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August 2007

# **Los Alamos National Laboratory**

## **Transuranic Waste Facility Permit Modification Request**

Revision 0.0

Prepared by:

*Los Alamos National Laboratory  
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Environmental Protection Division  
Los Alamos, New Mexico 87545*

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Los Alamos National Laboratory  
Transuranic Waste Facility  
Nuclear Facility  
Permit Modification Request

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## LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	Environmental Protection Agency
ft.	foot/feet
gal.	gallon(s)
HEPA	high-efficiency particulate air
HVAC	heating, ventilating, and air conditioning
L	liter
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
MLLW	mixed low-level waste
MTRUW	mixed transuranic waste
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
RCRA	Resource Conservation and Recovery Act
SWMU	Solid Waste Management Unit
T&E	threatened and endangered
TA	technical area
TRU	transuranic
TRUWF	Transuranic Waste Facility
USFWS	U.S. Fish and Wildlife Service
WIPP	Waste Isolation Pilot Plant



## 1.0 INTRODUCTION

This document is a Class 3 permit modification request for the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit. This permit modification package presents information to address the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised October 1, 2003 [10-01-03], specific to hazardous and mixed waste operations to be located at the LANL Technical Area (TA) 52 Transuranic Waste Facility (TRUWF). Additional information is provided in this permit modification request that exceeds regulatory standards required to satisfy Resource Conservation and Recovery Act (RCRA) as well as 20.4.1 NMAC compliance. This additional information is not intended for inclusion in LANL's hazardous waste facility permit.

This permit modification request and LANL permit renewal documents state that a unit to be permitted may also be referred to as a facility. The term "facility," as it appears in this context, is used only to denote building or area names and does not imply the regulatory meaning of "facility" as defined in 20.4.1 NMAC §260.1 [10-1-03]. However, pursuant to 20.4.1 NMAC §260.1 [10-01-03], the LANL facility as a whole does meet the regulatory definition of a facility. Table 1-1 provides a list of regulatory references and the corresponding location in this permit modification package, as appropriate. Where applicable, regulatory citations in this document reference 20.4.1 NMAC, which adopts, with a few exceptions, all of the Code of Federal Regulations (CFR), Title 40, Parts 260 to 266, Part 268, and Part 270.

LANL must retain a viable capability and support facility dedicated to characterize, store, manage and ultimately ship off-site for disposal transuranic (TRU) waste. TRU waste streams will be shipped to and disposed of at the Waste Isolation Pilot Plant (WIPP). The TRUWF will have the capability of the following functions for waste:

- Staging & Storage - sealed waste packages (e.g., drums and solid waste boxes) will be received from waste generators and waste materials will be staged pending certification and shipping.
- Characterization & Certification - sealed waste packages will undergo quantitative and visual examinations to determine and certify that they satisfy TRUWF and WIPP or other off-site treatment, storage, and disposal facility (TSDF) waste acceptance requirements.
- Packaging, Treatment, Size Reduction, and Decontamination – on an as needed basis, waste packages will be opened and contents will be resorted, treated, repackaged, size reduced, and/or decontaminated to satisfy WIPP or other TSDF criteria.

- Shipping, Receiving and Transport Operations – TRU Waste Package Transporter (TRUPACT) II and other waste containers (e.g., drums or standard waste boxes) will be prepared and loaded into waste trucks and will depart for the off-site TSDf.

Waste acceptance criteria and characterization changes made to the WIPP permit or other off-site TSDf may impact program requirements.

LANL requests a Class 3 permit modification to include this waste management unit within the LANL Hazardous Waste Facility Permit in accordance with 20.4.1 NMAC § 270.42(c)[10-1-03].

**Table 1-1  
Regulatory References and Corresponding Permit Modification Request Location**

<b>Regulatory Citation(s)</b>	<b>Description of Requirement</b>	<b>Location in this Permit Modification Request</b>
§270.14(b)(1)	General facility description	Appendix A
§270.14(b)(2)	Chemical and physical analyses of hazardous waste	Appendix B <sup>a</sup>
§270.14(b)(3)	Waste analysis plan	Appendix B <sup>a</sup>
§264.13(b)	Development and implementation of a written waste analysis plan	Appendix B <sup>a</sup>
§264.13(c)	Off-site waste analysis requirements	Appendix B <sup>a</sup>
§270.14(b)(4)	Security procedures and equipment	Appendix G
§264.14	Security procedures and equipment	Appendix G
§270.14(b)(5)	General inspection schedule	Appendix C <sup>a</sup>
§264.15(b)	General inspection schedule	Appendix C <sup>a</sup>
§264.174	Inspections/containers	Appendix C <sup>a</sup>
§264.195	Overfill control inspections	NA
§264.226	Surface impoundment monitoring and inspection	NA
§264.254	Waste pile monitoring and inspection	NA
§264.273	Land treatment and operating requirements	NA
§264.303	Landfill monitoring and inspection	NA
§264.1033	Process vent standards	NA
§264.1052	Equipment leak air emission standards	NA
§264.1053	Compressor standards	NA
§264.1058	Standards for pumps, valves, pressure relief devices, flanges, and connections	NA
§270.14(b)(6)	Request for waiver from preparedness and prevention requirements of 264 Subpart C	NA

**Table 1-1 (continued)**  
**Regulatory References and Corresponding Permit Modification Request Location**

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§264.30-37	Preparedness and prevention: applicability, design and operation, required equipment, testing and maintenance of equipment, access to communications or alarm systems, required aisle space, and arrangements with local authorities	Section 2 and Appendices C <sup>a</sup> , E <sup>a</sup> , G <sup>a</sup>
§264.227	Surface impoundment emergency repairs	NA
§270.14(b)(7)	Contingency Plan	Appendix E <sup>a</sup>
§264.50-56	Contingency plan and emergency procedures: applicability, purpose/implementation of contingency plan, content of contingency plan, copies of contingency plan, amendment to contingency, emergency coordinator, and emergency procedures	Appendix E <sup>a</sup>
§270.14(b)(8)	Description of preparedness and prevention	Appendix G
§270.14(b)(8)(i)	Hazard prevention in unloading operations	Appendix G
§270.14(b)(8)(ii)	Runoff prevention	Appendix G
§270.14(b)(8)(iii)	Contamination prevention of water supplies	Appendix G
§270.14(b)(8)(iv)	Mitigation of equipment failure and power outages	Appendix G
§270.14(b)(8)(v)	Prevention of undue exposure of personnel to hazardous waste	Appendix G
§270.14(b)(8)(vi)	Prevention of releases to the atmosphere	Appendix G
270.14(b)(9)	Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes	Section 2 and Appendix G
§264.17	Procedures to prevent accidental ignition, reaction of ignitables, reaction of reactives, reaction of incompatibles, and documentation of compliance with 264.17 (general requirements for ignitable, reactive, or incompatible wastes)	Section 2 and Appendix G

**Table 1-1 (continued)**  
**Regulatory References and Corresponding Permit Modification Request Location**

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
270.14(b)(10)	Traffic pattern: volume, controls, and access	Appendix A <sup>a</sup>
264.18(a)	Seismic considerations (NOTE GT: Align)	Appendix A <sup>a</sup>
§270.14(b)(11)	Facility/unit identification and location information	Appendix A
§270.14(b)(11)(i)	Seismic standard applicability [264.18(a)]	Appendix A
§270.14(b)(11)(ii)	Seismic standard requirements	Appendix A
§270.14(b)(11)(ii)(A)	No fault within 3,000 feet (ft) with displacement in Holocene time	Appendix A, Supplement A.1
§270.14(b)(11)(ii)(B)	If faults which have displacement in Holocene time are present within 3,000 ft, no faults pass within 200 ft of portions of the facility where treatment, storage, or disposal will be conducted	Supplement A.1
§270.14(b)(11)(iii)	100-year floodplain standard	Appendix A <sup>a</sup>
§270.14(b)(11)(iv)(A-C)	Facilities located within the 100-year floodplain	NA
§270.14(b)(11)(v)	Compliance schedule for 264.18(b)	NA
§270.14(b)(12)	Personnel training program	Appendix D
§270.14(b)(13)	Closure and post-closure plans	Appendix F and Supplements F.1 and F.2
§264, Subpart G	Closure and post-closure	Appendix F and Supplements F.1 and F.2
§264.178	Closure/containers	Appendix F and Supplements F.1 and F.2
§264.197	Closure and post-closure care/tanks	NA
§264.228	Surface impoundments	NA

**Table 1-1 (continued)**  
**Regulatory References and Corresponding Permit Modification Request Location**

<b>Regulatory Citation(s)</b>	<b>Description of Requirement</b>	<b>Location in this Permit Modification Request</b>
§264.258	Waste piles	NA
§264.280	Land treatment	NA
§264.310	Landfills	NA
§264.351	Incinerators	NA
§264.603	Requirements by the Secretary	NA
§270.14(b)(14)	Deed restrictions/post-closure notices (264.119)	NA
§270.14(b)(15)	Closure cost estimate (264.142)	Appendix F
§270.14(b)(16)	Post-closure cost estimate (264.144)	Appendix F
§270.14(b)(17)	Liability insurance (264.147)	Appendix F
§270.14(b)(18)	Proof of financial coverage (264.149-150)	Appendix F
§270.14(b)(19)	Topographic map requirements	Appendix A <sup>b</sup>
§270.14(b)(19)(i)	Map scale and date	Appendix A <sup>b</sup>
§270.14(b)(19)(ii)	100-year floodplain area	Appendix A <sup>b</sup>
§270.14(b)(19)(iii)	Surface waters	Appendix A
§270.14(b)(19)(iv)	Surrounding land uses	Appendix A
§270.14(b)(19)(v)	Wind rose	Appendix A
§270.14(b)(19)(vi)	Map orientation	Appendix A <sup>b</sup>
§270.14(b)(19)(vii)	Legal boundaries	Appendix A <sup>b</sup>
§270.14(b)(19)(viii)	Access control	Appendices A and G
§270.14(b)(19)(ix)	Wells	Appendix A
§270.14(b)(19)(x)	Buildings	Appendix A
§270.14(b)(19)(xi)	Drainage barriers or flood control	Appendix A

