	1011.36	1011.36	1011.36	1011.36	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	0.00	$0.00	$0.00	$0.00	$0.00	$0.00
9	**Subtotal of Closure Costs**			**26329.00**	**21665.87**	**16134.44**	**15734.84**	**25139.07**	**23033**
10	Certification of Closure	TS-4	4-D	4045.44	4045.44	4045.44	4045.44	4045.44	4045.44
11									
12	**Subtotal (Add cost of certification report to closure costs)**			**30374.44**	**25711.31**	**20179.88**	**19780.28**	**29184.51**	**27078.44**
13	Localization factor			0.88	0.88	0.88	0.88	0.88	0.88
TOTAL COST OF CLOSURE				**26729.51**	**22625.95**	**17758.29**	**17406.65**	**25682.37**	**23829.03**

TA-55 CONTAINER STORAGE UNITS (CSU) TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
Unit TA-55-Container Storage Units (CSU) consist of six units: TA-55-B40 (B40), TA-55-B05 (B05), TA-55-K13 (K13), TA-55-B45 (B45), TA-55-185 and Vault TA-55-4. With the exception of Unit TA-55-185, the location of these units is in the basement of building TA-55-4. Building TA-55-185 is located west of building TA-55-4.

1-A	Maximum permitted capacity (gallons) of B40			21,500
	Maximum permitted capacity (gallons) of B05			3,600
	Maximum permitted capacity (gallons) of K13			2,500
	Maximum permitted capacity (gallons) of B45			1,100
	Maximum permitted capacity (gallons) of Vault TA-55-4			4,000
	Maximum permitted capacity (gallons) of TA-55-185			30,000
	Known Releases?			N/A
1-B	Dimensions of B40 length (ft) x width (ft) and sf *(L-shaped)*	61.5 30.1	24.6 20.7	2136
	Dimensions of B05 length (ft) x width (ft) and sf	26	10	260
	Dimensions of K13 length (ft) x width (ft) and sf	16	13	208
	Dimensions of KB45 length (ft) x width (ft) and sf	45	17.5	787.5
	Dimensions of Vault length (ft) x width (ft) and sf	79.5	50.5	4014.75
	Dimensions of TA-55-185 length (ft) x width (ft) and sf	60	40	2400
	Note: Drums are stacked 2 high in TA-55-4, according to Part B. Sampling is therefore based on wall height of 96 inches = 2 feet above 2 drums on 4" pallets			
1-C	Materials TA-55-4	Concrete floor in basement		
	Materials TA-55-185	Steel building, concrete floor		
1-D	Maximum volume of waste to be removed	None		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT for each of the 6 units

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Overhead (100%)	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.8	2	1685.6
	Inspection	Sr Engineer/Tech	4	42.14	168.56	2	337.12
	Report	Sr Engineer/Tech	40	42.14	1685.6	2	3371.2
TOTAL FOR STEP 2A							**5393.92**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	2	3371.2

TOTAL FOR STEP 2	**8765.12**

3. DECONTAMINATION for each of the units in TA-55-4, and TA-55-185
The decontamination process will involve pressure washing or steam cleaning the floors and adjacent walls as well as equipment.

	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-A	4	Project Engineer	4	32.94	131.76	3	395.28
		Staff Engineer	4	28.4	113.6	3	340.8
		Project Scientist	4	24.29	97.16	3	291.48
		Staff Scientist	4	19.13	76.52	3	229.56
TOTAL FOR STEP 3-A			**16**	**104.76**	**1676.16**	**3**	**5028.48**

3-B	Equipment pressure wash or steam clean	1	Labor hours accounted above			
3-C	Pressure wash or steam clean floors and walls	3	Wash water to RLWTF			

TA-55 CONTAINER STORAGE UNITS (CSU) TS-3

	Type of Sample	Number of Samples		Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
3-E	(1 sample per 500sf, including walls)	B40	8	4	43.42	173.68	3	521.04
		B05	3	1	43.42	43.42	3	130.26
		K13	2	1	43.42	43.42	3	130.26
		B45	4	2	43.42	86.84	3	260.52
		Vault	13	8	43.42	347.36	3	1042.08
		185	8	4	43.42	173.68	3	521.04
	Radioactive Swipe Sample	B40	10	4	43.42	173.68	3	521.04
		B05	2	1	43.42	43.42	3	130.26
		K13	2	1	43.42	43.42	3	130.26
		B45	4	2	43.42	86.84	3	260.52
		Vault	18	8	43.42	347.36	3	1042.08
		185	10	4	43.42	173.68	3	521.04

