TA-55 Rec'd 8/16

Department of Energy
National Nuclear Security Administration
Albuquerque Operations Office
Office of Los Alamos Site Operations
Los Alamos, New Mexico 87544

AUG 15 2002

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Will
LANL Permits Project Leader
RCRA Permits Management Program
Hazardous & Radioactive Materials Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Dear Mr. Will:

Subject: Transmittal of the Department of Energy (DOE)/University of California (UC) Response to NMED's Notice of Deficiency, TA-55 Part B Permit Application, January 2002, Revision 1.0 Los Alamos National Laboratory, EPA ID # NM0890010515 HWB-LANL-99-051

The purpose of this letter is to transmit the DOE/UC response to the above referenced Notice of Deficiency (NOD) dated May 16, 2002. This document responds to each of the comments presented in the NOD with some exceptions. As explained in the general comments of the response, the NOD raises issues of attempted regulation of radionuclides through the permit process that are preempted by, and otherwise contrary to, Federal Law.

In subsequent review of the application, DOE/UC failed to make it clear that the waste vitrification unit to be located at TA-55-PF4, was in the developmental stages. The purpose of including it in the permit application was to allow DOE/UC to proceed with detailed design and procurement of the unit. There will be some modifications required during the construction phase. These modifications will be submitted for your review once the necessary changes become apparent. However, installation of the unit cannot proceed prior to the permit being finalized.

As explained in earlier meetings and in our response to this NOD, DOE/UC intend to close Container Storage Unit TA-55 B38. A closure plan is being developed and will be submitted to NMED in September of this year. Within the application, DOE/UC also requested that another location, TA-50 FLO-1, be permitted for storage. The operations in the room where FLO-1 was to be located have been reevaluated and it has been determined that a permitted site is no longer required. When DOE/UC revises the TA-55 permit application at the end of the RSI/NOD process, all references to both the TA-55 B38 and FLO-1 storage locations will be removed from the application.

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Please inform us if this submittal completes the RSI/NOD process and if the responses contained in the enclosed document are acceptable. When your notification is received, the revision for this part of the DOE/UC permit application will be revised to reflect the changes agreed upon in the response.

If you have questions concerning this matter, please feel free to contact either Gene Turner, DOE, at (505) 667-5794 or Jack Ellvinger, UC, at (505) 667-0633.

Sincerely,

Joseph C. Vozella
Associate Director for Facility Operations
Office of Los Alamos Site Operations

OFO:1GT-008

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Response to Notice of Deficiency; TA-55 Part B RCRA Permit Application January 2002, Revision 1.0, May 16, 2002

LA-UR-02-5041
August 2002

Prepared by:
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Response to Notice of Deficiency; TA-55 Part B RCRA Permit Application January 2002, Revision 1.0, May 16, 2002

INTRODUCTION

The following document provides the response by Los Alamos National Laboratory (LANL) to a Notice of Deficiency (NOD) sent by the New Mexico Environment Department (NMED) on May 16, 2002. The full title of the NOD is "Notice of Deficiency, TA-55 Part B RCRA Permit Application, January 2002, Revision 1.0, Los Alamos National Laboratory, EPA ID No. NM0890010515," officially received by the U.S. Department of Energy (DOE) Office of Los Alamos Site Operations on May 17, 2002. The NMED required that the comments provided in the NOD be resolved in order for the "Los Alamos National Laboratory Technical Area 55 Part B Permit Application," Revision 1.0 (LANL, 2002a), submitted to the NMED in January 2002, to be evaluated for technical adequacy. Hereinafter, the permit application document will be referred to as "the application".

This document responds to the 127 comments contained in the NOD and includes appendices with information to supplement the individual responses to the numbered comments. The original comments from NMED are included as italicized text for ease of review. A copy of the original NOD is also included as Attachment A.

LANL GENERAL COMMENTS

LANL General Comment #1: LANL has reviewed its waste management operations at technical area (TA) 55, and will revise its application to permit seven container storage units (CSUs), one storage tank system, one cementation unit, and one vitrification unit. The B38 CSU will be closed under interim status and has a closure plan currently in development. This closure plan will be delivered to the Hazardous Waste Bureau (HWB) this fall for review and approval. The proposed FLO1 CSU is no longer necessary for operations in Room 401 and will not be permitted. Please note that this CSU was never permitted for hazardous waste storage. LANL will revise the application to remove the applicable information associated with these CSUs.

LANL General Comment #2: LANL submitted a permit application to HWB for review, and will provide any additional information needed by the agency to complete its technical review of the permit application. LANL has determined it is not in its best interest to revise the permit application other than to clarify details or correct errors/ omissions in that document. For LANL to make any other changes would result in an application that is a hybrid of LANL and HWB positions. This would be confusing to the reader and limit LANL's rights and abilities to subsequently comment and appeal a given section of the draft permit. The LANL permit application describes and supports LANL's waste management activities at TA-55. In response to the application, LANL expects that the HWB will draft a permit that complies with regulatory requirements and reflects its position on waste management practices. Keeping this in mind, LANL agrees to revise the TA-55 Permit Application to include all of the changes agreed upon in this and any subsequent RSI/NOD letters provided by the HWB. This revision will be conducted upon completion and mutual resolution of the RSI/NOD process with the HWB.

LANL General Comment #3: LANL will follow all applicable DOE and Nuclear Regulatory

Commission (NRC) procedures, requirements, and guidelines as they apply to the storage, treatment, and decontamination of radioactive constituents at the TA-55 waste management units. The DOE and NRC regulations are not preempted by the 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. The Permit Application will not be revised to include the DOE and NRC procedures, requirements, and guidelines, nor will it be revised to include details regarding the handling and/or radionuclide content of the waste streams stored and treated at the TA-55 units.

LANL General Comment #4: Facility specific procedures for waste management at TA-55 and LANL are intended to meet the operational requirements of the facility and are subject to frequent changes to update management structure, non-hazardous waste operations, and/or developing missions. It is inappropriate for these procedures to be included in the application and subsequently the permit due to their dynamic nature, which could require a permit modification each time they are updated. The procedures cited in the application and this NOD Response are written to meet facility and applicable regulatory requirements.

LANL General Comment #5: LANL is seeking to permit the vitrification unit prior to its construction at TA-55-4 and is aware that additional information may be required before commencing waste operations. The application provides the information available at the time it was issued and was intended as a placeholder pending submittal and approval of a permit modification at a later date. The "Final Design Report for DP Surety Vitrification System," (INEEL, 2001) is provided as Attachment B of this NOD Response and provides more detailed information on the unit. This information is subject to changes as the unit is constructed.

NOD COMMENTS AND RESPONSES

General Comments

1. *The Application lacks sufficient detail, especially in regard to the container storage units (CSU's). The Application does not provide detail as to how specifically the CSUs and the other waste storage and treatment activities and equipment will meet regulatory requirements. Revise the Application to include details on how the hazardous waste management units and the hazardous waste management activities will comply with requirements of the regulations.*

   LANL Response: The U.S. Environmental Protection Agency (EPA) has proposed a "Standardized Permit" for CSUs because they are routine and repetitive. The EPA suggests that, in lieu of an application, a letter of intent to operate a hazardous waste CSU be submitted to the regulatory agency. All other required documentation would be maintained on site. The existing regulations provide goals such as the closure performance standard. If that standard is met, then the closure is complete. LANL is concerned that the amount of detail being requested through the NOD process will result in an overly prescriptive permit that is difficult to implement. A more complex permit will require frequent and costly modifications to keep current, burdening both NMED and LANL without commensurate benefit. Please refer to LANL General Comment No. 2 for a discussion regarding the revision of the application.

2. *The Application does not specifically and consistently identify hazardous waste management units which are requested to be permitted. The Application refers variously to eight and nine CSU's. Page I-I states that there are nine CSU's; Page 2-1, paragraph 1, states that there are eight CSU's; Section 2.1 states there are nine CSU's; and page 2-1, Sections 2.1 and 2.1.1 list eight CSU's. Page 4-4, Section 4.1.2.3, identifies TA-55-4, Room 401, that "may be used to store hazardous waste," and is not identified elsewhere in the Application text. Figure G-1, "Basement Container Storage Units," includes Room B38, which is not identified elsewhere as a CSU to be permitted. Page 4-4, Section 4.1.2.3, states that B38 is an inactive CSU "that is scheduled for closure under interim status," though no schedule for closure is provided and B38 is not included in the TA-55 Closure Plan. The number of tanks in the storage tank system is not identified. NMED requests that Permittees review for internal consistency and accuracy all documents submitted to NMED. Revise the Application to include a list and description with identifiable locations of all hazardous waste management units included in the Application.*

   LANL Response: The application identifies the waste management units to be permitted in Section 2.0, Attachment G, Attachment H, Attachment I, and Attachment J. For additional clarification:

   There are a total of seven CSUs to be permitted at TA-55. The other two CSUs mentioned in the application consists of a proposed CSU (FLO-1) that will not be permitted and a CSU (B38) that will be closed under interim status (see LANL General Comment No. 1). Table 1 identifies each of the CSUs to be permitted including its location and capacity.

Table 1
Container Storage Units at TA-55

Unit Name	Location	Capacity [a] (gallons)
B40	TA-55-4, Basement	21,500
B05	TA-55-4, Basement	3,600
K13	TA-55-4, Basement	3,400
B45	TA-55-4, Basement	11,000
Vault	TA-55-4, Basement	4,000
Storage Pad	Northwest of TA-55-4	135,000
TA-55-185	West of TA-55-4	30,000

a This has been revised since the application to reflect the calculation of maximum capacities with a minimum aisle space of 2 feet. Please refer to the response to Comment No. 4b.

There is one storage tank system at TA-55. This tank system is composed of 4 tank components and consists of a total of 18 tanks with a maximum storage capacity of 1,200 liters or approximately 336 gallons. Table 2 identifies each tank component, its location, the number of tanks, and capacity of each tank.

Table 2
Storage Tank System at TA-55 [a]

Tank Component	Location	Number of Tanks	Tank Capacity (liters) [b]	Tank Capacity (gallons) [b]
Evaporator Glovebox Tank	TA-55-4, Room 401	1	270	71
Cementation Unit Pencil Tanks	TA-55-4, Room 401	5	50	13
Pencil Tanks	TA-55-4, Room 401	10	50	13
Vitrification Unit Slab Tanks	TA-55-4, Room 434B	2	125	33

a The storage tank system consists of 4 components that store the same waste matrix and share a common piping network. The overall capacity of the unit is 1,200 liters [~336 gallons].
b The tank capacity listed is for each individual tank associated with the component.

There are two Subpart X treatment units at TA-55. Table 3 identifies each unit, its location, and capacity.

Table 3
Subpart X Treatment Units at TA-55

Treatment Unit	Location	Capacity (liters)	Capacity (gallons)
Cementation Unit	TA-55-4, Room 401	568	150
Vitrification Unit	TA-55-4, Room 434B	50 liters/hour	13.2 gallons/hour

The unit identified in Section 4.1.2.3 that "may be used to store hazardous waste" in TA-55-4, Room 401 is FLO1, which will no longer be permitted as discussed in LANL General Comment No. 1.

The CSU at B38 is undergoing closure under interim status this fall. It is not included in the closure plan because it has a separate unit-specific closure plan containing specific information applicable to the CSU including data from the operating record. This closure plan will be submitted to NMED for approval upon completion.

LANL will revise the application to clarify the number and capacity of all the waste management units at TA-55.

3. *The Application does not address the radiological components of the wastes. Radiological characterization is required for storage, treatment, transportation and packaging of treated waste, disposal, decontamination, and verification for closure. The Application should address these issues or provide adequate references to documents that do address the radiological components of the waste.*

   LANL Response: Please refer to LANL General Comment No. 3.

4. *Attachments B.1 and B.2, the waste analysis plans for the cementation unit and vitrification unit, respectively, only provide information related to the waste analysis plan for the hazardous waste component of the mixed wastes and not the radiological component.*

   LANL Response: Please refer to LANL General Comment No. 3.

5. *In the event that there is leak or spill from one of the storage tanks (e.g., storage tank system, cementation unit tank component and/or vitrification unit tank component), the tank must be removed from service until the requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.196) have been met. If major repairs are warranted, the tank system cannot be returned to service until certification by an independent, qualified, registered, professional engineer has been obtained demonstrating that the repaired system is capable of handling hazardous wastes without a release for the intended life of the system. This certification must be submitted to NMED within seven days after returning the tank system to use. Revise the Application to discuss repair issues for each of the tank systems and include a discussion of the certification of major repairs.*

   LANL Response: LANL addressed the requirements of 20.4.1 NMAC, Subpart V, 264, 196 [6-14-00] in Attachment H, Section H.3 of the application. The final paragraph reads as follows:

   > "If it is determined that there has been a leak or spill from any of the storage tank components into the secondary containment, the affected component or portion thereof will be removed from service immediately and the requirements of 20.4.1 NMAC, Subpart V, 264, 196 [6-14-00], will be initiated."

   In the event of a leak or spill from one of the tank components associated with the storage tank systems (e.g., cementation pencil tanks) the tank must be removed from service until the requirements of 20.4.1 NMAC, Subpart V, 264.196 have been met. If a major repair were needed to a storage tank system component, the component would likely be replaced not repaired. In either case, an independent certification will be needed prior to returning the tank component to service.

6. *The Application references the definition for a solid waste management unit (SWMU) in Section 4.0. However, hazardous waste management units and regulated units are not*

addressed. Closure of hazardous waste management units must be addressed in the Application, not under general LANL corrective action, and compliance must be demonstrated with all requirements under 40 C.F.R Part 264, Subpart G.

LANL Response: All of the hazardous waste management and regulated units (as applicable) located at TA-55 are addressed in Section 4.1.2 of the application. These units are, by definition, solid waste management units (SWMUs) as provided in Module VIII of the LANL Hazardous Waste Facility permit, which states that a SWMU is

> "any discernable unit at which solid wastes have been placed at any time..."

The SWMUs at TA-55 that are active hazardous waste management units are not included in Module VIII of the permit and are not subject to corrective action requirements. Section 4.1.2 of the application states that these units

> ".....are active hazardous/mixed waste management units operating under interim status standards and will be closed in accordance with a RCRA closure plan."

Closure for these active units is addressed in Attachments F.1, F.2, F.3, and F.4 of the application.

Specific Comments

Comment No. 1, Section 1.0 - Introduction

1. *Section 1.0, Table 1-1*

Delete or indicate as NA references to "post-closure plans," "post-closure," "post-closure care," "Post-closure notices," and "Post-closure cost estimate. " Treatment, storage, and miscellaneous units at TA-55 must be closed by removal or decontamination of hazardous waste and hazardous waste residues, and post-closure care with waste left in place is not an option at those units.

LANL Response: Table 1-1 was generated from the Review Checklist for Part B General Requirements found in the "HRMB Standard Operating Procedures Manual" (HRMB, 1998). These items are listed in Table 1-1 to ensure compatibility with the checklist. Post closure plans, post closure, post closure care, post closure notices, and post closure cost estimate may not be an available option at these units, but they are an option for surrounding soils and adjacent SWMUs. Because they are an option for these areas they are addressed in Attachments F.1, F.2, F.3, and F.4 as indicated in the table.

Delete or indicate as NA references to "Closure cost estimate, "Post-closure cost estimate," "Liability insurance, " and "Proof of financial coverage. " Permittees as state and federal governments are exempt from those requirements under 20.4.1.500 (incorporating 40 C.F.R § 264.140(c)).

LANL Response: Table 1-1 was generated from the Review Checklist for Part B General Requirements found in the "HRMB Standard Operating Procedures Manual" (HRMB, 1998). These items are listed in Table 1 to ensure compatibility with the checklist. LANL agrees that, as a DOE facility, it is exempt from the closure cost estimate, post-closure cost estimate, liability insurance, and proof of financial coverage requirements of 20.4.1 NMAC, Subpart V, 264.140 (c). However, these items are addressed in Attachments F.1, F.2, F.3, and F.4 as indicated in the table.

Comment Nos. 2 - 26, Section 2.0 – Waste Management Units

2. *Section 2.1. Container Storage (40 C.F.R. §§ 270.15 and 264.170 through 264.178)*

The Application refers to eight and nine CSU's. Revise the Application to accurately describe the hazardous waste management units for which a permit is being requested.

LANL Response: Please refer to the response to General Comment No. 2.

3. *Section 2.1.2. Storage Containers (40 C.F .R. § 264.172)*

a) *The Application must discuss each type of waste container that will be used to store each type of waste at each CSU. Revise the Application to strike vague descriptors such as the words "may be," "may have," and "not limited to" and revise the Application to include all types of waste containers that will be used to store waste at all CSU's.*

LANL Response: LANL conducts basic research in a variety of disciplines for a number of government agencies, including the DOE, the U.S. Department of Defense, and the National Aeronautics and Space Administration. In addition, the University of California (UC) (the operator of the laboratory) receives a fee from the DOE under its contract to perform Locally-Directed Research and Development. This allows UC to conduct basic research in areas of its own direction. There are a number of mature programs at LANL where specific containers can be identified for future use. However, the broad range of research that could be conducted during the term of the renewed permit makes it difficult to identify all of the containers that might ever be used at TA-55.

As discussed with the HWB on May 23, 2002, LANL will not limit the flexibility of its CSUs by specifying the type of containers to be stored in them. In addition, LANL requires the flexibility to place waste types in various sized containers to maximize packaging and storage efficiency at its CSUs. For this reason and as agreed upon at the May 23, 2002 discussion, specific information regarding the type of waste placed in each type of container beyond the hazardous and/or mixed waste classifications is not provided.

LANL will remove "may be," "may have," and "not limited to" and revise the application to include the following basic container sizes:

- 0.25, 0.5, 0.75, 1, 2, and 4, 6 Liter Containers
- 5, 10, 12, and 15 Gallon Containers
- 30, 55, and 85 Gallon Steel Drums
- Special Order Waste Boxes
- Large Waste Boxes
- Standard Waste Boxes (SWB)

Additional information regarding typical storage containers utilized at TA-55 is also provided as Tables C-1 and C-2, in Attachment C of this NOD Response. Please note that these tables do not contain information on all of the possible containers to be used and that the containers are identified by size without limiting the materials of construction.

b) *Several types of containers are mentioned in the Application including "various small containers." These various small containers are not described in Section 2.1.2 or anywhere else in the Application. Revise the Application to include a detailed description of all containers to be permitted for use for storage of any hazardous waste.*

LANL Response: The "various small containers" to be used for waste storage at the TA-55 CSUs include 0.25, 0.5, 0.75, 1, 2, and 4, 6 Liter containers. Please refer to the response to Comment No. 3a for additional discussion.

c) *For each type of container listed, the maximum number of each type of container allowed at each CSU must be provided. In addition, the type of waste placed in each container should also be provided. Revise the Application to include this information.*

LANL Response: Please refer to the response to Comment No. 3a.

4. *Section 2.1.3, Minimum Aisle Space and Storage Configuration (40 C.F.R. § 264.35)*

a) *The requirements for aisle space as outlined in 20.4.1.500 NMAC (incorporating 40 C.F .R § 264.35) state that aisle space must be maintained that will allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility in an emergency. The Application indicates that, for all storage locations, a minimum aisle space of two feet will be used. It is questionable whether an aisle space of two feet will be adequate to meet the above stated requirements. Standard industry practice is to use an aisle space of three feet. Either provide adequate justification for the use of an aisle space of two feet in all storage locations within TA-55 or revise the Application to specify a minimum of three feet of aisle space.*

LANL Response: LANL has reviewed the hazardous waste regulatory requirements for aisle space and has not found a specified width for CSUs. The regulatory requirement in 20.4.1 NMAC, Subpart V, 264.35 states:

> "The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the Regional Administrator that aisle space is not needed for any of these purposes."

LANL can justify a two-foot minimum aisle space, as follows:

- Waste storage operations at the active TA-55 CSUs currently utilize a minimum two-foot aisle space. This includes the use of

this aisle space for routine hazardous waste inspections, which have been unhindered, successfully completed, and documented.

- The current LANL Hazardous Waste Facility Permit provides a precedent for the two-foot aisle space at TA-54 as an established permit condition.

- The aisle spacing in between rows of drums at the CSUs is considered a "means of egress." As stated in OSHA (29 CFR § 1910.37(c)(2)) "a means of egress shall be measured in units of exit width of 22 inches." Because the aisle spacing at each of the CSUs is a minimum of two feet, this OSHA requirement is met.

- Four of the seven CSUs (Storage Pad, B40, K13, and the Vault) discussed in the application will be used to store liquid and/or potentially liquid hazardous/mixed wastes. Since these CSUs have the potential for a spill, the necessary spill control equipment is available and will be hand carried between the rows of drums. This hand carried spill equipment easily fits within the two-foot aisle space.

- Combustible materials at the CSUs are kept at a minimum and the majority of waste storage is conducted in steel containers (e.g., drums, SWBs). Fire protection at the TA-55 CSUs is provided either by a room sprinkler system or by fire extinguishers that can be hand carried within two-foot aisle spaces. The routine procedure in the event of a fire is for an individual to evaluate the situation and, if the situation will not put the individual at risk, use the fire extinguisher if he/she is trained to operate the extinguisher. The individual's main responsibility is to pull the fire alarm, safely exit the structure, and await the arrival of the emergency response team and the fire department; the activities by the response crews would not likely involve fighting the fire at close proximity.

b) *A container layout figure for each of the CSU's within TA-55 must be provided. The figure must contain a layout of the storage location, location of each type of storage container, location of aisles, and containment systems. Revise the Application to include container layout figures for each of the CSU's.*

LANL Response: A container layout figure for each of the TA-55 CSUs is provided in Attachment D of this NOD Response. These figures represent one possible storage configuration and provide the dimensions and location of potential aisle space at each CSU. Please note that the figures in Attachment D are provided for informational purposes only and that the actual configuration and number of containers may vary up to the maximum capacity indicated on the figure. Please refer to the response to Comment No. 3a for additional discussion regarding container sizes and types.

c) *Six CSU's are requested to be permitted in the April 1998 General Part A Application. There are eight or nine proposed CSU's in the TA-55 Permit Application. The numbering scheme for the container storage, vitrification, and cementation units must provide a cross reference to the numbering scheme found in the General Part A Application. Additionally, the capacities found in the General Part A are inconsistent with the TA-55 Permit Application. For example, the Building 185 CSU has a maximum storage capacity of 55,000 gallons in the TA-55 Application and a maximum storage capacity of 27,500 gallons in the General Part A Application. Revise the Applications to be accurate and consistent with one another.*

LANL Response: Table 4 provides a summary of the differences between the "Los Alamos National Laboratory General Part A Permit Application" (LANL, 1998a), hereinafter referred to as the General Part A, and the application:

Table 4
General Part A and TA-55 Part B Permit Applications Crosswalk for Container Storage Unit Identifications and Capacities

1998 General Part A Application [a]		2002 TA-55 Part B Application [b]		Status
Unit ID	Capacity (gallons)	Unit ID	Capacity (gallons)	
Area 1	27,500 [c]	B40	21,500	Active CSU
Area 2		B38	3.000	To be closed
Area 3		B05	3,000	Active CSU
Area 4	3,400	K13	3,400	Active CSU
Area 5	3,400	B45	3,400	Active CSU
Area 6	4,000	Vault	4,000	Active CSU
Storage Pad	135,000	Storage Pad	135,000	Active CSU
TA-55-185	27,500	TA-55-185	55,000 [d]	Proposed CSU

a LANL, 1998, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.
b LANL, 2002, "Los Alamos National Laboratory TA-55 Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.
c Total combined capacity for all three areas.
d Previous capacity was based on use of only half the building for storage. The waste management needs of the facility have changed such that the entire building will now be used.

The application represents the most up to date information for the CSUs at TA-55 and supercedes the General Part A. LANL is in the process of revising the LANL General Part A to match the numbering scheme and capacities identified in the application as revised due to the RSI/NOD process. This revised General Part A application will be delivered to the HWB in August of this year.

Please refer to the response to General Comment 2 for the revised capacity, which was updated to reflect minimum aisle space requirements.

d) *The Application states that large containers may be stacked to a maximum of two "high unless size and weight restrictions prohibit it for safety reasons. Revise the Application to include a discussion of specific criteria and methods that will be used to determine the maximum stacking height for each type of container.*

LANL Response: LANL will revise the application to clarify that containers will be stacked to a maximum of two high unless they are to large or heavy to be supported by the container(s) to be located underneath and/or maneuvered with the available forklift/crane/hoist. Containers will be arranged in rows and stacked to a maximum of 10 feet high, based on the requirements in 49 CFR 178.606 (c), "Performance-Oriented Stack Test."

5. *Section 2.1.5, Condition of Containers (40 C.F.R. § 264.171)*

a) *The Application states that any waste container not in good condition will be overpacked or the waste will be repackaged in a container in good condition. The materials of the overpack container must be compatible with both the waste and the other container. In addition, the overpack container and/or new container must be compatible and resistant to environmental conditions (e.g., corrosion). Revise the Application to include a discussion of this information.*

LANL Response: LANL will revise Section 2.1.5 as follows:

"Containers must be without severe rust, dents, deep scratches, bulges, or other structural defects. Any waste container that is not in good condition (e.g., severe rusting, apparent structural defects) is overpacked or the waste is repackaged in a container that is in good condition and is compatible with the waste, packaging material, and/or other container. Overpack and/or new containers must also be compatible with and resistant to environmental conditions. This meets the requirements of 20.4.1 NMAC, Subpart V, 264.171 [6-14-00]. "

b) *Containers must be shown to be free of surface contamination. Revise the Application to discuss how containers will be examined or surveyed to determine if the outside surfaces are free of contamination.*

LANL Response: LANL will add the following paragraph to Section 2.1.7 as follows:

"All containers are regularly inspected for evidence (e.g., corrosion, visible staining, bulges, rupture, dents, leaks) that may indicate surface contamination. If any evidence of surface contamination is detected, the waste container is either overpacked in an appropriate container or the waste is repackaged in a new container as discussed in Section 2.1.5."

c) *Container liners are not discussed, although it is mentioned in Section 2.1.2 that some drums may have liners. These liners are typically procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. Also, a quality control program is established to ensure liners meet the specifications. Revise the Application to discuss liners for all containers, requirements (including waste and container compatibility) and quality control procedures to ensure compliance with the requirements.*

LANL Response: LANL will revise Section 2.1.5 to include the following paragraphs:

> "TA-55 uses the LANL procurement system, administered by the Business Operations (BUS) Division, for procurement of waste container components. Suppliers of waste container components are audited by BUS for qualification prior to conducting business transactions. BUS also uses approved procurement product specifications that include quality assurance and ensure that the container package meets U.S. Department of Transportation (DOT) (49 CFR 173.410) requirements for Type A/7A packages.
>
> Containers procured by BUS include liners if required for the container to pass the manufacturer's tests for A/7A compliance. When liners are procured individually, a representative sample of the purchased liners is inspected for compliance with appropriate specifications using an approved inspection procedure. It is the generator's responsibility to ensure the container and pedigree is inspected for compliance with the specification provided to the supplier. Containers that do not pass inspection are segregated from those that are acceptable to prevent inadvertent use.
>
> Prior to filling the container with waste, all container components (e.g., lid, liner, and interior/exterior surface) are inspected by the waste generator to ensure container integrity as well as compatibility with the type of waste to be placed into the container. The "Los Alamos National Laboratory Waste Acceptance Criteria," hereinafter referred to as the LANL waste acceptance criteria (WAC) (LANL, 2002b) requires waste generators to ensure the compatibility of the waste container, including liners, with the waste to be containerized. Information regarding the liner's compatibility with the waste components can be obtained from the container/liner manufacturer."

6. *Section 2.1.6, Compatibility of Waste with Containers (40 C.F.R. § 264.172)*

a) *The Application states that only containers made of, or lined with, materials that will not react with wastes stored in them will be used. Revise the Application to provide a discussion of the documentation of waste compatibility for each of the containers and liners to be used. In addition, discuss what types of waste will be used in each type of container.*

LANL Response: The TA-55 CSUs are used to consolidate mixed waste generated at the Plutonium Facility. Transuranic mixed wastes are packaged in chemically compatible waste containers and prior to being shipped to TA-54 are placed in a container that is in compliance with the DOT requirements for containers. Low-level mixed wastes are packaged in chemical compatibility waste containers. Prior to shipping to the centralized treatment, storage, and disposal facility at TA-54, these low-level mixed waste containers are repackaged in compliance with the DOT requirements for containers.

DOT packaging requirements are based on the Packing Group of the material, its vapor pressure, and the chemical compatibility between the package and the hazardous material. In addition, for non-bulk containers, DOT requires performance-oriented testing. The required performance tests include the drop test, the leak-proofness test, the hydrostatic pressure test, the stacking test, the cooperage test for bung-type wooden barrels, and vibration standard. Bulk containers are divided into specification containers and intermediate containers. For specification bulk containers, DOT has developed detailed specification that covers the design, fabrication, and certification of these containers. For intermediate bulk containers, DOT has established performance testing that these containers must pass. In addition to the performance tests required for non-bulk packaging, intermediate bulk containers must also pass the bottom and top lift test, the topple test, the righting test, and the tear test. To verify that each bulk and non-bulk package has been manufactured to meet the requirements established by DOT, each authorized container must be specifically marked in accordance with DOT requirements. Manufactures who apply this marking must register with and are periodically inspected by the DOT. DOT regulations allow the user to accept these markings in determining the packaging compliance. In addition to the design qualification testing performed by the manufacturer, DOT also requires periodic re-testing.

For each hazardous material there is one and only one proper shipping name. DOT regulations provide specific guidance in determining this proper shipping name. Based on this proper shipping name, the Hazardous Materials Table identifies the Packing Group for this material as indicated in Table 5. The Packing Group is designed to indicate the degree of danger presented by the material.

Table 5
Identification of Packing Group

Packing Group	Degree of Danger
I	Great
II	Medium
III	Minor

For each proper shipping name, the Hazardous Materials Table also identifies the specific non-bulk and bulk containers authorized for the packaging of that material. The authorized containers are identified by reference to the specific numerical section in 49 CFR Part 173 that is applicable to that hazardous material. The authorized containers are identified by either their DOT specification or the United Nations (UN) standard. In addition to specifying the specific non-bulk or bulk containers that must be used, the numerical section also identifies any additional packaging requirement that must also be met, if applicable.

The container standards developed by DOT are designed to protect the health and safety of the workers, the public, and the environment from the hazards associated with the transport of hazardous materials. In conducting their evaluation, DOT examined all operations and conditions associated with and involved in the movement of hazardous materials; these include the design, fabrication, and maintenance of packaging, and the preparation, consigning, handling, carriage, storage, and receipt of packaged hazardous waste. A number of the performance tests are directly related to storage, such as the stacking test. In this test, the package is subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages that may be stacked on it during storage or transport. The minimum stack height is 10 feet for a maximum duration of 28 days. The stacking test for DOT Type 7A-specification packaging for the shipment of radioactive material is more stringent. These packages must be able to withstand the compressive load equivalent to five times the mass of the actual package or 1.9 pounds per square inch multiplied by the vertically projected area of the package, whichever is greater.

Some containers will be used for storage of waste prior to placement of the container in an approved DOT shipping container. These non-DOT approved storage containers will receive the same scrutiny when selecting the container as would be used for selecting a DOT shipping container. This selection ensures that there are no waste/container incompatibility problems.

Please refer to the response to Comment No. 5c for additional discussion.

7. *Section 2.1.7 Management of Containers*

a) *The Application states that waste containers will be opened when waste is added or removed or if the container's contents require repackaging. The Application does not discuss whether containers will be opened within a work enclosure that provides confinement, preventing any release of waste constituents. A detailed description of the waste enclosure, including any special ventilation systems, waste containment systems, and special handling requirements should be provided in the Application. Revise the Application to outline specific waste handling requirements for opening waste containers and the work enclosure area for handling each type of waste container and waste type.*

LANL Response: LANL will revise Section 2.1.7.1 to include the following paragraphs:

"Waste repackaging at TA-55 involves the addition of waste received from the waste generators into a partially filled secondary container or movement of waste from one secondary container to another. If the primary container requires overpacking due to container failure, it will be overpacked into a container that will become the primary container. Waste repackaging will occur at the K13 and the B40 CSUs except for overpacking, which will occur at any TA-55 CSU.