**Table 1-1 (continued)**  
**Regulatory References and Corresponding Permit Modification Request Location**

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§270.14(b)(19)(xii)	Location of operational units	Appendix A
§270.3(b)(20)	Other federal laws	3.0
§270.3(a)	Wild and Scenic Rivers Act	3.0
§270.3(b)	National Historic Preservation Act	3.0
§270.3(c)	Endangered Species Act	3.0
§270.3(d)	Coastal Zone Management	3.0
§270.3(e)	Fish and Wildlife Coordination Act	3.0
§270.3(f)	Executive Orders	3.0
§270.14(b)(21)	Notice of extension approval for land disposal facilities	NA
§270.14(c)	Groundwater monitoring requirements	Appendix A <sup>a</sup>
§270.14(c)(3)	Topographic map with points of compliance	NA
§270.14(c)(3)	Proposed location of groundwater monitoring wells	NA
§270.14(c)(4)	Description of plume of contamination that has entered the groundwater from a regulated unit at the time the application was submitted	NA
§270.14(c)(4)(i)	Extent of plume indicated on topographic map	NA
§270.14(c)(4)(ii)	Identification of constituents and concentration	NA
§270.14(c)(5)	Detailed plan and engineering report describing proposed groundwater monitoring program	Appendix A <sup>a</sup>
§270.14(c)(6)	If no release detected at date of submitted, then submit following	Appendix A <sup>a</sup>
§270.14(c)(6)(i)	List of proposed indicator parameters, waste constituents, and reaction products	NA

**Table 1-1 (continued)**  
**Regulatory References and Corresponding Permit Modification Request Location**

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§270.14(c)(16)(ii)	Proposed groundwater monitoring system	NA
§270.14(c)(16)(iii)	Background values for each proposed monitoring parameter	NA
§270.14(c)(16)(iv)	Description of proposed sampling, analysis, and statistic comparisons to be used	NA
§270.14(c)(7)	If a release is detected at the point of compliance, then corrective actions	NA
§270.14(d)	Information requirements for solid waste management units (SWMU)	4.0 and Supplement 4.1
§270.14(d)(1)(i)	Location of SWMUs on topographic map	4.0 and Supplement 4.1
§270.14(d)(1)(ii)	Types of SWMUs	4.0 and Supplement 4.1
§270.14(d)(1)(iii)	Dimensions and descriptions of SWMUs	4.0 and Supplement 4.1
§270.14(d)(1)(iv)	Dates of SWMU operations	4.0 and Supplement 4.1
§270.14(d)(1)(v)	Waste types managed at SWMUs	4.0 and Supplement 4.1
§270.14(d)(2)	Information on releases from SWMUs	4.0 and Supplement 4.1
§270.14(d)(3)	RCRA Facility Assessment sampling and analysis results	NA
§270.15	Information requirements for containers	Appendix G

<sup>a</sup> Requirement or information is also addressed in the most recent version of the "Los Alamos National Laboratory General Part B Permit Application," as appropriate.

<sup>b</sup> Some of the topographic map requirements are addressed in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application," as appropriate.

## 2.0 WASTE MANAGEMENT UNIT

The waste management unit described in this Transuranic Waste Facility (TRUWF) permit modification request will be located at Technical Area (TA) 52, in the central portion of the Los Alamos National Laboratory (LANL) as shown in Appendix A on Figure A-2. The TRUWF will consist of one waste management unit that will provide storage and treatment in containers for hazardous wastes, including the hazardous component of mixed transuranic (MTRUW) and mixed low-level (MLLW) waste streams. The information provided in this section is submitted to address 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 4.1, Subpart V, Part 264, Subpart I, revised October 1, 2003[10-01-03].

This section presents general descriptions of the proposed waste management unit and waste management practices. The structure number for the waste management unit will be TA-52, Building 190. The location of the unit is shown in Appendix A of this permit modification submittal on Figure A-2. The general storage area layout is shown on Figure A-3. The facility will be surrounded with an 8-foot (ft) security fence. Access to the facility will be controlled by badge readers and administrative controls. Detailed information for and additional figures of the proposed waste management unit at TA-52 and the waste management practices associated with the TRUWF are provided in Appendix G of this permit modification request package. A summary of applicable regulatory references and the corresponding location where the requirement is addressed in this permit modification request is located in Table 1-1. Table G-1 summarizes specific applicable regulatory references for container storage and the corresponding location where the requirement is addressed in this document.

### 2.1 CONTAINER STORAGE/TREATMENT UNIT

The maximum storage capacity of the TRUWF will be 105,875 gallons, or the equivalent of 1,925 55-gallon drums. The TRUWF will be used to store mostly newly generated MTRUW in solid form. Waste containers with potential liquids and other types of mixed or non-mixed hazardous waste may also be managed at the TRUWF (e.g., MLLW or hazardous waste), either as residuals from the preparation of MTRUW for transport and disposition at off-site disposal facilities or routinely if LANL waste management policies are revised in the future and capacity exists at this facility. Waste containers will be stored within the building in several designated areas, in waste transport trucks, or in TRU waste characterization trailers. The TRUWF will be made up of four general areas: the main staging and

storage area; the characterization and certification area; the size reduction, decontamination, and repackaging area; and the shipping and receiving area. Figure 2-1 displays a representation of the proposed maximum storage capacity for the TRUWF. This maximum storage capacity is based on the proposed storage configuration within the designated storage areas. No medical, infectious, or explosive wastes will be accepted at the TRUWF. Proposed general dimensions, containment features, and materials of construction for the TRUWF are described in Appendix G of this permit modification submittal to satisfy the requirements of 20.4.1 NMAC § 270.15(a)(1) and (2) [10-01-03].

## 2.2 TREATMENT IN CONTAINERS

Waste received and stored in containers at the TRUWF may need further treatment to meet the waste acceptance criteria for transport and disposition at off-site facilities. Treatment methods that will be used at the TRUWF may include absorption, neutralization, cementing or grouting, and puncturing of aerosol cans. The most common treatment method that is anticipated is absorption of liquids. These methods of treatment will be conducted at the TRUWF within waste containers and may be performed individually and in conjunction with each other to treat the waste in the most effective manner to meet off-site waste acceptance criteria. When more than one treatment will be performed on a waste, individual operations, as outlined below, may be combined. Treated waste may be consolidated with other treated waste provided that the wastes are compatible. These treatment processes may also be conducted during waste repackaging and/or resizing operations. All treatment will be conducted with the use of a glove bag, tent, and/or in the building's modular panelized containment system. Heating, ventilating, and air conditioning (HVAC)/ high-efficiency particulate air (HEPA) equipment will be used as necessary for containment purposes. Treatment operations associated with the containers may include:

- Transferring liquids into containers with absorbent;
- Adding absorbent into containers with liquids;
- Use of cement as an absorbent;
- Neutralizing liquids in containers;
- Simultaneous absorption and neutralization of liquids by adding a neutralizing absorbent to containers (either prior to or after the liquid is added);
- Transferring liquids from containers followed by neutralization and then absorption or cementation;
- Absorption followed by transferring excess liquid into containers and further absorption or cementation;
- Puncturing of aerosol cans found in waste containers and placement of the punctured can back into the original container or in a new waste container;
- Cementing or grouting liquids or sludge by mixing and binding it with an inert cementitious material;

- Adding absorbent into a container or secondary containment device prior to can puncturing to absorb any liquid that may be released.
- Commingling of compatible liquids after can puncturing or prior to neutralization, cementation, and/or absorption; and
- Commingling of compatible absorbed liquids.

The methods of proposed treatment to be conducted at the TRUWF are further described in Appendix G of this permit modification submittal.

### 2.3 STORAGE CONTAINERS

A variety of containers may be used for storage at the TRUWF including 0.25, 0.5, 0.75, 1, 2, 4, and 6 liter (L)/quart containers; 5-, 14-, 30-, 55-, 85-, and 110-gallon steel, polyethylene, and fiber drums; FRP boxes; steel SWBs; various steel boxes; ten drum overpacks (TDOP); metal overpack boxes; roll-off bins; cardboard shipping containers; labpacks; gas cylinders; and some oversized custom metal and wooden containers. Additional information for proposed typical storage containers that will be utilized at the TRUWF is provided in Tables 2-1 and 2-2. These tables do not contain information for all of the possible containers that may be used for future waste management activities. Each container is identified in the tables without limiting the association of size and material. All waste containers that will be stored at the TRUWF will be stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers, in structures elevated by design) to prevent contact with accumulated liquids, which meets the requirements in 20.4.1 NMAC § 264.175(b)(2) [10-01-03]. Information regarding the presence of free liquids in containers of hazardous waste is obtained through generator waste-characterization knowledge, visual examinations, real-time radiography (RTR), and/or the Paint Filter Liquids Test. Waste containers bearing free liquids are stored with secondary containment, by design or with pallets, and are kept from contact with any potentially accumulated liquids in accordance with 20 NMAC 4.1, Subpart V, 264.175(b)(2) [10-01-03].