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS

The documentation and analyses required for samples collected during the decontamination process as well as the associated costs are described in this section. The Closure Plan assumes clean closure and therefore no demolition and debris disposal is assumed.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
TA-55-B40	Toxic Metals	Wipe					0.00
	VOC	Wipe					0.00
	SVOC	Wipe	8	747.85	5982.80	NA	5982.80
	Rad		10	167.34	1673.40	3	5020.20
	Total cost B40						11003.00
TA-55-B05	Toxic Metals	Wipe					0.00
	VOC	Wipe					0.00
	SVOC	Wipe	3	747.85	2243.55	NA	2243.55
	Rad		2	167.34	1495.70	3	4487.10
	Total cost B05						6730.65
TA-55-4-K13	Ignitable	Wipe		28.60	28.60	NA	28.60
	Corrosive	Wipe		7.15	7.15	NA	7.15
	Reactive	Wipe		80.94	80.94	NA	80.94
	Toxic Metals	Wipe					0.00
	VOC	Wipe					0.00
	SVOC	Wipe	2	747.85	747.85	NA	747.85
	Rad		2	167.34	334.68	3	334.68
	Total cost K13						**1199.22**
TA-55-4-B45	Toxic Metals	Wipe					0.00
	VOC	Wipe					0.00
	SVOC	Wipe	4	747.85	2991.40	NA	1495.70
	Rad		4	167.34	669.36	3	669.36
	Total cost B45						**2165.06**
TA-55-4 Vault Unit	Toxic Metals	Wipe	13	335.85	4366.05	NA	4366.05
	VOC	Wipe	13	147.22	1913.86	NA	1913.86
	Rad		18	167.34	3012.12	3	3012.12
	Total cost 4 Vault						**9292.03**
TA-55-185	Toxic Metals	Wipe	8	335.85	2686.80	NA	2686.80
	Rad		10	167.34	1673.40	3	5020.20
	Total cost 185						**7707.00**

TA-55 CONTAINER STORAGE UNITS (CSU) TS-4

	Documentation for each of the 6 units	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	NA	---	---	---	---	---
4-D	Certification Report	Sr. Engineer/Tech	32	42.14	1348.48	3	4045.44
	Total						**5056.80**

TA-55 STORAGE TANK SYSTEM

Facility Name: Los Alamos National Labortory (LANL) TA-55 Storage Tank System

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**TA-55 STS Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	7458.78
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B	
4	Decontamination Waste Management	TS-3	AND 3-C	5028.48
5	Decontamination Verification Samples	TS-3	3-D	8134.11
6	Analyses	TS-4	4-A	12007.04
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	7542.72
9	**Subtotal of Closure Costs**			**46239.29**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**51296.09**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**45140.56**

TA-55 STORAGE TANK SYSTEM TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
The storage tank system at TA-55 is located in Room 401 of TA-55-4. This tank system is comprised of 16 tanks in three component systems; the Evaporator Glovebox Tank, Cementation Unit Pencil Tanks and Pencil Tanks.

1-A	Maximum permitted capacity (gallons) of the Evaporator Glovebox Tank			71
	Maximum permitted capacity (gallons) of the Cementation Unit Pencil Tanks			65
	Maximum permitted capacity (gallons) of the Pencil Tanks			130
	Known Releases?			N/A
1-B	Dimensions length (ft) x width (ft) and sf (Rm 401)	51.2	44.8	1859
1-C	Materials	Chemical-resistant epoxy primer and paint on steel, reinforced concrete floor		
1-D	Maximum volume of waste to be removed	None (deconstruction and removal of glovebox and tanks, piping, etc. accounted for in worksheet TS-4)		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	15	42.14	632.1	3	1896.30
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80
TOTAL FOR STEP 2A							**7458.78**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.6	3	5056.80

TOTAL FOR STEP 2	**12515.58**

3. DECONTAMINATION
The surfaces of equipment and other areas adjacent to the Storage Tank Systems will be pressure washed or steam cleaned. A portable berm will be used to collect excess water from the decontamination process.