K13 and B40 are also used to packaged waste received from the waste generators. Waste received into K13 consists of small waste items that are eventually packed into secondary containers to maximize storage and shipping efficiency. B40 receives large waste items that need to be packaged into an SWB or ST45/ST90 shipping container. The following procedures are used to package and repackage waste:

- "Packing TRU Waste Containers," NMT7-WI3-SOP-TA55-013 (LANL, 2002c).
- "Managing Solid Low-Level Waste at TA-55," NMT7-HCP-TA55-DP-02L (LANL, 2002d).
- "Certification and Disposal of Low-level," NMT7-SOP-TA55-DP-01L (LANL, 2002e).
- "Certification and Disposal of Low-Level, Oversize Waste," NMT7-WI3-TA55-HCP-DP-02L (LANL, 1999a).

The TA-55-4 basement floors and walls provide secondary containment for the K13 and B40 CSUs. Each CSU is provided with ventilation from the TA-55-4 facility ventilation system. This ventilation system is designed to monitor air pressure and ambient air for personnel working in areas where hazardous or mixed waste is managed. It 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.

b) *In addition to containers being closed, 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.1086(c)(ii)) also requires that the cover and closure devices form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position, there are no visible holes, gaps or other open spaces into the interior of the container. Revise the Application to clarify that in addition to containers being closed, the closing devices will be secured in a manner that there are no visible holes, gaps, or other open spaces into the interior of the container.*

LANL Response: LANL will revise the first paragraph of Section 2.1.7 to state the following:

"Waste containers stored at the TA-55 CSUs are handled in a manner that will not cause them to rupture or leak, as required in 20.4.1 NMAC, Subpart V, 264.173(b) [6-14-00]. All containers are kept closed during storage in accordance with 20.4.1 NMAC, Subpart V, 264.173(a), except when waste is added to or removed from the container or when a container's contents need to be repackaged. 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, Subpart V, 264.1086(c)(1)(ii). 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. These inspections will be conducted in accordance with "Storage Area Inspections" NMT7-WI1-HCP-TA-55-011 (LANL, 2001).

8. *Section 2.1.7.2, Labeling, Recording and Sampling System*

a) *The Application indicates that, where necessary, a "Radioactive Material/Radioactive Waste" label will be attached to waste containers, Revise the Application to include the specific criteria that is used to determine whether containers require radioactive labeling. Include whether the radioactive criteria applies to levels of activity of the waste inside the container and if it applies to external radiological container activity readings.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *Revise the Application to include a copy or example of the Waste Profile Form (WPF) that will accompany all wastes.*

LANL Response: An example of the waste profile form (WPF) is

provided as Attachment E to this NOD response. The WPF is provided for information purposed only.

9. *Section 2.1.8. Containment Systems (40 C.F.R §§ 270.15(a-b) and 264.175(a-b))*

a) *The Application states that LANL databases may be used initially to verify the absence or presence of free liquids in containers. The Application must provide the methodologies that will be used in addition to acceptable knowledge (AK) to determine the presence and amount of or absence of free liquids. Revise the Application to include these methodologies.*

LANL Response: The word "may" was used to indicate the possible use of the LANL databases as a source of AK information to determine the presence or absence of free liquids in waste containers. In addition to AK, visual examination and/or verification will be used. This visual verification is used as a quality assurance tool to ensure that the waste matches its associated waste profile description and meets LANL waste acceptance criteria.

Please refer to the "Response to Notice of Deficiency; RCRA Permit Application General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory; May 16, 2002" (LANL, 2002f) for a more detailed description of the AK process.

b) *The containment requirements as outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.175(b)(1)) are not addressed in the Application. Specifically, the Application must discuss the underlying base of the containment systems and demonstrate that the base will be free of cracks or gaps and will be sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. Revise the Application to discuss the base of the containment systems and to demonstrate compliance with the appropriate regulation.*

LANL Response: The containment requirements outlined in 20.4.1 NMAC, Subpart V, 264.175(b)(1) are addressed in Attachment G, Section G.2. In addition, photographs of the secondary containment associated with the applicable TA-55 CSUs are provided in Attachment F of this NOD Response.

c) *The Application should provide calculations showing the requirements for secondary containment at each CSU. The calculations should demonstrate the amount of liquid and necessary containment requirements. Revise the Application to include containment calculations.*

LANL Response: Table 6 is provided to summarize the capacity associated with the secondary containment provided for each container storage unit at TA-55.

Table 6
Secondary Containment Capacities for Container Storage at TA-55

Container Storage Unit	Location	Waste Types	Maximum Capacity (gallons)	Secondary Containment	Capacity of Secondary Containment (gallons)
B05	TA-55-4, Basement	Solid	3,600	Basement	46,258
B40		Solid and Liquid	21,500		
B45		Solid	11,000		
K13		Solid and Liquid	3,400		
Vault		Solid and Liquid	4,000		
TA-55-185	West of TA-55-4	Solid	30,000	NA	NA
Storage Pad	Northwest of TA-55-4	Solid and Liquid	135,000	Covered Self-Containment Pallets	112[a]

a No more then 110 gallons (i.e., 2 55-gallon drums) of free liquids will be stored on an individual self-containment pallet.

Attachment G of this NOD Response provides a spreadsheet that includes the dimensions of the secondary containment, the total surface area, maximum quantity of liquid to cover the area, and the capacity of the containment. LANL will revise Section 2.1.8 of the application to include Table 6.

d) *The description of secondary containment must also include a calculation of the surface area and the quantities of liquid that would cover the area for each CSU. Revise the Application to include this calculation.*

LANL Response: Attachment G of this NOD Response provides a spreadsheet that includes the dimensions of the secondary containment, the total surface area, maximum quantity of liquid to cover the area, and the capacity of the containment. Please note that these calculations were generated under the assumption that the total volume of the CSU was liquid and was released. This is an extremely conservative assumption and represents the maximum volume capable of being released into the secondary containment. LANL will revise Attachment H of the application to include the spreadsheet calculation provided in Attachment G.

e) *The Application states that accumulated liquids will be removed from containment areas. However, 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.175(b)(5)) specifically states that spilled and leaked waste and all accumulated liquids must be removed in a timely manner to prevent overflow of the collection system. Revise the Application to state that all accumulated liquids will be removed in a timely manner to prevent overflow of the collection system.*

LANL Response: Attachment K, Section K.3.2 of the application states the following:

> "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."

Please note that this text is applicable to all of the waste management units at TA-55.

f) *Provide a discussion that demonstrates how containers will be kept from contact with any potentially accumulated liquids.*

LANL Response: A discussion demonstrating how containers are kept from contact with potentially accumulated liquids is provided in Attachment G, Section G.2, Page G-4. This discussion includes the following text:

"Containers holding hazardous or mixed waste in each CSU will be protected from potential contact with accumulated liquids that could be introduced in the event of a plumbing failure or as a result of fire-suppression activities, leaks, spill, or precipitation by either being elevated or stored in an area that is designed and operated to removed accumulated liquids."

10. *Section 2.1.10, Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. && 270.14(b)(9), 270.15(b-c), 264.17(a-b). 264.176, and 264.177)*

a) *The Application must include engineering drawings or other data that show the storage location for containers of ignitable and/or reactive wastes and which demonstrate that the containers are located 50 feet from the TA boundary. Revise the Application to include this figure(s).*

LANL Response: 20.4.1 NMAC 264.176 states that containers holding ignitable or reactive waste must be located at least 50 feet from the facility property line. Please note that LANL considers the facility boundary to be the boundary of the entire laboratory. The topographic map included as Figure A-5 of the application shows that all of the CSUs at TA-55 are located at least 50 feet from the LANL facility boundary. Furthermore, the nearest public access road to TA-55 is Pajarito Road. The closest TA-55 CSU resides over 400 feet from Pajarito road.

b) *The Application states ignitable and reactive waste containers are protected from the possibility of accidental ignition or reaction. Revise the Application to include a discussion of these specific policies. Precautions to be taken should include prevention of ignition, spontaneous ignition, and radiant heat.*

LANL Response: LANL will revise Section 2.1.10 of the application to include the following text:

"Ignitable or reactive waste is stored at the K13 CSU and on the container storage pad. Pursuant to 20.4.1 NMAC, Subpart V, 264.17 [6-14-00], LANL will follow specific waste management

procedures for ignitable and reactive waste. Containers with ignitable or reactive wastes are located at least 50 feet from the facility property line at all times and are protected from sources of ignition or reaction. Waste management practices at the TA-55 CSUs minimize the possibility of accidental ignition. There are no sources of open flames allowed at the CSUs, and smoking is prohibited. Cutting and welding activities are never conducted in the vicinity of waste containers without proper controls. Ignitable and reactive wastes are segregated and separated by distance and are stored in either a flammable cabinet or self-containment unit. Only non-sparking tools are used in handling waste containers, and lightning rods are located on all storage structures. "No Smoking" signs are conspicuously placed wherever there is a potential hazard from ignitable or reactive waste.

Precautions are 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 include keeping containers closed during storage and venting containers of mixed transuranic waste. Together, these measures meet the requirements of 20.4.1 NMAC, Subpart V, 264.17(a) and (b) and 264.176.

Incompatible wastes, if any, are segregated and separated during storage. All waste is segregated and stored 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.

Incompatible wastes are separated and segregated from other wastes and materials by means of berm, dike, wall, or other specific means (e.g., secondary containment pallets, modular sheds, and distance). 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, Subpart V, 264.177(a) and (b), and 20.4.1 NMAC, Subpart IX, 270.15(d).

Ignitable, reactive, and incompatible wastes will not be stored at TA-55-4, B40, B05, B45, the Vault, and TA-55-185; therefore the requirements of 20.4.1 NMAC, Subpart V, 264.17, and 20.4.1 NAMC, Subpart IX, 270.15 (c) and (d) [6-14-00] do not apply."

c) *The Application must also describe all processes that will be used to prevent reactions that may generate extreme heat, pressure, fire, explosions, or violent reactions; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to threaten human health or the environment; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to pose a risk of fire or explosions; damage the structural integrity of the facility; or be a threat to human health or the environment. Revise the Application to include a discussion of these preventative processes.*

LANL Response: Please refer to the response to Comment No. 10b.

d) *Under 20.4.1.500 NMAC (incorporating 40 C.F.R § 246.1101(a)(3)), the Application must ensure the management of incompatible wastes within a CSU where secondary containment systems will be used and show that the presence of incompatible wastes will not cause the secondary containment system to leak, corrode, or fail. Revise the Application to discuss safeguards that are in place to ensure the compatibility of incompatible wastes with the secondary containment systems.*

LANL Response: Please refer to the response to Comment No. 10b.

11. *Section 2.1.11. Closure (40 C.F.R. § 264.111 and 264.178)*

Revise the Application to state that at closure of a CSU all hazardous waste will be removed from the CSU and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.178).

LANL Response: LANL will revise Section 2.1.11 to include the following text:

"Partial closure will be accomplished by removal of hazardous wastes and residues from the surfaces and/or equipment associated with the CSU to be closed and that may have come into contact with the wastes."

Refer to specific comments on Attachment F.1 of the Application.

LANL Response: No response required.

12. *Section 2.2, Storage Tank System (40 C.F.R. §§ 270.15 and 264.191 through 194)*

a) *Identify the number of tanks in the storage system.*

LANL Response: Please refer to Table 2 of the response to General Comment No. 2.

b) *The Application indicates types of wastes that "may" be stored in the tank system. The Application must include all types of wastes to be permitted for the tank system. Either remove the word "may" or revise the Application to include a discussion of all the specific types of wastes to be permitted for the tank system.*

LANL Response: The word "may" is used to indicate that the waste is allowed to be stored in the storage tank system. Only mixed waste evaporator bottoms solutions will be stored in the storage tank system. These mixed waste solutions are assigned the EPA Hazardous Waste Numbers presented in the LANL General Part A. LANL will remove the word "may" from the text.

c) *More detailed information on the storage tank system was provided in Attachment H of the Application. Refer also to comments related to Attachment H.*

LANL Response: No response required.

13. *Section 2.2.2 Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))*

a) *The secondary containment areas in TA-55-4, rooms 401 and 434A, consist of 10- inch thick, steel reinforced concrete floors. While the concrete appears to have sufficient strength and thickness to prevent containment failure, it is not clear how the surface of the concrete will decontaminated in the event of a system or tank failure. The overall decontamination plan was presented, however this plan does not address periodic decontamination of secondary containment systems in the event of a leak. The Application also does not address whether the concrete floors have an epoxy or similar coating to aid in removal of contaminants and to prevent contaminants from seeping into the concrete. Revise the Application to address these issues.*

LANL Response: These requirements specify that the containment be constructed of materials compatible with the waste and have sufficient strength and thickness to prevent failure. Section 2.2.2 provides this information. Discussion regarding the removal of spills from the containment is addressed in Attachment G, Section G.2. Spill removal and decontamination is also addressed in Attachment E of the Permit Application and Appendix E of the "Los Alamos National Laboratory General Part B Permit Application" (LANL, 1998b), hereinafter referred to as the General Part B.

In addition, LANL will revise the Section 2.2.2 of the application to include the following text:

> "The concrete in Rooms 401 and 434A is sealed with an epoxy or similar coating to aid in decontamination should a spill occur. Rooms 401 and 434A have a floor, which consists of 10 inches of concrete though which the constituents must migrate. This provides secondary containment. In addition, tertiary containment is provided by the basement level of TA-55-4, which also consists

of 10 inches of concrete. The tanks are located inside a building which prevent them from exposure to precipitation and prevent contaminate mobility out of the containment system."

b) *The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.*

LANL Response: Table 7 has been provided to summarize the secondary containment provided for the storage tank system.

Table 7
Secondary Containment Capacities for the Storage Tank System

Storage Tank System Component	No. of Tanks	Capacity of Each Tank (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
Cementation Unit Pencil Tanks	5	13			
Pencil Tanks	10	13			
Vitrification Slab Tanks	2	33	TA-55-4, Room 434A	TA-55-4, Room 434A	1,344

Attachment G of this NOD Response provides a spreadsheet that includes the dimensions of the secondary containment, the total surface area, maximum quantity of liquid to cover the area, and the capacity of the containment. LANL will revise Section 2.2.8 of the application to include Table 7.

c) *The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.*

LANL Response: To demonstrate that the secondary containment systems are currently free of cracks and/or gaps which compromise the containment, LANL has provided photographs of the floors in and around the TA-55 CSUs, storage tank system, cementation unit, and vitrification unit. These photographs are provided in Attachment G of this NOD response.

d) *Revise the Application to include a statement that the containment system is designed to completely surround the tanks.*

LANL Response: LANL will revise Section 2.2.2 to include the following text:

"The tanks are located at TA-55-4 inside Rooms 401 and 434A. These rooms have a floor, walls, and ceiling which completely surround the tanks and serve as secondary containment, therefore, the secondary containment meets the requirements of

20.4.1 NMAC, Subpart 264.193(1)(iv). "

14. *Section 2.2.4. Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.16(1).264.198 (a-b) and 264.199(a-b))*

In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:

a) *Provide the operating pressure and temperature specifications for the tanks;*

b) *Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank systems so that it is no longer is ignitable or reactive;*

c) *Demonstrate that the wastes are not placed in the same tank system unless there is compliance with 20.4.1 500 NMAC (incorporating 40 C.F.R § 264.17(b));*

d) *Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;*

e) *Demonstrate that the requirements for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;*

f) *Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and*

g) *Indicate whether the tank system is used solely for emergencies.*

LANL Response: LANL will revise Section 2.2.4 to state the following:

> "No ignitable, reactive, or incompatible mixed waste will be stored in the storage tank system.

15. *Section 2.2.5. Closure (40 C.F.R. & 264.111)*

Revise the Application to specify that partial closure means closure of all of a tank and its associated piping and underlying containment system, and that closure of parts of a hazardous waste management unit is not permitted.

LANL Response: The storage tank system at TA-55-4 is composed of 4 distinct components that share a common piping system and secondary containment (i.e. Rooms 401 and 434B). Closure of these components is defined as follows:

- Partial closure of the storage tank system will consist of the removal of a given tank component (e.g. the 5 cementation pencil tanks) and the ancillary equipment (i.e., piping, valves) connected directly to it. What remains in place will consist of the portions of the piping system which all of the tank

components share and the secondary containment. The secondary containment will be decontaminated in the vicinity of the tank component being removed in accordance with the closure plan found in Attachment F.2 of the application.

- Final closure of the storage tank system will include removal of all of the tank components and ancillary equipment, including the shared portions of the piping system. The facility headers for ventilation, the wet vacuum system, and the radioactive liquid waste collection system will be left in place for other uses.

LANL will revise Section 2.2.5 and Attachment F.2 to clarify.

Revise the Application to specify that at closure of a tank all hazardous waste will be removed from the tank and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.197).

LANL Response: LANL will revise Section 2.2.5 to include the following text:

> "Partial closure will be accomplished by removal of hazardous wastes and residues from the surfaces and/or equipment associated with the tank component being closed and that may have come into contact with the wastes."

Refer to the specific comments on the Storage Tank Closure Plan, Attachment F .2

LANL Response: No response required.

16. Section 2.2.6 Control of Runoff (40 C.F.R. §§ 270.14(b)(8)(ii) and 264.193(e)(i-ii)

a) The prevention of runoff from the storage tank system is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment.

LANL Response: Please refer to the response to Comment No. 13b.

b) The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F .R § 264.193(c)(3)), all hazardous wastes and/or accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.

LANL Response: LANL will revise Section 2.2.6 to include the following text:

> "In the event of a hazardous and/or mixed waste spill that results in the accumulation of free liquids in the secondary containment system, all free liquids will be removed within 24 hours unless "as low as reasonably achievable" (ALARA) concerns prevent accessibility.

17. *Section 2.3. Miscellaneous Unit -Cementation Unit*

More detailed information on the cementation unit was provided in Attachment I of the Application. Refer also to specific comments related to Attachment I.

LANL Response: No response required.

18. *Section 2.3.2. Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))*

a) *The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.*

LANL Response: Table 8 summarizes the secondary containment provided for the treatment units at TA-55.

Table 8
Secondary Containment for the Subpart X Treatment Units at TA-55

Subpart X Treatment Unit	Capacity (gallons)	Location	Secondary Containment	Capacity the Secondary Containment (gallons)
Cementation Unit	150	TA-55-4, Room 401	TA-55-4, Room 401	10,773
Vitrification Unit	17.7	TA-55-4, Room 434A	TA-55-4, Room 434A	1,344

Attachment G of this NOD Response provides a spreadsheet that includes the dimensions of the secondary containment, the total surface area, maximum quantity of liquid to cover the area, and the capacity of the containment. LANL will revise Section 2.3.2 and 2.4.2 of the application to include the information in Table 8.

b) *The reinforced concrete floor that is designated as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.*

LANL Response: Please refer to the response to Comment No. 13c.

c) *Revise the Application to include a statement that the containment system is designed to completely surround the cementation unit.*

LANL Response: LANL will revise Section 2.3.2 of the application to include the following text:

> "The cementation unit is located at TA-55-4 inside Room 401. This Room has a floor, walls, and ceiling which completely surround the unit and serve as secondary containment, therefore, the secondary containment meets the requirements of 20.4.1 NMAC, Subpart 264.193(1)(iv)."

19. *Section 2.3.4. Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.16(1).264.198 (a-b) and 264.199(a-b))*

a) *In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:*

- *Provide the operating pressure and temperature specifications for the tanks; Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank system so that it no longer is ignitable or reactive;*
- *Demonstrate that the wastes are not placed in the same tank system unless 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) is complied with;*
- *Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;*
- *Demonstrate that the requirements for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;*
- *Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.17(b)) to prevent reactions; and*
- *Indicate whether the tank system is used solely for emergencies.*

LANL Response: LANL will revise Section 2.3.4 to state the following:

> "No ignitable, reactive, or incompatible mixed waste will treated in the cementation unit."

b) *In addition, the containment system for the cementation unit is the same System to be used for the storage tanks and vitrification unit. The Application must address the potential for incompatible wastes commingling as a result of a leak or spill from either the storage tanks, vitrification units, and/or the cementation unit.*

LANL Response: The tank system, cementation unit, and vitrification unit are used to store/treat mixed waste evaporator bottoms solutions, therefore, there is not an incompatibility issue with commingling resulting from a leak.

20. *Section 2.3.5. Closure (40 C.F.R. § 264.111)*

Revise the Application to specify that at closure of the cementation unit all hazardous waste will be removed from the cementation unit and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F .R. § 264.197).

LANL Response: LANL will revise Section 2.3.5 of the application to include the following text:

> "Partial closure will be accomplished by removal of hazardous wastes and residues from the surfaces and/or equipment associated with the cementation unit that may have come into contact with the wastes. Closure will include decontamination and disposal activities that will ensure the removal of hazardous wastes and residues to established cleanup levels."

Refer to specific comments on the cementation unit Closure Plan, Attachment F .3

LANL Response: No response required.

21. *Section 2.3.6. Control of Runoff (40 C.F.R. § 270.1402)(8)(ii))*

a) *The prevention of runoff from the cementation unit is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment system.*

LANL Response: Please refer to the response to Comment No. 18a.

b) *The containment system for the cementation unit is also the same containment system to be used for the storage tank system and the vitrification unit. In the unlikely event that a leak occurs in both the storage tank system and/or the vitrification unit and the cementation unit, the containment system will have to be sufficient to contain liquids from all units. Provide a discussion of how the containment system will handle a leak in the storage tank system, the vitrification unit, and/or the cementation unit.*

LANL Response: The secondary containment system for the storage tank system, cementation unit, and vitrification unit consists of the floor, walls, and ceiling associated with Rooms 401 and 434A at TA-55-4. The system is

- completely surrounds the waste management units;
- constructed of concrete that is sealed with an epoxy or similar coating to aid in decontamination should a spill occur;

- managed such that in the event of a spill, which results in accumulation of free liquids in the secondary containment system, all free liquids will be removed within 24 hours; and

- consists of adequate capacity to contain both a catastrophic spill from a single unit as well as any combination of units.

Table 9 provides a comparison of the secondary containment capacity associated with Rooms 401 and 434A and the waste management units located within it.

Table 9
Containment System Capacity Verses
Waste Management Unit Capacity

Location	Secondary Containment Capacity (gallons)	Waste Management Units	
		Unit	Total Capacity (gallons)
TA-55-4, Room 401	10,773	Storage Tank System *(Evaporator Storage Tank, Cementation Unit Pencil Tanks, Pencil Tanks)*	266
		Cementation Unit	150
TA-55-4, Room 434A	1,344	Storage Tank System *(Vitrification Slab Tanks)*	66
		Vitrification Unit	17.7

c) *The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R.§ 264.193(c)(3)), all hazardous wastes and accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.*

LANL Response: LANL will revise Section 2.3.6 to include the following text:

> "In the event of a hazardous and/or mixed waste spill that results in the accumulation of free liquids in the secondary containment system, all free liquids will be removed within 24 hours unless ALARA concerns prevent accessibility."

22. *Section 2.4, Miscellaneous Unit -Vitrification Unit*

Revise the Application to include a definition of the vitrification unit that describes all the ancillary piping and equipment and other components that are included as part of the unit.

LANL Response: The vitrification unit, glovebox, ancillary equipment, and associated secondary containment are described in Attachment J of the application.

More detailed information on the vitrification unit was provided in Attachment J of the Application. Refer to specific comments related to Attachment J.

LANL Response: No response required.

23. *Section 2.4.2, Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))*

a) *The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.*

LANL Response: Please refer to the response to Comment No. 18a.

b) *The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.*

LANL Response: Please refer to the response to Comment No. 13c.

c) *Revise the Application to include a statement that the containment system is designed to completely surround the vitrification unit.*

LANL Response: LANL will revise Section 2.4.3 of the application to include the following text:

> "The vitrification unit is located at TA-55-4 inside Room 434A. This Room has a floor, walls, and ceiling which completely surround the unit and serve as secondary containment, therefore, the secondary containment meets the requirements of 20.4.1 NMAC, Subpart 264.193(1)(iv).

24. *Section 2.4.4, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. §§ 270.16(i), 264.198 (a-b) and 264.199(a-b))*

While reactive, ignitable, and incompatible wastes will not be treated in the vitrification unit itself, the containment system to be used by the vitrification unit is the same as that to be used for the storage tanks and cementation unit, which may be used to Store or treat reactive, ignitable, and incompatible wastes. The Application must address the potential for the vitrification unit to come into contact with these wastes as a result of a leak, rupture, spill, etc. from either a storage tank or the cementation unit. Revise the Application to include this discussion.

LANL Response: LANL will revise Section 2.4.4 to state the following:

> "No ignitable, reactive, or incompatible mixed waste will be treated in the vitrification unit."

25. *Section 2.4.5. Closure (40 C.F.R. § 264.111)*

Revise the Application to specify that partial closure means closure of all of the vitrification unit, and that closure of parts of a hazardous waste management unit is not permitted.

LANL Response: LANL will revise Section 2.4.5 of the application to include the following text:

> "Partial closure will consist of closing the vitrification unit, vitrification unit ancillary equipment (e.g., glass frit feed system, off-gas system, associated structures, piping), and/or glovebox at TA-55, while leaving the other waste management units at LANL in service."

Revise the Application to specify that at closure of the vitrification unit all hazardous waste will be removed from the vitrification unit and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.197).

LANL Response: LANL will revise Section 2.4.5 of the application to include the following text:

> "Partial closure will be accomplished by removal of hazardous wastes and residues from the surfaces and/or equipment associated with the vitrification unit that may have come into contact with the wastes."

Refer to specific comments on the vitrification unit Closure Plan, Attachment F.4

LANL Response: No response required.

26. *Section 2.4.6. Control of Runoff (40 C.F.R. § 270.14(b)(8)(ii))*

a) *The prevention of runoff from the vitrification unit is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment.*

LANL Response: Please refer to the response to Comment No. 18a.

b) *The containment system for the vitrification unit is also the same containment system to be used for the storage tank system and cementation unit. In the unlikely event that a leak occurs in the storage tank system, the cementation unit, and the vitrification unit, the containment system will have to be sufficient to contain liquids from all units. Provide a discussion of how the containment system will handle a leak in the storage tank system, the cementation unit and the vitrification unit.*

LANL Response: Please refer to the response to Comment No. 21b.

c) *The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.193(c)(3)), all hazardous wastes and accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.*

LANL Response: LANL will revise Section 2.4.6 to include the following text:

> "In the event of a hazardous and/or mixed waste spill that results in the accumulation of free liquids in the secondary containment system, all free liquids will be removed within 24 hours unless ALARA concerns prevent accessibility."

Comment Nos. 27 - 29, Section 4.0 – Solid Waste Management Units

27. *Section 4.2. Releases (40 C.F.R. § 270.16(d)(2))*

a) *Revise the Application to reference the SWMU Reports that will be submitted to comply with the requirements of 20.4.1.900 NMAC (incorporating 40 C.F.R. § 270.14(d)).*

LANL Response: As discussed previously with the HWB, LANL has proposed submitting the most recent SWMU reports produced through LANL's Environmental Restoration (ER) Project in lieu of summarizing that information in Section 4.0 of all permit applications. This approach is intended to reduce redundancy and improve overall quality by providing the most recent and accurate information available. This approach will still meet the requirements of 20.4.1 NMAC, Subpart IX, 270.14(d).

The ER Project is in the process of updating LANL's 1990 SWMU Report as a vehicle to provide the HWB and the public with the most recent information regarding the SWMUs located at LANL. LANL negotiated the format of the revised SWMU Report with the HWB prior to beginning the process. A prototype version was presented to the HWB to ascertain whether or not the new report would meet the HWB's needs, and LANL has incorporated the HWB's comments into the final version of the report.

The final version of the TA-55 and TA-42 SWMU Reports are provided as Attachment H of this NOD Response. These SWMU Reports summarize all available information about each SWMU in those TAs. Please note that many of the active waste management sites listed in the application are not listed in Module VIII of the LANL Hazardous Waste Facility Permit and therefore are not included in the updated SWMU Report.

To facilitate review of SWMU information, the table included herein as Attachment I provides a cross reference of SWMUs listed in Sections 4.1.1 and 4.1.2 of the application to the TA-55 and TA-42 SWMU Reports sections included as Attachment H of this NOD Response.

b) *Provide an explanation for why active and closing hazardous waste management units are included in this Section and not in the Closure Plan for TA-55. Section 4.1.2 states that these active units "will be closed in accordance with an applicable RCRA closure plan." The "applicable RCRA closure plan" is the TA-55 Closure Plan, which is Attachment F to the Application. Section 4.1.2.3 identifies "storage location B38" that is "scheduled for closure under interim status." B38 is not included in the Closure Plan. B38 and other hazardous waste management units must be either permitted or closed prior to issuance of the Permit. Provide a schedule for closure of B3 8, revise the Closure Plan to include B38, and provide an explanation for why B38 was not included in the Closure Plan.*

LANL Response: Active and closing hazardous waste management units are addressed in Section 4.0 for regulatory completeness; by definition, they are SWMUs.

All of the active hazardous waste management units at TA-55 are addressed in the closure plans found in Attachments F.1, F.2, F.3, and F.4 of the application. B38 is an inactive CSU that will be closed under interim status. It is not included in the closure plan found in Attachment F.1 of the application because it is not intended to be a permitted unit. A closure plan for B38 is presently being developed and will be submitted to NMED separate from this NOD Response. The closure plan for B38 will be submitted to NMED this fall.

c) *The Application must identify all releases that may have occurred from all of the Swami's identified in Section 4.1 of the Application or provide documentation that no release occurred from a particular SWMU. Releases may include spills, leaks, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing to the environment. In addition, the date of the release(s), type of waste released, quantity or volume released, nature of the release(s), and groundwater monitoring and other analytical data available to describe the nature and extent of the release(s) should be provided. Other data may include physical evidence of distressed vegetation or soil contamination, historical evidence of releases, state, federal, or local enforcement actions, public complaints, and any other information showing the incidence of or migration of a release. Revise the Application to include this information.*

LANL Response: The status of the characterization activities for releases from SWMUs at TA-55 and TA-42 is summarized in the updated SWMU Reports, provided as Attachment H of this NOD Response. The SWMU Reports provide a comprehensive summary of all available information about the TA-55 and TA-42 SWMUs, however, this information does not necessarily include all of the examples of data noted in the HWBs comments.

d) *The incinerator complex, SWMU 42-001(a), was shut down due to operational problems. Discuss whether these operational problems (e.g., system failures, startup or shutdown releases, and/or filtration breakthrough) resulted in releases of contaminants to the atmosphere. Also discuss the waste feed system and any potential releases associated with it.*

LANL Response: Information concerning potential releases from SWMU 42-001(a) is included in the TA-42 SWMU Report provided in Attachment H of this NOD Response.

e) *The discussion of SWMU Nos. 42-001(b) and (c) does not address whether there were any leaks from the underground drain lines or the tanks, which could have led to contamination of surface soils, subsurface soils, and potentially groundwater and the environment. Revise the Application to address potential leaks from the underground drainlines and tanks.*

LANL Response: Information concerning potential releases from SWMUs 42-001(b) and (c) is included in the TA-42 SWMU Report provided in Attachment H of this NOD Response.

f) *The sumps, pumps, and tanks, drains, and drainlines associated with SWMU 55-008 are not addressed as having any releases. Provide documentation that no releases occurred, or provide a discussion of potential releases from these systems.*

LANL Response: Information concerning potential releases from SWMU 55-008 is included in the TA-55 SWMU Report provided in Attachment H of this NOD Response.

g) *Provide a discussion of whether there were any releases from the concrete enclosure, SWMU 55-009.*

LANL Response: Information concerning potential releases from SWMU 55-009 is included in the TA-55 SWMU Report provided in Attachment H of this NOD Response.

h) *The Application does not address releases from any of the active hazardous waste management units. Revise the Application to discuss whether there have been any releases from these active units.*

LANL Response: There has not been a recorded release to the environment from any of the active TA-55 hazardous waste management units. In addition, there has not been a recorded release from the inactive B38 CSU that will be closed under interim status as discussed in the response to Comment No. 27b.

28. *Section 4.3. Characterization of Release*

Information related to the characterization of releases is referenced to documents not provided with the Application, such as the 1990 SWMU Report and the RFI Work Plan for Operable Unit 1129. However, the Application states that, at a minimum, the corrective action process will include investigations to verify whether or not a release has occurred. However, for a RCRA Part B Permit Application, characterization of releases must include the following types of available information concerning prior or current releases:

a) *Date of the release;*
b) *Type of waste or constituent released;*
c) *Quantity or volume released;*
d) *Nature of the release: (e.g., spill, overflow, ruptured tank or pipe, construction failure, etc.);*
e) *Groundwater monitoring and other analytical data available to describe nature and extent of release;*
f) *Physical evidence of distressed vegetation or soil contamination;*
g) *Historical evidence of releases such as tanker truck accidents;*
h) *Any state, local, or federal enforcement action that may address releases;*
i) *Any public citizen complaints about the facility that could indicate a release; and*
j) *Any information showing the migration of the release.*

Revise the Application to include, at a minimum, the above-listed information.