### 2.4 MINIMUM AISLE SPACE AND STORAGE CONFIGURATION

Waste containers at the TRUWF will be arranged in rows with a minimum aisle space of 24 inches (in.). Storage configuration within a row will depend upon the type of container, its size, and its weight restrictions. Waste containers equal to or greater than 55 gallons (drums, FRP boxes, SWBs, and metal overpack boxes) will be arranged in rows and stacked to a maximum of three high unless they are too large or heavy to be supported by the container(s) to be located underneath and/or maneuvered with available forklift/crane/hoist. This stacking configuration is based upon the Code of Federal Regulations (CFR) requirements in 49 CFR 178.606(c), "Performance-Oriented Stack Test" which requires a minimum testing height of ten feet for demonstrating container integrity. For MTRUW

and MLLW, the stacking limit is also based on a criticality assessment, which shows that there is not a criticality concern for these containers in an infinite array stacked three high. All other types of containers less than 55 gallons will be arranged in rows and will be stacked to a maximum of 10 feet (ft) high. Figure 2-1 illustrates a storage configuration that reflects the maximum storage at the TRUWF; however, storage operations are dynamic and the storage configuration is subject to change based on daily operations.

## 2.5 AUTHORIZED WASTE

The TRUWF will be used to store hazardous waste containers bearing one or more of the U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers presented in the revision to the “Los Alamos National Laboratory General Part A Permit Application, Revision 5.1” included with this permit modification submittal.

## 2.6 CONDITION OF CONTAINERS [20.4.1 NMAC §264.171]

Any container at the TRUWF that is not in good condition either during or prior to storage (e.g., severe rusting, apparent structural defects, leaking (dewatering etc.) will be over packed or the wastes will undergo repackaging in containers that are in structurally sound condition. Containers shall not exhibit severe rust, dents, deep scratches, bulges, leaks or other structural defects. Any waste container that is not in good condition (e.g., severe rusting, apparent structural defects, leaks) will be over packed, or repackaged in a container that is in good condition and is compatible with the waste materials, packaging materials, and/or other container. Over packed and/or new containers must also be compatible with and resistant to environmental conditions. This meets the requirements of 20.4.1 NMAC §264.171 [10-01-03].

Suppliers of waste container components are audited by LANL for qualification prior to conducting business transactions. LANL also uses approved procurement product specifications that include quality assurance requirements and ensure that container package specifications meet U.S. Department of Transportation (DOT) (49 CFR 173.410) requirements for Type A/7A packages.

Containers procured by LANL include liners if required for the container to meet the manufacturer’s specifications for Type A/7A compliance. When liners are procured individually, a representative sample of the purchased liners will be inspected for compliance with appropriate specifications using an approved inspection procedure. Containers that do not pass inspection are segregated and marked from those that are acceptable to prevent inadvertent use.

## 2.7 COMPATIBILITY OF WASTE WITH CONTAINERS [20.4.1 NMAC §264.172]

The TRUWF will only store containers made of or lined with materials that will not react with and are otherwise compatible with the wastes stored in them. Prior to filling the container with waste, all container components (e.g., lid, liner, and interior/exterior surface) are inspected to ensure container integrity as well as compatibility with the type of waste to be placed into the container. Compatibility of the waste container, including liners, and the waste to be containerized is required and ensured by the facility. Information regarding the liner's compatibility with the waste components can be obtained from the container/liner manufacturer. This fulfills the requirements of 20.4.1 NMAC §264.172 [10-01-03].

## 2.8 MANAGEMENT OF CONTAINERS [20.4.1 NMAC §264.173(a) and (b)]

Waste containers that will be stored at the TRUWF will be handled in a manner that will not cause them to rupture or leak, as required in 20.4.1 NMAC §264.173(b) [10-01-03]. All containers will be kept closed during storage in accordance with 20.4.1 NMAC §264.173(a) [10-01-03], except when waste is added to or removed from the container, when a container's contents need to be repackaged, or during treatment. In addition to the containers being closed, the closing devices will be secured in a manner that provides no visible holes, gaps, or other open spaces into the interior of the container, in accordance with 20.4.1 NMAC §264.1086(c)(1)(iii)[10-01-03].

The TRUWF will be constructed with a ventilation system that will monitor air pressure and ambient air for personnel working in areas where hazardous or mixed waste will be managed. It will create zones within the TRUWF that are at a lower pressure than the outside air (negative pressure) to prevent the movement of contaminants from the building. Air will flow from the zones of highest pressure to those of lowest pressure (i.e., highest potential contamination areas). The airflow through the different zones will be carefully balanced, controlled and monitored to provide the greatest protection to personnel as well as to the environment. If negative air pressure exceeds designed limits, a ventilation alarm will be activated. Detailed information on general facility operations and container management practices are contained in Appendix G of this permit modification submittal.

### 2.8.1 Packaging and Over packing

Waste packaging/repackaging activities will be conducted at the TRUWF container storage/treatment unit. This includes the addition of waste received from generators into secondary containers or movement of waste from one secondary container to another. Some wastes may be received as small waste items that will be packed into secondary containers to maximize storage and shipping efficiency. Other wastes will be received as large waste items that require packaging into a shipping container.

Over packing will occur at the TRUWF when a primary container fails to provide adequate containment. The over pack container will then be considered the primary container.

### 2.8.2 Labeling

Each container of hazardous waste will be labeled with a “Hazardous Waste” label bearing the following information:

- Generator name and address
- EPA Identification Number
- The accumulation start date
- The applicable EPA Hazardous Waste Number(s)

A “Radioactive Material/Radioactive Waste” label will be applied, if appropriate. LANL will follow all applicable U.S. Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) procedures, requirements and guidelines as they apply to storage, treatment, and radioactive decontamination of the TRUWF waste management units. The DOE and NRC regulations are not preempted by federal or state regulations governing the handling of hazardous waste. Compliance with all available DOE and NRC requirements is protective of human health and the environment.

### 2.8.3 Transportation of Containers

Flatbed trucks, trailers, and/or forklifts may be used to transport waste containers to and from the waste management units at the TRUWF. Forklift operations 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 will mitigate hazards while moving containers.

## 2.9 CONTAINMENT SYSTEMS [20.4.1 NMAC §270.15(A)(1-5) AND 270.15(B)(1-2)]

In accordance with 20.4.1 NMAC §270.15(b)(1) [10-01-03], information contained in LANL’s waste databases or waste characterization records can be used initially to verify the absence of free liquids in containers. In addition to records, visual examination can be used to verify the absence of free liquids. Potential liquids that might accumulate at the TRUWF container storage/treatment unit are contained within containment systems (e.g., self-containment pallets) at each storage location until the liquid is removed. All secondary containment systems will be designed 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) [10-01-03]. Secondary containment will not be engineered into the final facility design; however, secondary containment systems will be used to ensure the safe storage and management of liquid bearing waste containers.

Concrete floors within the main storage building and the concrete containment building (where treatment, repackaging, and resizing will occur) will be sealed with an epoxy or similar protective coating to aid in decontamination should a spill occur.

Any accumulated liquids will be removed in a timely manner to prevent overflow of the containment system. The collected liquids will then be transferred to appropriate containers and sampled, as necessary. The facility will have floor drains and sumps to handle and contain leaks, as well as retain liquids for sampling and appropriate disposal, should they occur. If the accumulated liquids are from an identifiable source, or from water generated during fire-suppression activities, the resulting material may be characterized as a newly-generated waste and analyzed for 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 Appendix E of this submittal. Containers of collected liquids will be stored with secondary containment, pending analytical results, which will 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 prevention of overflow.

## 2.10 INSPECTION SCHEDULES AND PROCEDURES

Inspections will be used to identify leaking containers, deterioration of containers, and/or loss of integrity of the containment system, as required by 20.4.1 NMAC §264.174 [10-01-03]. The inspections will include checking the structural integrity of the containers (e.g., for bulging or warping). Inspections will follow the Inspection Plan in Appendix C of this permit modification submittal. Inspections of the containers while they are in storage will be used to verify that there are no visible holes, gaps, or other open spaces into the interior of containers while they are in storage.

All containers will be regularly inspected for evidence (e.g., corrosion, visible staining, bulges, rupture, dents, and leaks) that may indicate surface contamination. If any evidence of surface contamination from a breach of container integrity is detected, the waste container will either be over packed in an appropriate container or repackaged in a new container as discussed in Section 2.7.1.

### 2.10.1 Special Requirements for Ignitable, Reactive, and Incompatible Wastes [20.4.1 NMAC §264.17 and 20.4.1 NMAC §§270.15(c) and 270.15(d)]

Pursuant to 20.4.1 NMAC §264.17 [10-01-03], LANL will adhere to the following specific waste management procedures for ignitable and reactive waste. Containers with ignitable or reactive wastes will be located at least 50 ft from the LANL property line (Figure A-2) at all times and will be protected

from sources of ignition or reaction. Waste management practices at the TRUWF will minimize the possibility of accidental ignition. No sources of open flames or spark producing equipment will be allowed at the TRUWF container storage/treatment unit, and smoking will be prohibited. Cutting and welding activities will never be conducted in the vicinity of waste containers without proper controls, only non-sparking tools will be used to handle ignitable waste containers, and lightning rods will be located on all storage structures. "No Smoking" signs will be conspicuously placed at the facility wherever there is a potential hazard from ignitable or reactive waste.

Precautions will be taken to prevent reactions that may produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment or produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions. These precautions will include keeping containers closed during storage and venting containers of mixed transuranic waste. Together, these measures meet the requirements of 20.4.1 NMAC §§264.17(a) and (b) and 264.176[10-01-03].