3-A	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	4	Project Engineer	16	32.94	527.04	3	1581.12
		Staff Engineer	16	28.40	454.4	3	1363.20
		Project Scientist	16	24.29	388.64	3	1165.92
		Staff Scientist	16	19.13	306.08	3	918.24
TOTAL FOR STEP 3-A			**64**	**104.76**	**1676.16**	**3**	**5028.48**

3-B	Decontamination of Ancillary Equipment (surface, interior and exterior)	8	Labor hours accounted above	Wash water to RLWTF			0.00
3-C	Decontamination of Areas Adjacent to the Storage Tank System	8	Labor hours accounted above				0.00
TOTAL FOR STEPS 3-B AND 3-C		**16**					

TOTAL FOR STEPS 3-A, 3-B AND 3-C	**5028.48**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	8	4	43.42	173.68	3	7541.19
	Radioactive Swipe Sample	12	6	32.94	197.64	3	592.92
TOTAL FOR STEP 3-E							**8134.11**

TOTAL FOR TASK 3	**13162.59**

TOTAL FOR TS-3 WORKSHEET	**25678.17**

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, VOCs and SVOCs	Wipe	8	747.85	5982.8	NA	5982.8
	Radioactive Elements	Wipe	12	167.34	2008.08	3	6024.24
TOTAL FOR STEP 4-A							**12007.04**

		Labor Category and Description	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	4 man crew as for decon	24	104.76	2514.24	3	7542.72
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.6	3	5056.8
TOTAL FOR STEP 4-B, 4-C AND 4-D							**13610.88**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**25617.92**

TA-55-4 CEMENTATION UNIT

Facility Name: Los Alamos National Laboratory TA-55 Cementation Unit

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**Cementation Unit Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	7585.20
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B	
4	Decontamination Waste Management	TS-3	AND 3-C	5028.48
5	Decontamination Verification Samples	TS-3	3-E	728.70
6	Analyses	TS-4	4-A	9015.64
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Removal	TS-4	4-C	5028.48
9	**Subtotal of Closure Costs**			**33454.66**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add engineering expenses and cost of certification of closure to closure costs)**			**38511.46**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**33890.08**

TA-55-4 CEMENTATION UNIT

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

The Cementation Unit is located at TA-55-4, Room 401 and consists of a pH column, vacuum trap, two motor-driven mixers, four impellers, and piping inside a glovebox.

1-A	Maximum permitted capacity (gallons)			150
	Known Releases?			N/A
1-B	Dimensions length (ft) x width (ft) and sf	51.2	44.8	1859
1-C	Materials	Chemical-resistant epoxy primer and paint on steel, reinforced concrete floor.		
1-D	Maximum volume of waste to be removed	None except wash water to be disposed at RLWTF. Demolition of unit accounted for in TS-4.		
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D		

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	16	42.14	674.24	3	2022.72
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**7585.20**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**12642.00**

3. DECONTAMINATION

The surfaces of the glovebox, equipment and areas adjacent to the Cementation Unit will be decontaminated by pressure washing or steam cleaning. A portable berm will be used to collect excess water from the decontamination process.

3-A	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	4	Project Engineer	16	32.94	527.04	3	1581.12
		Staff Engineer	16	28.40	454.40	3	1363.20
		Project Scientist	16	24.29	388.64	3	1165.92
		Staff Scientist	16	19.13	306.08	3	918.24
TOTAL FOR STEP 3-A			**64**	**104.76**	**1676.16**	**3**	**5028.48**

3-B	Decontamination of Cementation Unit Equipment and Glovebox	4	Labor hours accounted above	Decon solution to RLWTF		0.00
3-C	Decontamination of Ancillary Equipment	6	Labor hours accounted above			0.00
3-D	Decontamination of Areas Adjacent to the Cementation Unit Glovebox	6	Labor hours accounted above			0.00
TOTAL FOR STEP 3						**5028.48**

TOTAL FOR STEPS 3-A, 3-B, 3-C AND 3-D	**5028.48**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe	4	4	24.29	97.16	3	291.48
	Radioactive Swipe Sample	12	6	24.29	145.74	3	437.22
TOTAL FOR STEP 3-E							**728.70**

TOTAL FOR TASK 3	**5757.18**

TOTAL FOR TS-3 WORKSHEET	**18399.18**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Samples	Number of Samples	ECHOS Unit Cost	Bare Task Cost	Add Overhead	Loaded $
	Toxic Metals, VOCs and SVOCs	Water/Wipe	4	747.85	2991.40	NA	2991.40
	Radioactive Elements	Wipe	12	167.34	2008.08	3	6024.24
TOTAL FOR STEP 4-A							**9015.64**

		Labor Category and Description	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris removal	4 man crew as for decon	16	104.76	1676.16	3	5028.48
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C AND 4-D							**11096.64**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**20112.28**