LANL Response: The status of the characterization activities for releases from SWMUs at TA-55 and TA-42 is summarized in the updated TA-55 and TA-42 SWMU Reports, provided as Attachment H of this NOD Response. The SWMU reports summarize all available information about each SWMU, to the extent that it is available; however, this information does not necessarily include all of the examples of data noted in the HWB comments.

29. *Section 4.4. Corrective Actions (40 C.F.R. § 264.101)*

The Application states that corrective action will be conducted in accordance with approved NMED and LANL ER corrective action activities and that the corrective action will generally follow the RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) process. However, 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.101) and proposed 40 C.F .R Part 264, Subpart S, language, requires that the Application specify corrective actions and how they will be implemented for each SWMU. The Permittees must include a summary of completed corrective action activities and a schedule for future corrective action activities in the Application rather than only reference the corrective action program of the LANL ER Project. Revise the Application to specify corrective action investigation and remediation for releases from SWMU's at TA-55. The corrective actions must include implementation beyond area boundaries where necessary to protect human health and the environment.

LANL Response: The status of the characterization activities for releases from SWMUs at TA-55 and TA-42 is summarized in the TA-55 and TA-42 SWMU Reports, provided as Attachment H of this NOD

Response. The SWMU Reports provide a summary of corrective action activities completed to date and the current status of each SSWMU or AOC. Please note that the schedule for future corrective action activities is beyond the scope f the application. The specifics of future corrective action activities are agreed upon by HWB and LANL and documented in the ER Project baseline, in accordance with the existing schedule of compliance included in Module VIII of the Hazardous Waste Facility Permit.

Comment No. 30, Attachment A – Facility Description

30. *Attachment A.1, TA-55 General Description (40 C.F.R. § 270.14(b)(1)*

The description of the Facility must briefly describe the processes involved in the generation of hazardous wastes, including mixed wastes. Revise the Application to include this discussion as part of the general Facility description.

LANL Response: 20.4.1 NMAC, Subpart IX, 270.14(b)(1) requires "a general description of the facility." This is provided in Section A.1 as written. In addition, Section A.1 refers to Attachments G, H, I, and J for detailed descriptions of the waste management units at TA-55. These attachments each provide description of the processes involved in the generation of hazardous and mixed waste due to TA-55 waste management operations.

Comment Nos. 31-43, Attachments B.1 and B.2 – Waste Analysis Plan

31. *Attachments B.1 and B.2, Waste Analysis Plans for the Cementation Unit and Vitrification Unit*

Incorporate Attachments B.1 and B.2, the Waste Analysis Plans (WAP's) for the TA-55 cementation unit and vitrification unit, into the Facility-wide WAP included with the Facility-wide General Application. Address Comment Nos. 32 through 43 in the Facility-wide WAP.

LANL Response: LANL will incorporate Attachments B.1 and B.2 into the LANL-Wide WAP.

32. *Attachment B.1.2, Description of Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(a)(1))*

a) *The Application uses several vague descriptors (e.g., primarily, generally, and typically) as to the source of waste, type of waste, and components of the waste. The Application must discuss all waste streams that will be treated at the cementation unit, and Table B.1-1 should reflect all the waste streams and waste descriptions. Revise the Application accordingly.*

LANL Response: Section B.1.2 and Table B.1-1 of the application contain the waste descriptions and waste streams to be treated in the cementation unit. The descriptors of primarily, generally, and typically were added because TA-55 and LANL conducts basic research in a variety of disciplines for a number of government agencies, including

DOE, DOD, and NASA. In addition, UC (the operator of the laboratory) receives a fee from the DOE under its contract to perform Locally-Directed Research and Development. This allows UC to conduct basic research in areas of its own direction.

The waste streams destined for treatment in the cementation unit are limited to solid and liquid hazardous/mixed wastes that carry the EPA Hazardous Waste Numbers identified in the LANL General Part A (LANL, 1998).

b) *The WAP does not address the radiological component of the waste. The radioactivity of the waste is critical in determining health and safety measures, packing, labeling and transportation requirements, and decontamination and verification processes. Revise the Application to include a description of the radiological components of the waste.*

LANL Response: Please refer to LANL General Comment No. 3.

33. *Attachment B.1.3.1, Proposed Analytical Parameters and Methods (40 C.F.R 270.14(b)(2) and 264.13(b)(1-2))*

Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13(b)(2)), the Application must include all of the test methods that will be used for the chosen parameters and not just methods that may be used. These parameters should be for both hazardous and radiological components. Revise the Application to include all the test methods that will be used for the chosen parameters.

LANL Response: Table B.1-2 of the application summarizes the test methods that will be used to characterize the hazardous components of waste to be treated by cementation at TA-55. In addition, please refer to LANL General Comment No. 3.

34. *Attachment B.1.3.2, Criteria and Rationale for Parameter Selection (40 C.F.R. 264.13(b)(1))*

The Application indicates that acceptable knowledge (AK) will be used for waste characterization where possible. AK is acceptable only when adequate documentation and data from the process generator is available which shows consistency of the waste streams. However, where there is variability in waste streams, sampling must occur on a regular basis. A schedule of the frequency of sampling and sampling methods (pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13(b)(3) and (4)) must be included in the WAP, as well as a specific decision-making process that describes when AK is acceptable and when sampling should be conducted. Revise the Application to include this information.

LANL Response: The information requested is provided in the LANL General Part B, WAP (LANL, 1998) and/or its subsequent revisions. In addition, the specific decision-making process for AK acceptability consistent with the WAP is established in the following:

- LIG 404-00-02, "Acceptable Knowledge Guidance" (LANL, 1999b) and the PLAN-WASTEMGMT-002,
- "LANL Waste Acceptance Criteria" (LANL, 2002b).
- "Los Alamos National Laboratory Transuranic Waste Certification Plan," (TWCP) (LANL, 2002g).

Please refer to the "Response to Notice of Deficiency; RCRA Permit Application General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory; May 16, 2002" (LANL, 2002f) for a more detailed description of the AK process.

35. *Attachment B.1.4, Characterization Procedures (40 C.F.R. §§ 270.14(b)(2), 264.13(a)(1-3) and 264.13(b)(2))*

The Application indicates that most of the waste characterization will be based on AK. However, there is no decision tree to indicate when AK will not meet characterization requirements and when sampling is required, or the frequency at which sampling will be conducted.' Also, the Application must address how often sampling of waste streams will be conducted to ensure that the waste streams are consistent, indicating that AK is applicable. Revise the Application accordingly.

LANL Response: Please refer to the response to Comment No. 34.

36. *Attachment B.1.4.1, Characterization Procedures for Waste to be Treated (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))*

The Application must include a decision tree indicating how it will be determined that AK is sufficient to define waste streams and specifically when sampling will be required, In addition, if sampling is necessary, the sampling frequency and analytical parameters must be clearly identified. The sampling methods to be used to obtain a representative sampling of each waste stream and the appropriateness of these methods must also be provided. If LANL-specific protocol is to be used for sample collection, preservation, QA/QC and health and safety issues, then either this information must be contained within the Application or a specific reference to the protocol to be followed must be provided in the Application. Revise the Application to include this information.

LANL Response: The information requested is provided in the LANL General Part B, WAP (LANL, 1998b) and/or its subsequent revision. Sampling methods consistent with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (SW-*846)* (EPA, 1986) will be utilized in addition to the requirements specified in the response to Comment No. 34.

In addition, please refer to the "Response to Notice of Deficiency; RCRA Permit Application General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory; May 16, 2002" (LANL, 2002f) for a more detailed description of the AK process.

37. *B.1.4.2, Characterization Procedures for Treated Waste (40 C.F.R. §§ 270.14) and 264.13(b)(2-4))*

The characterization processes to be used on the treated waste are referenced to the "LANL Transuranic Waste Certification Plan, " the "Waste Isolation Pilot Plant (WIPP) Waste Analysis Plan" permit conditions, and LANL-specific protocol. The LANL- specific protocol to be used for sampling techniques should be either included in the Application or specifically referenced by document and/or protocol number, so that the applicability and appropriateness of the methods can be determined. Revise the Application to include this information on the LANL-specific protocols.

LANL Response: Please refer to the response to Comment No. 36.

38. *Attachment B.1.4.5, Reevaluation Frequencies (40 C.F.R. §§ 264.13(a)(3) and 264.13(b)(4))*

The Application is vague as to how waste stream verification will be conducted and when waste stream verification will be conducted for non-routinely generated wastes. No decision criteria are provided for the frequency of reevaluation of non-routinely generated wastes. Revise the Application to discuss how and when waste stream verification for non-routinely generated wastes will be conducted. Also provide a decision tree outlining when and how reevaluation for non-routinely generated wastes will be done.

LANL Response: Please refer to the response to Comment No. 34.

39 *Attachment B.2.2, Description of Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(a)(1))*

The WAP does not address the radiological component of the waste. The radioactivity of the waste is critical in determining health and safety measures, packing, labeling and transportation requirements, and decontamination and verification processes. Revise the Application to include a description of the radiological components of the waste.

LANL Response: Please refer to LANL General Comment No. 3.

40. *Attachment B.2.3.2, Criteria and Rationale for Parameter Selection (40 C.F.R. §§ 264.13(b)(1-4))*

The Application indicates that AK will be used for waste characterization where possible. AK is acceptable only when adequate documentation and data from the process generator is available which shows consistency of the waste streams. However, where there is variability in waste streams, sampling must occur on a regular basis. A schedule of the frequency of sampling and sampling methods (pursuant to 20.4.1.500 NMAC, incorporating 40 C.F.R § 264.13(b)(3) and (4)) must be included in the waste analysis plan as well as a specific decision-making process for when AK is acceptable and when sampling should be conducted. Methods for radiological screening of samples to determine whether health and safety issues are a concern should also be provided as part of characterization. Revise the Application to address these issues.

LANL Response: Please refer to the response to Comment No. 34 and LANL General Comment No. 3.

41. *Attachment B.2.4.1, Characterization Procedures for Waste to be Treated (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))*

The sampling methods to be used to obtain a representative sampling of each waste stream and the appropriateness of these methods must be provided. Sample collection frequency must also be discussed. If LANL-specific protocol is to be used for sample collection, preservation, QA/QC, and health and safety issues, then a specific reference to the protocol to be followed must be provided in the Application. Revise the Application to include this information.

LANL Response: Please refer to the response to Comment Nos. 34 and 36.

42. *B.2.4.2, Characterization Procedures for Treated Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))*

The characterization processes to be used on the treated waste are referenced to the "LANL Transuranic Waste Certification Plan", the "Waste Isolation Pilot Plant (WIPP) Waste Analysis Plan" permit conditions, and LANL-specific protocol. The LANL- specific protocol to be used for sampling techniques should be specifically referenced so that the applicability and appropriateness of the methods can be determined. Revise the Application to include these references.

LANL Response: Please refer to the response to Comment No. 36.

43. *Attachment B.2.4.5, Reevaluation Frequencies (40 C.F.R. §§ 264.13(a)(3) and 264.13(b)(4))*

The Application is vague as to how and when waste stream verification will be conducted for non-routinely generated wastes. No decision criteria are provided for the frequency of reevaluation of non-routinely generated wastes. Revise the Application to discuss how and when waste stream verification for non-routinely generated wastes will be conducted. Also provide a decision tree outlining when and how reevaluation for non-routinely generated wastes will be done.

LANL Response: Please refer to the response to Comment No. 38.

Comment Nos. 44 - 59, Attachment F.1 – Closure Plan for Container Storage Units

44. *Attachment F.1.1.1, Closure Performance Standard*

Delete "and post-closure" from the third bullet.

LANL Response: The third bullet will be revised to read the same as the performance standard in 20.4.1 NMAC, Subpart V, 264.111(c).

45. *Attachment F.1.1.2, Partial and Final Closure Activities 40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), 264.110 through 264.151 and 264.178)*

Revise the Application to discuss which structure(s) within the CSU's may be left in service during closure activities.

LANL Response: Section F.1.1.2 of the application states:

> "Partial closure may consist of closing one or more of the CSUs at TA-55 while leaving the other regulated hazardous/mixed waste units at LANL in service."

There are not any structures within the units that will be left in service, however, the units themselves are located in buildings and rooms that will be decontaminated and reused for other LANL missions upon certification of closure.

46. *Attachment F.1.1.9, Survey Plat and Post-Closure Requirements (40 C.F.R §§ 270.14(b)(13), 270.14(b2)(15-18), 264.110 through 264.151 and 264.178)*

Any criteria used to demonstrate compliance for closure that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. §264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

LANL Response: The requirements of 20.4.1 NMAC, Subpart V, 264.112(c) are addressed in Section F.1.1.4.

47. *Attachment F.1.2, Closure Procedures*

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to the NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)). a written notification of, or request for. a permit modification to authorize a change in operating plans. facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c). must be met. Revise the Application to address the written notification requirement.

LANL Response: Please refer to the response to Comment No. 46.

48. *Attachment F.1.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))*

The Application must provide an estimate of the maximum inventory for each type of waste and within what types of containers that waste is contained. In addition, the Application must include a discussion of how much waste and the type of wastes that are located at each CSU. Revise the Application to include, for each CSU, the maximum quantity of waste, waste type, maximum capacity based on area, and the maximum number of containers by container type.

LANL Response: Please refer to the response to General Comment No. 2 and Specific Comment No 3a.

49. *Attachment F.1.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3) and 264.178)*

According to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(3))), the types(s) of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the types of waste that will be shipped to each specific off-site facility.

LANL Response: LANL intends to develop a unit-specific closure/sampling plan for the TA-55 CSUs at the time of each closure that is consistent with the operating record. This approach was discussed with Carl Will of the HWB on April 23 and June 7, 2002, regarding the closure of the TA-54 CSUs. LANL would like to establish the same approach for the TA-55 storage tank system as described below.

LANL intends to develop a unit-specific closure/sampling plan. This plan will utilize the operating record of the unit at the time of its closure to determine the hazardous constituents that were actually stored in the unit and to identify the nature and extent of spills (if any) that may have occurred. The use of the operating record will narrow the range of hazardous constituents to be sampled for and be more representative of the potential contamination at the unit. A list of potential hazardous constituents for the TA-55 CSUs is provided in Table F.1-2 of the application and represents the breadth of EPA Hazardous Waste Numbers capable of being stored in the unit as identified in the LANL General Part A (LANL, 1998a).

In addition, this unit-specific closure/sampling plan will utilize the operating record of the unit to determine:

- The waste types that will be removed prior to and during closure.
- The final disposal destination for the waste in the unit and for any wastes generated as a result of the decontamination and disposal operations.
- The most recent procedures, technologies, and innovations to provide clean closure of the unit and protect human health and the environment.

50. *Attachment F.1.2.4, Closure Procedures and Decontamination*

a) *As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)) a detailed description for the closure of each CSU must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to*

satisfy the closure performance standard. Revise the Application to provide detailed descriptions of the closure procedures and decontamination techniques for each CSU.

LANL Response: LANL maintains that Attachment F.1 of the Permit Application meets the closure criteria set forth in the regulations with the following sections:

- Section F.1.2.4 - general decontamination information applicable to all of the CSUs at TA-55 including PPE, pre-closure activities, and inspection criteria.
- Section F.1.2.4.1 - specific decontamination information for the indoor CSUs.
- Section F.1.2.4.2 - specific decontamination information for the Vault.
- Section F.1.2.4.3 – specific decontamination information for the outdoor storage pad including a discussion regarding the decontamination and/or removal of the asphalt.
- Section F.1.2.5 - decontamination of the equipment used to conduct the closure.
- Section F.1.2.6 - verification method to ensure adequate decontamination.
- Section F.1.3 – sampling and analytical procedures including both soils and liquid.

b) *The Application does not address methods for sampling and testing surrounding soils and removing contaminated soils during either partial closure or closure. Revise the Application to address surrounding soils and soil that underlies CSU's, particularly the outdoor storage pad.*

LANL Response: Soil and sediment sampling is discussed in Section F.1.3.1, which states the following:

> "Soil samples (if required) will be collected from various depths to determine the vertical extent of contamination. Sediment samples will be collected from the surface or near surface. Sampling procedures will be performed in accordance with the most recent version of ER-SOP-6.09, "Spade and Scoop Method for Collection of Soil Samples" (LANL, 1995); ER-SOP-6-10, "Hand Auger and Thin-Walled Tube Samples" (LANL, 1998); or other appropriate ER SOPs or NMED approved methods."

The sited procedures have methods that are consistent with SW-846 for sampling and prevention of potential cross contamination. In addition, Section F.1.3.3 (which is applicable to all decontamination efforts) states:

"To prevent cross contamination, it is important to clean non-disposable samplers after each ample is collected. Cleaning of samplers will be performed in accordance with ER-SOP-1.08, "Field Decontamination of Drilling and Sampling Equipment" (LANL, 2001)."

LANL intends to determine the necessity of soil sampling at the TA-55 storage pad at the time of closure based upon the operating and inspection record associated with the unit. If a spill is indicated in the operating record, soil sampling and/or remediation will be conducted according to the procedures identified in the unit-specific closure plan as discussed in the response to Comment No. 49.

Please note that the B05, B40, B45, K13 and the Vault CSUs are located inside Building 4 at TA-55. The floor of these CSUs consists of a 10-in. thick reinforced concrete slab that is maintained to remain free of cracks and gaps and is compatible with the wastes stored in the CSUs. The TA-54-185 CSU is also located inside a building on top of a concrete slab that is maintained to remain free of cracks and gaps and is compatible with the waste stored in the CSU. Inspections and maintenance of the floors and walls in each CSU is effective at preventing migration of waste to the environment, therefore, soil sampling activities will not be applicable to these CSUs.

c) *The Application states that all sampling will be done in accordance with Quality Assurance/Quality Control (QA/QC) procedures. Revise the Application to include these QA/QC procedures.*

LANL Response: Please refer to LANL General Comment No. 4.

d) *The schedule for closure activities for the CSU's are presented in Table F.1-1. However, the schedule does not appear to allow for the sampling, analysis, and potential removal of contaminated soils surrounding the CSU's. It is not apparent that the schedule allows time for proper data validation, time to treat wastes, time for additional leaching tests for the asphalt, or adequate time for transporting wastes to disposal sites, if warranted. In addition, some structures in the CSU's may be left in service during partial closure. Revise the schedule to be comprehensive of all potential activities for closure and partial closure.*

LANL Response: The schedule presented in the closure plan is a placeholder for a comprehensive schedule to be provided in the unit-specific closure/sampling plan as discussed in the response to Comment No. 49. The comprehensive schedule will utilize the operating record of the unit to determine appropriate timeframes for data validation, waste treatment, leach testing, and/or transportation of wastes.

e) *The Application states that all workers will have proper training and medical monitoring. Reference the appropriate section(s) of the Application that discuss the training requirements and medical monitoring requirements for workers.*

LANL Response: Training requirements for TSDF workers/supervisors, site workers (LANL and contractor), and emergency responders are addressed in Appendix D of the LANL General Part B. Personnel (LANL and contractor) involved in the closure of the TA-55 CSUs are required to meet the minimum training requirements for a general site worker as outlined in Table D-1. In addition to the training outlined in Table D-1, personnel (LANL and contractor) are required to attend General Employee Training (GET) if they will be working 10 days or more on-site. GET includes an overview of the Occupational Medicine Program, which is managed by the Occupational Medicine Group (HSR-2).

All new LANL employees are provided with a full medical evaluation at the Occupational Medicine building (TA-3-409) to provide baseline medical information. In addition to this baseline assessment, some job assignments require medical surveillance and/or certification evaluations every year (e.g., those who work with identified carcinogens) to monitor for early signs of health effects and/or to ensure their health meets job-performance standards. Before leaving LANL employment, personnel are required to schedule an appointment with HSR-2 to review their health status. HSR-2 maintains an occupational medical record on each LANL employee; these confidential medical records are released to others only with the employee's written consent, except as required by law.

Contract personnel are required to meet the occupational medical monitoring requirements provided by the company they work for in accordance with OSHA.

f) *Revise the Closure Plan for the closure of CSU's to include the sampling of potential contaminated areas using swipe sampling rather than sampling the rinse water to determine if a release has occurred and to determine if contamination has been remediated.*

LANL Response: LANL maintains that the use of swipe sampling is not the best or only method for closure decontamination verification. Swipe samples are not an approved methodology for hazardous waste constituent sampling. In addition, their use is not necessarily appropriate for all types of hazardous constituents or closure circumstances.

LANL has only been able to verify the following approved sampling methodologies for swipe sampling:

- Polychlorinated biphenyl (PCB) - "Verification of PCB Spill Cleanup by Sampling and Analysis" EPA-560/5-85-026 (EPA, 1985), and as included in Attachment A of SW-846, Method 8290A)

- Surface Contamination - Occupational Safety and Health Administration (OSHA) (OSHA, 1999).

The first is limited to sampling for PCBs, which are non-volatile,

somewhat viscous compounds. The technical intent of this sampling method is also limited to establishing the presence of the compounds at concentrations of 10 ppm or higher. This is a relatively high level of contamination compared to the risk-based concentration limits required for closure determinations. The second method limits the use of swipe sampling to act as a quality control measure to ensure that a cleaning procedure is being implemented effectively. The method states specifically that this type of sampling is not intended to assess health risk resulting from contamination. The use of these sampling methodologies has not been expressly extended or approved beyond the stated purpose or context. LANL stipulates that swipe sampling is commonly used as a screening tool to determine the presence of hazardous constituents quantitatively.

Swipe sampling, by nature, does not involve the collection of samples from the entire surface being verified. The method relies upon a statistical random sampling approach that will require a large number of samples (with associated costs) to ensure a high confidence level for the verification data. Swipe sampling is dependent upon the efficiency of the contact between the analyte and the collection medium. This can effect the reproducibility of data for each swipe per surface contact over the time frame of the closure and from one contact surface to another within the same CSU. This is due to inherent limitations associated with the collection medium and the total surface area contacted. In addition, swipe sampling may not be the best or most appropriate method for the full range of hazardous constituents found at the TA-55 CSUs and/or the differing materials of construction. Constituents that have hardened, reside in relatively rougher surface features (e.g., cracks, surface irregularities), or will not be absorbed by collection medium used may not be successfully collected using a swipe. Furthermore, the conditions during the closure may also prevent a successful collection.

Wash water sampling, as described in the application, presents two areas in which it may be superior for decontamination verification. The first has to do with the composition of the wash water solution, which consists of water and a surfactant/solvent. This solution is more effective at the removal of hazardous constituents because there is a higher potential that an acknowledged decontamination surfactant/solvent (e.g. Alconox) will solubilize the full range of hazardous constituents found at the TA-55 CSUs verses a compound-specific material utilized on a swipe (see SW-846 Method 8290A). The second has to do with surface contact, which is arguably more significant when the entire surface of the CSU is wiped down with wash water as opposed to random samples using swipes.

LANL proposes a method of utilizing wash water samples that minimizes dilution and provides a specific set of criteria by which the verification results can be compared as follows:

1. Minimize dilution of hazardous constituents by limiting the wash water solution to an amount that is sufficient to wipe down the surface to be verified and collect the required number of samples.

2. Limit the sampling area to a specific discrete location (e.g., a wall or portion thereof depending on the size of the unit).

3. Verify decontamination by comparing the discrete sample results to a blank result obtained from the wash water solution prior to its use for the verification wipe down. If the result is at or below that of the blank, the closure is considered complete. If the result is above the blank, apply one or all of the following options:

    - Repeat the decontamination and verification of the discrete location.

    - Compare the result to the Region 9 Risk Based levels for drinking water. If below, apply for an alternate demonstration of closure.

    - Disposal of the surface (e.g. asphalt) at an appropriate on-site location.

This proposed method minimizes dilution and establishes an extremely conservative set of criteria (blank results or drinking water standards) by which to establish verification.

Finally, LANL has established wash water sampling for decontamination verification during container storage closure at both TA-21-61 and TA-50-37. The approach has never been previously questioned by NMED permit writers/inspectors and it is currently included in the approved closure plans in LANL's Hazardous Waste Facility Permit. Additionally, NMED has usually required prior approval of detailed sampling and decontamination activities prior to the start of the closure process unless LANL proceeds "at risk" (i.e., subject to changes made by NMED). Rinse water sampling has not been identified as a problem in previous closure plan reviews and approvals.

g) *There is no discussion of how background levels for soils will be determined. At closure of a CSU, Permittees must demonstrate that hazardous waste and hazardous waste residues have been removed from all soils surrounding the CSU. Revise the Application to reference "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Ryti et al., 1998, for determination of background soil levels.*

LANL Response: Please refer to the response to Comment No. 50b.

h) *The Application states that each storage structure will be inspected for any cracks or conditions that would potentially lead to loss of decontamination liquids, and that, if any defects affecting containment are found, appropriate remedial actions, for example repairs, maintenance, or replacement, will be conducted. It is unclear from the Application whether the cracks or other flaws will be*

monitored for contamination prior to sealing or other treatment. Contamination could be sealed within a crack of a structure. Revise the Application to discuss how these defects in storage Structures will be investigated to ensure that no contamination has migrated into the defect prior to remedial action.

LANL Response: LANL will revise Attachment F of the application to include the following:

> "Preventive maintenance inspections are conducted routinely (i.e., weekly) at each of the TA-55 CSUs while waste is in storage. If any defects, deterioration, damage, or hazards affecting containment have developed, appropriate remedial actions (including sampling, repairs, maintenance, or replacement) are completed immediately. Prior to beginning of any decontamination activities at the TA-55 CSUs, the base or secondary containment of each CSU will be inspected for any cracks or conditions that could potentially lead to loss of decontamination water and/or verification wash water during closure. If a crack or gap is present, a swipe sample or a representative sample of the media (i.e., concrete, metal) will be taken to determine the presence of contamination. The sample will be analyzed for the hazardous contaminates identified in the operating record of the CSU. If contamination is detected, the surface flaw will be decontaminated prior to repairing the crack/gap. Complete or partial removal (e.g., scabbling) of the material may be performed until contamination is no longer detected. If partial removal is successful in eliminating the contamination, it will be assumed that the remaining material is clean."

51. *Attachment F.1.2.4.1, Indoor Storage Area (40 C.F.R. § 264.112(b)(4))*

a) *The Application states that a wash water solution will be used in the decontamination of portable equipment. Discuss what will comprise the wash solution and discuss the appropriateness of this solution for organics, inorganics, and radionuclides.*

LANL Response: The wash water solution will consist of water and an appropriate surfactant/solvent. This surfactant/solvent will be determined at the time of closure based its capability to remove the hazardous constituents identified in the operating record for the CSU. General laboratory surfactants (e.g. Alconox) will be used for the majority of the closures with specialized solvents used for more focused removal, if necessary.

Please refer to LANL General Comment No. 3 for discussion regarding radionuclides.

b) *The description of portable equipment also includes wooden pallets. The use of a wash water solution on wood, which is known to absorb water, could result in additional contamination of the pallet. Discuss mitigative measures that will be*

used to ensure the pallets do not absorb any potentially contaminated wash water, becoming contaminated by the decontamination procedure.

LANL Response: LANL will revise Section F.1.2.4 to delete the reference to wooden pallets. Please note that there are not any in use at the TA-55 CSUs.

c) *The Application states that a portable berm may be used to collect and contain wash water. Discuss what alternate methods may be used, if the portable berm is not used, for containment of wash water.*

LANL Response: The word "may" in this case is used to indicate that portable berms are allowed to be used for wash water collection and containment. They will be used if the CSU does not have a sump or low area designed for collection.

d) *The Application indicates that wash water will be allowed to accumulate in the bottom of recessed areas (e.g., sumps), where the water will be removed and tested for potential contamination. The Application does not discuss how the recessed area where the wash water was allowed to collect will be decontaminated if the results from the wash water indicate contamination. Revise the Application to discuss how the entire recessed area will be decontaminated and verified.*

LANL Response: The second paragraph in Section F.1.2.4.1 states the following:

> "After the walls and floors have been washed down, any recessed areas present (e.g. sumps) will be wiped down with wash water. The used wash water will collect in the recessed area where it will be sampled."

This indicates that the recessed areas will be decontaminated and the wash water is allowed to accumulate in the recessed area (if present). Decontamination verification samples will only be taken after wash cycles have been completed as described in Section F.1.2.6.

e) *Sumps are often connected to a central drainage system. Include in the Application a discussion of how drain lines connected to sumps and other recessed areas will be investigated and decontaminated.*

LANL Response: The word "sump" is used to describe all recessed areas located in the vicinity of the TA-55 waste management units. Most of these areas are not connected to any central drainage system. Drains, if any, will be blocked off (using berms and/or metal plates) during decontamination to prevent the loss of water.

f) *The Application infers that the decontamination procedures are only for loose contamination and that any item that is shown to have fixed contamination will be removed and disposed of properly. Clarify the Application accordingly.*

LANL Response: It is anticipated that due to the presence of painted surfaces and operating procedures designed to prevent spills there will be little or no contamination present. This would require only the surface decontamination procedures described in the closure plan presented in the application. However, if the operating record of the unit (at the time of closure) indicates a spill or an event that with the potential to result in fixed contamination of hazardous constituents, an appropriate method for removal will be proposed. This may include sandblasting, removal of asphalt, and or chemical decontamination as appropriate to the situation.

g) *The Application states that the wash water will only be analyzed for hazardous constituents. At closure of a CSU, Permittees must determine that there is no fixed radiological contamination. Revise the Application to address radiological contamination and decontamination.*

LANL Response: Please refer to LANL General Comment No. 3.

52. *Attachment F.1.2.4.2, Vault (40 C.F.R. § 264.112(b)(4))*

The Application must contain a description, of all measures of decontamination (i.e., decontamination measures will be initiated to accomplish chemical decontamination, as well as to satisfy ALARA requirements for mixed waste in accordance with applicable DOE Orders) that will be applied in decontaminating the vault. Revise the Application to include a detailed description of the alternative decontamination measures.

LANL Response: LANL intends to close the Vault using the procedures described in Section F.1.2.4 and F.1.2.4.1. It is important to note that storage in the Vault is not limited to hazardous and mixed waste. Other items with radiological constituents are and will be present in the Vault. Section F.1.2.4.2 is provided to indicate that alternative procedures may be required due to the presence of these items and ALARA concerns for closure personnel inside the Vault at the time of closure. LANL will evaluate the contents of the Vault and the operating record at the time of closure to determine if an alternate approach is necessary. This approach will be detailed in a CSU specific closure plan to be presented to the NMED at the time of closure.

53. *Attachment F.1.2.4.3, Outdoor Storage Pad (40 C.F.R. §§ 264.112(b)(4))*

a) *The Application states that "potential closure activities...include...future remediation under RCRA corrective actions," "a final option may be to remediate the asphalt storage pad as part of LANL's RCRA corrective actions," and "the final assessment and remediation of the container storage pad and the soil at this CSU location will be integrated and coordinated under a corrective action program at LANL." The meaning of these terms is uncertain, but seem to state that Permittees will choose whether or not to comply with the closure regulations at 20.4.1.500 NMAC (incorporating 40 C.F .R. Part 264, Subpart G and § 264.178) when closing the outdoor storage pad. Revise the Application to demonstrate compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 264, Subpart G and § 264.178).*

LANL Response: The storage pad at TA-55 was constructed for use as a storage area prior to the implementation of RCRA regulations in 1980 and mixed waste in 1990. This establishes the pad and any contamination from it as being subject to the LANL Corrective Action Program. LANL intends to close the unit in accordance with the closure plan found in Attachment F.1 but has the option to remediate the storage pad under corrective action should contamination from storage activities prior to 1980 render the unit incapable of clean closure in accordance with the approved closure plan.

b) *The Application states that decontamination procedures similar to those described in Application Section F.1.2.4.1 may be used for the storage pad. It is not clear what other procedures may be used in lieu of those listed in Application Section F.1.2.4.1 or described in this Section. It is also unclear what deviations from the procedure may be applied. Revise the Application to include a discussion of all procedures that will be used to decontaminate the storage pad.*

LANL Response: LANL intends to close the storage pad according to the procedures identified in Section F.1.2.4 and F.1.2.4.1. The storage pad, however, presents some difficulties, which include the leaching of anomalously high levels of organic compounds inherent to the composition of the asphalt. At the time of closure the operating record of the unit will be reviewed to determine the location and presence of spills, if any. If a spill occurred, an alternative demonstration of closure may be required to determine the presence of constituents due to the spill verses those associated with the asphalt. The alternative will be based on the constituents of concern and may include:

- Sampling of "clean asphalt" using the same wash water to eliminate constituents associated only with the asphalt.
- Comparison of wash water sample results to the EPA Region 9 Human Health risk based values for drinking water.
- Comparison of soil sample results to the EPA Region 9 Human Health risk based values for soil.