Incompatible wastes will be separated and segregated from other wastes and materials by means of berm, dike, wall, or other specific means (e.g., secondary containment pallets, cabinets, distance). Incompatible waste will also be stored at the TRUWF separately in accordance with the following DOT compatibility groups:

- Flammables (Class 3)
- Oxidizers (Class 5.1)
- Combustible/Noncombustible Miscellaneous Hazardous Material (Class 9)
- Corrosives (Class 8)
- Poisons (Class 6)
- Radioactive (Class 7)
- Acids (Class 8)
- Reactive (Class 4)
- Non-regulated materials.

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).

## 2.11 CLOSURE

Closure will consist of partial closure of the hazardous waste management unit at the TRUWF while leaving the other hazardous and mixed waste management units at LANL in service. Partial closure activities will be accomplished by removal of hazardous wastes and residues from the surfaces and/or

equipment associated with the unit to be closed and that may have come into contact with the waste. Detailed closure procedures for the TRUWF are addressed in Appendix F of this permit modification submittal. This information is provided to meet the requirements of 20.4.1 NMAC §§264.111 and 264.178 [10-01-03].

## 2.12 CONTROL OF RUN-ON/RUNOFF

Controlling run-on and run-off at the TRUWF locations where waste management operations will regularly occur is accomplished by the design of the building and the use of control structures with appropriate contouring of surface areas. Run-on of storm water into the indoor container storage areas at the TRUWF will not occur due to the building enclosure and surface contouring along the perimeter of the building to prevent impoundment of water against the foundations, doors, and loading areas. The outdoor storage area on the southwestern portion of the building will be sloped away from the building to direct potential run-on away. Storm drains and trenches will be included in the building design as necessary to collect any precipitation or snowmelt that may enter the building through the loading/unloading area.

Run-on from off-site and storm water run-off at the building will be collected by a perimeter system including ditches and culverts. The system will direct storm water around the site and to the north. Run-off from the outside storage area on the southwest side of the building will be collected by a central drain. The drain will be piped to a storm water sampling system prior to being directed to the perimeter drainage system (See Figure A-9 of Appendix A of this document).

Liquids that may result from fire suppression related activities within the building will be collected in the fire water tank on the east side of the building. The tank will be sized to accommodate standard fire collection volumes for the facility as specified by applicable National Fire Protection Association (NFPA) and U. S. Department of Energy standards. All stored waste containers in the building will be elevated to provide protection from liquids that could be introduced through fire-suppression activities. Liquids resulting from fire suppression activities outside the building will follow the external drainage collection system (drains, perimeter drainage ditches, and culverts) toward the north side of the area. Fire suppression overflow from the outside storage area will be directed as discussed above for storm water.

Further details regarding run-off from waste management activities at this facility are included in Appendix G. Design details of these features may be subject to change. This information is provided

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to meet the requirements of 20.4.1 NMAC §264.175(b)(4), and 20.4.1 NMAC §270.14(b)(8)(ii) [10-01-03].

Table 2-1

## Proposed Typical Storage Containers for Hazardous and Mixed Waste

Container Type	Description	Requirements
Non-Bulk Performance-Oriented Packaging <sup>a</sup>	Steel drums	<ul style="list-style-type: none"> <li>• 49 CFR §178.504.</li> <li>• Maximum capacity not to exceed 119 gal.</li> </ul>
	Aluminum drums	<ul style="list-style-type: none"> <li>• 49 CFR §178.505.</li> <li>• Maximum capacity will not exceed 119 gal.</li> </ul>
	Metal drums other than steel or aluminum	<ul style="list-style-type: none"> <li>• 49 CFR §178.506.</li> <li>• Maximum capacity will not exceed 119 gal.</li> </ul>
	Fiber drums	<ul style="list-style-type: none"> <li>• 49 CFR §178.508.</li> <li>• Maximum capacity will not exceed 119 gal.</li> </ul>
	Plastic drums	<ul style="list-style-type: none"> <li>• 49 CFR §178.509.</li> <li>• Maximum capacity will not exceed 119 gal.</li> </ul>
	Plastic Jerricans	<ul style="list-style-type: none"> <li>• 49 CFR §178.509.</li> <li>• Maximum capacity will not exceed 16 gal.</li> </ul>
	Steel or aluminum boxes	<ul style="list-style-type: none"> <li>• 49 CFR §178.512.</li> </ul>
	Aluminum or steel Jerricans	<ul style="list-style-type: none"> <li>• 49 CFR §178.511.</li> <li>• Maximum capacity will not exceed 16 gal.</li> </ul>
	Plywood boxes	<ul style="list-style-type: none"> <li>• 49 CFR §178.514.</li> </ul>
	Fiberboard boxes	<ul style="list-style-type: none"> <li>• 49 CFR §178.516.</li> </ul>
	Composite packaging with inner receptacles	<ul style="list-style-type: none"> <li>• 49 CFR §178.522.</li> <li>• Maximum capacity will not exceed 66 gallons.</li> </ul>
	Composite packaging with inner glass, porcelain, or stone receptacles	<ul style="list-style-type: none"> <li>• 49 CFR §178.523.</li> </ul>
	Intermediate Bulk Performance-Oriented Packaging <sup>b</sup>	Metal intermediate bulk containers
Rigid plastic intermediate bulk containers		<ul style="list-style-type: none"> <li>• 49 CFR §178.706.</li> </ul>
Composite intermediate bulk containers		<ul style="list-style-type: none"> <li>• 49 CFR §178.707.</li> </ul>
Fiberboard intermediate bulk containers		<ul style="list-style-type: none"> <li>• 49 CFR §178.708.</li> </ul>
Wooden intermediate bulk containers		<ul style="list-style-type: none"> <li>• 49 CFR §178.709.</li> </ul>
Flexible intermediate bulk containers		<ul style="list-style-type: none"> <li>• 49 CFR §178.710.</li> </ul>
Cylinders <sup>c</sup>	Seamless steel cylinders	<ul style="list-style-type: none"> <li>• DOT Specification 3A, 3AX, 3AA, 3AAX, 3B, 3E, or 3T in 49 CFR, Part 178, Subpart C.</li> </ul>
	Welded or brazed steel cylinders	<ul style="list-style-type: none"> <li>• DOT Specification 4B, 4BA, 4B240ET, 4AA480, 4L, or 4BW in 49 CFR, Part 178, Subpart C.</li> </ul>
	Seamless or welded aluminum cylinders	<ul style="list-style-type: none"> <li>• DOT Specification 3AL or 4E in 49 CFR, Part 178, Subpart C.</li> </ul>
	Seamless nickel cylinders	<ul style="list-style-type: none"> <li>• DOT Specification 3BN in 49 CFR, Part 178, Subpart C.</li> </ul>
Containers Used for Transport of Radioactive Materials	DOT Containers	<ul style="list-style-type: none"> <li>• DOT Specification 7A in 49 CFR §178.350.</li> </ul>
	IP Containers	<ul style="list-style-type: none"> <li>• Industrial Packaging IP-1, IP-2, or IP-3 in 49 CFR §173.411.</li> </ul>
	Exceptions	<ul style="list-style-type: none"> <li>• 49 CFR §173.410.</li> </ul>

a Manufacturer has provided the required UN marking in accordance with 49 CFR §178.503.

b Marked by the manufacturer in accordance with 49 CFR §178.703.

c Marked with the applicable DOT specification number in accordance with 49 CFR §178.35.

CFR = Code of Federal Regulations

DOT = U.S. Department of Transportation

IP = Industrial Packaging

gal = gallons

lbs = pounds

**Table 2-2**  
**Proposed Storage Containers for Mixed Transuranic Waste**

Container Type	Description	Requirements	Filter Vents <sup>a</sup>
Standard 55-gallon Drum	<ul style="list-style-type: none"> <li>Gross internal volume of 7.3 ft<sup>3</sup> (0.21 m<sup>3</sup>).</li> <li>Constructed of mild steel.</li> <li>May also contain ridge, molded polyethylene (or other compatible material) liner.</li> </ul>	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Standard Waste Box	Gross internal volume of 66 ft <sup>3</sup> (1.88 m <sup>3</sup> ).	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Standard 85-gallon Drum Over Pack	<ul style="list-style-type: none"> <li>Gross internal volume of 11.3 ft<sup>3</sup> (0.32 m<sup>3</sup>).</li> <li>Used for over packing contaminated 55-gallon drums.</li> </ul>	Not Applicable	One or more filter vents installed on top of the container.
100-gallon (379-liter) Drum	<ul style="list-style-type: none"> <li>gross internal volume of 13.4 ft<sup>3</sup> (0.38m<sup>3</sup>).</li> <li>May be direct loaded with contact-handled transuranic mixed waste</li> </ul>	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Ten Drum Overpack	<ul style="list-style-type: none"> <li>Gross internal volume of 160 ft<sup>3</sup> (4.5 m<sup>3</sup>).</li> <li>Used to contain up to ten standard 55-gallon drums or one standard waste box</li> </ul>	DOT Specification 7A and is certified to meet applicable requirements for Type A packaging	One or more filter vents installed on top of the container.
Oversized Waste Box	<ul style="list-style-type: none"> <li>Gross internal volume greater than 11.3 ft<sup>3</sup> (0.32 m<sup>3</sup>).</li> <li>Used for oversized waste.</li> </ul>	Not Applicable	Two or more filter vents installed on sides of container.
Remote-handled Transuranic Canister	<ul style="list-style-type: none"> <li>gross internal volume of 31.4 ft<sup>3</sup> (0.89 m<sup>3</sup>)</li> <li>Used for waste packaged in small containers (e.g., 55-gallon drums) or waste loaded directly into the canister.</li> </ul>	Not Applicable	Vented

a Vents are high-efficiency particulate air grade filters to preclude container pressurization caused by gas generation and to prevent particulate material from escaping. Vents have an orifice approximately 0.375 inches (9.53 millimeters [mm]) in diameter through which internally generated gas may pass. Filter media can be any material compatible with the contents of the container (e.g., composite carbon, sintered metal).