TA-55 OUTSIDE STORAGE PAD CSU

Facility Name: Los Alamos National Laboratory TA-55 Outside Storage Pad CSU

SUMMARY WORKSHEET				
	Activity	**Worksheet Number**	**Step**	**TA-55 Outside Storage Pad CSU Cost ($)**
1	Pre-Closure and Structural Assessment	TS-3	2-A	5562.48
2	Sampling and Analysis Plan	TS-3	2-B	5056.80
3	Decontamination Process		3-A, 3-B	
4	Decontamination Waste Management	TS-3	AND 3-C	5509.44
5	Decontamination Verification Samples	TS-3	3-E	2084.16
6	Analyses	TS-4	4-A	17948.40
7	Sample Logbook	TS-4	4-B	1011.36
8	Demolition and Debris Disposal	TS-4	4-C	25896.78
9	**Subtotal of Closure Costs**			**63069.42**
10	Certification of Closure	TS-4	4-D	5056.80
11				
12	**Subtotal (Add cost of certification of closure to closure costs)**			**68126.22**
13	Localization factor			0.88
TOTAL COST OF CLOSURE				**59951.07**

TA-55 OUTSIDE STORAGE PAD CSU TS-2

INVENTORY

1. UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY
The TA-55 Outside Storage Pad CSU is located northwest of TA-55-4.

1-A	Maximum permitted capacity (gallons) of the Storage Pad	135000
	Known Releases?	N/A
1-B	Dimensions: trapezoid Total area = 11,794 sf	102 x 86 x 156 x 105 + 70 x 10 rectangle
1-C	Materials	Asphalt 4 to 6 inches thick
1-D	Maximum volume of waste to be removed	None (demolition of pad accounted for in worksheet TS-4)
1-E	Level of PPE assumed for this activity (protection level D, C, or B)	Level D

TA-55 OUTSIDE STORAGE PAD CSU TS-3

PRE-CLOSURE AND STRUCTURAL ASSESSMENT AND DECONTAMINATION

2. PRE-CLOSURE AND STRUCTURAL ASSESSMENT

2-A	Pre-Closure Process	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Review	Sr Engineer/Tech	20	42.14	842.80	3	2528.40
	Inspection	Sr Engineer/Tech	4	42.14	168.56	3	505.68
	Report	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 2A							**5562.48**

2-B	Sampling and Analysis Plan	Sr Engineer/Tech	40	42.14	1685.60	3	5056.80

TOTAL FOR STEP 2	**8090.88**

3. DECONTAMINATION

Equipment will be pressure washed or steam cleaned, and the Storage Pad will be inspected and sampled.

3-A	Number of crew members	Labor Category	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	4	Project Engineer	24	32.94	790.56	3	2371.68
		Staff Engineer	24	28.40	681.60	3	2044.80
		Project Scientist	24	24.29	582.96	3	1748.88
		Staff Scientist	24	19.13	459.12	3	1377.36
TOTAL FOR STEP 3-A			**96**	**104.76**	**1836.48**	**3**	**5509.44**

3-B	Decontamination of Equipment	24	Crew labor accounted above			0.00
3-C	Decontamination of the Storage Pad will first be assessed and should there be evidence of leaks through the asphalt pad, soil samples will be collected and analyzed.		Assumed no contamination for this estimate			0.00
3-D	Removal of the contaminated soil will be processed during the decontamination stage					0.00
TOTAL FOR STEPS 3-B, 3-C AND 3-D						**5509.44**

TOTAL FOR STEPS 3-A, 3-B, 3-C AND 3-D	**5509.44**

3-E	Type of Sample	Number of Samples	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Wipe samples for decontamination verification	24	16	43.42	694.72	3	2084.16
	Soil Verification Samples	NA					
TOTAL FOR STEP 3-E							**2084.16**

TOTAL FOR TASK 3	**7593.60**

TOTAL FOR TS-3 WORKSHEET	**13103.04**

DOCUMENTATION

4. DOCUMENTATION AND ANALYSIS
The documentation and analysis required for each of the samples collected during the decontamination process as well as the associated costs are described in this section.

4-A	Analysis	Type of Sample	Number of Samples	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
	Toxic Metals, VOCs and SVOCs	Wipe	24	747.85	17948.40	NA	17948.40
TOTAL FOR STEP 4-A							**17948.40**

		Labor Category and Description	Hours	ECHOS Unit Cost ($)	Bare Task Cost ($)	Add Overhead	Loaded $
4-B	Sample Logbook	Sr. Engineer/Tech	8	42.14	337.12	3	1011.36
4-C	Demolition and Debris Disposal	Front End Loader and 2 Trucks, 182 cy		47.43	8632.26	3	25896.78
4-D	Certification Report	Sr. Engineer/Tech	40	42.14	1685.60	3	5056.80
TOTAL FOR STEP 4-B, 4-C AND 4-D							**31964.94**

TOTAL FOR TS-4 WORKSHEET and TOTAL FOR STEP 4	**49913.34**