If an adequate demonstration cannot be made, the pad or portion thereof will be removed. At the time of closure, a unit specific closure plan will be submitted to NMED for approval. This plan will include details for any proposed alternative demonstration if necessary.

c) *The Application states that a wash water solution will be used in the decontamination of equipment. Discuss what will comprise the wash solution and discuss the appropriateness of this solution for organics, inorganics, and radionuclides.*

LANL Response: Please refer to the response to Comment No. 51a.

d) *If decontamination verification of asphalt cannot be determined, the Application indicates that the material will be removed from the site. If the asphalt is removed, sampling of the soil underlying the removed asphalt must be conducted in accordance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112 (b)(4)). In addition, all contaminated underlying soil must also be removed and verification sampling conducted. Revise the Application to include a discussion of sampling the underlying soils, removal methods for any contaminated soils, and verification procedures for the remaining soils.*

LANL Response: Please refer to the response to Comment No. 50b.

e) *20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(b)(4)) requires that all surrounding soils be sampled and tested for potential contamination. The Application does not discuss how soils surrounding the storage pad will be sampled, how many samples will be taken, what sampling methods will be applied, and how contaminated soils will be removed. Revise the Application to discuss these issues regarding surrounding soils.*

LANL Response: Please refer to the response to Comment No. 50b.

f) *The Application states that additional testing may be used to determine if leaching of contaminants from the asphalt is contributing to elevated readings in the wash water. Revise the Application to include what sampling and analytical methods will be used to determine if leaching from the asphalt is the source of contamination in the wash water.*

LANL Response: Please refer to the response to Comment No. 53b.

g) *The Application states that, if verification cannot be demonstrated, an alternative demonstration of decontamination will be used. Provide, discuss, and justify the alternative demonstration of decontamination.*

LANL Response: Please refer to the response to Comment No. 53b.

54. *Attachment F.1.2.5, Decontamination Equipment (40 C.F.R. § 264.112(b)(4))*

The Application discusses cleaning of equipment, but neither this Section of the Application nor Section F .1.4.2.1 discusses how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

LANL Response: Section F.1.2.6 provides detailed information for decontamination verification. This is inclusive of the decontamination equipment.

55. *Attachment F.1.2.6, Decontamination Verification (40 C.F.R. §§ 264.112(b)(4-5) and 264.178)*

a) *The Application states that sampling and analysis will be used to demonstrate*

that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

LANL Response: Please refer to LANL General Comment No. 3.

b) *The Application should provide a listing of expected contaminants (parameters) that may be present at each CSU. Revise the Application to include a listing of potential contaminants at each CSU.*

LANL Response: Please refer to the response to Comment No. 49.

c) *The Application states that the significance of an increase in contaminant levels in wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied must be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.*

LANL Response: The specific statistical methods to be utilized are determined by the hazardous constituent and analytical method as identified in SW-846. LANL intends to develop a unit-specific closure/sampling plan at the time of closure that is consistent with the operating record as described in the response to Comment No. 49. This plan will identify the specific hazardous constituents and statistical methods as they are applicable to that specific closure. In addition, decontamination verification may be conducted utilizing a clean closure equivalency based on EPA Region 9 Human Health Risk values for drinking water.

d) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: LANL intends to utilize the operating record of the unit at the time of its closure to establish the presence of "hot spots" based on the inspection record and records associated with spills. If any hot spots are identified, special attention will be given to them during decontamination and subsequently during verification. Please note that the TA-55 waste management units are carefully managed to prevent spills and contamination of the surfaces. Decontamination efforts conducted prior to verification will likely remove what little contamination (if any) may be present.

e) *Decontamination verification for radionuclides must include swipe sample*

analyses of CSU surfaces, structures, and "equipment that is to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of the area requiring swipe sampling, and the method of analysis.

LANL Response: Please refer to LANL General Comment No. 3.

f) *In addition, surveying, using appropriate radiation instruments, should be conducted in areas where radiological contamination may have been present. If radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of fixed radiological contamination. Revise the Application to provide for surveying of each CSU where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

g) *Decontamination verification of CSU surface areas for hazardous waste residues must also be verified using swipe analysis, similar to that as outlined in Comment e) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

h) *The Application does not discuss how surrounding soils will be sampled to ensure that no cross contamination as a result of decontamination activities have occurred. Revise the Application to include a discussion of how soils around areas to be decontaminated will be sampled and verified for potential cross contamination as a result of decontamination procedures.*

LANL Response: Please refer to the response to Comment No. 50b.

i) *The Application does not discuss soils under or around a CSU, in particular the outdoor pad, that are to be decontaminated. 20.4.1.500 NMAC (incorporating 40 C.F .R § 264.112(b)(4)) requires that the Application include methods for sampling and testing surrounding soils and verification that these soils meet closure performance standards. Revise the Application to include the methods for sampling and testing surrounding soils at each CSU.*

LANL Response: Please refer to the response to Comment No. 50b.

56. *Attachment F.1.3, Sampling and Analytical Procedures (40 C.F.R. § 264.112(b)(4))*

The Application states that sampling and analysis will be conducted in accordance with procedures outlined in SW-846 or other approved procedures or methods. Revise the Application to include references for all proposed procedures and methods that will be used. Revise Tables F.1-1, F.1-2, F.1-5 and F.1-6, as necessary.

LANL Response: Please refer to the response to Comment No. 49.

57. *Attachment F.1.3.1, Soil and Sediment Sampling*

a) *Discuss when soil or sediment sampling is appropriate and required as well as the criteria that will be used to determine when soil or sediment sampling will be conducted.*

LANL Response: Please refer to the response to Comment No. 50b.

b) *The soil sampling protocol does not address how many samples will be taken and how soil sample locations will be determined. Revise the Application to include this information.*

LANL Response: Please refer to the response to Comment No. 49.

58. *Attachment F.1.3.2, Liquid Sampling*

Samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

LANL Response: Please refer to the response to Comment No. 50f.

59. *Attachment F.1.3.4, Sampling Handling and Documentation*

a) *The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *Discuss special labeling and shipping requirements for radiological samples.*

LANL Response: Please refer to LANL General Comment No. 3.

Comment Nos. 60 - 73, Attachment F.2 – Closure Plan for the Storage Tank System

60. *Attachment F.2.1.1, Closure Performance Standard*

Delete "and post-closure" from the performance standard third bullet.

LANL Response: Please refer to the response to Comment No. 44.

61. *Attachment F.2.1.2, Partial and Final Closure Activities (40 C.F.R. § 270.14(b)(13), 270.14(b)(15-18), 264.110 through 264.151 and 264.197)*

a) *Define what is included in the storage tank system, including ancillary equipment and secondary containment, and use the term consistently throughout.*

LANL Response: The storage tank system, ancillary equipment, and associated secondary containment are described in Attachment H of the application.

b) *Discuss the structure(s) within the storage tank system that may be left in service during closure activities.*

LANL Response: Please refer to the response to Comment No. 15.

62. *Attachment F.2.1.9, Survey Plat and Post-Closure Requirements*

Any criteria used to demonstrate compliance for closure that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

LANL Response: The requirements of 20.4.1, Subpart V, 264.112(c) are addressed in Section F.2.1.4.

63. *Attachment F.2.2, Closure Procedures*

The Application states that, if necessary, the closure plan will be modified and the modified closure plan will be submitted to the NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F .R § 264.112(c), must be met. Revise the Application to address the written notification requirement.

LANL Response: Please refer to the response to Comment No. 62.

64. *Attachment F.2.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))*

The Application must provide an estimate of the maximum inventory for each type of waste and within what components of the storage tank system that waste is contained. Revise the Application to include, for each component of the storage tank system, the maximum quantity of waste, waste type, and maximum capacity.

LANL Response: Please refer to the response to General Comment No. 2.

65. *Attachment F.2.2.3, Removal of waste (40 C.F.R. § 264.112(b)(3-4) and 264.197)*

a) *The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), which states that a detailed plan of*

how waste is to be removed shall be included in the closure plan. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the storage tank system.

LANL Response: The waste removed from the tank system will be solidified in the cementation or vitrification units as discussed in Section F.2.2.3. LANL intends to develop a unit-specific closure/sampling plan for the storage tank system component(s) at the time of closure that is consistent with the operating record. This approach was discussed with Carl Will of the HWB on April 23 and June 7, 2002, regarding the closure of the TA-54 CSUs. LANL would like to establish the same approach for the TA-55 storage tank system as described below.

LANL intends to develop a unit-specific closure/sampling plan. This plan will utilize the operating record at the time of closure to determine the hazardous constituents that were actually stored and to identify the nature and extent of spills (if any) that may have occurred. The use of the operating record will narrow the range of hazardous constituents to be sampled for and be more representative of the potential contamination at the unit. A list of potential hazardous constituents is provided in Table F.2-2 and represents the breadth of EPA Hazardous Waste Numbers capable of being treated in the unit as identified in the LANL General Part A (LANL, 1998b).

In addition, this unit-specific closure/sampling plan will utilize the operating record to determine:

- The waste types that will be removed prior to and during closure.
- The final disposal destination for the waste and for any wastes generated as a result of the decontamination and disposal operations.
- The most recent procedures, technologies, and innovations to provide clean closure of the unit and protect human health and the environment.

b) *The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(b)(3)), the types of off-site hazardous waste, management facilities to be used must be identified. Revise the Application to describe the handling and disposal of removed waste and, if waste is to be shipped to an off-site location, the types of waste that will be shipped to each specific off-site facility.*

LANL Response: Please refer to the response to Comment No. 65a.

66. *Attachment F.2.2.4, Closure Procedures and Decontamination (40 C.F.R. §§ 264.112(b)(3-4) and 264.197)*

a) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.112(b)(3) and (4)) a detailed description for the closure of each component of the storage tank*

system must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.2.2.4.1 through F.2.2.4.3 do not provide information to fulfill the requirements. Revise the Application to adequately address the requirements for closure, decontamination, and verification.

LANL Response: LANL maintains that Attachment F.2 of the Permit Application meets the closure criteria set forth in the regulations with the following sections:

- Section F.2.2.4 - general decontamination information including PPE, pre-closure activities, and inspection criteria.
- Section F.2.2.4.1 - specific information for the storage tank components.
- Section F.2.2.4.2 - specific information for the ancillary equipment.
- Section F.2.2.4.3 – specific decontamination information for the areas adjacent to the storage tank system (i.e., secondary containment).
- Section F.2.2.5 - decontamination of the equipment used to conduct the closure
- Section F.2.2.6 - verification method to ensure adequate decontamination.
- Section F.2.3 – sampling and analytical procedures including both soils and liquid.

b) *The Application states that all sampling will be done in accordance with Quality Assurance/Quality Control (QA/QC) procedures, however, the procedures are not provided. Revise the Application to include these QA/QC procedures.*

LANL Response: Please refer to LANL General Comment No. 4.

c) *The schedule for closure activities for the storage tank system is presented in Table F .2-1. However. it is not apparent that the schedule allows time for proper data validation, time to treat wastes, or adequate time for transporting wastes to disposal sites, if warranted. In addition, some structures in the storage tank system area may be left in service during partial closure. Revise the schedule to be comprehensive of all potential activities for closure and partial closure.*

LANL Response: Please refer to the response to Comment No. 50d.

d) *The Application states that all workers will have proper training and medical monitoring. Reference the appropriate portions of the Application that discuss the training requirements and medical monitoring requirements for workers.*

LANL Response: Please refer to the response to Comment No. 50e.

67. *Section F.2.2.4.1, Storage Tank System Components*

a) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how the storage tank system will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residue's and contaminated containment system components, equipment, and structures of the storage tank system.*

LANL Response: The storage tank system component(s) and/or ancillary equipment to be closed will be removed and cut up into pieces that can be packaged into containers. Details regarding exactly how this will be conducted will be provided in the unit-specific closure/sampling plan at the time of closure as discussed in the response to Comment No. 65a.

b) *Provide the regulations that will be applicable for managing the containerized components of the storage tank system.*

LANL Response: Please refer to the response to Comment No. 65a.

68. *Section F.2.2.4.2, Ancillary Equipment*

a) *The Application states that ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.*

LANL Response: Please refer to the response Comment No. 15.

b) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how ancillary equipment will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous and radiological waste residues and contaminated ancillary equipment components of the storage tank system.*

LANL Response: Please refer to the response to Comment No. 67a.

c) *Revise the Application to reference the regulations that will be applicable for managing the containerized ancillary equipment components.*

LANL Response: Please refer to the response to Comment No. 65a.

d) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.*

LANL Response: Please refer to LANL General Comment No. 3.

e) *The Application should provide a listing of expected contaminants (parameters) that may be present in the ancillary equipment. Revise the Application to include a listing of potential contaminants in the ancillary equipment.*

LANL Response: Please refer to the response to Comment No. 65a

f) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

g) *Decontamination verification for radionuclides must include swipe analyses of structures or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of Swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

h) *Decontamination verification of hazardous waste management unit surfaces for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in Comment g) above. Revise the Application to include swipe sampling methods and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

i) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the*

prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

LANL Response: Please refer to the response to Comment No. 65a.

69. *Section F.2.2.4.3, Areas Adjacent to the Storage Tank System*

a) *The Application states that random swipes will be taken from the area adjacent to the storage tank system. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also, indicate that swipe samples will be taken for both hazardous and radiological constituents.*

LANL Response: Please refer to the response to Comment No. 65a

b) *Clarify whether swipe samples will be taken from secondary containment systems.*

LANL Response: The swipe samples are to be taken from the surfaces in Rooms 401 and 434A adjacent to the storage tank system, this is the secondary containment.

c) *The Application states that swipe samples will be taken from sumps and drains. Discuss how the extent of contamination, for example to the trap or past the trap into the drain system, will be determined. If the swipe analysis indicates the presence of contamination, discuss how sumps and drains past the trap will be sampled. Also, if drains are found to be contaminated, discuss how drain systems will either be removed or decontaminated. Also, for any decontaminated drain system, soils surrounding the drain system must be sampled to ensure that soils have not been contaminated as a result of leakages. Revise the Application to address these issues.*

LANL Response: Please refer to the response to Comment No. 51e.

d) *The Application indicates that drains will be washed down. Clarify how a drain is washed down and clarify how wash water will be prevented from entering the drain lines.*

LANL Response: Please refer to the response to Comment No. 51e.

e) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 65a.

70. *Attachment F.2.2.5, Decontamination Equipment (40 C.F.R. && 264.112(b)(3-4) and 264.197)*

The Application discusses cleaning of equipment, but it does not discuss how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

LANL Response: Section F.2.2.6 provides detailed information for decontamination verification. This is inclusive of the decontamination equipment.

71. *Attachment F.2.2.6, Decontamination Verification (40 C.F.R. && 264.112(b)(3-5))*

a) *Sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *The Application should provide a listing of expected contaminants (parameters) that may be present within the storage tank system. Revise the Application to include a listing of potential contaminants within the storage tank system.*

LANL Response: Please refer to the response to Comment No. 65a.

c) *The Application states that the significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied must be provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.*

LANL Response: Please refer to the response to Comment No. 55c.

d) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated With this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

e) *Decontamination verification for radionuclides must include swipe analyses of storage tank system surfaces and structures or other equipment that are to be*

left on site, in accordance with NRC Regulatory Guide 1.86, to verify radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of surfaces requiring swipe sampling, and the method of analysis.

LANL Response: Please refer to LANL General Comment No. 3.

f) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

g) *Decontamination verification of storage tank system surfaces for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment e) above. Revise the Application to include swipe sampling methods and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

h) *The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination, must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F .R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R § 264.112(c), must be met. Revise the Application to address the written notification requirement.*

LANL Response: Please refer to the response to Comment No. 62.

72. *Attachment F.2.3.2, Liquid Sampling*

The Application states that samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated, However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

LANL Response: Please refer to the response to Comment No. 50f.

73. *Attachment F.2.3.4, Sampling Handling and Documentation*

a) *The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *Discuss special labeling and shipping requirements for radiological samples.*

LANL Response: Please refer to LANL General Comment No. 3.

Comment Nos. 74 - 88, Attachment F.3 – Closure Plan for the Cementation Unit

74. *Attachment F.3.1.1, Closure Performance Standard*

Delete "and post-closure" from the performance standard third bullet.

LANL Response: Please refer to the response to Comment No. 44.

75. *Attachment F.3.1.2, Partial and Final Closure Activities (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), and 264.110 through 264.151)*

a) *Page F.3-1 states that the cementation unit includes the glovebox and associated structures and piping. Section F.3.1.2 refers to the cementation unit, ancillary equipment, and glovebox. Section F.3.2.4 is titled cementation unit and glovebox. Define what is included in the cementation unit and use the term consistently throughout.*

LANL Response: The cementation unit, glovebox, ancillary equipment, and associated secondary containment are described in Attachment I of the application.

b) *Discuss which structure(s) within the cementation unit may be left in service during closure activities.*

LANL Response: The cementation unit is connected to the TA-50-4 facility ventilation, and wet vacuum systems. At closure the piping and ductwork (i.e., ancillary equipment) associated with the unit will be removed to the header that connects them to the facility system. Please note that the facility systems are protected from contamination by vacuum traps, which will also be removed at closure. The facility portions of the ventilation and wet vacuum systems will be left in place to be used by other LANL missions.

In addition, the secondary containment surfaces (i.e. walls and floor) associated with the cementation unit will be decontamination and left in

place to be used by other LANL missions.

76. *Attachment F .3.1.9, Survey Plat and Post-Closure Requirements*

Any criteria used to demonstrate compliance that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

LANL Response: The requirements of 20.4.1 NMAC, Subpart V, 264.112(c) are addressed in Section F.3.1.4.

77. *Attachment F .3.2, Closure Procedures*

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification," also outlined in 40 C.F.R § 264.112(c), must be met. Revise the Application to address the written notification requirement.

LANL Response: Please refer to the response to Comment No. 76.

78. *Attachment F.3.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))*

The Application must provide an estimate of the maximum inventory for each type of waste and within what components of the cementation unit that waste is contained. Revise the Application to include the maximum quantity of waste, waste type, and maximum capacity for the cementation unit.

LANL Response: Please refer to the response to General Comment No. 2.

79. *Attachment F.3.2.2, Description of waste (40 C.F.R. & 264.112(b)(3))*

The description of the waste includes several generalities, such as "typically," "generally," and "may." Revise the Application to remove these generalities and discuss all of the waste streams and waste types that will be treated in the cementation unit.

LANL Response: LANL will revise the application to remove the terms "typically," "generally," and "may." In addition, please refer to the response to Comment No. 80a.

80. *Attachment F .2.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3-4)*

a) *The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F .R. § 264.112(b)(4), which requires submittal of a detailed plan for waste removal. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the cementation unit.*

LANL Response: Solidified waste from the cementation unit will be removed and transported to a permitted CSU prior to disposal at a permitted facility as described in Section F.3.2.3. LANL intends to develop a unit-specific closure/sampling plan for the cementation unit at the time of its closure that is consistent with the operating record. This approach was discussed with Carl Will of the HWB on April 23 and June 7, 2002, regarding the closure of the TA-54 CSUs. LANL would like to establish the same approach for the TA-55 storage tank system as described below.

LANL intends to develop a unit-specific closure/sampling plan. This plan will utilize the operating record of the unit at the time of its closure to determine the hazardous constituents that were actually stored in the unit and to identify the nature and extent of spills (if any) that may have occurred. The use of the operating record will narrow the range of hazardous constituents to be sampled for and be more representative of the potential contamination at the unit. A list of potential hazardous constituents for the cementation unit is provided in Table F.3-2 and represents the breadth of EPA Hazardous Waste Numbers capable of being treated in the unit as identified in the "Los Alamos National Laboratory General Part A Permit Application," (LANL, 1998b).

In addition, this unit-specific closure/sampling plan will utilize the operating record of the unit to determine:

- The waste types that will be removed prior to and during closure.
- The final disposal destination for the waste in the tank component(s) and for any wastes generated as a result of the decontamination and disposal operations.
- The most recent procedures, technologies, and innovations to provide clean closure of the unit and protect human health and the environment.

b) *The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F .R. § 264.112(b)(3)), the types of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the management and disposal of removed waste. If waste will be shipped to an off-site location, describe the types of waste that will be shipped to each specific off-site facility.*

LANL Response: Please refer to the response to Comment No. 80a.

81. *Attachment F.3.2.4, Closure Procedures and Decontamination (40 C.F.R. §§ 264.112(b)(3-4))*

As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R §§ 264.112(b)(3) and (4)) a detailed description for the closure of each hazardous waste management unit must include the steps needed to remove or decontaminate all hazardous waste residues and

contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.3.2.4.1 through F.3.2.4.3 do not provide information sufficient to fulfill these requirements.

LANL Response: LANL maintains that Attachment F.1 of the Permit Application meets the closure criteria set forth in the regulations with the following sections:

- Section F.3.2.4 - general decontamination information applicable to the cementation unit including PPE, pre-closure activities, and inspection criteria.
- Section F.3.2.4.1 - specific decontamination information for the cementation unit and the glovebox it is contained in.
- Section F.3.2.4.2 - specific decontamination information for the ancillary equipment associated with the unit.
- Section F.3.2.4.3 – specific decontamination information for the decontamination of the surface areas adjacent to the unit, which includes the secondary containment.
- Section F.3.2.5 - decontamination of the equipment used to conduct the closure.
- Section F.3.2.6 - verification method to ensure adequate decontamination.
- Section F.3.3 – sampling and analytical procedures including both soils and liquid.

82. *Attachment F.3.2.4.1, Cementation Unit and Glove Box*

a) *The Application states that the cementation unit equipment and glove box will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of equipment may be decontaminated for future use.*

LANL Response: Please refer to the response to Comment No. 75b.

b) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how equipment and pieces of the cementation unit will be disassembled, broken down into container-sized pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residues and contaminated equipment components of the cementation unit and glove box.*

LANL Response: The cementation unit and/or ancillary equipment to be closed will be removed and cut up into pieces that can be packaged into containers. Details regarding exactly how this will be provided in the unit-specific closure plan at the time of closure as discussed in the response to Comment No. 80a.

c) *Revise the Application to include a reference to the regulations that will be applicable for managing the containerized components and removed waste.*

LANL Response: Please refer to the response to Comment No. 80a.

d) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.*

LANL Response: Please refer to LANL General Comment No. 3.

e) *The Application should provide a listing of expected contaminants (parameters) that may be present in the cementation unit equipment and glove box. Revise the Application to include a listing of potential contaminants in the cementation unit equipment and glove box.*

LANL Response: Please refer to the response to Comment No. 80a.

f) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

g) *Decontamination verification for radionuclides must include swipe analyses of cementation unit surfaces and structures or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there: are no remaining hot spots of unacceptable level. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

h) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If*

the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

LANL Response: Please refer to LANL General Comment No. 3.

i) *Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

j) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 80a.

83. *Section F.3.2.4.2, Cementation Unit Ancillary Equipment*

a) *The Application states that ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.*

LANL Response: Please refer to the response to Comment No. 80a.

b) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residue and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how ancillary equipment will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residue and contaminated ancillary equipment components of the cementation unit.*

LANL Response: Please refer to the response to Comment No. 80a.

c) *Revise the Application to include a reference to the regulations that will be applicable, for managing the containerized ancillary equipment components.*

LANL Response: Please refer to the response to Comment No. 80a.

d) *Sampling and analysis will be used to demonstrate that hazardous constituents*

are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

LANL Response: Please refer to LANL General Comment No. 3.

e) *The Application should provide a listing of expected contaminants (parameters) that may be present in the ancillary equipment. Revise the Application to include a listing of potential contaminants in the ancillary equipment.*

LANL Response: Please refer to the response to Comment No. 80a.

f) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

g) *Decontamination verification for radionuclides must include swipe analyses of surfaces and Structures or other equipment that are to be left on-site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable level. Revise the Application to discuss how many swipes will be taken, the amount of coverage of the item requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer LANL General Comment No. 3.

h) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected ;contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

i) *Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

j) *The Application States that the wash cycles will Continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 80a.

84. *Attachment F.3.2.4.3, Areas Adjacent to the Cementation Unit Glove Box*

a) *The Application states that random swipes are to be taken from the area adjacent to the cementation unit glove box. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also indicate that swipes will be taken for both hazardous and radiological constituents.*

LANL Response: Please refer to the response to Comment No. 80a and LANL General Comment No. 1.

b) *Clarify whether swipes will be taken of secondary containment systems other than the floor.*

LANL Response: Swipe samples will be collected from the surfaces in Room 401 adjacent to the cementation unit, this is the secondary containment.

c) *Revise the Application to address investigation of any cracks or fractures in the floors and walls prior to decontamination activities.*

LANL Response: Please refer to the response to Comment No. 13c.

d) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide those levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 80a.

85. *Attachment F.3.2.5, Decontamination Equipment (40 C.F.R. §§ 264.112(b)(3-4))*

The Application discusses cleaning of equipment, but the Application does not discuss how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

LANL Response: Section F.3.2.6 provides detailed information for decontamination verification. This is inclusive of the decontamination equipment.

86. *Attachment F.3.2.6, Decontamination Verification (40 C.F.R. §§ 264.112(b)(5))*

a) *Delete the decontamination criteria. At closure all hazardous waste and hazardous waste residues must be removed or decontaminated.*

LANL Response: The five criteria identified as means of achieving successful decontamination have been approved by NMED in past closure plans. These criteria provide a spectrum of methods that allow the necessary flexibility in the closure plan for conducting a closure. In the past, inordinate amounts of time have been spent modifying closure plans due to unforeseen circumstances that only allowed a single-option approach to successfully demonstrate decontamination. The multi-option approach has proven to be a successful and expedient approach to conducting closures.

b) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination of acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification. Also provide the regulatory limits for the hazardous constituents.*

LANL Response: Please refer to LANL General Comment No. 3.

c) *The Application must provide a listing of expected contaminants (parameters) that may be present within the cementation unit. Revise the Application to include a listing of potential contaminants within the cementation unit.*

LANL Response: Please refer to the response to Comment No. 80a.

d) *The significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW -846. The specific statistical methods that are to be applied must be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.*

LANL Response: Please refer to the response to Comment No. 55c.

e) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

f) *Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

g) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

h) *Decontamination verification of cementation unit surfaces for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in Comment f) above. Revise the Application to include swipe sampling of surfaces and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

i) *The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination, must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F .R. § 264 .112(c), must be met. Revise the Application to discuss the written notification requirement.*

LANL Response: Please refer to the response to Comment No. 76.

87. *Attachment F.3.3.2, Liquid Sampling (40 C.F.R 264.112(b)(4))*

Samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash

water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

LANL Response: Please refer to the response to Comment No. 50f.

88. *Attachment F.3.3.4, Sampling Handling and Documentation (40 C.F.R. & 264.112(b)(4))*

a) *The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *Discuss special labeling and shipping requirements for radiological samples.*

LANL Response: Please refer to LANL General Comment No. 3.

Comment Nos. 89 - 102, Attachment F.4 – Closure Plan for the Vitrification Unit

89. *Attachment F.4.1.1, Closure Performance Standard (40 C.F.R. 264.111)*

Delete "and post-closure" from the performance standard third bullet.

LANL Response: Please refer to the response to Comment No. 44.

90. *Attachment F.4.1.2, Partial and Final Closure Activities (40 C.F.R. 270.14(b)(13), 270.14(b)(15-18), and 264.110 through 264.151)*

a) *Define the vitrification unit and use the term consistently throughout.*

LANL Response: Please refer to the response to Comment No. 22.

b) *Discuss the structures within the vitrification unit that may be left in service during closure activities.*

LANL Response: The vitrification unit is connected to the TA-50-4 facility ventilation of wet vacuum systems. At closure the piping and duct work associated with this unit will be removed to the header which connects them to the facility system. Please note that the facility systems are protected from contamination by vacuum traps, which will also be removed at closure. The facility portions of the ventilation and wet vacuum systems will be left in place to be used by other LANL missions.

91. *Attachment F. 4.1.9, Survey Plat and Post-Closure Requirements*
Any criteria used to demonstrate compliance that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

LANL Response: The requirements of 20.4.1 NMAC, Subpart V, 264.112(c) are addressed in Section F.4.1.4.

92. *Attachment F.4.2, Closure Procedures*

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of, or request for, a permit modification to authorize a change in operating plans, facility design or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F .R. § 264.112(c), must be met. Revise the Application to discuss the written notification requirement.

LANL Response: Please refer to the response to Comment No. 91.

93. *Attachment F.4.2.1, Estimate of Maximum Waste in Storage (40 C.F.R § 264.112(b)(3))*

The Application must provide an estimate of the maximum inventory for each type of waste and identify the components of the vitrification unit where that waste is contained Revise the Application to include for each component of the vitrification unit, the maximum quantity of waste, waste type, and maximum capacity.

LANL Response: Please refer the response to General Comment No. 2.

94. *Attachment F .4.2.3, Removal of waste (40 C.F .R. §§ 264.112(b)(3-4))*

a) *The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(b)(4)), which requires the submittal of a detailed plan for waste removal. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the vitrification unit.*

LANL Response: Solidified waste from the vitrification unit will be removed and transported to a permitted CSU prior to disposal at a permitted facility as described in Section F.3.2.3. LANL intends to develop a unit-specific closure/sampling plan for the vitrification unit at the time of its closure that is consistent with the operating record. This approach was discussed with Carl Will of the HWB on April 23 and June 7, 2002, regarding the closure of the TA-54 CSUs. LANL would like to establish the same approach for the TA-55 storage tank system as described below.

LANL intends to develop a unit-specific closure/sampling plan. This plan will utilize the operating record of the unit at the time of its closure to determine the hazardous constituents that were actually stored in the unit

and to identify the nature and extent of spills (if any) that may have occurred. The use of the operating record will narrow the range of hazardous constituents to be sampled for and be more representative of the potential contamination at the unit. A list of potential hazardous constituents for the vitrification unit is provided in Table F.4-2 and represents the breadth of EPA Hazardous Waste Numbers capable of being treated in the unit as identified in the "Los Alamos National Laboratory General Part A Permit Application," (LANL, 1998b).

In addition, this unit-specific closure/sampling plan will utilize the operating record of the unit to determine:

- The waste types that will be removed prior to and during closure.
- The final disposal destination for the waste in the unit and for any wastes generated as a result of the decontamination and disposal operations.
- The most recent procedures, technologies, and innovations to provide clean closure of the unit and protect human health and the environment.

b) *The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(b)(3)), the types(s) of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the management and disposal of removed waste If waste will be shipped to an off-site location, describe the types of waste that will be shipped to each specific off-site facility.*

LANL Response: Please refer to the response to Comment No. 94a.

95. *Attachment F.4.2.4, Closure Procedures and Decontamination*

As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.112(b)(3) and (4)), a detailed description for the closure of each hazardous waste management unit must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.4.2.4.1 through F.4.2.4.3 do not provide information to fulfill the requirements.

LANL Response: Attachment F.4 of the Permit Application meets the closure criteria set forth in the regulations with the following sections:

- Section F.4.2.4 - general decontamination information applicable to the vitrification unit including PPE, pre-closure activities, and inspection criteria.

- Section F.4.2.4.1 - specific decontamination information for the vitrification unit and glovebox.
- Section F.4.2.4.2 - specific decontamination information for the ancillary equipment associated with the unit.
- Section F.4.2.4.3 – specific decontamination information for the decontamination of the surface areas adjacent to the unit which includes the secondary containment.
- Section F.4.2.5 - decontamination of the equipment used to conduct the closure.
- Section F.4.2.6 - verification method to ensure adequate decontamination.
- Section F.4.3 – sampling and analytical procedures including both soils and liquid.