CFR = Code of Federal Regulations  
DOT = U.S. Department of Transportation  
ft<sup>3</sup> = cubic feet  
m<sup>3</sup> = cubic meters

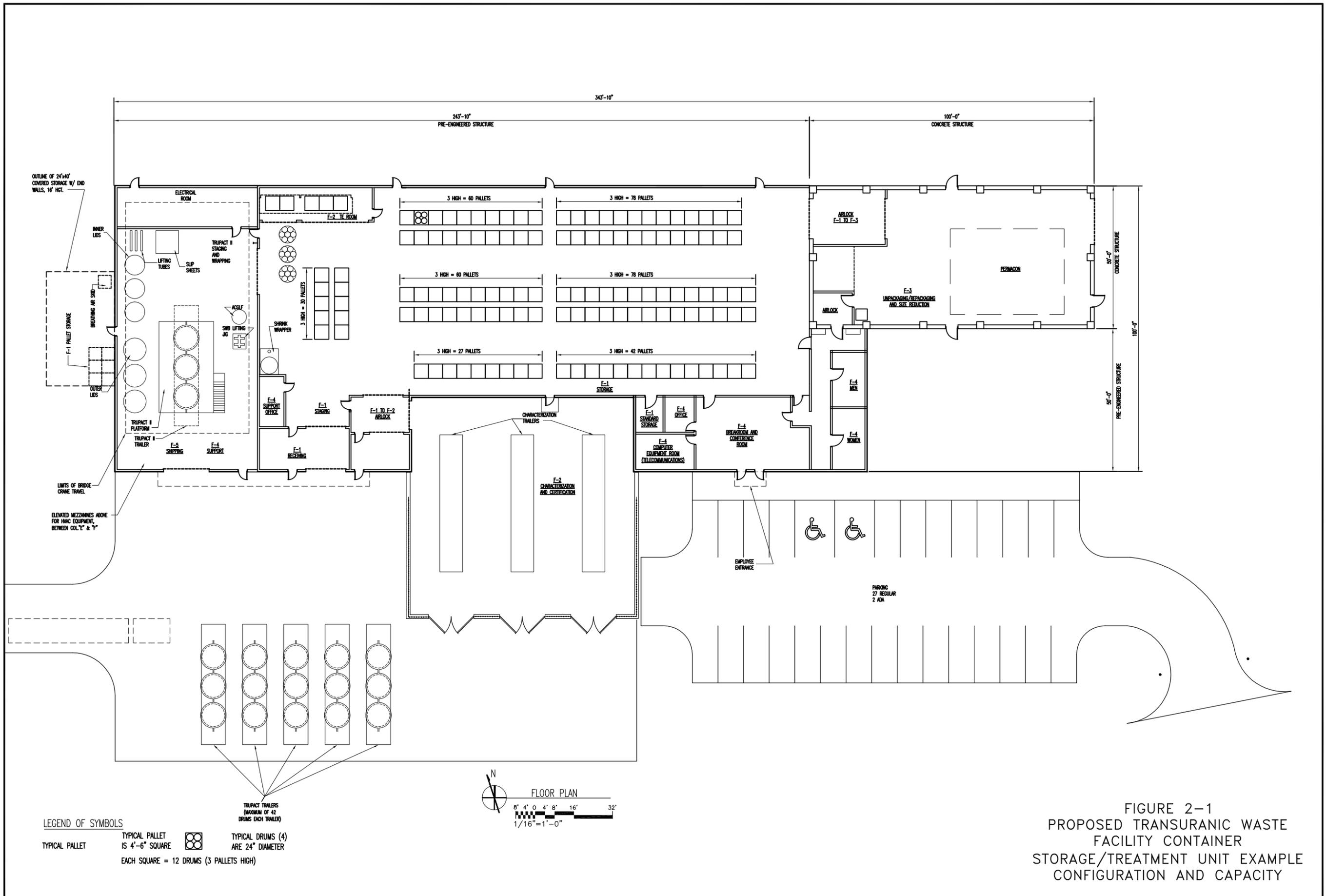


FIGURE 2-1  
 PROPOSED TRANSURANIC WASTE  
 FACILITY CONTAINER  
 STORAGE/TREATMENT UNIT EXAMPLE  
 CONFIGURATION AND CAPACITY

### 3.0 OTHER FEDERAL LAWS

The following federal laws are required under the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), §§ 270.3 and 270.14(b)(20), revised October 1, 2003 [10-01-03], to be given consideration when applying for a hazardous waste facility permit. When any of these laws is applicable, its procedures must be followed:

1. *The Wild and Scenic Rivers Act (16 United States Code [USC] 1273 et seq.)*. This act provides for a national wild and scenic rivers system and prohibits construction of any waterway that would have a direct adverse effect on the values for which a wild and scenic river was established.
2. *The National Historic Preservation Act of 1966 (16 USC 470 et seq.)*. This act establishes a program for the preservation of historic properties throughout the country. The act has provisions that require mitigation of adverse effects to registered properties.
3. *The Endangered Species Act of 1973 (16 USC 1531)*. This act provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The act prohibits any action that would jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.
4. *The Coastal Zone Management Act of 1972 (16 USC 1451 et seq.)*. This act establishes national policy for the management, use, protection, and development of land and water resources of the nation's coastal zones. Section 307(c) of the act and implementing regulations prohibit the U.S. Environmental Protection Agency from issuing a permit for activity affecting coastal zone land or water without the certification from the applicant that the activity is in compliance with the state Coastal Zone Management Program.
5. *The Fish and Wildlife Coordination Act of 1934, as amended (16 USC 661 et seq.)*. This act promotes the conservation of wildlife, fish, and game and integrates this conservation with water resource projects. Certain provisions of the act require that permits proposing or authorizing the impoundment, diversion, or other control or modification of any body of water be considered by the appropriate state agency for impacts to wildlife resources.

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

The National Historic Preservation Act is administered by the Advisory Council on Historic Preservation, appointed by the President, and the New Mexico State Historic Preservation Office. Section 106 of the Act requires the U.S. Department of Energy (DOE) to consider the effects of its actions on historic properties and provide the Council with a reasonable opportunity to comment on those actions and the manner in which DOE considers historic properties in their decisions. DOE

accomplishes this through consultation with the State Historic Preservation Office whenever a project may potentially impact a historic property. LANL may prepare a Historic Building Survey Report assessing the eligibility of a historic building dating from the Manhattan Project and early Cold War periods (1943 to 1956) for the National Register of Historic Places and evaluating the impacts of the proposed actions. The consultation process was formalized in April 2000 through a Programmatic Agreement between DOE, the Council, and the State.

For any undertaking on DOE land that may directly or indirectly impact threatened and endangered (T&E) species or their habitat, DOE must consult with the U.S. Fish and Wildlife Service (USFWS), as provided under Section 7 of the Endangered Species Act. Similarly, DOE must consult with the USFWS for projects that would impound, divert, or otherwise control or modify a body of water, as required by the Fish and Wildlife Coordination Act. For Endangered Species Act compliance, LANL may prepare a Biological Assessment to document the presence of T&E species and to evaluate the impacts of a project on a listed species or its habitat. DOE will then request in writing that the USFWS concurs with DOE's findings in the Biological Assessment. In recent years, DOE and LANL have streamlined the consultation process by preparing a T&E Species Habitat Management Plan. This plan fulfills the provisions of the Endangered Species Act that requires federal agencies to implement programs for the conservation of T&E species and their habitat. The USFWS approved this plan in February 1999.

Provisions in the Wild and Scenic Rivers Act and the Coastal Zone Management Act are not applicable to LANL's activities. Consideration will be given to Executive Orders, issued by the President, that are relevant to waste management activities at LANL. When any of these Orders is applicable, its provisions will be fully followed. Requirements for Executive Orders are reserved in 20.4.1 NMAC § 270.3(f) [10-01-03].

#### **4.0 CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS**

The information provided in this section is submitted to address the requirements for solid waste management units (SWMU) in accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 §270.14(d), revised October 1, 2003 [10-01-03]. This section provides the SWMUs identified for the Transuranic Waste Facility (TRUWF) to be located at Technical Area (TA) 52 at the Los Alamos National Laboratory (LANL).

LANL uses the definition of a SWMU presented in the LANL Compliance Order on Consent (Consent Order) signed by the U.S. Department of Energy, the University of California, and the New Mexico Environment Department on March 1, 2005, hereinafter referred to as the Consent Order. This definition states that SWMUs are "any discernible unit at which solid waste has been placed at any time, and from which the Department determines there may be a risk of 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."

Table 4-1 lists the SWMUs at TA-52 and at TA-4, which historically overlapped a portion of TA-52. Supplement 4-1, which has been extracted from the 2006 "Solid Waste Management Unit and Area of Concern Report" (LANL, 2006) provides descriptions of the SWMUs listed in Table 4-1. These descriptions include, to the extent available, the unit type, general dimensions and structural descriptions, the dates of operation, and the waste managed at the unit. Supplement 4-1 also includes the most current information available pertaining to releases of hazardous wastes or hazardous constituents from the units and results of sampling analyses conducted to date. In addition, the location of each SWMU is presented on topographic maps included with Supplement 4-1.

**Table 4-1  
Solid Waste Management Units Identified at Technical Areas 4 and 52**

<b>SWMU No./Former SWMU No.</b>	<b>Consolidated SWMU No.</b>	<b>Location</b>	<b>Description</b>	<b>Status</b>
04-001	04-001-99	Site of former TA-4 within TA-52	Firing Pit	Consolidated
04-002			Disposal Site	
04-003(b)			Drain line and outfall	
04-003(a)	04-003(a)-00	Former Alpha Site – former building 04-7	Outfall and drain lines from former building 04-7	Consolidated
04-004			Building footprint of 04-7	
52-001(d)		Inside building 52-1	Contaminated equipment	Inactive
52-002(a)		North of building 52-1	Septic system	Active
52-003(a)		Former building 52-2	Former waste neutralization and pumping facility	Inactive

SWMU = Solid Waste Management Unit  
TA = technical area

**Supplement 4.1**

**Solid Waste Management Units at Technical Areas 4 and 52  
[Information Extracted from the 2006 “Solid Waste Management Unit and Area of  
Concern Report”,  
LA-UR-06-2183]**



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## ***TA-04, Alpha Site***

TA-04, called Alpha Site, was used as a firing site; use was discontinued in the late 1940s. The TA was decontaminated and decommissioned in 1985. The former site of TA-04 lies within the current boundaries of TA-63 and TA-52. The location of the SWMUs addressed in this section are within the current boundaries of TA-52.

The site of former TA-04 is located on a small finger mesa that extends eastward from the main Pajarito Mesa. The mesa is bounded on the north by Ten Site Canyon, which branches west from Mortandad Canyon, and on the south by Cañada del Buey.

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## Consolidated Unit 04-001-99 – Firing Site

<b>Technical Area</b>	TA-04	<b>Has ER Sampled the Site?</b>	Yes
<b>Dates of Operation</b>	1945-1946	<b>ER Remedial Action Conducted?</b>	No
<b>Former Operable Unit</b>	OU 1129	<b>Other Remedial Action Conducted?</b>	Yes
<b>Structure Number</b>	N/A	<b>Aggregate Area (reporting)</b>	Middle Mortandad/ Ten Site Canyon

### Unit Description

Consolidated unit 04-001-99 consists of SWMUs 04-001, 04-002, and 04-003(b), an inactive firing pit and its associated surface disposal site, and the drainline and outfall from a control building. Former TA-04, known as Alpha Site, lies within the current boundaries of TA-63 and TA-52. Alpha Site is located on Mesita del Buey, a small finger mesa that extends east from the main Pajarito Mesa. It is bounded on the north by Ten Site Canyon and on the south by Cañada del Buey. Alpha Site was established in 1944 as a test firing site for small charges. It was used for implosion studies using the "electric" method of detonation wave determination. Maximum charges fired were 200 lb. Other documented studies at Alpha Site included smaller tests of the "pin shot" and "magnetic" methods of studying implosions and "equation of state" experiments. The use of Alpha Site was discontinued in 1946, and the site underwent D&D in 1985 as part of the LASCPC.

SWMU 04-001 is a former 10-square-ft firing pit that was built in 1945. The pit contained conduit and firing lines. Debris in the vicinity of the firing pit included wire and shrapnel. The energy source for the firing experiments was HE, and shot sizes ranged from 0.5 to 200 lb of this material. The pit was cleaned of all debris, backfilled, and contoured in 1985 during the LASCPC cleanup effort. Wastes were disposed of at TA-54. The ground surface has been scraped clear of vegetation and topsoil. No radioactive or surface soil contamination was detected during the cleanup, which did not address nonradioactive contamination. LANL conducted a radiation survey at the site in 1988. At that time, beta-gamma activity was found to be above background. One surface-soil sample was collected at SWMU 04-001 in 1991. The sample was screened for HE residues and analyzed for TCLP metals, total beryllium, total uranium, and organic chemicals. Gross-alpha, -beta, and -gamma activity was at background level. All inorganic chemicals were below EPA guidelines. Total beryllium and uranium were determined to be at background levels. No HE or other organic chemicals were detected.

SWMU 04-002 is the 20-ft-wide canyon-side disposal site associated with 04-001. The site is located on the north-facing slope of Mortandad Canyon immediately north of SWMU 04-001. After a shot, residual material from the firing site was bulldozed over the edge of the canyon to the area designated as the surface disposal site. The shot debris consisted of cables, wires, and possibly small amounts of uranium, beryllium, lead, aluminum, and HE. The material was not covered, and this site was not addressed during the 1985 LASCPC.

SWMU 04-003(b) is the former drainline and outfall from a laboratory control building (Building 04-3), located at former TA-04. The outfall discharged about 20 ft north of Building 04-3 into Mortandad Canyon. No radioactivity was detected in a 1953 survey, and the building was demolished and partially removed in 1956. The concrete storm drain, electrical conduit, wood and other surface debris, and the drainpipe were removed during the 1985 LASCPC cleanup effort. During the LASCPC cleanup, a portable radiation monitor was used, and no radioactive contamination was detected. In a 1988 survey, gamma radiation was detected at nearly twice the background level. The site has not been investigated for nonradioactive contamination. Potential contaminants are not known.

### ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SSL/SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. Activities conducted at this site are described in detail in the documents listed in the reference section below.*

ER Project RFI activities were performed at these SWMUs in 1994 and 1995. Approximately 42 samples were collected and analyzed for radioactivity, gamma spectroscopy, alpha spectroscopy, inorganic chemicals, and HE. Engineering surveys of SWMUs 04-001, 04-002, and 04-003(b) were performed according to the SAP. The location of the former TA-04 firing pit, SWMU 04-001, was established using aerial photographs of the site. Two boreholes were drilled to 20 ft deep to collect discrete soil samples at 5-ft intervals. Four of the surface samples were relocated to possible shrapnel sites in the vicinity of the former firing pit to collect potentially contaminated soil. At SWMU 04-002, engineering surveys revealed a dozer trench leading from the site of the former firing pit to the edge of the mesa. A pile of debris is located at the edge of the mesa and has potentially migrated over the edge of the mesa. The SAP was amended to collect additional samples of potentially contaminated soil at SWMU 04-002. The outfall trench from former structure 04-3 at SWMU 04-003(b) was located near the former firing pit site during the engineering surveys. Sample locations were revised as a result of the engineering surveys. Because HE is a potential contaminant of concern at this consolidated unit, HE was added to the analytical suite for all samples. Forty-two samples were collected and submitted to an off-site analytical laboratory for analysis of organic chemicals, inorganic chemicals, and radionuclides. Three inorganic chemicals were detected above BVs. Eleven radionuclides were detected above BVs/FVs.

Following the Cerro Grande fire of 2000, LANL's Water Quality and Hydrology group, in conjunction with NMED and DOE, determined that this consolidated unit needed erosion control measures to be installed because the area had been affected by the fire. Straw wattles were installed above the site to divert run-on, at the mesa's edge within the north-facing drainage and on the lower bench for sediment retention. Spot hand raking, reseeding, and straw mulch also were applied. Within one year after the fire, the site was in good condition, with a vegetative cover of approximately 50%. The area was stable, with minimal evidence of sediment migration.

In 2004, the ER Project sampled this consolidated unit to address additional data needs identified following 1994 and 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

### ER Project Sampling Summary

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
HEs	—	N/A	—
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	✓
SVOCs	—	N/A	—
VOCs	✓	N/A	—

The following table provides the analytes that exceeded FY2004 SSL/SALs.

Analytical Suite	Analyte	FY2004 SSL/SAL (Residential)
Radionuclides	Uranium-234	63 pCi/g
	Uranium-238	86 pCi/g

### References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate	LA-UR Number: 04-1714
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume I of IV (TA-0 through TA-9)	LA-UR Number: 90-3400