96. *Attachment F.4.2.4.1, Vitrification Unit and Glove Box*

a) *The Application states that the vitrification unit equipment and glove box will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of equipment may be decontaminated for future use.*

LANL Response: Please refer to the response to comment Nos. 90b.

b) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how equipment or pieces of the vitrification unit will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residue and contaminated equipment components of the vitrification unit.*

LANL Response: The vitrification unit and/or ancillary equipment to be closed will be removed and cut up into pieces that can be packaged into containers. Details regarding exactly how this will be provided in the unit-specific closure plan at the time of closure as discussed in the response to Comment No. 94a.

c) *Revise the Application to include a reference to the regulations that will be applicable for managing the containerized components and removed waste.*

LANL Response: Please refer to the response to Comment No. 94a.

d) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure.*

However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Applicati9n to include a discussion of radiological decontamination verification.

LANL Response: Please refer to LANL General Comment No. 3.

e) *The Application must provide a listing of expected contaminants (parameters) that may be present in the vitrification unit equipment and glove box. Revise the Application to include a listing of potential contaminants in the vitrification unit equipment and glove box.*

LANL Response: Please refer to the response to Comment No. 94a.

f) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to-address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

g) *Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount' of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

h) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

i) *Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in the Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

j) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 94a.

97. *Section F.4.2.4.2, Vitrification Unit Ancillary Equipment*

a) *The Application states that vitrification unit ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.*

LANL Response: Please refer to the response to Comment No. 90b.

b) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how vitrification unit ancillary equipment .will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residues and contaminated ancillary equipment components of the vitrification unit.*

LANL Response: Please refer to the response to Comment No. 94a.

c) *Revise the Application to include a reference to the regulations that will be applicable for managing the containerized ancillary equipment components.*

LANL Response: Please refer to the response to Comment No. 94a.

d) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.*

LANL Response: Please refer to LANL General Comment No. 3.

e) *The Application must provide a listing of expected contaminants (parameters) that may be present in the vitrification unit. Revise the Application to include a listing of potential contaminants in the vitrification unit.*

LANL Response: Please refer to the response to Comment No. 94a.

f) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for*

the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

g) *Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

h) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the, present of fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.*

LANL Response: Please refer to LANL General Comment No. 3.

i) *Decontamination verification for hazardous waste residues must be verified using swipe analysis similar to that as outlined in the Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage. and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

j) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide those levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 94a.

98. *Attachment F .4.2.4.3, Areas Adjacent to the Vitrification Unit Glove Box*

a) *The Application states that random swipes are to be taken from the area adjacent to the vitrification unit glove box. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also indicate that swipes will be taken for both hazardous and radiological constituents.*

LANL Response: Please refer to the response to Comment No. 94a and LANL General Comment No. 3.

b) *Clarify whether swipes will be taken of secondary containment systems other than the floor.*

LANL Response: Swipe samples will be taken from the surfaces in Room 434A adjacent to the vitrification unit to determine the presence of hazardous constituents, if any. Please refer to the response to Comment No. 50f.

c) *Revise the Application to address investigation of any cracks or fractures in the floors and walls prior to decontamination activities.*

LANL Response: Please refer to the response to Comment No. 13c.

d) *The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.*

LANL Response: Please refer to the response to Comment No. 94a.

99. *Attachment F.4.2.5, Decontamination Equipment (40 C.F.R. §§ 264.112(b)(3-4))*

The Application discusses cleaning of equipment, but the Application does not discuss how the equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

LANL Response: Section F.4.2.6 provides detailed information for decontamination verification. This is inclusive of the decontamination equipment, if applicable.

100. *Attachment F.4.2.6, Decontamination Verification (40 C.F.R. § 264.112(b)(5))*

a) *The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination levels and verification. Also provide the regulatory limits for the hazardous constituents.*

LANL Response: Please refer to LANL General Comment No. 3.

b) *The Application must provide a listing of expected contaminants (parameters) that may be present within the vitrification unit. Revise the Application to include a listing of potential contaminants within the vitrification unit.*

LANL Response: Please refer to the response to Comment No. 94a.

c) *The Application states that the significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied should be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.*

LANL Response: Please refer to the response to Comment No. 55c.

d) *The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.*

LANL Response: Please refer to the response to Comment Nos. 50f and 55d.

e) *Decontamination verification for radionuclides must also include swipe analyses of surfaces, structures, or other equipment that are left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable level. Revise the Application to include the use of swipe sampling methods and discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.*

LANL Response: Please refer to LANL General Comment No. 3.

f) *In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present; If*

the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

LANL Response: Please refer to LANL General Comment No. 3.

g) *Decontamination verification of the vitrification unit for hazardous waste residues must also be verified using swipe analysis, similar to that as outlined in the Comment e) above. Revise the Application to include swipe sampling of surfaces and analysis for hazardous waste residues. The discussion must include how many swipes will be taken, percent surface coverage, and the method of analysis.*

LANL Response: Please refer to the response to Comment No. 50f.

h) *The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R § 264.112(c), must be met. Revise the Application to discuss the written notification requirement.*

LANL Response: Please refer to the response to Comment No. 91.

101. *Attachrnent F.4.3.2, Liquid Sampling (40 C.F.R. & 264.112(b)(4))*

The Application states that samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

LANL Response: Please refer to the response to Comment No. 50f.

102. *Attachment F.4.3.4, Sampling Handling and Documentation (40 C.F.R. § 264.112(b)(4))*

a) *The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.*

LANL Response: Please refer to LANL General Comment No. 3.

b) Discuss special labeling and shipping requirements for radiological samples.

LANL Response: Please refer to LANL General Comment No. 3.

Comment Nos. 103 - 107, Attachment G – Container Storage

103. Attachment G, Container Storage (40 C.F.R. § 270.15 and 264 Subpart I)

The Application does not provide engineering drawings or figures for each CSU showing container layout, including waste placement by waste container type and locations of aisles. In addition, drawings must demonstrate locations of containment systems and flow of liquids to collection areas. Revise the Application to include these drawings for each CSU.

LANL Response: Engineering Drawings are provided as Figures G-1, G-2, G-3, and G-4 in attachment G of the Application. Additional Figures are provided in Attachment D of this NOD Response and provide one potential container layout for 55-gallon and SWB's at the CSUs for the purposes of determining capacity.

104. Attachment G.1, Container Storage at TA-55 (40 C.F.R. 270.14(h)(1 and 264.172)

It is not clear that all types of waste containers to be used for storage of hazardous waste have been identified. The Application must identify all waste containers to be permitted for storage at all CSU's. Revise the Application to remove the term "but are not limited to" and indicate all the types of waste containers that will be used at all CSU's.

LANL Response: Please refer to the response to Comment Nos. 3a and b.

105. Attachment G.2, Containment Systems (40 C.F.R. 270.15(a)(1-5), 270 and 264.175)

a) For containers bearing liquid wastes, the Application does not provide the dimensions for containment systems and the number of containers, by container type, the containment systems are designed for. In addition, the calculations of the capacity of the containment system relative to waste containers must be provided. Revise the Application accordingly.

LANL Response: Please refer to the response to Comment Nos. 3a and 9c.

b) For containers that will not contain liquid wastes, the Application must provide the test procedures and results or other documentation for demonstrating that containers do not contain free liquids. The Application must also identify each specific type of waste that will be permitted for storage at each of the CSU's storage areas. Revise the Application accordingly.

LANL Response: Please refer to the response to Comment No. 9a.

c) The Application implies that since wastes to be stored at TA-55-4, B05, B45 and TA-55-185 will not contain liquids, secondary containment requirements are not

required. While the secondary containment requirements outlined in 20.4.1.900 NMAC (incorporating 40 C.F.R § 270.15(a)) are not applicable, the requirements of 20.4.1.900 NMAC (incorporating 40 C.F.R § 270.15(b)), must be met. This includes demonstrating how the CSUs are designed to drain and remove liquids and how containers will be kept from contact with liquids. Revise the Application to address these issues.

LANL Response: LANL will revise Attachment G to include the following:

> "The CSUs in TA-55-4 (B05 and B45), and TA-55-185 all reside in a building so 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. On working days a daily inspection of each CSUs is usually conducted. Some drummed waste are placed on pallets or stored in self-containment structures. Standard waste boxes are placed in pallets and our large waste boxes have raised legs. All waste items placed in TA-55-185 will either be placed on pallets or have raised legs."

d) *The Application implies that wastes to be stored at TA-55-4, B05, B45, and TA-55-185 include but are not limited to cemented, mixed heterogeneous, and vitrified wastes. Revise the Application to specify all wastes to be permitted for storage at TA-55-4, B05, B45, and TA-55-185.*

LANL Response: LANL will revise the application to indicate that the wastes allowed to be stored in TA-55 CSUs are identified in the General Part A.

106. *Attachment G.3, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. §& 270.14(b)(9). 270.15(c-d). 264.17.264.176 and 264.177)*

a) *The Application must include engineering drawings or other data that will demonstrate the containers of ignitable or reactive waste are located 50 feet from the TA boundary. Revise the Application to include this figure(s).*

LANL Response: Please refer to Figure A-5 of the application.

b) *Provide specific policies that are in place to ensure that precautions are taken to include prevention of ignition, spontaneous ignition, and radiant heat.*

LANL Response: Please refer to the response to Comment No. 10b.

c) *The requirements for incompatible waste outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.177(c)) are not addressed. A storage container with incompatible hazardous waste must be separated from other materials or be protected from other materials by means of a berm, dike, wall, or other device. Revise the Application to clarify that incompatible wastes will be separated and , segregated from other wastes and materials by means of a berm, dike, wall, or other specific means.*

LANL Response: Please refer to the response to Comment No. 10b.

d) *The Application must describe all processes that will be used to prevent reactions that may generate extreme heat, pressure, fire, explosions, or violent reactions; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to threaten human health or the environment; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to pose a risk of fire or explosions; damage the structural integrity of the facility; or be a threat to human health or the environment. Revise the Application to include a discussion of these preventative processes.*

LANL Response: Please refer to the response to Comment No. 10b.

e) *Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)(4)), the Application must ensure the management of incompatible wastes within a CSU where secondary containment systems will be used and show that the presence of incompatible wastes will not cause the secondary containment system to leak, corrode, or fail. Revise the Application to discuss safeguards that are in place to ensure the compatibility of incompatible wastes with the secondary containment systems.*

LANL Response: Please refer to the response to Comment No. 10b.

107. *Attachment G.4, Air Emission Standards for Containers*

The Application refers to containers meeting the U.S. Department of Transponation (DOT) specifications of 49 C.F.R Part 178. Revise the Application to include a description of the specific specifications in 49 C.F.R Part 178 and the criteria for determining compliance with these specifications for each type of container to be used for storage at each CSU.

LANL Response: Please refer to the response to Comment No. 3a and Attachment B of this NOD Response.

Comment Nos. 108 - 110, Attachment H – Storage Tank System

108. *Attachment H.1, Design, Construction, Materials and Operation (40 C.F.R. 270.16(b-d) and 264.191(b)(1 and 3))*

a) *Revise the Application to provide the criteria that will be used to determine whether wastes will be treated in the cementation unit or the vitrification unit.*

LANL Response: Wastes will be treated in the cementation unit or vitrification unit based upon the radionuclide and chemical content. Please refer to Attachment I, Section I.2 and Attachment J, Section J.2 for additional discussion regarding treatment effectiveness for each unit.

b) *Revise the Application to provide the radionuclide discard limit that will be used to determine if wastes will be transferred to the cementation unit pencil tank or, the pencil tanks.*

LANL Response: Please refer to LANL General Comment No. 3.

c) *The Application states that if sample analysis indicates that concentrations are above the discard limit the solutions will be re-circulated. It is not clear from the Application how they will be re-circulated and what the re-circulation process does to lower concentrations, for example by dilution into other solutions. Provide a discussion of the re-circulation process and how this process will affect radionuclide concentrations in solutions.*

LANL Response: If the evaporator bottom solutions are above the plutonium discard limit they are sent back to the TA-55 recovery process where the plutonium is recovered for programmatic use. Please refer to LANL General Comment No. 3.

109. *Attachment H.3, Secondary Containment (40 C.F.R. §§ 270.16(g) and 264.193)*

a) *Information must be included in the Application that demonstrates, using calculations, that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.*

LANL Response: Please refer to the response to Comment No. 13b.

b) *The Application is not clear whether the floor, which will act as the secondary containment system, is sloped to allow collection of liquids. Discuss this issue.*

LANL Response: The floor is not sloped to allow for the collection of liquids. Please refer to the response to Comment No. 13b.

c) *The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.*

LANL Response: Please refer to the response to Comment No. 13c.

d) *Revise the Application to include a statement that the containment system is designed to completely surround the storage tank system.*

LANL Response: Please refer to the response to Comment No. 13d.

e) *The Application states that any accumulated liquids will be removed as soon as possible. Revise the Application to include the requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.193(c)(4)) that all hazardous waste and accumulated liquids must be removed from the secondary containment system within 24 hours, unless Permittees demonstrate. to NMED that removal of the hazardous waste or accumulated liquids cannot be .accomplished in 24 hours, in which case the hazardous waste and liquids must be removed in as timely a manner as possible to prevent harm to human health and the environment.*

LANL Response: Please refer to the response to Comment No. 16b.

110. *Attachment H.4, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. 66 270.16(g-h). 264.17.264.198 and 264.199)*

In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:

a) *Provide the operating pressure and temperature specifications for the tanks;*
b) *Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank systems so that it no longer is ignitable or reactive;*
c) *Demonstrate that the wastes are not placed in the same tank system unless there is compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.17(b));*
d) *Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;*
e) *Demonstrate that the requirements are met for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;*
f) *Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R § 264.17(b)) to prevent reactions; and*
g) *Indicate whether the tank system is used solely for emergencies.*

LANL Response: Please refer to the response to Comment No. 14.

Comment Nos. 111 - 112, Attachment I – Cementation Unit

111. *Attachment I.3.3, Protection of the Atmosphere (40 C.F.R. §§ 270.23(b-c) and 264.601(a-c))*

The cementation unit has a system of negative pressure zones and high-efficiency particulate filters (HEPA) that are designed to work together to prevent releases of contaminants to the atmosphere. Attachment K.3.4 of the Application states that backup generators are available at TA-55 in the event of a power outage. However, it appears that there is no immediately available backup system for the cementation unit. The Application must address how releases to the atmosphere will be prevented in the event of a power outage causing a temporary shutdown of the negative pressure zones and HEPA filter system. In addition, the Application must address how long the system will

be shut down before the backup generators can be activated to operate the cementation unit pressure regulation system. Revise the Application to address these issues.

LANL Response: LANL will revise the application to include the following:

> "The cementation unit is contained inside a glovebox that is connected to the TA-55-4 facility ventilation system. The HEPA 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 which provides exhausts 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."

112. *Attachment I.4, Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R §§ 270.14(b)(9), 264.17, 264.198 and 264.199)*

In the event that ignitable or reactive waste is stored in any part of the cementation unit, the following must be either provided or demonstrated. Revise the Application to address these issues.

a) *Provide the operating pressure and temperature specifications for the system and associated tanks;*
b) *Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the system so that it no longer is ignitable or reactive;*
c) *Demonstrate that the wastes are not placed in the same system unless there is compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b));*
d) *Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;*
e) *Demonstrate that the requirements are met for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;*
f) *Provide procedures assuring that hazardous waste will not be placed in a system that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and*
g) *Indicate whether the system is used solely for emergencies.*

LANL Response: Please refer to the response to Comment No. 19a.

Comment Nos. 113 - 117, Attachment J – Vitrification Unit

113. *Attachment J.1.4, Off-Gas System (40 C.F.R. § 270.23(a))*

a) *This Section describes a caustic scrubber column for cleaning the off-gas. The rationale for the choice of a caustic scrubber is not provided. Identify and provide measured or estimated concentrations of all contaminants in the off-gas that are to be controlled by the caustic scrubber column. Also provide the scrubber's design removal efficiency and the outlet concentrations for each contaminant.*

LANL Response: Please refer to LANL General Comment No. 5.

b) *The description of the scrubber is incomplete in that it does not identify the type or size of the packing nor the concentration of caustic (or pH) of the scrubber solution. Provide this information.*

LANL Response: Please refer to LANL General Comment No. 5.

c) *The second paragraph indicates that the off-gas will be cooled by a quencher before entering the scrubber. This quencher is not described and the temperature to which the gas will be cooled is not given. Revise the Application to provide a description of the quencher and indicate the design outlet temperature.*

LANL Response: Please refer to LANL General Comment No. 5.

d) *The scrubber is stated to exhaust to the building wet/dry vacuum system. This system is not described. Revise the Application to provide a brief description of this system, oriented towards its ability to control any contaminants remaining in the scrubber exhaust.*

LANL Response: Please refer to LANL General Comment No. 5.

e) *Once the off-gas system has been constructed, a performance evaluation must be completed to determine the effectiveness of the system. The evaluation must include a determination of the actual control efficiency of the scrubber, emission rates, and whether any additional controls to supplement the efficiency of the scrubber are required.*

LANL Response: Please refer to LANL General Comment No. 5.

f) *As it is unlikely that a 100 percent control efficiency for mercury can be obtained, measurements of the actual control efficiency must be made. Also, the amount of mercury that is actually vaporized must be determined. Include these in the performance evaluation.*

LANL Response: Please refer to LANL General Comment No. 5.

g) *In addition. provide a detailed plan for how the performance evaluation will be conducted, including how and where within the system influent and effluent samples will be taken. how these samples will be evaluated and against what performance criteria, and the specific constituents that will be monitored.*

LANL Response: Please refer to LANL General Comment No. 5.

h) *During start up and shut down of the system, waste must not be fed into the vitrification unit unless it is demonstrated that the off-gas system is operating within the parameters specified in the Application. Revise the Application to discuss start up and shut down procedures.*

LANL Response: Please refer to LANL General Comment No. 5.

i) *Discuss monitoring that will be conducted to ensure continued operational effectiveness of the off-gas system.*

LANL Response: Please refer to LANL General Comment No. 5.

114. *Attachment J.1.5, Glove Box (40 C.F.R. & 270.23(a))*

The Application states that a small cooling system for the glove box will be used if necessary to maintain temperatures within specification. This cooling system is not addressed in any of the supporting engineering information provided with the Application. Revise the Application to include a description and design of the cooling system, operating conditions, and the location of the cooling system in the glove box.

LANL Response: Please refer to LANL General Comment No. 5.

115. *Attachment J.2, Vitrification Unit Demonstration of Treatment Effectiveness C.F.R. § 270.23(d)*

The Application States that the Permittees will implement appropriate waste management options for mercury in the scrubber solution. Revise the Application to provide these waste management options.

LANL Response: Please refer to LANL General Comment No. 5.

116. *Attachment J.3.3, Protection of the Atmosphere (40 C.F.R §§ 270.23(b-c) and 264.601(c))*

a) *The vitrification unit has a system of negative pressure zones and HEP A filters that are designed to work together to prevent releases of contaminants to the atmosphere. Attachment K.3.4 of the Application states that backup generators are available at TA-55 in the event of a power outage. However, it appears that there is no immediately available backup system for the vitrification unit to ensure there will be no downtime in the operation of the off-gas system. The Application must address how releases to the atmosphere will be prevented in the event of a power outage causing a temporary shutdown of the negative pressure zones and the off-gas system. In addition, the Application must address how long the system will be shut down until the backup generators can be activated to operate the vitrification unit pressure regulation system. Revise the Application to address these issues.*

LANL Response: LANL will revise the application to include the following:

> "The negative pressure on the melter and off-gas system is provided by the facility wet vacuum system. In the event that the wet vacuum system goes down, the melter will be shut down. Gases in the system at the time of shut down will continue to exhaust through the off-gas system (which will remain operating – pumps are connected to a independent UPS) until the internal

pressure of the melter cannot overcome the pressure drop associated with the scrubber packing (approximately 5 psi). No release to the glove box or room is anticipated in the event of wet vacuum failure."

b) *This Section describes the fugitive emission prevention system. It does not appear that a fan in the off-gas system is used and that the building wet/dry vacuum system provides the suction to move the gas. Revise the Application to specify that the system will keep the off-gas system at a pressure below that of the glove box and describe how this is achieved.*

LANL Response: LANL will revise the application to include the following:

"The wet vacuum system maintains the off-gas system and the melter at a negative pressure relative to the glove box. The glove box is maintained at a negative pressure relative to the room through the Zone 1 ventilation system. These systems are independent and maintained at the desired set points through associated control systems."

c) *It appears that cascaded levels of negative pressure are being used to collect fugitive emissions. Revise the Application to include the methods that the facility glove box exhaust system will employ to control what is collected.*

LANL Response: LANL will revise the application to include the following:

"The facility-wide ventilation system is designed maintain series of progressively more negative pressure zones (i.e. air flows from the PF-4 corridors into the rooms, then into the glove boxes) and is then discharged into the Zone 1 ventilation system. Air flowing through Zone 1 passes through 3 stages of HEPA filters before being discharged through a stack to the environment. Zone 1 does not provide for the removal of chemical constituents unless they are in a particulate form."

d) *The HEPA filter on the glove box will not control NOx emissions that might get into the glove box. Discuss whether NOx will be controlled and if NOx will be vented to the atmosphere.*

LANL Response: Gases released into the glovebox will pass into the Zone 1 ventilation system. This system does not prevent the release of NO_x to the environment.

117. *Attachment J.4, Special Requirements for Ignitable, Reactive, or Incompatible Wastes (40 C.F.R. §§ 270.14(b)(9), 264.17, 264.198 and 264.199)*

While no ignitable, reactive, or incompatible wastes will be treated in the vitrification unit, the unit is located in the same room and utilizing the same secondary containment system as the storage tanks, which may be used for ignitable, reactive, or incompatible

wastes. Therefore, the Application must address the potential for contact of these wastes with the vitrification unit and associated waste streams in the event of a leak of either ignitable, reactive, or incompatible: waste from either the storage tank system, cementation unit. or vitrification unit.

LANL Response: Please refer to the response to Comment No. 19b.

Comment Nos. 118 - 121, Attachment K – Waste Management Practices

118. *Attachment K.2.4, Aisle Space Requirements (40 C.F.R. § 264.35)*

The requirements for aisle space as outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.35) state that aisle space must be maintained that will allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility in an emergency. It is not apparent that the proposed aisle space meets this requirement. Revise the Application to indicate that a minimum aisle space of three feet will be used, or provide adequate justification for the use of a smaller aisle space.

LANL Response: Please refer to the response to Comment No. 4a.

119. *Attachment K.3.4, Mitigating Effects of Power Outages (40 C.F.R. § 270.14(b)(8) and 264 Subpart C)*

The Application states that, in the event of a power outage, portable generators are available. This statement allows that there is no immediate backup generator system that would provide immediate power in the event of an outage. This is especially a concern for the off-gas system of the vitrification unit. Provide a discussion regarding the prevention of process upsets and system failures in the vitrification unit off-gas system in the event of a power failure.

LANL Response: The cementation unit is contained inside a glovebox that is connected to the TA-55-4 facility ventilation system. The HEPA 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 which provides exhausts 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.

120. *Attachment K.3.6, Preventing Releases to the Atmosphere (40 C.F.R. § 270.14(b)(8) and 264 Subpart C)*

As discussed in previous comments, a performance evaluation demonstrating the effectiveness of the vitrification system's off-gas unit must be provided to demonstrate that there will be no releases of either hazardous or radiological constituents to the atmosphere. Include a reference to the vitrification off-gas system performance evaluation.

LANL Response: Please refer to LANL General Comment No. 2.

121. *Attachment K.4.1, Hazardous Waste Report (Biennial Report)*

Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.75), the biennial report must cover activities during the previous calendar year only. The Application indicates that more than one calendar year may be covered by the report. While some activities may overlap into more than one year, the report should focus on one calendar year. Clarify that the report will primarily address only the previous calendar year.

LANL Response: Section K.4.1 states the following:

"The report will cover facility activities during the previous calendar year..."

REFERENCES

EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (SW-846) Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington D.C..

EPA, 1985, "Verification of PCB Spill Cleanup by Sampling and Analysis," EPA-560/5-85-026, U.S. Environmental Protection Agency, Washington D.C.

HRMB, 1998, "Standard Operating Procedures Manual," Volume1, Hazardous and Radioactive Materials Bureau, Santa Fe, New Mexico, March 1998.

INEEL, 2001, "Final Design Report for DP Surety Vitrification System," Rev. 2.0, Idaho Engineering and Environmental Laboratory, Idaho Falls, Idaho.

LANL, 2002a, "Los Alamos National Laboratory Technical Area 55 Part B Permit Application, " LA-UR-02-561, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002b, "LANL Waste Acceptance Criteria, "PLAN-WASTEMGMT-002, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002c, "Packing TRU Waste Containers," NMT7-WI3-SOP-TA55-013, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002d, "Managing Solid Low-Level Waste at TA-55," NMT7-HCP-TA55-DP-02L, R0.3, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002e, "Certification and Disposal of Low-level," NMT7-SOP-TA55-DP-01L, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002f, "Response to Notice of Deficiency; RCRA Permit Application General Part A, April 1998, Revision 0.0; General Part B, October 1998, Revision 1.0; Los Alamos National Laboratory; May 16, 2002," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002g, "Los Alamos National Laboratory Transuranic Waste Certification Plan," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2001, "Storage Area Inspections, " NMT7-WI1-HCP-TA-55-011, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1999a, "Certification and Disposal of Low-Level, Oversize Waste," NMT7-WI13-TA55-HCP–DP-2L, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1999b, "Acceptable Knowledge Guidance," LIG 404-00-02, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998a, "Los Alamos National Laboratory General Part A Permit Application, "Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, "Los Alamos National Laboratory General Part B Permit Application," Los Alamos National Laboratory, Los Alamos, New Mexico.

OSHA, 1999, "Surface Contamination," Occupational Safety and Health Administration.

CERTIFICATION

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 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.

Barbara Ostrue for

James L. Holt
Associate Director, Operations
Los Alamos National Laboratory
Operator

8/14/02
Date Signed

Ralph E. Erickson
Director, Office of Los Alamos Site Operation
U.S. Department of Energy
Albuquerque Operations
Owner/Operator

8/15/02
Date Signed

ATTACHMENT A

Notice of Deficiency; TA-55 Part B RCRA Permit Application, Revision 1.0, May 16, 2002

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone (505) 428-2500
Fax (505) 428-2567
www.nmenv.state.nm.us

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

VIA OVERNIGHT DELIVERY

May 16, 2002

Dr. John C. Browne, Director
Los Alamos National Laboratory
P.O. Box 1663, MS A100
Los Alamos, NM 87545

Mr. David A. Gurulé, Area Manager
Los Alamos Area Office
Department of Energy
528 35th Street, MS A316
Los Alamos, NM 87544

SUBJECT: NOTICE OF DEFICIENCY
TA-55 PART B RCRA PERMIT APPLICATION
JANUARY 2002, REVISION 1.0
LOS ALAMOS NATIONAL LABORATORY EPA ID# NM0890010515
HWB-LANL-99-051

Dear Dr. Browne and Mr. Gurulé:

The New Mexico Environment Department (NMED) has reviewed the above-referenced Application for technical adequacy, as required under 20.4.2.201.3 NMAC.

NMED requires additional information from the Permittees in order for the Application to be considered technically adequate. This additional information that must be addressed is described in Attachment A.

The Permittees must submit the requested information to NMED within ninety days of receipt of this letter.

If you have any questions or need additional information please contact Carl Will of my staff at 505-428-2542.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

attachment

cc: J. Kieling, NMED HWB
D. Cobrain, NMED HWB
C. Will, NMED HWB
A. Ortiz, NMED OGC
P. Walton, Techlaw
L. King, EPA 6PD-N
J. Ellvinger, LANL ESH-19, MS K490
G. Bacigalupa, LANL ESH-19, MS K490
G. Turner, DOE LAAO, MS A316

file: Reading and LANL TA-55

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file: Reading and LANL TA-55

ATTACHMENT A
NOTICE OF DEFICIENCY
TECHNICAL ADEQUACY REVIEW

RCRA PART B PERMIT APPLICATION
TA-55, REVISION 1.0, JANUARY 2002

LOS ALAMOS NATIONAL LABORATORY
EPA ID NO. NM0890010515

May 16, 2002

GENERAL COMMENTS

1. The Application lacks sufficient detail, especially in regard to the container storage units (CSU's). The Application does not provide detail as to how specifically the CSU's and the other waste storage and treatment activities and equipment will meet regulatory requirements. Revise the Application to include details on how the hazardous waste management units and the hazardous waste management activities will comply with requirements of the regulations.

2. The Application does not specifically and consistently identify hazardous waste management units which are requested to be permitted. The Application refers variously to eight and nine CSU's. Page 1-1 states that there are nine CSU's; Page 2-1, paragraph 1, states that there are eight CSU's; Section 2.1 states there are nine CSU's; and page 2-1, Sections 2.1 and 2.1.1 list eight CSU's. Page 4-4, Section 4.1.2.3, identifies TA-55-4, Room 401, that "may be used to store hazardous waste," and is not identified elsewhere in the Application text. Figure G-1, "Basement Container Storage Units," includes Room B38, which is not identified elsewhere as a CSU to be permitted. Page 4-4, Section 4.1.2.3, states that B38 is an inactive CSU "that is scheduled for closure under interim status," though no schedule for closure is provided and B38 is not included in the TA-55 Closure Plan. The number of tanks in the storage tank system is not identified. NMED requests that Permittees review for internal consistency and accuracy all documents submitted to NMED. Revise the Application to include a list and description with identifiable locations of all hazardous waste management units included in the Application.

3. The Application does not address the radiological components of the wastes. Radiological characterization is required for storage, treatment, transportation and packaging of treated waste, disposal, decontamination, and verification for closure. The Application should address these issues or provide adequate references to documents that do address the radiological components of the waste.

4. Attachments B.1 and B.2, the waste analysis plans for the cementation unit and vitrification unit, respectively, only provide information related to the waste analysis

plan for the hazardous waste component of the mixed wastes and not the radiological component.

5. In the event that there is leak or spill from one of the storage tanks (e.g., storage tank system, cementation unit tank component and/or vitrification unit tank component), the tank must be removed from service until the requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.196) have been met. If major repairs are warranted, the tank system cannot be returned to service until certification by an independent, qualified, registered, professional engineer has been obtained demonstrating that the repaired system is capable of handling hazardous wastes without a release for the intended life of the system. This certification must be submitted to NMED within seven days after returning the tank system to use. Revise the Application to discuss repair issues for each of the tank systems and include a discussion of the certification of major repairs.

6. The Application references the definition for a solid waste management unit (SWMU) in Section 4.0. However, hazardous waste management units and regulated units are not addressed. Closure of hazardous waste management units must be addressed in the Application, not under general LANL corrective action, and compliance must be demonstrated with all requirements under 40 C.F.R. Part 264, Subpart G.

SPECIFIC COMMENTS

1. Section 1.0, Table 1-1

Delete or indicate as NA references to "post-closure plans," "post-closure," "post-closure care," "Post-closure notices," and "Post-closure cost estimate." Treatment, storage, and miscellaneous units at TA-55 must be closed by removal or decontamination of hazardous waste and hazardous waste residues, and post-closure care with waste left in place is not an option at those units.

Delete or indicate as NA references to "Closure cost estimate," Post-closure cost estimate," "Liability insurance," and "Proof of financial coverage." Permittees as state and federal governments are exempt from those requirements under 20.4.1.500 (incorporating 40 C.F.R. § 264.140(c)).

2. Section 2.1, Container Storage (40 C.F.R. §§ 270.15 and 264.170 through 264.178)

The Application refers to eight and nine CSU's. Revise the Application to accurately describe the hazardous waste management units for which a permit is being requested.

3. Section 2.1.2, Storage Containers (40 C.F.R. § 264.172)

a) The Application must discuss each type of waste container that will be used to store each type of waste at each CSU. Revise the Application to strike vague descriptors such as the words "may be," "may have," and "not limited to" and revise the Application to include all types of waste containers that will be used to store waste at all CSU's.

b) Several types of containers are mentioned in the Application including "various small containers." These various small containers are not described in Section 2.1.2 or anywhere else in the Application. Revise the Application to include a detailed description of all containers to be permitted for use for storage of any hazardous waste.

c) For each type of container listed, the maximum number of each type of container allowed at each CSU must be provided. In addition, the type of waste placed in each container should also be provided. Revise the Application to include this information.

4. Section 2.1.3, Minimum Aisle Space and Storage Configuration (40 C.F.R. § 264.35)

a) The requirements for aisle space as outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.35) state that aisle space must be maintained that will allow the

unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility in an emergency. The Application indicates that, for all storage locations, a minimum aisle space of two feet will be used. It is questionable whether an aisle space of two feet will be adequate to meet the above stated requirements. Standard industry practice is to use an aisle space of three feet. Either provide adequate justification for the use of an aisle space of two feet in all storage locations within TA-55 or revise the Application to specify a minimum of three feet of aisle space.

b) A container layout figure for each of the CSU's within TA-55 must be provided. The figure must contain a layout of the storage location, location of each type of storage container, location of aisles, and containment systems. Revise the Application to include container layout figures for each of the CSU's.

c) Six CSU's are requested to be permitted in the April 1998 General Part A Application. There are eight or nine proposed CSU's in the TA-55 Permit Application. The numbering scheme for the container storage, vitrification, and cementation units must provide a cross reference to the numbering scheme found in the General Part A Application. Additionally, the capacities found in the General Part A are inconsistent with the TA-55 Permit Application. For example, the Building 185 CSU has a maximum storage capacity of 55,000 gallons in the TA-55 Application and a maximum storage capacity of 27,500 gallons in the General Part A Application. Revise the Applications to be accurate and consistent with one another.

d) The Application states that large containers may be stacked to a maximum of two high unless size and weight restrictions prohibit it for safety reasons. Revise the Application to include a discussion of specific criteria and methods that will be used to determine the maximum stacking height for each type of container.

5. <u>Section 2.1.5, Condition of Containers (40 C.F.R. § 264.171)</u>

a) The Application states that any waste container not in good condition will be overpacked or the waste will be repackaged in a container in good condition. The materials of the overpack container must be compatible with both the waste and the other container. In addition, the overpack container and/or new container must be compatible and resistant to environmental conditions (e.g., corrosion). Revise the Application to include a discussion of this information.

b) Containers must be shown to be free of surface contamination. Revise the Application to discuss how containers will be examined or surveyed to determine if the outside surfaces are free of contamination.

c) Container liners are not discussed, although it is mentioned in Section 2.1.2 that some drums may have liners. These liners are typically procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. Also, a quality control program is established to ensure liners meet the specifications. Revise the Application to discuss liners for all containers, requirements (including waste and container compatibility) and quality control procedures to ensure compliance with the requirements.

6. Section 2.1.6 Compatibility of Waste with Containers (40 C.F.R. § 264.172)

The Application states that only containers made of, or lined with, materials that will not react with wastes stored in them will be used. Revise the Application to provide a discussion of the documentation of waste compatibility for each of the containers and liners to be used. In addition, discuss what types of waste will be used in each type of container.

7. Section 2.1.7, Management of Containers (40 C.F.R. §§ 264.173(a) and (b))

a) The Application states that waste containers will be opened when waste is added or removed or if the container's contents require repackaging. The Application does not discuss whether containers will be opened within a work enclosure that provides confinement, preventing any release of waste constituents. A detailed description of the waste enclosure, including any special ventilation systems, waste containment systems, and special handling requirements should be provided in the Application. Revise the Application to outline specific waste handling requirements for opening waste containers and the work enclosure area for handling each type of waste container and waste type.

b) In addition to containers being closed, 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.1086(c)(ii)) also requires that the cover and closure devices form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position, there are no visible holes, gaps or other open spaces into the interior of the container. Revise the Application to clarify that in addition to containers being closed, the closing devices will be secured in a manner that there are no visible holes, gaps, or other open spaces into the interior of the container.

8. Section 2.1.7.2, Labeling, Recording and Sampling System

a) The Application indicates that, where necessary, a "Radioactive Material/Radioactive Waste" label will be attached to waste containers. Revise the Application to include the specific criteria that is used to determine whether

containers require radioactive labeling. Include whether the radioactive criteria applies to levels of activity of the waste inside the container and if it applies to external radiological container activity readings.

b) Revise the Application to include a copy or example of the Waste Profile Form (WPF) that will accompany all wastes.

9. Section 2.1.8. Containment Systems (40 C.F.R. §§ 270.15(a-b) and 264.175(a-b))

a) The Application states that LANL databases may be used initially to verify the absence or presence of free liquids in containers. The Application must provide the methodologies that will be used in addition to acceptable knowledge (AK) to determine the presence and amount of or absence of free liquids. Revise the Application to include these methodologies.

b) The containment requirements as outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.175(b)(1)) are not addressed in the Application. Specifically, the Application must discuss the underlying base of the containment systems and demonstrate that the base will be free of cracks or gaps and will be sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. Revise the Application to discuss the base of the containment systems and to demonstrate compliance with the appropriate regulation.

c) The Application should provide calculations showing the requirements for secondary containment at each CSU. The calculations should demonstrate the amount of liquid and necessary containment requirements. Revise the Application to include containment calculations.

d) The description of secondary containment must also include a calculation of the surface area and the quantities of liquid that would cover the area for each CSU. Revise the Application to include this calculation.

e) The Application states that accumulated liquids will be removed from containment areas. However, 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.175(b)(5)) specifically states that spilled and leaked waste and all accumulated liquids must be removed in a timely manner to prevent overflow of the collection system. Revise the Application to state that all accumulated liquids will be removed in a timely manner to prevent overflow of the collection system.

f) Provide a discussion that demonstrates how containers will be kept from contact with any potentially accumulated liquids.

10. Section 2.1.10. Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.14(b)(9), 270.15(b-c), 264.17(a-b), 264.176, and 264.177)

a) The Application must include engineering drawings or other data that show the storage location for containers of ignitable and/or reactive wastes and which demonstrate that the containers are located 50 feet from the TA boundary. Revise the Application to include this figure(s).

b) The Application states ignitable and reactive waste containers are protected from the possibility of accidental ignition or reaction. Revise the Application to include a discussion of these specific policies. Precautions to be taken should include prevention of ignition, spontaneous ignition, and radiant heat.

c) The Application must also describe all processes that will be used to prevent reactions that may generate extreme heat, pressure, fire, explosions, or violent reactions; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to threaten human health or the environment; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to pose a risk of fire or explosions; damage the structural integrity of the facility; or be a threat to human health or the environment. Revise the Application to include a discussion of these preventative processes.

d) Under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 246.1101(a)(3)), the Application must ensure the management of incompatible wastes within a CSU where secondary containment systems will be used and show that the presence of incompatible wastes will not cause the secondary containment system to leak, corrode, or fail. Revise the Application to discuss safeguards that are in place to ensure the compatibility of incompatible wastes with the secondary containment systems.

11. Section 2.1.11. Closure (40 C.F.R. §§ 264.111 and 264.178)

Revise the Application to state that at closure of a CSU all hazardous waste will be removed from the CSU and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.178).

Refer to specific comments on Attachment F.1 of the Application.

12. Section 2.2. Storage Tank System (40 C.F.R. §§ 270.15 and 264.191 through 194)

a) Identify the number of tanks in the storage tank system.

b) The Application indicates types of wastes that "may" be stored in the tank system. The Application must include all types of wastes to be permitted for the tank system. Either remove the word "may" or revise the Application to include a discussion of all the specific types of wastes to be permitted for the tank system.

c) More detailed information on the storage tank system was provided in Attachment H of the Application. Refer also to comments related to Attachment H.

13. Section 2.2.2, Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))

a) The secondary containment areas in TA-55-4, rooms 401 and 434A, consist of 10-inch thick, steel reinforced concrete floors. While the concrete appears to have sufficient strength and thickness to prevent containment failure, it is not clear how the surface of the concrete will decontaminated in the event of a system or tank failure. The overall decontamination plan was presented, however this plan does not address periodic decontamination of secondary containment systems in the event of a leak. The Application also does not address whether the concrete floors have an epoxy or similar coating to aid in removal of contaminants and to prevent contaminants from seeping into the concrete. Revise the Application to address these issues.

b) The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.

c) The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.

d) Revise the Application to include a statement that the containment system is designed to completely surround the tanks.

14. Section 2.2.4, Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.16(j), 264.198 (a-b) and 264.199(a-b))

In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:

a) Provide the operating pressure and temperature specifications for the tanks;
b) Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank systems so that it is no longer is ignitable or reactive;
c) Demonstrate that the wastes are not placed in the same tank system unless there is compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b));

d) Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;
e) Demonstrate that the requirements for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;
f) Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and
g) Indicate whether the tank system is used solely for emergencies.

15. Section 2.2.5, Closure (40 C.F.R. § 264.111)

Revise the Application to specify that partial closure means closure of all of a tank and its associated piping and underlying containment system, and that closure of parts of a hazardous waste management unit is not permitted.

Revise the Application to specify that at closure of a tank all hazardous waste will be removed from the tank and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.197).

Refer to the specific comments on the Storage Tank Closure Plan, Attachment F.2.

16. Section 2.2.6, Control of Runoff (40 C.F.R. §§ 270.14(b)(8)(ii) and 264.193(e)(i-ii))

a) The prevention of runoff from the storage tank system is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment.

b) The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.193(c)(3)), all hazardous wastes and/or accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.

17. Section 2.3, Miscellaneous Unit – Cementation Unit

More detailed information on the cementation unit was provided in Attachment I of the Application. Refer also to specific comments related to Attachment I.

18. Section 2.3.2, Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))

a) The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.

b) The reinforced concrete floor that is designated as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.

c) Revise the Application to include a statement that the containment system is designed to completely surround the cementation unit.

19. Section 2.3.4, Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.16(j), 264.198 (a-b) and 264.199(a-b))

a) In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:

- Provide the operating pressure and temperature specifications for the tanks;
- Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank system so that it no longer is ignitable or reactive;
- Demonstrate that the wastes are not placed in the same tank system unless 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) is complied with;
- Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;
- Demonstrate that the requirements for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;
- Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and
- Indicate whether the tank system is used solely for emergencies.

b) In addition, the containment system for the cementation unit is the same system to be used for the storage tanks and vitrification unit. The Application must address

the potential for incompatible wastes commingling as a result of a leak or spill from either the storage tanks, vitrification units, and/or the cementation unit.

20. Section 2.3.5, Closure (40 C.F.R. § 264.111)

Revise the Application to specify that at closure of the cementation unit all hazardous waste will be removed from the cementation unit and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.197).

Refer to specific comments on the cementation unit Closure Plan, Attachment F.3.

21. Section 2.3.6, Control of Runoff (40 C.F.R. § 270.14(b)(8)(ii))

a) The prevention of runoff from the cementation unit is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment system.

b) The containment system for the cementation unit is also the same containment system to be used for the storage tank system and the vitrification unit. In the unlikely event that a leak occurs in both the storage tank system and/or the vitrification unit and the cementation unit, the containment system will have to be sufficient to contain liquids from all units. Provide a discussion of how the containment system will handle a leak in the storage tank system, the vitrification unit, and/or the cementation unit.

c) The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.193(c)(3)), all hazardous wastes and accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.

22. Section 2.4, Miscellaneous Unit – Vitrification Unit

Revise the Application to include a definition of the vitrification unit that describes all the ancillary piping and equipment and other components that are included as part of the unit.

More detailed information on the vitrification unit was provided in Attachment J of the Application. Refer to specific comments related to Attachment J.

23. Section 2.4.2, Containment Systems (40 C.F.R. §§ 270.16(g) and 264.193(a-d))

a) The Application must include calculations to show that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.

b) The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.

c) Revise the Application to include a statement that the containment system is designed to completely surround the vitrification unit.

24. Section 2.4.4, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. §§ 270.16(j), 264.198 (a-b) and 264.199(a-b))

While reactive, ignitable, and incompatible wastes will not be treated in the vitrification unit itself, the containment system to be used by the vitrification unit is the same as that to be used for the storage tanks and cementation unit, which may be used to store or treat reactive, ignitable, and incompatible wastes. The Application must address the potential for the vitrification unit to come into contact with these wastes as a result of a leak, rupture, spill, etc. from either a storage tank or the cementation unit. Revise the Application to include this discussion.

25. Section 2.4.5, Closure (40 C.F.R. § 264.111)

Revise the Application to specify that partial closure means closure of all of the vitrification unit, and that closure of parts of a hazardous waste management unit is not permitted.

Revise the Application to specify that at closure of the vitrification unit all hazardous waste will be removed from the vitrification unit and all hazardous waste and hazardous waste residues will be removed or decontaminated in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.197).

Refer to specific comments on the vitrification unit Closure Plan, Attachment F.4.

26. Section 2.4.6, Control of Runoff (40 C.F.R. § 270.14(b)(8)(ii))

a) The prevention of runoff from the vitrification unit is based upon the assumption that the secondary containment system is sufficient to contain 100 percent of the volume of the largest tank. Provide calculations demonstrating that each secondary containment system is sufficient to contain 100 percent of the volume of the largest tank within the containment.

b) The containment system for the vitrification unit is also the same containment system to be used for the storage tank system and cementation unit. In the unlikely event that a leak occurs in the storage tank system, the cementation unit, and the vitrification unit, the containment system will have to be sufficient to contain liquids from all units. Provide a discussion of how the containment system will handle a leak in the storage tank system, the cementation unit and the vitrification unit.

c) The Application states that any accumulated liquids will be removed as soon as possible. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.193(c)(3)), all hazardous wastes and accumulated liquids must be removed from the secondary containment system within 24 hours to prevent harm to human health and the environment. If adequate information is provided to NMED that removal of released waste or accumulated liquids cannot be accomplished within 24 hours, then the liquids and waste may be removed in as timely a manner a possible. Either revise the Application to state that accumulated wastes and liquids will be removed within 24 hours or provide adequate justification as to why removal of liquids cannot be accomplished within 24 hours.

27. Section 4.2, Releases (40 C.F.R. § 270.16(d)(2))

a) Revise the Application to reference the SWMU Reports that will be submitted to comply with the requirements of 20.4.1.900 NMAC (incorporating 40 C.F.R. § 270.14(d)).

b) Provide an explanation for why active and closing hazardous waste management units are included in this Section and not in the Closure Plan for TA-55. Section 4.1.2 states that these active units "will be closed in accordance with an applicable RCRA closure plan." The "applicable RCRA closure plan" is the TA-55 Closure Plan, which is Attachment F to the Application. Section 4.1.2.3 identifies "storage location B38" that is "scheduled for closure under interim status." B38 is not included in the Closure Plan. B38 and other hazardous waste management units must be either permitted or closed prior to issuance of the Permit. Provide a

schedule for closure of B38, revise the Closure Plan to include B38, and provide an explanation for why B38 was not included in the Closure Plan.

c) The Application must identify all releases that may have occurred from all of the SWMU's identified in Section 4.1 of the Application or provide documentation that no release occurred from a particular SWMU. Releases may include spills, leaks, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing to the environment. In addition, the date of the release(s), type of waste released, quantity or volume released, nature of the release(s), and groundwater monitoring and other analytical data available to describe the nature and extent of the release(s) should be provided. Other data may include physical evidence of distressed vegetation or soil contamination, historical evidence of releases, state, federal, or local enforcement actions, public complaints, and any other information showing the incidence of or migration of a release. Revise the Application to include this information.

d) The incinerator complex, SWMU 42-001(a), was shut down due to operational problems. Discuss whether these operational problems (e.g., system failures, startup or shutdown releases, and/or filtration breakthrough) resulted in releases of contaminants to the atmosphere. Also discuss the waste feed system and any potential releases associated with it.

e) The discussion of SWMU Nos. 42-001(b) and (c) does not address whether there were any leaks from the underground drainlines or the tanks, which could have led to contamination of surface soils, subsurface soils, and potentially groundwater and the environment. Revise the Application to address potential leaks from the underground drainlines and tanks.

f) The sumps, pumps, and tanks, drains, and drainlines associated with SWMU 55-008 are not addressed as having any releases. Provide documentation that no releases occurred, or provide a discussion of potential releases from these systems.

g) Provide a discussion of whether there were any releases from the concrete enclosure, SWMU 55-009.

h) The Application does not address releases from any of the active hazardous waste management units. Revise the Application to discuss whether there have been any releases from these active units.

28. Section 4.3, Characterization of Release

Information related to the characterization of releases is referenced to documents not provided with the Application, such as the 1990 SWMU Report and the RFI Work Plan for Operable Unit 1129. However, the Application states that, at a minimum, the corrective action process will include investigations to verify whether or not a release has occurred. However, for a RCRA Part B Permit Application, characterization of releases must include the following types of available information concerning prior or current releases:

a) Date of the release;
b) Type of waste or constituent released;
c) Quantity or volume released;
d) Nature of the release: (e.g., spill, overflow, ruptured tank or pipe, construction failure, etc.);
e) Groundwater monitoring and other analytical data available to describe nature and extent of release;
f) Physical evidence of distressed vegetation or soil contamination;
g) Historical evidence of releases such as tanker truck accidents;
h) Any state, local, or federal enforcement action that may address releases;
i) Any public citizen complaints about the facility that could indicate a release; and
j) Any information showing the migration of the release.

Revise the Application to include, at a minimum, the above-listed information.

29. Section 4.4, Corrective Actions (40 C.F.R. § 264.101)

The Application states that corrective action will be conducted in accordance with approved NMED and LANL ER corrective action activities and that the corrective action will generally follow the RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) process. However, 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.101) and proposed 40 C.F.R. Part 264, Subpart S, language, requires that the Application specify corrective actions and how they will be implemented for each SWMU. The Permittees must include a summary of completed corrective action activities and a schedule for future corrective action activities in the Application rather than only reference the corrective action program of the LANL ER Project. Revise the Application to specify corrective action investigation and remediation for releases from SWMU's at TA-55. The corrective actions must include implementation beyond area boundaries where necessary to protect human health and the environment.

30. Attachment A.1, TA-55 General Description (40 C.F.R. § 270.14(b)(1))

The description of the Facility must briefly describe the processes involved in the generation of hazardous wastes, including mixed wastes. Revise the Application to include this discussion as part of the general Facility description.

31. Attachments B.1 and B.2, Waste Analysis Plans for the Cementation Unit and Vitrification Unit

Incorporate Attachments B.1 and B.2, the Waste Analysis Plans (WAP's) for the TA-55 cementation unit and vitrification unit, into the Facility-wide WAP included with the Facility-wide General Application. Address Comment Nos. 32 through 43 in the Facility-wide WAP.

32. Attachment B.1.2, Description of Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(a)(1))

a) The Application uses several vague descriptors (e.g., primarily, generally, and typically) as to the source of waste, type of waste, and components of the waste. The Application must discuss all waste streams that will be treated at the cementation unit, and Table B.1-1 should reflect all the waste streams and waste descriptions. Revise the Application accordingly.

b) The WAP does not address the radiological component of the waste. The radioactivity of the waste is critical in determining health and safety measures, packing, labeling and transportation requirements, and decontamination and verification processes. Revise the Application to include a description of the radiological components of the waste.

33. Attachment B.1.3.1, Proposed Analytical Parameters and Methods (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(1-2))

Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13(b)(2)), the Application must include all of the test methods that will be used for the chosen parameters and not just methods that may be used. These parameters should be for both hazardous and radiological components. Revise the Application to include all the test methods that will be used for the chosen parameters.

34. Attachment B.1.3.2, Criteria and Rationale for Parameter Selection (40 C.F.R. § 264.13(b)(1))

The Application indicates that acceptable knowledge (AK) will be used for waste characterization where possible. AK is acceptable only when adequate documentation

and data from the process generator is available which shows consistency of the waste streams. However, where there is variability in waste streams, sampling must occur on a regular basis. A schedule of the frequency of sampling and sampling methods (pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13(b)(3) and (4)) must be included in the WAP, as well as a specific decision-making process that describes when AK is acceptable and when sampling should be conducted. Revise the Application to include this information.

35. Attachment B.1.4, Characterization Procedures (40 C.F.R. §§ 270.14(b)(2), 264.13(a)(1-3) and 264.13(b)(2))

The Application indicates that most of the waste characterization will be based on AK. However, there is no decision tree to indicate when AK will not meet characterization requirements and when sampling is required, or the frequency at which sampling will be conducted. Also, the Application must address how often sampling of waste streams will be conducted to ensure that the waste streams are consistent, indicating that AK is applicable. Revise the Application accordingly.

36. Attachment B.1.4.1, Characterization Procedures for Waste to be Treated (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))

The Application must include a decision tree indicating how it will be determined that AK is sufficient to define waste streams and specifically when sampling will be required. In addition, if sampling is necessary, the sampling frequency and analytical parameters must be clearly identified. The sampling methods to be used to obtain a representative sampling of each waste stream and the appropriateness of these methods must also be provided. If LANL-specific protocol is to be used for sample collection, preservation, QA/QC and health and safety issues, then either this information must be contained within the Application or a specific reference to the protocol to be followed must be provided in the Application. Revise the Application to include this information.

37. B.1.4.2, Characterization Procedures for Treated Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))

The characterization processes to be used on the treated waste are referenced to the "LANL Transuranic Waste Certification Plan," the "Waste Isolation Pilot Plant (WIPP) Waste Analysis Plan" permit conditions, and LANL-specific protocol. The LANL-specific protocol to be used for sampling techniques should be either included in the Application or specifically referenced by document and/or protocol number, so that the applicability and appropriateness of the methods can be determined. Revise the Application to include this information on the LANL-specific protocols.

38. Attachment B.1.4.5, Reevaluation Frequencies (40 C.F.R. §§ 264.13(a)(3) and 264.13(b)(4))

The Application is vague as to how waste stream verification will be conducted and when waste stream verification will be conducted for non-routinely generated wastes. No decision criteria are provided for the frequency of reevaluation of non-routinely generated wastes. Revise the Application to discuss how and when waste stream verification for non-routinely generated wastes will be conducted. Also provide a decision tree outlining when and how reevaluation for non-routinely generated wastes will be done.

39. Attachment B.2.2, Description of Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(a)(1))

The WAP does not address the radiological component of the waste. The radioactivity of the waste is critical in determining health and safety measures, packing, labeling and transportation requirements, and decontamination and verification processes. Revise the Application to include a description of the radiological components of the waste.

40. Attachment B.2.3.2, Criteria and Rationale for Parameter Selection (40 C.F.R. §§ 264.13(b)(1-4))

The Application indicates that AK will be used for waste characterization where possible. AK is acceptable only when adequate documentation and data from the process generator is available which shows consistency of the waste streams. However, where there is variability in waste streams, sampling must occur on a regular basis. A schedule of the frequency of sampling and sampling methods (pursuant to 20.4.1.500 NMAC, incorporating 40 C.F.R. § 264.13(b)(3) and (4)) must be included in the waste analysis plan as well as a specific decision-making process for when AK is acceptable and when sampling should be conducted. Methods for radiological screening of samples to determine whether health and safety issues are a concern should also be provided as part of characterization. Revise the Application to address these issues.

41. Attachment B.2.4.1, Characterization Procedures for Waste to be Treated (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))

The sampling methods to be used to obtain a representative sampling of each waste stream and the appropriateness of these methods must be provided. Sample collection frequency must also be discussed. If LANL-specific protocol is to be used for sample collection, preservation, QA/QC, and health and safety issues, then a specific reference to the protocol to be followed must be provided in the Application. Revise the Application to include this information.

42. B.2.4.2, Characterization Procedures for Treated Waste (40 C.F.R. §§ 270.14(b)(2) and 264.13(b)(2-4))

The characterization processes to be used on the treated waste are referenced to the "LANL Transuranic Waste Certification Plan", the "Waste Isolation Pilot Plant (WIPP) Waste Analysis Plan" permit conditions, and LANL-specific protocol. The LANL-specific protocol to be used for sampling techniques should be specifically referenced so that the applicability and appropriateness of the methods can be determined. Revise the Application to include these references.

43. Attachment B.2.4.5, Reevaluation Frequencies (40 C.F.R. §§ 264.13(a)(3) and 264.13(b)(4))

The Application is vague as to how and when waste stream verification will be conducted for non-routinely generated wastes. No decision criteria are provided for the frequency of reevaluation of non-routinely generated wastes. Revise the Application to discuss how and when waste stream verification for non-routinely generated wastes will be conducted. Also provide a decision tree outlining when and how reevaluation for non-routinely generated wastes will be done.

44. Attachment F.1.1, Closure Performance Standard

Delete "and post-closure" from the third bullet.

45. Attachment F.1.1.2, Partial and Final Closure Activities (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), 264.110 through 264.151 and 264.178)

Revise the Application to discuss which structure(s) within the CSU's may be left in service during closure activities.

46. Attachment F.1.1.9, Survey Plat and Post-Closure Requirements (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), 264.110 through 264.151 and 264.178)

Any criteria used to demonstrate compliance for closure that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

47. Attachment F.1.2, Closure Procedures

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to the NMED for review and approval. Pursuant

to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of, or request for, a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to address the written notification requirement.

48. Attachment F.1.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))

The Application must provide an estimate of the maximum inventory for each type of waste and within what types of containers that waste is contained. In addition, the Application must include a discussion of how much waste and the type of wastes that are located at each CSU. Revise the Application to include, for each CSU, the maximum quantity of waste, waste type, maximum capacity based on area, and the maximum number of containers by container type.

49. Attachment F.1.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3) and 264.178)

According to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(3)), the types(s) of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the types of waste that will be shipped to each specific off-site facility.

50. Attachment F.1.2.4, Closure Procedures and Decontamination

a) As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)) a detailed description for the closure of each CSU must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Revise the Application to provide detailed descriptions of the closure procedures and decontamination techniques for each CSU.

b) The Application does not address methods for sampling and testing surrounding soils and removing contaminated soils during either partial closure or closure. Revise the Application to address surrounding soils and soil that underlies CSU's, particularly the outdoor storage pad.

c) The Application states that all sampling will be done in accordance with Quality Assurance/Quality Control (QA/QC) procedures. Revise the Application to include these QA/QC procedures.

d) The schedule for closure activities for the CSU's are presented in Table F.1-1. However, the schedule does not appear to allow for the sampling, analysis, and potential removal of contaminated soils surrounding the CSU's. It is not apparent that the schedule allows time for proper data validation, time to treat wastes, time for additional leaching tests for the asphalt, or adequate time for transporting wastes to disposal sites, if warranted. In addition, some structures in the CSU's may be left in service during partial closure. Revise the schedule to be comprehensive of all potential activities for closure and partial closure.

e) The Application states that all workers will have proper training and medical monitoring. Reference the appropriate section(s) of the Application that discuss the training requirements and medical monitoring requirements for workers.

f) Revise the Closure Plan for the closure of CSU's to include the sampling of potential contaminated areas using swipe sampling rather than sampling the rinse water to determine if a release has occurred and to determine if contamination has been remediated.

g) There is no discussion of how background levels for soils will be determined. At closure of a CSU, Permittees must demonstrate that hazardous waste and hazardous waste residues have been removed from all soils surrounding the CSU. Revise the Application to reference "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Ryti et al., 1998, for determination of background soil levels.

h) The Application states that each storage structure will be inspected for any cracks or conditions that would potentially lead to loss of decontamination liquids, and that, if any defects affecting containment are found, appropriate remedial actions, for example repairs, maintenance, or replacement, will be conducted. It is unclear from the Application whether the cracks or other flaws will be monitored for contamination prior to sealing or other treatment. Contamination could be sealed within a crack of a structure. Revise the Application to discuss how these defects in storage structures will be investigated to ensure that no contamination has migrated into the defect prior to remedial action.

51. <u>Attachment F.1.2.4.1, Indoor Storage Area (40 C.F.R. § 264.112(b)(4))</u>

a) The Application states that a wash water solution will be used in the decontamination of portable equipment. Discuss what will comprise the wash

solution and discuss the appropriateness of this solution for organics, inorganics, and radionuclides.

b) The description of portable equipment also includes wooden pallets. The use of a wash water solution on wood, which is known to absorb water, could result in additional contamination of the pallet. Discuss mitigative measures that will be used to ensure the pallets do not absorb any potentially contaminated wash water, becoming contaminated by the decontamination procedure.

c) The Application states that a portable berm may be used to collect and contain wash water. Discuss what alternate methods may be used, if the portable berm is not used, for containment of wash water.

d) The Application indicates that wash water will be allowed to accumulate in the bottom of recessed areas (e.g., sumps), where the water will be removed and tested for potential contamination. The Application does not discuss how the recessed area where the wash water was allowed to collect will be decontaminated if the results from the wash water indicate contamination. Revise the Application to discuss how the entire recessed area will be decontaminated and verified.

e) Sumps are often connected to a central drainage system. Include in the Application a discussion of how drain lines connected to sumps and other recessed areas will be investigated and decontaminated.

f) The Application infers that the decontamination procedures are only for loose contamination and that any item that is shown to have fixed contamination will be removed and disposed of properly. Clarify the Application accordingly.

g) The Application states that the wash water will only be analyzed for hazardous constituents. At closure of a CSU, Permittees must determine that there is no fixed radiological contamination. Revise the Application to address radiological contamination and decontamination.

52. <u>Attachment F.1.2.4.2, Vault (40 C.F.R. § 264.112(b)(4))</u>

The Application must contain a description of all measures of decontamination (i.e., decontamination measures will be initiated to accomplish chemical decontamination, as well as to satisfy ALARA requirements for mixed waste in accordance with applicable DOE Orders) that will be applied in decontaminating the vault. Revise the Application to include a detailed description of the alternative decontamination measures.

53. Attachment F.1.2.4.3, Outdoor Storage Pad (40 C.F.R. § 264.112(b)(4))

a) The Application states that "potential closure activities . . . include . . . future remediation under RCRA corrective actions," "[a] final option may be to remediate the asphalt storage pad as part of LANL's RCRA corrective actions," and "[t]he final assessment and remediation of the container storage pad and the soil at this CSU location will be integrated and coordinated under a corrective action program at LANL." The meaning of these terms is uncertain, but seem to state that Permittees will choose whether or not to comply with the closure regulations at 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 264, Subpart G and § 264.178) when closing the outdoor storage pad. Revise the Application to demonstrate compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 264, Subpart G and § 264.178).

b) The Application states that decontamination procedures similar to those described in Application Section F.1.2.4.1 may be used for the storage pad. It is not clear what other procedures may be used in lieu of those listed in Application Section F.1.2.4.1 or described in this Section. It is also unclear what deviations from the procedure may be applied. Revise the Application to include a discussion of all procedures that will be used to decontaminate the storage pad.

c) The Application states that a wash water solution will be used in the decontamination of equipment. Discuss what will comprise the wash solution and discuss the appropriateness of this solution for organics, inorganics, and radionuclides.

d) If decontamination verification of asphalt cannot be determined, the Application indicates that the material will be removed from the site. If the asphalt is removed, sampling of the soil underlying the removed asphalt must be conducted in accordance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112 (b)(4)). In addition, all contaminated underlying soil must also be removed and verification sampling conducted. Revise the Application to include a discussion of sampling the underlying soils, removal methods for any contaminated soils, and verification procedures for the remaining soils.

e) 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)) requires that all surrounding soils be sampled and tested for potential contamination. The Application does not discuss how soils surrounding the storage pad will be sampled, how many samples will be taken, what sampling methods will be applied, and how contaminated soils will be removed. Revise the Application to discuss these issues regarding surrounding soils.

f) The Application states that additional testing may be used to determine if leaching of contaminants from the asphalt is contributing to elevated readings in the wash water. Revise the Application to include what sampling and analytical methods will be used to determine if leaching from the asphalt is the source of contamination in the wash water.

g) The Application states that, if verification cannot be demonstrated, an alternative demonstration of decontamination will be used. Provide, discuss, and justify the alternative demonstration of decontamination.

54. Attachment F.1.2.5, Decontamination Equipment (40 C.F.R. § 264.112(b)(4))

The Application discusses cleaning of equipment, but neither this Section of the Application nor Section F.1.4.2.1 discusses how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

55. Attachment F.1.2.6, Decontamination Verification (40 C.F.R. §§ 264.112(b)(4-5) and 264.178)

a) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

b) The Application should provide a listing of expected contaminants (parameters) that may be present at each CSU. Revise the Application to include a listing of potential contaminants at each CSU.

c) The Application states that the significance of an increase in contaminant levels in wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied must be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.

d) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination

verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

e) Decontamination verification for radionuclides must include swipe sample analyses of CSU surfaces, structures, and equipment that is to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of the area requiring swipe sampling, and the method of analysis.

f) In addition, surveying, using appropriate radiation instruments, should be conducted in areas where radiological contamination may have been present. If radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of fixed radiological contamination. Revise the Application to provide for surveying of each CSU where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

g) Decontamination verification of CSU surface areas for hazardous waste residues must also be verified using swipe analysis, similar to that as outlined in Comment e) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

h) The Application does not discuss how surrounding soils will be sampled to ensure that no cross contamination as a result of decontamination activities have occurred. Revise the Application to include a discussion of how soils around areas to be decontaminated will be sampled and verified for potential cross contamination as a result of decontamination procedures.

i) The Application does not discuss soils under or around a CSU, in particular the outdoor pad, that are to be decontaminated. 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)) requires that the Application include methods for sampling and testing surrounding soils and verification that these soils meet closure performance standards. Revise the Application to include the methods for sampling and testing surrounding soils at each CSU.