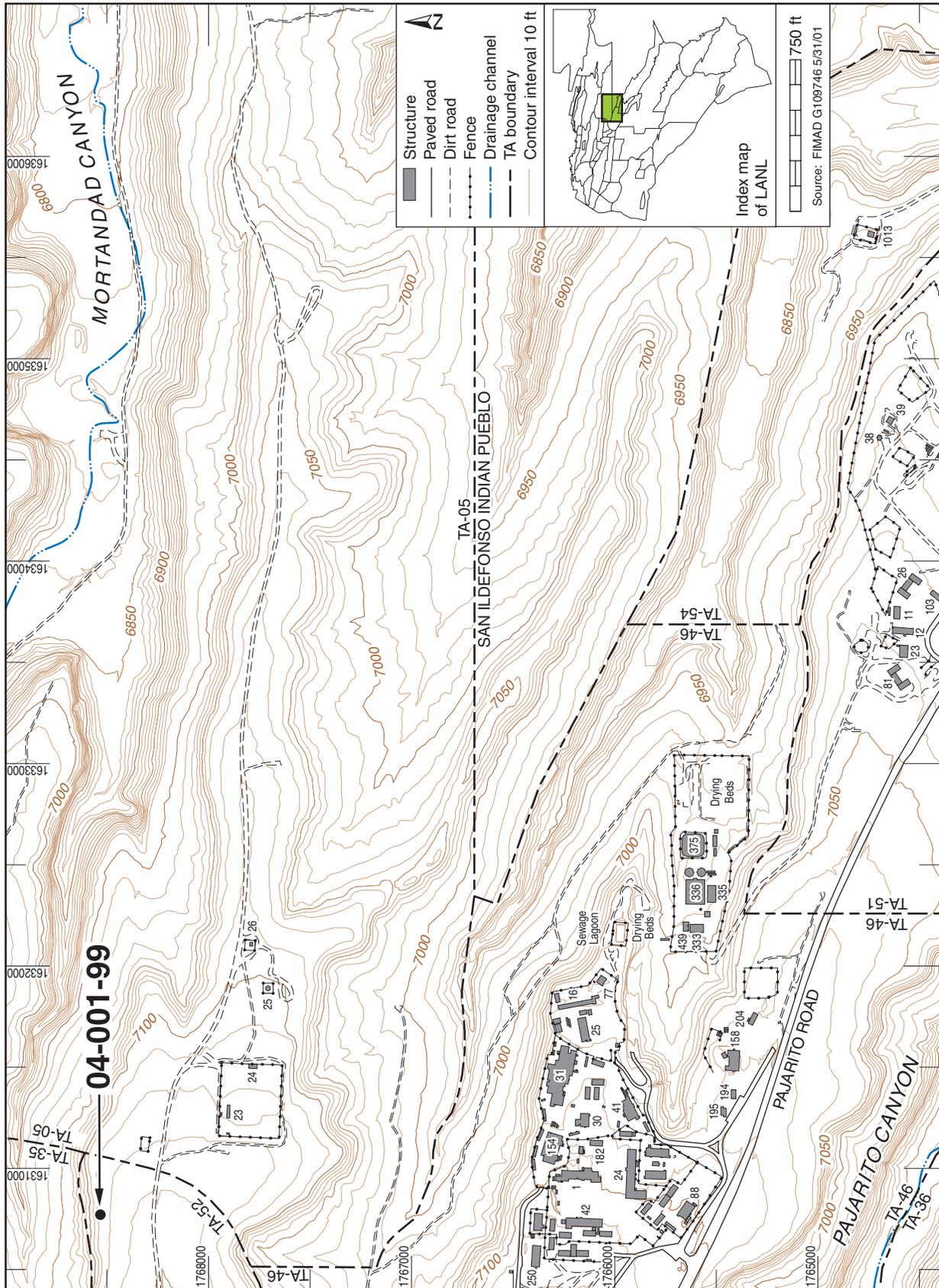
**After Cerro Grande fire [SWMU 04-003(b)]**



**View of SWMU 04-001**



**View of SWMU 04-002**



## **Consolidated Unit 04-003(a)-00 – Alpha Site Photo Processing Building, Drainlines, and Outfall**

<b>Technical Area</b>	TA-04	<b>Has ER Sampled the Site?</b>	Yes
<b>Dates of Operation</b>	1945-1946	<b>ER Remedial Action Conducted?</b>	No
<b>Former Operable Unit</b>	OU 1129	<b>Other Remedial Action Conducted?</b>	Yes
<b>Structure Number</b>	04-7	<b>Aggregate Area (reporting)</b>	Middle Mortandad/ Ten Site Canyon

### **Unit Description**

Consolidated unit 04-003(a)-00 consists of SWMU 04-003(a) and AOC 04-004. Former TA-04, known as Alpha Site, lies within the current boundaries of TA-63 and TA-52. Alpha Site is located on Mesita del Buey, a small finger mesa that extends east from the main Pajarito Mesa. It is bounded on the north by Ten Site Canyon and on the south by Cañada del Buey. Alpha Site was established in 1944 as a test firing site for small charges and was used as a firing site for implosion studies using the "electric" method of detonation wave determination. Maximum charges fired were 200 lb. Other documented studies at Alpha Site included smaller tests of the "pin shot" and "magnetic" methods of studying implosions and "equation of state" experiments. Alpha Site underwent D&D in 1985 as part of the LASCP.

SWMU 04-003(a) consists of the outfall from a photo processing laboratory (Building 04-7) and any associated drainlines that may still remain in place. The outfall discharged on the south side of the building to a trench that led to the head of Cañada del Buey. Portions of the probable path of the outfall have since been covered by two buildings (structures 52-114 and -115) and an asphalt parking lot. Beta activity was detected in the darkroom in 1953, and portions of the floor were removed in an attempt to remediate the contamination. The outfall was not removed when the building was dismantled in 1956, and it is not known if the drainlines remain or were removed. Potential contaminants at this SWMU are photo processing chemicals and uranium.

AOC 04-004 is the building footprint of a photo processing laboratory (Building 04-7), where film was reportedly developed from approximately 1948 to 1955. The structures have been removed but potential soil contamination may remain in the vicinity of the building footprint. Potential contaminants are photo processing chemicals and uranium.

### **ER Project Activities**

*Activities conducted at this site are described in detail in the documents listed in the reference section below.*

RFI activities were performed at SWMU 04-003(a) and AOC 04-004 in 1994 and 1995. Thirty-one soil samples were collected from 10 sample locations, 15 from AOC 04-004 and 16 from SWMU 04-003(a). Samples were submitted for radionuclide, inorganic and organic chemicals analyses. Twenty-nine additional surface and subsurface samples were collected in 1998 to fill in data gaps and to provide information on the potential for HE contamination. These samples were submitted for inorganic and organic chemical analysis and HE. Contaminants detected at concentrations above BV in the sampling set included arsenic, chromium, and lead. Approximately 10 organic chemicals were also detected. Of those chemicals detected, only arsenic, thallium, and benzo(a)pyrene were present at concentrations exceeding screening levels.

### **ER Project Sampling Summary**

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Note: The BV for arsenic is higher than its SSL. Therefore, arsenic may be above its SSL, but not necessarily above its BV.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
HEs	—	N/A	—
Inorganic chemicals	✓	✓	✓
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	—	N/A	—

The following table provides the analytes that exceeded FY2004 SSL/SALs.

Analytical Suite	Analyte	FY2004 SSL/SAL (Residential)
Inorganic chemicals	Arsenic	3.9 mg/kg
	Thallium	5.16 mg/kg

## References

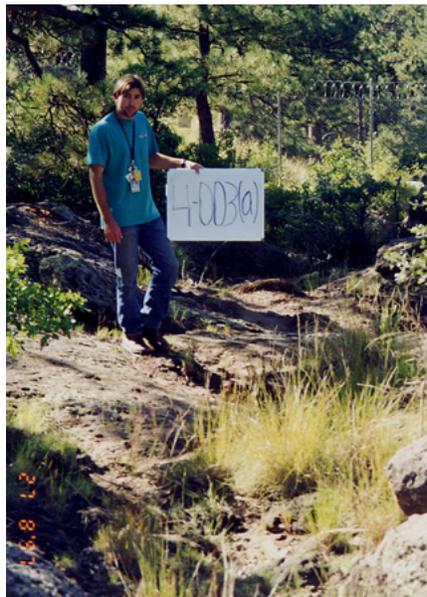
Addendum to RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

Solid Waste Management Units Report, Volume I of IV (TA-0 through TA-9) LA-UR Number: 90-3400



**View of AOC 04-004**



**View of SWMU 04-003(a)**



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## ***TA-52, Reactor Development Site***

TA-52 provides a wide variety of theoretical and computational research and development activities related to nuclear reactor performance and safety, as well as to several environment, safety, and health activities. The work carried out at this site involves both classified and unclassified activities. Classified work is conducted in an area protected by a security fence.

TA-52 suffered minor damage from the Cerro Grande fire. One trailer (structure 52-111) was destroyed, and two transportables (structures 52-35 and -36) required filter replacement.

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## **SWMU 52-001(d) – Former Facility Equipment**

<b>Technical Area</b>	TA-52	<b>Has ER Sampled the Site?</b>	No
<b>Dates of Operation</b>	1965-1970	<b>ER Remedial Action Conducted?</b>	No
<b>Former Operable Unit</b>	OU 1129	<b>Other Remedial Action Conducted?</b>	Yes
<b>Structure Number</b>	N/A	<b>Aggregate Area (reporting)</b>	Upper Cañada del Buey

### **Unit Description**

SWMU 52-001(d) is the historical site of contaminated equipment inside the reactor development building (Building 52-1) at TA-52. This equipment was associated with the UHTREX. The equipment included the sump pump room (Room 303), hot cells, and duct work. The sump pump probably received contaminated wastes. Hot cells were located in Rooms 104, 211, 212, and 213. UHTREX was intended for the advancement of high-temperature, gas-cooled reactor technology and research and development of new fuels. However, plans to operate UHTREX with uranium-thorium fuel elements and other fuels with high yield of fission products did not materialize. Instead, UHTREX was used for reactor experiments from 1965 to 1968. Criticality was attained in August 1967, and the reactor operated for only about one year. In 1970, the reactor was shut down and the fuel was removed. The contaminated equipment was removed in 1989 and the building was decontaminated. Building 52-1 currently houses the offices and laboratories of N-Division.

### **ER Project Activities**

*Activities conducted at this site are described in detail in the documents listed in the reference section below.*

This SWMU was recommended for NFA in the March 1995 permit modification request because it was remediated in accordance with applicable regulations, and available data indicate that contaminants pose no potential unacceptable level of risk under current and projected future land use. The recommendation was not accepted. Additional documentation will be provided to the NMED in support of the NFA recommendation.

### **ER Project Sampling Summary**

No analytical samples have been collected at this site.