56. <u>Attachment F.1.3, Sampling and Analytical Procedures (40 C.F.R. § 264.112(b)(4))</u>

The Application states that sampling and analysis will be conducted in accordance with procedures outlined in SW-846 or other approved procedures or methods. Revise the

Application to include references for all proposed procedures and methods that will be used. Revise Tables F.1-1, F.1-2, F.1-5 and F.1-6, as necessary.

57. Attachment F.1.3.1, Soil and Sediment Sampling

a) Discuss when soil or sediment sampling is appropriate and required as well as the criteria that will be used to determine when soil or sediment sampling will be conducted.

b) The soil sampling protocol does not address how many samples will be taken and how soil sample locations will be determined. Revise the Application to include this information.

58. Attachment F.1.3.2, Liquid Sampling

Samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

59. Attachment F.1.3.4, Sampling Handling and Documentation

a) The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.

b) Discuss special labeling and shipping requirements for radiological samples.

60. Attachment F.2.1.1, Closure Performance Standard

Delete "and post-closure" from the performance standard third bullet.

61. Attachment F.2.1.2, Partial and Final Closure Activities (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), 264.110 through 264.151 and 264.197)

a) Define what is included in the storage tank system, including ancillary equipment and secondary containment, and use the term consistently throughout.

b) Discuss the structure(s) within the storage tank system that may be left in service during closure activities.

62. Attachment F.2.1.9, Survey Plat and Post-Closure Requirements

Any criteria used to demonstrate compliance for closure that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

63. Attachment F.2.2, Closure Procedures

The Application states that, if necessary, the closure plan will be modified and the modified closure plan will be submitted to the NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to address the written notification requirement.

64. Attachment F.2.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))

The Application must provide an estimate of the maximum inventory for each type of waste and within what components of the storage tank system that waste is contained. Revise the Application to include, for each component of the storage tank system, the maximum quantity of waste, waste type, and maximum capacity.

65. Attachment F.2.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3-4) and 264.197)

a) The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), which states that a detailed plan of how waste is to be removed shall be included in the closure plan. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the storage tank system.

b) The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(3)), the types of off-site hazardous waste management facilities to be used must be identified. Revise the Application to describe the handling and disposal of removed waste and, if waste is to be shipped to an off-site location, the types of waste that will be shipped to each specific off-site facility.

66. Attachment F.2.2.4, Closure Procedures and Decontamination (40 C.F.R. §§ 264.112(b)(3-4) and 264.197)

a) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.112(b)(3) and (4)) a detailed description for the closure of each component of the storage tank system must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.2.2.4.1 through F.2.2.4.3 do not provide information to fulfill the requirements. Revise the Application to adequately address the requirements for closure, decontamination, and verification.

b) The Application states that all sampling will be done in accordance with Quality Assurance/Quality Control (QA/QC) procedures, however, the procedures are not provided. Revise the Application to include these QA/QC procedures.

c) The schedule for closure activities for the storage tank system is presented in Table F.2-1. However, it is not apparent that the schedule allows time for proper data validation, time to treat wastes, or adequate time for transporting wastes to disposal sites, if warranted. In addition, some structures in the storage tank system area may be left in service during partial closure. Revise the schedule to be comprehensive of all potential activities for closure and partial closure.

d) The Application states that all workers will have proper training and medical monitoring. Reference the appropriate portions of the Application that discuss the training requirements and medical monitoring requirements for workers.

67. Section F.2.2.4.1, Storage Tank System Components

a) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how the storage tank system will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residues and contaminated containment system components, equipment, and structures of the storage tank system.

b) Provide the regulations that will be applicable for managing the containerized components of the storage tank system.

68. Section F.2.2.4.2, Ancillary Equipment

a) The Application states that ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.

b) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how ancillary equipment will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous and radiological waste residues and contaminated ancillary equipment components of the storage tank system.

c) Revise the Application to reference the regulations that will be applicable for managing the containerized ancillary equipment components.

d) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

e) The Application should provide a listing of expected contaminants (parameters) that may be present in the ancillary equipment. Revise the Application to include a listing of potential contaminants in the ancillary equipment.

f) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

g) Decontamination verification for radionuclides must include swipe analyses of structures or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and

to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

h) Decontamination verification of hazardous waste management unit surfaces for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in Comment g) above. Revise the Application to include swipe sampling methods and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

i) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

69. Section F.2.2.4.3, Areas Adjacent to the Storage Tank System

a) The Application states that random swipes will be taken from the area adjacent to the storage tank system. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also, indicate that swipe samples will be taken for both hazardous and radiological constituents.

b) Clarify whether swipe samples will be taken from secondary containment systems.

c) The Application states that swipe samples will be taken from sumps and drains. Discuss how the extent of contamination, for example to the trap or past the trap into the drain system, will be determined. If the swipe analysis indicates the presence of contamination, discuss how sumps and drains past the trap will be sampled. Also, if drains are found to be contaminated, discuss how drain systems will either be removed or decontaminated. Also, for any decontaminated drain system, soils surrounding the drain system must be sampled to ensure that soils have not been contaminated as a result of leakages. Revise the Application to address these issues.

d) The Application indicates that drains will be washed down. Clarify how a drain is washed down and clarify how wash water will be prevented from entering the drain lines.

e) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the

prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

70. Attachment F.2.2.5, Decontamination Equipment (40 C.F.R. §§ 264.112(b)(3-4) and 264.197)

The Application discusses cleaning of equipment, but it does not discuss how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

71. Attachment F.2.2.6, Decontamination Verification (40 C.F.R. §§ 264.112(b)(3-5))

a) Sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

b) The Application should provide a listing of expected contaminants (parameters) that may be present within the storage tank system. Revise the Application to include a listing of potential contaminants within the storage tank system.

c) The Application states that the significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied must be provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.

d) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

e) Decontamination verification for radionuclides must include swipe analyses of storage tank system surfaces and structures or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify radioactive contamination has been adequately removed and that there are no remaining hot

spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of surfaces requiring swipe sampling, and the method of analysis.

f) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

g) Decontamination verification of storage tank system surfaces for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment e) above. Revise the Application to include swipe sampling methods and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

h) The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination, must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to address the written notification requirement.

72. <u>Attachment F.2.3.2, Liquid Sampling</u>

The Application states that samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

73. <u>Attachment F.2.3.4, Sampling Handling and Documentation</u>

a) The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.

b) Discuss special labeling and shipping requirements for radiological samples.

74. Attachment F.3.1.1, Closure Performance Standard

Delete "and post-closure" from the performance standard third bullet.

75. Attachment F.3.1.2, Partial and Final Closure Activities (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), and 264.110 through 264.151)

a) Page F.3-1 states that the cementation unit includes the glovebox and associated structures and piping. Section F.3.1.2 refers to the cementation unit, ancillary equipment, and glovebox. Section F.3.2.4 is titled cementation unit and glovebox. Define what is included in the cementation unit and use the term consistently throughout.

b) Discuss which structure(s) within the cementation unit may be left in service during closure activities.

76. Attachment F.3.1.9, Survey Plat and Post-Closure Requirements

Any criteria used to demonstrate compliance that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

77. Attachment F.3.2, Closure Procedures

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to address the written notification requirement.

78. Attachment F.3.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))

The Application must provide an estimate of the maximum inventory for each type of waste and within what components of the cementation unit that waste is contained. Revise the Application to include the maximum quantity of waste, waste type, and maximum capacity for the cementation unit.

79. Attachment F.3.2.2, Description of Waste (40 C.F.R. § 264.112(b)(3))

The description of the waste includes several generalities, such as "typically," "generally," and "may." Revise the Application to remove these generalities and discuss all of the waste streams and waste types that will be treated in the cementation unit.

80. Attachment F.2.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3-4))

a) The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), which requires submittal of a detailed plan for waste removal. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the cementation unit.

b) The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(3)), the types of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the management and disposal of removed waste. If waste will be shipped to an off-site location, describe the types of waste that will be shipped to each specific off-site facility.

81. Attachment F.3.2.4, Closure Procedures and Decontamination (40 C.F.R. §§ 264.112(b)(3-4))

As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.112(b)(3) and (4)) a detailed description for the closure of each hazardous waste management unit must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.3.2.4.1 through F.3.2.4.3 do not provide information sufficient to fulfill these requirements.

82. Attachment F.3.2.4.1, Cementation Unit and Glove Box

a) The Application states that the cementation unit equipment and glove box will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of equipment may be decontaminated for future use.

b) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how equipment and pieces of the cementation unit will be disassembled, broken down into container-sized pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residues and contaminated equipment components of the cementation unit and glove box.

c) Revise the Application to include a reference to the regulations that will be applicable for managing the containerized components and removed waste.

d) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

e) The Application should provide a listing of expected contaminants (parameters) that may be present in the cementation unit equipment and glove box. Revise the Application to include a listing of potential contaminants in the cementation unit equipment and glove box.

f) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

g) Decontamination verification for radionuclides must include swipe analyses of cementation unit surfaces and structures or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable level. Revise the Application to include the use of swipe

sampling methods and to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

h) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

i) Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

j) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

83. <u>Section F.3.2.4.2, Cementation Unit Ancillary Equipment</u>

a) The Application states that ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.

b) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residue and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how ancillary equipment will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residue and contaminated ancillary equipment components of the cementation unit.

c) Revise the Application to include a reference to the regulations that will be applicable for managing the containerized ancillary equipment components.

d) Sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

e) The Application should provide a listing of expected contaminants (parameters) that may be present in the ancillary equipment. Revise the Application to include a listing of potential contaminants in the ancillary equipment.

f) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

g) Decontamination verification for radionuclides must include swipe analyses of surfaces and structures or other equipment that are to be left on-site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable level. Revise the Application to discuss how many swipes will be taken, the amount of coverage of the item requiring swipe sampling, and the method of analysis.

h) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying ancillary equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

i) Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that outlined in Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

j) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the

prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

84. Attachment F.3.2.4.3, Areas Adjacent to the Cementation Unit Glove Box

a) The Application states that random swipes are to be taken from the area adjacent to the cementation unit glove box. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also indicate that swipes will be taken for both hazardous and radiological constituents.

b) Clarify whether swipes will be taken of secondary containment systems other than the floor.

c) Revise the Application to address investigation of any cracks or fractures in the floors and walls prior to decontamination activities.

d) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide those levels. Include contaminant-specific levels where applicable.

85. Attachment F.3.2.5, Decontamination Equipment (40 C.F.R. §§ 264.112(b)(3-4))

The Application discusses cleaning of equipment, but the Application does not discuss how the decontamination of equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

86. Attachment F.3.2.6, Decontamination Verification (40 C.F.R. § 264.112(b)(5))

a) Delete the decontamination criteria. At closure all hazardous waste and hazardous waste residues must be removed or decontaminated.

b) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification. Also provide the regulatory limits for the hazardous constituents.

c) The Application must provide a listing of expected contaminants (parameters) that may be present within the cementation unit. Revise the Application to include a listing of potential contaminants within the cementation unit.

d) The significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied must be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.

e) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

f) Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

g) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

h) Decontamination verification of cementation unit surfaces for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in Comment f) above. Revise the Application to include swipe sampling of surfaces and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

i) The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination, must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to discuss the written notification requirement.

87. Attachment F.3.3.2, Liquid Sampling (40 C.F.R. § 264.112(b)(4))

Samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

88. Attachment F.3.3.4, Sampling Handling and Documentation (40 C.F.R. § 264.112(b)(4))

a) The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.

b) Discuss special labeling and shipping requirements for radiological samples.

89. Attachment F.4.1.1, Closure Performance Standard (40 C.F.R. § 264.11)

Delete "and post-closure" from the performance standard third bullet.

90. Attachment F.4.1.2, Partial and Final Closure Activities (40 C.F.R. §§ 270.14(b)(13), 270.14(b)(15-18), and 264.110 through 264.151)

a) Define the vitrification unit and use the term consistently throughout.

b) Discuss the structures within the vitrification unit that may be left in service during closure activities.

91. Attachment F.4.1.9, Survey Plat and Post-Closure Requirements

Any criteria used to demonstrate compliance that is not permitted in this Application will require a permit modification. Revise the Application to indicate that the requirements for a permit modification pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), will be followed in the event that an amendment to the closure plan is warranted.

92. Attachment F.4.2, Closure Procedures

The Application states that, if necessary, the closure plan will be modified and that the modified closure plan will be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of, or request for, a permit modification to authorize a change in operating plans, facility design or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to discuss the written notification requirement.

93. Attachment F.4.2.1, Estimate of Maximum Waste in Storage (40 C.F.R. § 264.112(b)(3))

The Application must provide an estimate of the maximum inventory for each type of waste and identify the components of the vitrification unit where that waste is contained. Revise the Application to include for each component of the vitrification unit, the maximum quantity of waste, waste type, and maximum capacity.

94. Attachment F.4.2.3, Removal of Waste (40 C.F.R. §§ 264.112(b)(3-4))

a) The Application must address the requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), which requires the submittal of a detailed plan for waste removal. Revise the Application to include a detailed discussion of how waste will be removed from each of the components of the vitrification unit.

b) The Application must also address how removed waste will be handled. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(3)), the types(s) of off-site hazardous waste management facilities to be used must be identified. Revise the Application to discuss the management and disposal of removed waste. If waste will be shipped to an off-site location, describe the types of waste that will be shipped to each specific off-site facility.

95. Attachment F.4.2.4, Closure Procedures and Decontamination

As outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.112(b)(3) and (4)), a detailed description for the closure of each hazardous waste management unit must include the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard. Subsections F.4.2.4.1 through F.4.2.4.3 do not provide information to fulfill the requirements.

96. Attachment F.4.2.4.1, Vitrification Unit and Glove Box

a) The Application states that the vitrification unit equipment and glove box will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of equipment may be decontaminated for future use.

b) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how equipment or pieces of the vitrification unit will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residue and contaminated equipment components of the vitrification unit.

c) Revise the Application to include a reference to the regulations that will be applicable for managing the containerized components and removed waste.

d) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

e) The Application must provide a listing of expected contaminants (parameters) that may be present in the vitrification unit equipment and glove box. Revise the Application to include a listing of potential contaminants in the vitrification unit equipment and glove box.

f) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

g) Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to include the use of swipe sampling methods and to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

h) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

i) Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in the Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

j) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

97. <u>Section F.4.2.4.2. Vitrification Unit Ancillary Equipment</u>

a) The Application states that vitrification unit ancillary equipment will be either decontaminated, decommissioned, or dismantled depending on anticipated disposition or use after closure. Clarify whether this statement means that certain pieces of ancillary equipment may be decontaminated for future use.

b) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(b)(4)), a detailed description of all the steps needed to remove all hazardous waste residues and contaminated containment system components, equipment, and structures must be provided. The Application does not delineate how vitrification unit ancillary equipment will be disassembled, broken down into containerizable pieces, and managed. Revise the Application to include a detailed discussion of all the steps for removing all hazardous waste residues and contaminated ancillary equipment components of the vitrification unit.

c) Revise the Application to include a reference to the regulations that will be applicable for managing the containerized ancillary equipment components.

d) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination verification.

e) The Application must provide a listing of expected contaminants (parameters) that may be present in the vitrification unit. Revise the Application to include a listing of potential contaminants in the vitrification unit.

f) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

g) Decontamination verification for radionuclides must include swipe analyses of surfaces, structures, or other equipment that are to be left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable levels. Revise the Application to discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

h) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no fixed

contamination above acceptable levels remains and that there are no unacceptable hot spots.

i) Decontamination verification for hazardous waste residues must be verified using swipe analysis, similar to that as outlined in the Comment g) above. Revise the Application to include swipe sampling and analysis for hazardous waste residues. The discussion should include how many swipes will be taken, percent surface coverage, and the method of analysis.

j) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide those levels. Include contaminant-specific levels where applicable.

98. Attachment F.4.2.4.3, Areas Adjacent to the Vitrification Unit Glove Box

a) The Application states that random swipes are to be taken from the area adjacent to the vitrification unit glove box. Revise the Application to include how many swipes will be taken, what percentages of area will be swiped, and the size of the swipe samples. Also indicate that swipes will be taken for both hazardous and radiological constituents.

b) Clarify whether swipes will be taken of secondary containment systems other than the floor.

c) Revise the Application to address investigation of any cracks or fractures in the floors and walls prior to decontamination activities.

d) The Application states that the wash cycles will continue until equipment has been cleaned to established levels. Provide the methodology for determining the prescribed established levels and provide these levels. Include contaminant-specific levels where applicable.

99. Attachment F.4.2.5, Decontamination Equipment (40 C.F.R. §§ 264.112(b)(3-4))

The Application discusses cleaning of equipment, but the Application does not discuss how the equipment used during decontamination procedures of other equipment will be verified. Revise the Application to include procedures for the verification of decontamination of equipment and how levels of residual contamination will be determined.

100. Attachment F.4.2.6, Decontamination Verification (40 C.F.R. § 264.112(b)(5))

a) The Application states that sampling and analysis will be used to demonstrate that hazardous constituents are not present above regulatory limits after closure. However, the Application does not address radiological decontamination or acceptable levels of radiological contamination for closure. Revise the Application to include a discussion of radiological decontamination levels and verification. Also provide the regulatory limits for the hazardous constituents.

b) The Application must provide a listing of expected contaminants (parameters) that may be present within the vitrification unit. Revise the Application to include a listing of potential contaminants within the vitrification unit.

c) The Application states that the significance of increased constituent concentrations in contaminated wash down waters is to be determined using statistical methods defined in SW-846. The specific statistical methods that are to be applied should be discussed and provided in the Application. Revise the Application to include the specific statistical methods that will be used to determine if wash down waters show a significant increase in analytical parameters when compared to clean wash water solutions. Also, define numerically a significant increase.

d) The practice of testing wash water for determination of decontamination can result in significant dilution of constituents. This method also does not allow for the detection of potential hot spots. Revise the Application to discuss the potential uncertainties associated with this method of decontamination verification and to address the investigation methods for detecting hot spots and the methods for verification of decontamination.

e) Decontamination verification for radionuclides must also include swipe analyses of surfaces, structures, or other equipment that are left on site, in accordance with NRC Regulatory Guide 1.86, to verify that radioactive contamination has been adequately removed and that there are no remaining hot spots of unacceptable level. Revise the Application to include the use of swipe sampling methods and discuss how many swipes will be taken, the amount of coverage of the surface requiring swipe sampling, and the method of analysis.

f) In addition, surveying, using appropriate radiation instruments, must be conducted in areas where radiological contamination may have been present. If the radiological contaminants exist as fixed contamination, analysis of the wash down water will not indicate the presence of potential fixed radiological contamination. Revise the Application to provide for surveying equipment and adjacent areas where radiological contamination is a suspected contaminant to verify that no

fixed contamination above acceptable levels remains and that there are no unacceptable hot spots.

g) Decontamination verification of the vitrification unit for hazardous waste residues must also be verified using swipe analysis, similar to that as outlined in the Comment e) above. Revise the Application to include swipe sampling of surfaces and analysis for hazardous waste residues. The discussion must include how many swipes will be taken, percent surface coverage, and the method of analysis.

h) The Application states that an alternative demonstration of decontamination may be proposed and justified at the time of closure. Using an alternative method from that outlined in the Application for demonstrating decontamination would constitute a modification of the closure plan. The modified closure plan, outlining the alternative demonstration of decontamination must be submitted to NMED for review and approval. Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.112(c)), a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan must be submitted to NMED. In addition, the requirements for a permit modification, also outlined in 40 C.F.R. § 264.112(c), must be met. Revise the Application to discuss the written notification requirement.

101. Attachment F.4.3.2, Liquid Sampling (40 C.F.R. § 264.112(b)(4))

The Application states that samples of used wash water are to be collected and analyzed to determine when a structure or piece of equipment is deemed sufficiently decontaminated. However, this method appears to lead to uncertainty, as contamination can become diluted as wash water volume increases. Include a discussion regarding the frequency of analysis of the used wash water and provide the minimum and maximum surface area that will be cleaned using one volume of wash water.

102. Attachment F.4.3.4, Sampling Handling and Documentation (40 C.F.R. § 264.112(b)(4))

a) The Application states that sample container surfaces will be screened for radiological contamination and decontaminated if necessary. Provide the methodology and proposed instrumentation for screening of samples. Also provide the criteria for determining if decontamination is necessary.

b) Discuss special labeling and shipping requirements for radiological samples.

103. Attachment G, Container Storage (40 C.F.R. § 270.15 and 264 Subpart I)

The Application does not provide engineering drawings or figures for each CSU showing container layout, including waste placement by waste container type and locations of aisles. In addition, drawings must demonstrate locations of containment systems and flow of liquids to collection areas. Revise the Application to include these drawings for each CSU.

104. Attachment G.1, Container Storage at TA-55 (40 C.F.R. §§ 270.14(b)(1), 264.171, and 264.172)

It is not clear that all types of waste containers to be used for storage of hazardous waste have been identified. The Application must identify all waste containers to be permitted for storage at all CSU's. Revise the Application to remove the term "but are not limited to" and indicate all the types of waste containers that will be used at all CSU's.

105. Attachment G.2, Containment Systems (40 C.F.R. §§ 270.15(a)(1-5), 270.15(b)(1-2) and 264.175)

a) For containers bearing liquid wastes, the Application does not provide the dimensions for containment systems and the number of containers, by container type, the containment systems are designed for. In addition, the calculations of the capacity of the containment system relative to waste containers must be provided. Revise the Application accordingly.

b) For containers that will not contain liquid wastes, the Application must provide the test procedures and results or other documentation for demonstrating that containers do not contain free liquids. The Application must also identify each specific type of waste that will be permitted for storage at each of the CSU's storage areas. Revise the Application accordingly.

c) The Application implies that since wastes to be stored at TA-55-4, B05, B45 and TA-55-185 will not contain liquids, secondary containment requirements are not required. While the secondary containment requirements outlined in 20.4.1.900 NMAC (incorporating 40 C.F.R. § 270.15(a)) are not applicable, the requirements of 20.4.1.900 NMAC (incorporating 40 C.F.R. § 270.15(b)), must be met. This includes demonstrating how the CSU's are designed to drain and remove liquids and how containers will be kept from contact with liquids. Revise the Application to address these issues.

d) The Application implies that wastes to be stored at TA-55-4, B05, B45, and TA-55-185 include but are not limited to cemented, mixed heterogeneous, and

vitrified wastes. Revise the Application to specify all wastes to be permitted for storage at TA-55-4, B05, B45, and TA-55-185.

106. Attachment G.3, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. §§ 270.14(b)(9), 270.15(c-d), 264.17, 264.176 and 264.177)

a) The Application must include engineering drawings or other data that will demonstrate the containers of ignitable or reactive waste are located 50 feet from the TA boundary. Revise the Application to include this figure(s).

b) Provide specific policies that are in place to ensure that precautions are taken to include prevention of ignition, spontaneous ignition, and radiant heat.

c) The requirements for incompatible waste outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.177(c)) are not addressed. A storage container with incompatible hazardous waste must be separated from other materials or be protected from other materials by means of a berm, dike, wall, or other device. Revise the Application to clarify that incompatible wastes will be separated and segregated from other wastes and materials by means of a berm, dike, wall, or other specific means.

d) The Application must describe all processes that will be used to prevent reactions that may generate extreme heat, pressure, fire, explosions, or violent reactions; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to threaten human health or the environment; produce uncontrolled flammable fumes, dust, or gases in sufficient quantities to pose a risk of fire or explosions; damage the structural integrity of the facility; or be a threat to human health or the environment. Revise the Application to include a discussion of these preventative processes.

e) Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)(4)), the Application must ensure the management of incompatible wastes within a CSU where secondary containment systems will be used and show that the presence of incompatible wastes will not cause the secondary containment system to leak, corrode, or fail. Revise the Application to discuss safeguards that are in place to ensure the compatibility of incompatible wastes with the secondary containment systems.

107. Attachment G.4, Air Emission Standards for Containers

The Application refers to containers meeting the U.S. Department of Transportation (DOT) specifications of 49 C.F.R. Part 178. Revise the Application to include a description of the specific specifications in 49 C.F.R. Part 178 and the criteria for

determining compliance with these specifications for each type of container to be used for storage at each CSU.

108. Attachment H.1, Design, Construction, Materials and Operation (40 C.F.R. §§ 270.16(b-d) and 264.191(b)(1 and 3))

a) Revise the Application to provide the criteria that will be used to determine whether wastes will be treated in the cementation unit or the vitrification unit.

b) Revise the Application to provide the radionuclide discard limit that will be used to determine if wastes will be transferred to the cementation unit pencil tank or the pencil tanks.

c) The Application states that if sample analysis indicates that concentrations are above the discard limit the solutions will be re-circulated. It is not clear from the Application how they will be re-circulated and what the re-circulation process does to lower concentrations, for example by dilution into other solutions. Provide a discussion of the re-circulation process and how this process will affect radionuclide concentrations in solutions.

109. Attachment H.3, Secondary Containment (40 C.F.R. §§ 270.16(g) and 264.193)

a) Information must be included in the Application that demonstrates, using calculations, that the external liner system is designed to contain 100 percent of the capacity of the largest tank within its boundary. Revise the Application to include these calculations.

b) The Application is not clear whether the floor, which will act as the secondary containment system, is sloped to allow collection of liquids. Discuss this issue.

c) The reinforced concrete floor that will serve as the containment system must be demonstrated to be free of cracks or gaps. Provide this information.

d) Revise the Application to include a statement that the containment system is designed to completely surround the storage tank system.

e) The Application states that any accumulated liquids will be removed as soon as possible. Revise the Application to include the requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.193(c)(4)) that all hazardous waste and accumulated liquids must be removed from the secondary containment system within 24 hours, unless Permittees demonstrate to NMED that removal of the hazardous waste or accumulated liquids cannot be accomplished within 24 hours,

in which case the hazardous waste and liquids must be removed in as timely a manner as possible to prevent harm to human health and the environment.

110. Attachment H.4, Special Requirements for Ignitable, Reactive and Incompatible Wastes (40 C.F.R. §§ 270.16(g-h), 264.17, 264.198 and 264.199)

In the event that ignitable or reactive waste is stored in any part of the storage tank system, the following must be either provided or demonstrated. Revise the Application to address these issues:

a) Provide the operating pressure and temperature specifications for the tanks;
b) Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the tank systems so that it no longer is ignitable or reactive;
c) Demonstrate that the wastes are not placed in the same tank system unless there is compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b));
d) Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;
e) Demonstrate that the requirements are met for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;
f) Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and
g) Indicate whether the tank system is used solely for emergencies.

111. Attachment I.3.3, Protection of the Atmosphere (40 C.F.R. §§ 270.23(b-c) and 264.601(a-c))

The cementation unit has a system of negative pressure zones and high-efficiency particulate filters (HEPA) that are designed to work together to prevent releases of contaminants to the atmosphere. Attachment K.3.4 of the Application states that backup generators are available at TA-55 in the event of a power outage. However, it appears that there is no immediately available backup system for the cementation unit. The Application must address how releases to the atmosphere will be prevented in the event of a power outage causing a temporary shutdown of the negative pressure zones and HEPA filter system. In addition, the Application must address how long the system will be shut down before the backup generators can be activated to operate the cementation unit pressure regulation system. Revise the Application to address these issues.

112. Attachment I.4, Special Requirements for Ignitable, Reactive, and Incompatible Wastes (40 C.F.R. §§ 270.14(b)(9), 264.17, 264.198 and 264.199)

In the event that ignitable or reactive waste is stored in any part of the cementation unit, the following must be either provided or demonstrated. Revise the Application to address these issues.

a) Provide the operating pressure and temperature specifications for the system and associated tanks;
b) Demonstrate that waste is treated, rendered, or mixed before or immediately after placement in the system so that it no longer is ignitable or reactive;
c) Demonstrate that the wastes are not placed in the same system unless there is compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b));
d) Demonstrate that the waste is stored or treated in a manner such that it protects against ignition or reaction;
e) Demonstrate that the requirements are met for the maintenance of protective distances between waste management areas and any public ways, streets, alleys, or adjoining property lines;
f) Provide procedures assuring that hazardous waste will not be placed in a system that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17(b)) to prevent reactions; and
g) Indicate whether the system is used solely for emergencies.

113. Attachment J.1.4, Off-Gas System (40 C.F.R. § 270.23(a))

a) This Section describes a caustic scrubber column for cleaning the off-gas. The rationale for the choice of a caustic scrubber is not provided. Identify and provide measured or estimated concentrations of all contaminants in the off-gas that are to be controlled by the caustic scrubber column. Also provide the scrubber's design removal efficiency and the outlet concentrations for each contaminant.

b) The description of the scrubber is incomplete in that it does not identify the type or size of the packing nor the concentration of caustic (or pH) of the scrubber solution. Provide this information.

c) The second paragraph indicates that the off-gas will be cooled by a quencher before entering the scrubber. This quencher is not described and the temperature to which the gas will be cooled is not given. Revise the Application to provide a description of the quencher and indicate the design outlet temperature.

d) The scrubber is stated to exhaust to the building wet/dry vacuum system. This system is not described. Revise the Application to provide a brief description of

this system, oriented towards its ability to control any contaminants remaining in the scrubber exhaust.

e) Once the off-gas system has been constructed, a performance evaluation must be completed to determine the effectiveness of the system. The evaluation must include a determination of the actual control efficiency of the scrubber, emission rates, and whether any additional controls to supplement the efficiency of the scrubber are required.

f) As it is unlikely that a 100 percent control efficiency for mercury can be obtained, measurements of the actual control efficiency must be made. Also, the amount of mercury that is actually vaporized must be determined. Include these in the performance evaluation.

g) In addition, provide a detailed plan for how the performance evaluation will be conducted, including how and where within the system influent and effluent samples will be taken, how these samples will be evaluated and against what performance criteria, and the specific constituents that will be monitored.

h) During start up and shut down of the system, waste must not be fed into the vitrification unit unless it is demonstrated that the off-gas system is operating within the parameters specified in the Application. Revise the Application to discuss start up and shut down procedures.

i) Discuss monitoring that will be conducted to ensure continued operational effectiveness of the off-gas system.

114. Attachment J.1.5. Glove Box (40 C.F.R. § 270.23(a))

The Application states that a small cooling system for the glove box will be used if necessary to maintain temperatures within specification. This cooling system is not addressed in any of the supporting engineering information provided with the Application. Revise the Application to include a description and design of the cooling system, operating conditions, and the location of the cooling system in the glove box.

115. Attachment J.2. Vitrification Unit Demonstration of Treatment Effectiveness (40 C.F.R. § 270.23(d))

The Application states that the Permittees will implement appropriate waste management options for mercury in the scrubber solution. Revise the Application to provide these waste management options.

116. Attachment J.3.3, Protection of the Atmosphere (40 C.F.R. §§ 270.23(b-c) and 264.601(c))

a) The vitrification unit has a system of negative pressure zones and HEPA filters that are designed to work together to prevent releases of contaminants to the atmosphere. Attachment K.3.4 of the Application states that backup generators are available at TA-55 in the event of a power outage. However, it appears that there is no immediately available backup system for the vitrification unit to ensure there will be no downtime in the operation of the off-gas system. The Application must address how releases to the atmosphere will be prevented in the event of a power outage causing a temporary shutdown of the negative pressure zones and the off-gas system. In addition, the Application must address how long the system will be shut down until the backup generators can be activated to operate the vitrification unit pressure regulation system. Revise the Application to address these issues.

b) This Section describes the fugitive emission prevention system. It does not appear that a fan in the off-gas system is used and that the building wet/dry vacuum system provides the suction to move the gas. Revise the Application to specify that the system will keep the off-gas system at a pressure below that of the glove box and describe how this is achieved.

c) It appears that cascaded levels of negative pressure are being used to collect fugitive emissions. Revise the Application to include the methods that the facility glove box exhaust system will employ to control what is collected.

d) The HEPA filter on the glove box will not control NOx emissions that might get into the glove box. Discuss whether NOx will be controlled and if NOx will be vented to the atmosphere.