### **References**

Request for Permit Modification, Units Proposed for NFA, March 1995	LA-UR Number: 95-0767
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume IV of IV (TA-51 through TA-74)	LA-UR Number: 90-3400



**View of SWMU 52-001(d)**



**View of SWMU 52-001(d)**



**View of SWMU 52-001(d)**



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## SWMU 52-002(a) – Septic System

<b>Technical Area</b>	TA-52	<b>Has ER Sampled the Site?</b>	Yes
<b>Dates of Operation</b>	1965-Present	<b>ER Remedial Action Conducted?</b>	No
<b>Former Operable Unit</b>	OU 1129	<b>Other Remedial Action Conducted?</b>	No
<b>Structure Number</b>	52-3, 52-4	<b>Aggregate Area (reporting)</b>	Middle Mortandad/ Ten Site Canyon

### Unit Description

SWMU 52-002(a) is the septic system that serves Building 52-1. Historically, Building 52-1 housed UHTREX. Currently, the building houses offices and laboratories. This septic system was installed in 1965 and consists of a 2580-gal. tank (structure 52-3) and its associated distribution box (structure 52-4). The system is located north of Building 52-1, approximately 30 ft north of Puye Road and 10 ft east of former Building 52-2 [former waste neutralization and pumping facility, SWMU 52-003(a)]. Overflow from the tank flowed to a 300-ft-long tile drainfield trench that turns west and then east near the edge of Ten Site Canyon. The tank was designed to receive only sanitary waste; however, hazardous constituents and/or radionuclides may historically have entered the system.

### ER Project Activities

*Activities conducted at this site are described in detail in the documents listed in the reference section below.*

Phase I RFI sampling was conducted at SWMU 52-002(a) in 1995. Twenty-six samples were collected from six locations to a depth of 20 feet bgs and submitted for organic chemical, inorganic chemical, and radionuclide analyses.

In 2004, the ER Project re-sampled this SWMU to address additional data needs identified following 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site aggregate will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

### ER Project Sampling Summary

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

<b>Analytical Suite Sampled</b>	<b>Analytical Suite Detected?</b>	<b>Analytical Suite &gt;FY2004 BV/FV (If Applicable)</b>	<b>Analytical Suite &gt;FY2004 SSL/SAL (Residential)</b>
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	✓	N/A	—

### References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate	LA-UR Number: 04-1714
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
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**No photo available**



## AOC 52-003(a) – Former Wastewater Treatment Facility

<b>Technical Area</b>	TA-52	<b>Has ER Sampled the Site?</b>	Yes
<b>Dates of Operation</b>	1965-1989	<b>ER Remedial Action Conducted?</b>	No
<b>Former Operable Unit</b>	OU 1129	<b>Other Remedial Action Conducted?</b>	Yes
<b>Structure Number</b>	52-2	<b>Aggregate Area (reporting)</b>	Middle Mortandad/ Ten Site Canyon

### Unit Description

AOC 52-003(a) is the site of TA-52's former waste neutralization and pumping facility (former Building 52-2) that was located about 200 ft north of the UHTREX facility on the north side of Puye Road. The waste neutralization and pumping facility was designed for caustic pretreatment of UHTREX liquid acid wastes, to neutralize them, before they were piped to TA-50. This treatment facility included five tanks: two 5000-gal. concrete waste holding tanks on the north side of the building (which were recessed into the ground at basement level); two tanks located in the basement (size and purpose unknown); and a mixing tank of less than 50-gal. capacity that was used to neutralize caustics. In addition, a 150-gal. tank on the building's ground-level floor stored sodium hydroxide. Building 52-2, including its associated tanks, was removed in 1989 during UHTREX D&D activities performed by HSE-7. Soils beneath the foundation were excavated to solid tuff, and the area was backfilled, graded, and revegetated. Confirmation soil samples were taken to demonstrate compliance with radiological standards. The samples were not analyzed for nonradiological contaminants.

### ER Project Activities

*Activities conducted at this site are described in detail in the documents listed in the reference section below.*

During the 1995 Phase I RFI at AOC 52-003(a), nine samples were collected from three locations, to a depth of approximately 20 ft in the backfill material and submitted for organic chemical, inorganic chemical, and radionuclide analyses.

In 2004, the ER Project re-sampled this AOC to address additional data needs identified following 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site aggregate will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

### ER Project Sampling Summary

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

<b>Analytical Suite Sampled</b>	<b>Analytical Suite Detected?</b>	<b>Analytical Suite &gt;FY2004 BV/FV (If Applicable)</b>	<b>Analytical Suite &gt;FY2004 SSL/SAL (Residential)</b>
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	✓	N/A	—

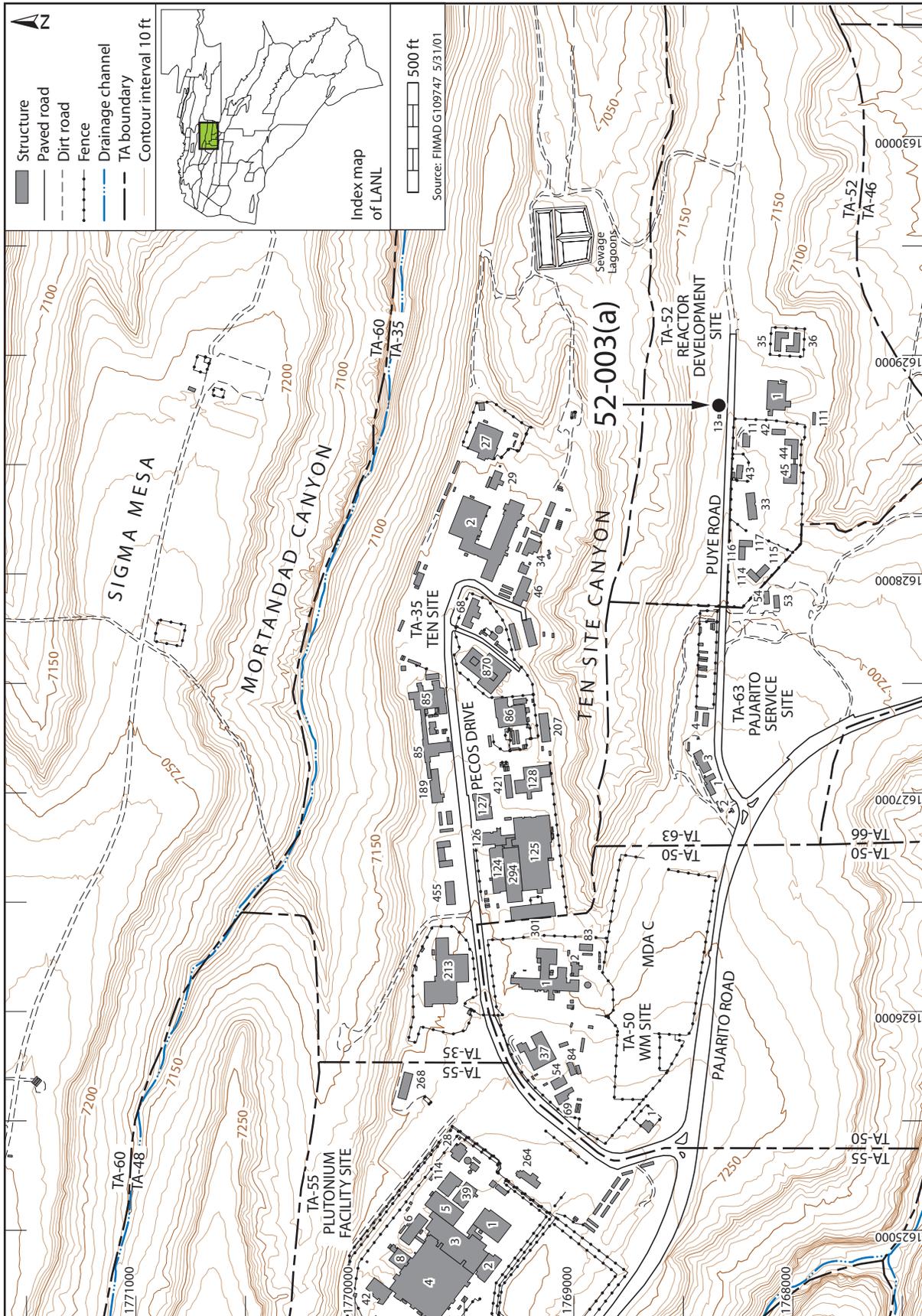
## References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate	LA-UR Number: 04-1714
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume IV of IV (TA-51 through TA-74)	LA-UR Number: 90-3400

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**Former location of Building 52-2 [AOC 52-003(a)]**



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## 6.0 REFERENCES

“Compliance Order on Consent” signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California and the New Mexico Attorney General, March 1, 2005.

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,” effective date May 19, 1994, U.S. Environmental Protection Agency, Region 6, Hazardous Waste Management Division, Dallas, Texas.

LANL, 2006 and all recent revisions, “Solid Waste Management Unit and Area of Concern Report,” LA-UR-06-2183, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2006 and all recent revisions, “Los Alamos National Laboratory General Part A Permit Application, Revision 5.0, April 2006,” LA-UR-06-2553, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003 and all recent revisions, “Los Alamos National Laboratory General Part B Permit Application, Revision 2.0, August 2003,” LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002b and all recent revisions, “Packing TRU Waste Containers,” NMT7-WI3-SOP-TA55-013, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002c and all recent revisions, “Managing Solid Low-Level Waste at TA-55,” NMT7-HCP-TA55-DP-02L, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1999 and all recent revisions, “Certification and Disposal of Low-Level, Oversize Waste,” NMT7-WI3-TA55-HCP-DP-02L, Los Alamos National Laboratory, Los Alamos, New Mexico.