117. Attachment J.4, Special Requirements for Ignitable, Reactive, or Incompatible Wastes (40 C.F.R. §§ 270.14(b)(9), 264.17, 264.198 and 264.199)

While no ignitable, reactive, or incompatible wastes will be treated in the vitrification unit, the unit is located in the same room and utilizing the same secondary containment system as the storage tanks, which may be used for ignitable, reactive, or incompatible wastes. Therefore, the Application must address the potential for contact of these wastes with the vitrification unit and associated waste streams in the event of a leak of either ignitable, reactive, or incompatible waste from either the storage tank system, cementation unit, or vitrification unit.

118. Attachment K.2.4, Aisle Space Requirements (40 C.F.R. § 264.35)

The requirements for aisle space as outlined in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.35) state that aisle space must be maintained that will allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility in an emergency. It is not apparent that the proposed aisle space meets this requirement. Revise the Application to indicate that a minimum aisle space of three feet will be used, or provide adequate justification for the use of a smaller aisle space.

119. Attachment K.3.4, Mitigating Effects of Power Outages (40 C.F.R. § 270.14(b)(8) and 264 Subpart C)

The Application states that, in the event of a power outage, portable generators are available. This statement allows that there is no immediate backup generator system that would provide immediate power in the event of an outage. This is especially a concern for the off-gas system of the vitrification unit. Provide a discussion regarding the prevention of process upsets and system failures in the vitrification unit off-gas system in the event of a power failure.

120. Attachment K.3.6, Preventing Releases to the Atmosphere (40 C.F.R. § 270.14(b)(8) and 264 Subpart C)

As discussed in previous comments, a performance evaluation demonstrating the effectiveness of the vitrification system's off-gas unit must be provided to demonstrate that there will be no releases of either hazardous or radiological constituents to the atmosphere. Include a reference to the vitrification off-gas system performance evaluation.

121. Attachment K.4.1, Hazardous Waste Report (Biennial Report)

Pursuant to 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.75), the biennial report must cover activities during the previous calendar year only. The Application indicates that more than one calendar year may be covered by the report. While some activities may overlap into more than one year, the report should focus on one calendar year. Clarify that the report will primarily address only the previous calendar year.

ATTACHMENT B

Final Design Report for DP Surety Vitrification System

INEEL/EXT-98-00916,
Revision 2

September 2001

Final Design Report for DP Surety Vitrification System

S. O. Bates
J. D. Grandy
G. L. Leatherman
J. B. Klinger
P. B. Blacker
R. K. Farnsworth

INEEL
Home of Science and Engineering Solutions

INEEL/EXT-98-00916,
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ABSTRACT

The Idaho National Engineering and Environmental Laboratory (INEEL) DP Environmental Surety Program has been tasked with providing a vitrification system for aqueous evaporator bottom waste generated in the TA-55 facility at the Los Alamos National Laboratory (LANL). This system will be designed, fabricated, and tested at the INEEL before it is shipped to LANL for installation. To complete these tasks, the project has been divided into phases: requirement documentation, technology selection, conceptual design, title design, final design, fabrication, and testing. This document and the associated drawings present the final design of the vitrification system.

An in-can melter system has been designed. This vitrification system includes both liquid and frit feed subsystems, a melter subsystem, a glass handling subsystem to cool and move the glass-filled cans within the glovebox, and an off-gas subsystem. The melter and glass handling subsystems will be contained within a designed glovebox.

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ACRONYMS

C	Celsius
DOE	U.S. Department of Energy
F	Fahrenheit
ft	feet/foot
g	gram
gpm	gallons per minute
HEPA	high efficiency particulate air (filter)
HVAC	heating, ventilation, and air conditioning
ID	inside diameter
INEEL	Idaho National Engineering and Environmental Laboratory
kW	kilowatt
L	liter
LANL	Los Alamos National Laboratory
MMI	Man Machine Interface (a TACS software subsystem)
MOA	memorandum of agreement
P&ID	piping and instrumentation diagram
PHA	process hazards analysis
PLC	programmable logic computer
PNL	Pacific Northwest Laboratory
PPCW	positive pressure cooling water
SCFM	standard cubic feet per minute
TRU	Transuranic
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

FINAL DESIGN REPORT FOR DP SURETY VITRIFICATION SYSTEM

1. INTRODUCTION AND BACKGROUND

The Idaho National Engineering and Environmental Laboratory (INEEL) DP Environmental Surety Program has been tasked with providing a vitrification system for aqueous evaporator bottom waste generated in the TA-55 facility at the Los Alamos National Laboratory (LANL). Currently at LANL, aqueous evaporator bottom waste (transuranic [TRU] waste) is being solidified in cement for transport to the Waste Isolation Pilot Plant (WIPP). However, using cement to package this waste is restricted by radiolytic degradation (expressed as watts of heat generated by radiolytic degradation) of the hydrogenous component (water) in the cement matrix that creates hydrogen gas (H_2). As a result, wattage limits have been imposed on the TRU waste drums to prevent the accumulation of dangerous concentrations of H_2. Waste matrices with a higher water content, such as cement, are assigned a lower wattage limit to compensate for the greater amount of H_2 generation. The resulting WIPP waste acceptance criteria (WAC) restriction of 0.2 watts per drum is difficult to achieve and significantly increases the number of waste packages that must be prepared and shipped, thereby driving up the costs of waste handling and disposal.

To address this problem, a system to vitrify the aqueous waste will be designed and constructed at the INEEL for installation at LANL. Because a vitrified (glass) matrix is nonhydrogenous, only very small amounts of H_2 are generated, and drums will have the WIPP WAC maximum allowable limit of 40 watts. Since this limit is greater than the 200-gram fissile-equivalent drum criticality limit, the drums can be loaded to the criticality limit instead of the <15 grams of plutonium, one-gram americium currently required to meet the 0.2 watt limit of the cement waste matrix. This will significantly reduce the number of drums required to dispose of this waste stream. At a WIPP disposal cost of approximately $10K per drum, vitrification will provide substantial cost savings.

This system will be designed, fabricated, and tested at the INEEL before it is shipped to LANL for installation. To complete these tasks, the project has been divided into phases: requirement documentation, conceptual design, title design, final design, fabrication, and testing. The conceptual design report was issued and approved in October 1997.[a] Based on the conceptual design, title design was started and is defined at 50% complete. Title design was submitted for review in March 1998. Comments from the title design review have been incorporated into the design as the final design proceeds. This document and the associated drawings present the final design of the vitrification system.

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a Bates, S. O., J. D. Grandy, G. L. Leatherman, and B. P. Blacker, *Conceptual Design Report for DP Surety Vitrification System*, INEEL DP Surety Vitrification files, October, 1997.

2. FACILITY DESCRIPTION

The vitrification system will be installed in a new glove box system in Room 434A, in PF-4, at the LANL TA-55 facility. Constructed inside Room 401, Room 434 is approximately 21 × 14 ft with an 11 to 13-ft ceiling (see Figure 1) and a stainless steel floor with the steel going up the walls approximately 1 foot. The vitrification system will occupy a 14 × 14 ft space on west side of the room and another system will occupy the east side of the room. Included, is a glass frit delivery system consisting of a bulk bag unloader (located outside the PF-4 wall) and an auger that introduces frit into Room 434 through a penetration in the south wall and ceiling. This feeder supplies the glass frit to a batch hopper that discharges to the melter inside the glove box. While part of the design, the bulk feed equipment up to the batch hopper is provided as part of the facility by LANL. Liquid waste is transported from the existing waste tanks used in the cementation process. From within the room, off-gas from the melter will be discharged to the facility wet vacuum system. Facility preparation and the installation of the vitrification system are tasked to LANL and are not part of this design report except in those areas were the vitrification system interfaces with the facility.

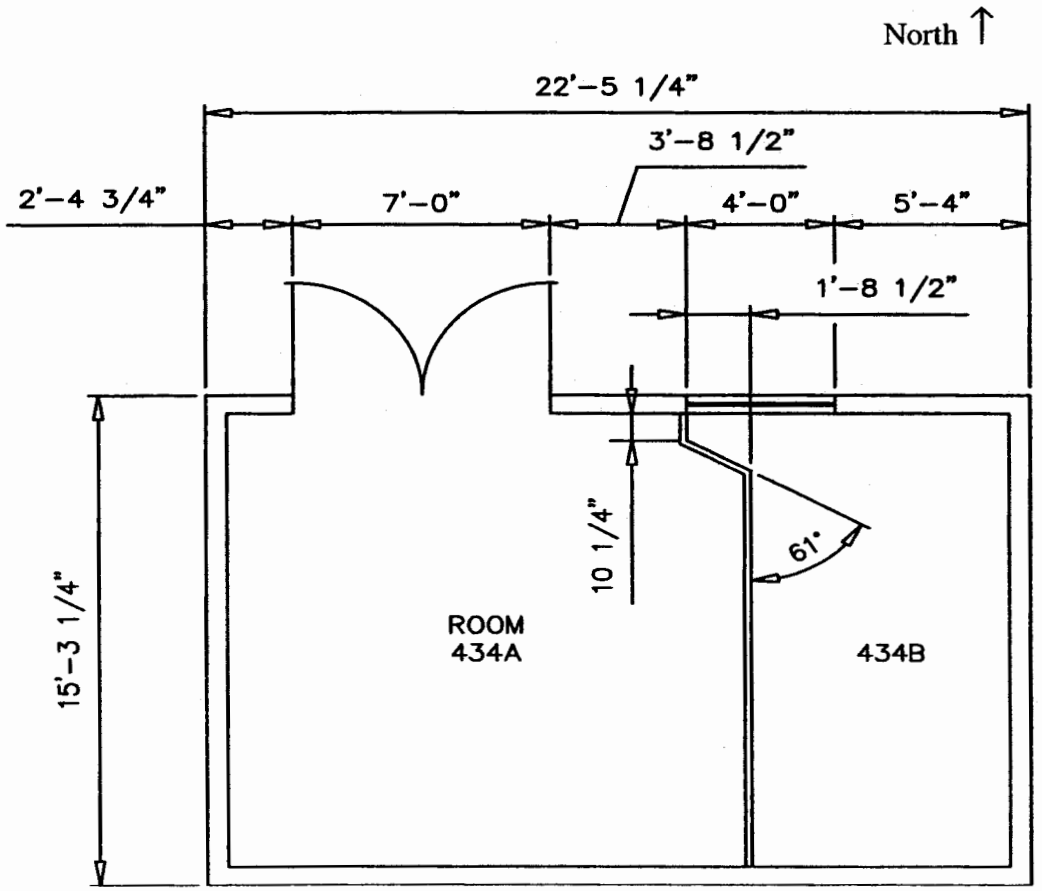

Figure 1. Drawing of PF-4 Room 434.

3. DESIGN BASIS AND REQUIREMENTS

Because of the unique requirements of the waste to be treated and the particular layout of the TA-55 facility, the first step in the design process was to identify and document all the requirements. LANL provided the basic design requirements at the start of the project; INEEL technical and system engineering staff generated additional detailed requirements from subsequent visits to LANL.

3.1 Basic Requirements

The basic requirements specified at the beginning of the project via the statement of work and/or memorandum of agreement (MOA)[b] are as follows:

- The melter itself must be capable of receiving liquid waste and dry frit as a feed. The waste stream is a concentrated nitric acid saturated with nitrate salts of alkalis, alkali earth, and transition metals. The design specification for the oxide waste loading is 200 ± 50 g/L as oxides in the liquid waste and a 25–30 wt% oxide waste loading in the glass.

- The vitrification system must be capable of processing an average throughput of 100 L/day of aqueous waste for a 10-hour shift and a 4-day workweek. The power to the system must be turned off at the end of the day (10 hour shifts) or reduced so that the melter temperature is approximately 500°C.

- The vitrification system must be capable of processing about 320 kg of glass per week.

- Off-gas volume should be approximately 25 standard cubic feet per minute (SCFM) and cannot exceed 300 SCFM.

- The melter subsystem must be contained within a glove box, inside an approximately 12 × 14-ft space that has a two-level ceiling at heights of 11 and 13 feet.

- Technicians must be able to maintain the melter using standard glove box techniques.

- The melter must be insulated to reduce heating within the glove box enclosure.

- Parts of the disassembled melter shall fit in 55-gallon drums.[c]

- The produced waste form shall meet the WIPP Waste Acceptance Criteria[d,e] and Resource Conservation and Recovery Act Toxicity Characterization Leach Procedure standards. The resultant waste form shall not be classified as mixed waste.

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b. Letter from A. E. Whiteman, DOE-ABQ to G. C. Bowman, DOE-ID, "Environmental Surety Memorandum of Agreement Between the Albuquerque Operations Office and the Idaho Operations Office for the Los Alamos National Laboratory Vitrification System," May 20, 1997.

c. The very few cases where a specific part will not fit in a 55-gal. drum be itemized and details for cutting will be provided.

d. DOE (U.S. Department of Energy), November 1996, *Waste Isolation Pilot Plant Disposal Phase Draft Supplemental Environmental Impact Statement*, DOE/EIS-0026-S02, Washington DC.

3.2 Detailed Requirements Generation

Beyond the basic requirements provided as part of the statement of work and MOA, INEEL technical staff traveled to LANL and met with LANL's technical, facility, Environmental, Safety and Heath, and administrative staff to obtain detailed requirements. These basic and detailed requirements were entered into a requirements management computer program called CORE where the requirements are matched to various components comprising the vitrification system. From the CORE database, a system description document was written[f] which contains the requirements identified for all components of the vitrification system. The system description is a living document and additional requirements and details to existing requirements are added as they are generated. This final design and all other stages of the design are checked against this document to insure that all requirements are met.

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e. DOE (U.S. Department of Energy), April 1996, *Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, WIPP-DOE-069, Revision 5, Carlsbad, New Mexico.

f. C. Ischay, June 1997, *System Description Document for Vitrification Project*, LMITCO DP Surety Files.

4. TECHNOLOGY SELECTION

Once the requirements were established, existing melter technologies, which could be used for the LANL TA-55 vitrification system, were evaluated. This evaluation consisted of a first and second cut of technologies existing within the U.S. Department of Energy (DOE) system. The first cut was made based on general requirements established in the requirements document. The second cut consisted of an engineering review of each of the remaining technologies. Based on both cuts, in-can melter technologies were determined to be the most applicable to the project.

Because the cans are generally metal, in-can melters operate at temperatures below 1,200°C. In-can melters have the advantage of completely zeroing out the inventory of nuclear material in the melter, which is a big advantage in nuclear material accountability. Due to their simplicity, in-can melters tend to be less expensive than other types of melters, depending on the heating method used. There are four major methods used to heat in-can melters; resistance heaters, induction heating, microwave heating, and insertion of a plasma arc or torch into the can. Resistance heaters have been selected as the heating method. Resistance melters use electrical elements similar to those found in a toaster or electric heater. As the elements heat, they radiate heat to the can, which in turn conductively heats the waste inside the can. These types of heating elements, widely used in industry, are both inexpensive and available in standard sizes. Resistance heating is the most simple and reliable technology available, and commercial vendors may exist that can meet our specific requirements. However, resistance heating may be limited in its ability to get heat into the waste/frit/glass quickly, but reducing the diameter of the can and/or adding heat fins to the inside of the can may compensate for this limitation. Modeling of the melter can has indicated that heat can be transferred into the waste/frit/glass fast enough to complete the throughput requirements.

In-can melters come in two basic types—single batch per can and multiple batches per can. In single batch-per-can melters, waste feed is added to the can and then heated, filling the can with molten material. The filled can is then removed, a new can is inserted, and the process repeated. In multiple batches-per-can melters, the can has a drain and the glass is removed instead of replacing the can. Because metal cans are generally used, the service lifetime of the multiple batch can is relatively short; however, these cans are relatively inexpensive and easily replaced. A multiple batches per can melter technology was originally elected to eliminate the need to move heavy cans of molten glass and to reduce the thermal loading within the glove box. However, the cost of the glass handling equipment intended to convert the molten glass to cooled marbles (a gem maker) was found to be prohibitive and the single batch per can option was developed. While some of the advantages of the gem maker were lost, the single batch per can option also has some advantages. The advantages and disadvantages are summarized below.

- The advantages of the single batch-per-can option include:
  - With the one-use can, questions/concerns about can lifetime/corrosion are eliminated
  - New money will not be required to procure the gem maker
  - The melter/glass handling system will be shorter so the overall height of the glove box will be lower.
  - Without the use of a drain, the complications associated with heating the drain and cooling it off will be eliminated
  - Complete zeroing out of Pu inventory with every can

- The complicated and labor intensive gem maker is eliminated from the process
- If there is a problem with a can, that can is moved and the next can set into place without the loss of melter operations.

- The disadvantages of the single batch-per-can option include:
  - Special inner melter cans have to be made for every batch
  - An additional hoist would be required to lift the inner can to the bag-out port
  - If the cooling panels used for cooling the can fail, there is the possibility of transferring the heat of the glass to the inside of the glove box
  - A heavy glass filled drum will have to be lifted inside the glove box
  - There is a loss of flexibility in packaging the glass for disposal or in reworking the glass.

5. VITRIFICATION SYSTEM

This section describes the overall vitrification system and each of the major subsystems. Figure 2 shows the vitrification system and identifies each of the subsystems and their relationships to each other.

5.1 Feed Subsystems

The feed subsystems will consist of the liquid feed subsystem and the glass frit feed subsystem. All materials and components of the liquid feed system must be compatible with concentrated nitric acid. Components of the frit feed system must be compatible with the abrasive nature of the glass frit.

5.1.1 Liquid Feed Subsystem

Liquid will be supplied to the melter from two 125-L waste slab (feed) tanks located outside the glove box in Room 434. The feed tanks will be supplied from facility evaporator holding tanks. The liquid waste stream consists of a nitric acid solution saturated with nitrate salts of alkalis, alkali earth, and transition metals. Nitric acid waste from the facility evaporator holding tanks will be drawn into the waste feed tanks via a vacuum transfer system connected through the waste feed tanks. A single vacuum trap with a float ball shut off provides protection from drawing waste into the vacuum system should the shutoff interlock from the level detectors ever fail. This transfer will take place only after a waste analysis has been completed. During the calcination phase, the nitric acid waste will be transferred from the feed tanks to the melter at a nominal rate of 25 liters per hour (L/hr) using a magnetically coupled gear pump. Control and monitoring circuitry for the various components will be routed through the programmable logic computer (PLC).

The primary components of the liquid feed subsystem include two slab (feed) tanks, remote control valves, and a feed pump. The feed tanks are 4-in. thick, 24-in. wide, and 76-in. high with a sloping base to facilitate complete draining. The feed tanks will be constructed of 316 L stainless steel and reinforced with steel tubes welded to opposite sides of the tank on 6-in. centers to prevent the tank walls from bulging outward (see drawings, Appendix A). They will hold approximately 125 L and be oriented vertically, both to minimize the use of valuable floor space and to make liquid-level measurements more accurate. An air sparge will be inserted in each feed tank to agitate the waste. Connections to the tank will be via standard weld neck flanges. The fill lines entering the tanks will extend to the bottom to minimize foaming while the tank is being filled. The tanks will be vented back to the facility process vent system when waste is being pumped to the melter and all other times except when the tanks are being filled. The tanks have a criticality safe design.

Combined sight and electronic liquid level indicators mounted on the side of each tank will measure the liquid level. The electronic signal will provide an electronic level indication to the PLC and the operator. The "tank full" indication will be interlocked by the PLC to automatically close the vacuum control valve and close the fill valve on the appropriate tank. The tank level indicators will also be used to monitor waste input into the melter. The PLC will be programmed to display the flow rate to the operator as well as the total amount of waste for each processing run. The feed line going to the melter will have connections to water for cleaning the feed tube in the top of the melter and for cooling the feed tube prior to introducing the liquid waste. This will help prevent rapid drying of the waste and clogging on the end of the feed line.

The feed pump will be a magnetically coupled gear pump compatible with the nitric acid waste. The feed pump is a remotely controlled variable speed unit with a maximum capacity 1.6 L/min (0.35 gpm). The tank feed valves will be interlocked with the pump so that the pump will not operate unless the valves are open.

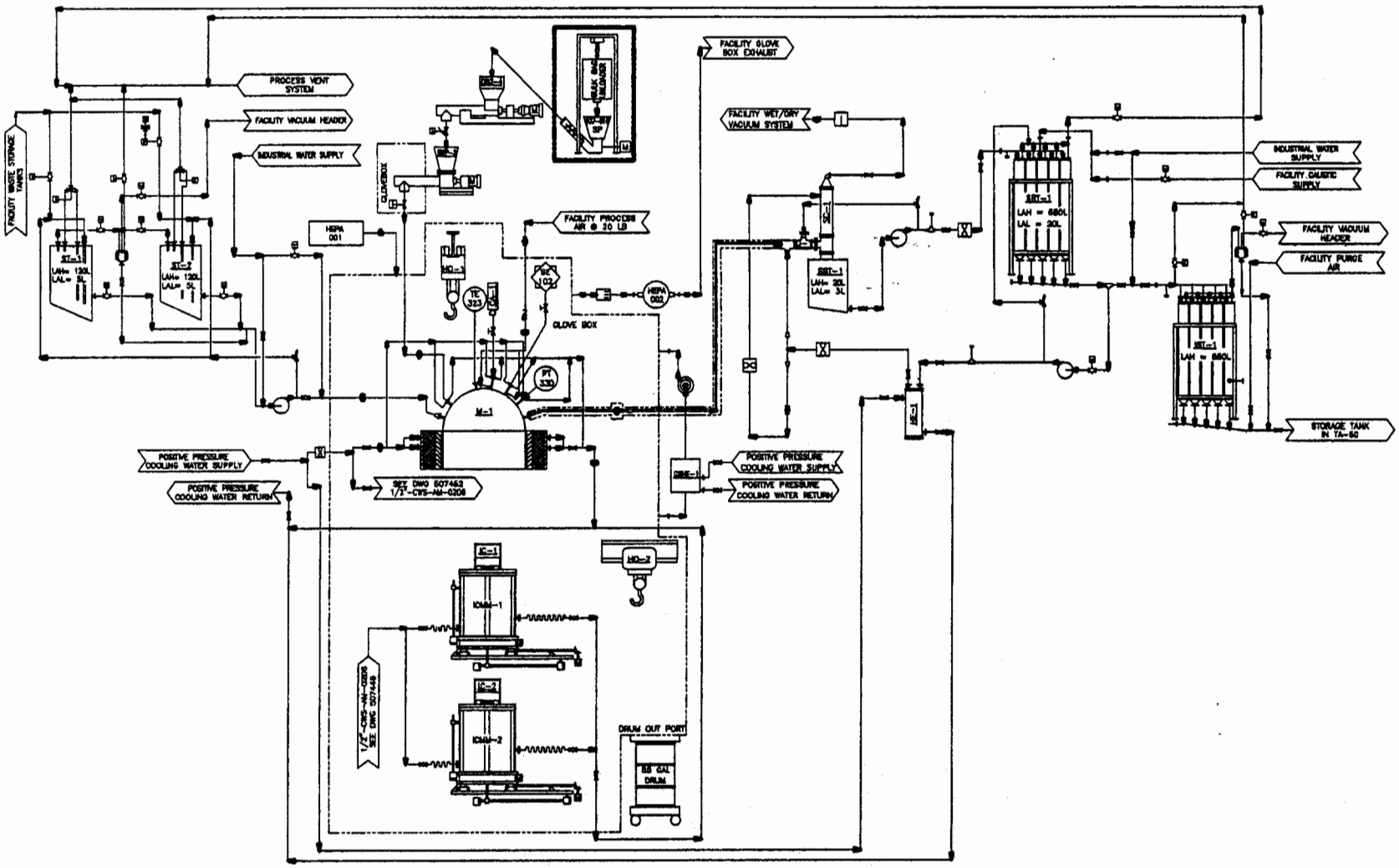

Figure 2. Diagram of Vitrification System for TA-55.

5.1.1 Frit Feed Subsystem

The Frit Feeder subsystem supplies a borosilicate glass frit for the vitrification process. The entire frit feeder subsystem is being supplied by a commercial vendor. This vendor will be providing the detailed design of the frit feeder subsystem.

The frit originates from a bulk bag unloader located outside the TA-55 building and is transferred via a 6-in. auger pipe to a volumetric screw feeder that will penetrate the building wall. This volumetric screw feeder will penetrate the outside wall below the roof but above the ceiling of the TA-55 facility, directly over room 434. Frit will be fed from the volumetric screw feeder horizontally through the wall via a 4-in. auger, and drop vertically through an isolation valve into a batch hopper. The batch hopper, located within room 434 but outside the glove box, transfers the frit through a penetration in the glove box wall with a 2-in. screw auger. The frit is then dropped vertically through another isolation valve into the melter. The two sealable valves, one located on top of the batch hopper and the other located on a flange on top of the melter, prevent contamination in the melter from exiting to the outside while either feeding frit to the melter or loading the batch hopper. The stainless-steel gate valves will be rated for dry abrasive feedstocks and opened by a pneumatic actuator. They will normally be closed without air pressure and will be interlocked so that both valves cannot be opened at the same time.

The bulk-bag unloader allows for easy replenishment of the frit supply. The bags are supported from above with a steel bag rack. The bag rack is used in conjunction with a forklift to load and remove the bulk bags in the frame of the forklift. The bulk-bag unloader will be equipped with a loss-in-weight indicator and the amount of frit remaining in the bag will be displayed at the control console. The bulk density of the frit is approximately 1.2 g/cm^3 (the full density is 2.36 g/cm^3). The exact angle of the auger pipe from the bulk-bag unloader to the volumetric feeder hopper will remain unknown until the position of the bulk-bag unloader is finalized. The bulk-bag unloader must remain within 10 ft of the outside wall. However, since it could be placed to the side of the volumetric feeder, it could be situated more than 10 ft away, making the angle of the auger pipe from the bulk-bag unloader to the volumetric feeder less steep.

The volumetric feeder has a 142-L (10 ft^3) hopper with a 4-in. auger to transport frit through the outside wall and into the batch hopper. The auger will penetrate the outside wall above the level of soffit in room 434 but below the roofline. The batch hopper will also have a capacity of about 142 L (5 ft^3). When the hopper is full, it should contain about 180 kg (82 lbs) of frit. The batch hopper assembly will provide an output signal indicating the amount of frit in the hopper. The batch feeder will be located near the ceiling and next to the east side of the glove box. The batch hopper, chutes, and auger pipe must be a sealed system but with a removable door or lid to allow inspection and maintenance inside the hopper. A port on the side and near the top of hopper will house a small high efficiency particulate air (HEPA) filter. The HEPA filter will allow the inside of the hopper to remain at ambient pressure while preventing any dust from escaping.

The sealable valves are located above the feed port on the batch hopper and above the melter frit feed port. When filling the batch hopper from the bulk frit feeder, the valve above the melter will prevent gases from escaping containment into the batch hopper. When the batch feeder is supplying frit to the melter, the valve above the batch hopper will prevent radioactive contamination in the melter from reaching the outside through the hopper. This possibility is further reduced since the melter will be operating at a slightly negative pressure with respect to the atmospheres both within and outside the glove box. This will create a flow of air from the HEPA filter, through the hopper and into the melter through the auger pipe.

The entire frit feed system uses an autonomous controller, which controls the operating mode, feed rate, automatic rate calibration, and interlocks. Instructions will be down loaded to the controller from the

PLC using Allen Bradley blue hose communications. The status and all operations concerning the frit feed subsystem will be displayed and controlled remotely via the PLC and the operator interface.

5.2 Melter Subsystem

The melter subsystem is composed of three separate components: the power supply, the melter itself, and a glass handling system.

5.2.1 Power Supply

The power supply will be controlled by the Allen-Bradley PLC with operator input from the control console. The power required for the melter will be 480 Y/277 V, converted to 240 Y and approximately 50 kW. This power will be provided to the melter in three parallel legs. Each leg will power four of the 12 silicon carbide elements. The amount of power going to the melter and each set of four electrodes will be controlled and displayed via the Allen-Bradley PLC and the control panel. The power supply will have an interlock system so that power will be shut off automatically when certain conditions arise. Examples of the types of conditions that will shut down the melter power are loss of facility heating, ventilation, and air conditioning (HVAC), loss of off-gas system, cooling water loss, excessive glove box temperature, or a manual system emergency shut down via an emergency shut down button.

5.2.2 Melter

The melter will have an in-can type configuration with a nominal operating temperature of 1,050°C and a maximum operating temperature of 1,100°C. Thermocouple interlocks will prevent the melter from exceeding the maximum design temperature. The melter consists of three sets of four SiC resistance-heating elements (in parallel) surrounding the can. The temperatures of the metal can and the waste/glass inside the can will provide feedback to control the power to the melter. Programmable heating rates will be provided. A reusable melter lid will attach to the top of the can. Ports in the lid of the melter will accommodate the introduction of liquid waste and frit, an off-gas exhaust outlet, thermowells, and a window to allow camera observations of the inside of the melter. A water-cooled shell surrounds the entire insulated melter assembly to reduce the heat load transferred to the interior of the glove box. Some flanges on the melter head are water cooled to prevent damage to valves and attached equipment.

Because of the 10-hr shift-processing limit, the diameter of the melter can is limited by the heat flux into the center of the cell without melting the can itself and the requirement to fit into a 55-gal drum. However, the can size must also be maximized to process the required amounts of waste per week. The size of the can will be a 15.5-in. inside diameter (ID) cylinder with a 0.25-in. wall thickness. The can height is 27.25 in. The total volume of the melter can is approximately 85 L. This can will also contain a set of internal fins to provide for faster heat transfer.

The melter lid sits atop the melter can. The lid is a standard industrial 2 to 1 elliptical head with the appropriate ports welded to it. A lip on the bottom of the melter lid and on the top of the melter contain grooves that will hold a high temperature seal material. Because the seal on the lid and the can will not be completely tight, the melter is operated at a slight negative pressure with respect to the atmosphere in the glove box. This prevents any pressure fluctuations that might occur when feeding the nitric acid waste from forcing nitric acid fumes and contamination through the seal. The negative pressure in the melter will be sufficient so that if a transient pressure spike occurs while feeding the waste, a positive pressure in the vessel with respect to that in the glove box will not be created. The negative pressure for the melter is provided by the controlled draw of the facility wet/vacuum system through the off-gas system.

The melter lid has various ports and penetrations for input and output of materials and process monitoring. Frit is fed into the system via a 2-in. diameter pipe. The melter is sealed off from the frit feed system with a gate valve connected into the 2-in. pipe just above the melter. The valves are rated for corrosive and abrasive service. An air purge, built into the valve, will help keep corrosive vapors away from the valve.

A 2-in. exhaust port will convey the exhaust gases to the off-gas subsystem. The exhaust gases will be drawn out via the facility wet vacuum system through the off-gas system. Two other ports with windows provide a view for the camera monitor and lighting inside the melter when required. A small amount of purge air will be introduced into the port to help prevent fumes and particulate from collecting on the window. The ports are water cooled to prevent damage to seals in the valves.

The nitric acid waste feed is introduced through a penetration in the center of the lid. A simple nozzle (a shaped end of the feed line) will distribute the waste over the hot frit in the can. Prior to feeding the waste, a small amount of water will be fed through the nozzle to cool it and flush it to prevent clogging. Water will also be fed through the nozzle after feeding the waste to flush out the nozzle and prevent solids in the waste from condensing to form a clog.

Penetrations for a thermowell and an infrared pyrometer in the top of the melter will provide redundant measurements of the temperature inside the melter. The thermowell will allow continuous thermocouple measurements to be made. The pyrometer will be optimized for measuring glass surface temperatures and consists of a remote infrared sensing head and associated electronics. It will have an air purge and water-cooling capability built into it.

Due to the temperature and corrosive environment during processing, the melter elements will periodically need to be changed out. The melter design will accommodate melter element removal from either the top or the side. Top removal (the easiest) will require removing the melter lid, lifting out the element via a small crane mounted on the ceiling of the glove box, and bagging the element. Side removal (more difficult) will require additional dismantling of the melter that includes removing a water cooling panel, its insulation panels, and their supports in addition to undoing water and electrical connections. A detailed procedure for removal of the melter can will be published in an operations manual. Once the connections to the melter are disconnected, the melter itself is on a turntable that will allow the melter to be turned within the glove box and provide better access for maintenance.

5.2.3 Glass Handling

After melting, the can of glass will be lowered into a cooling jacket. The cooling jacket and hot can will then be moved out from under the melter to cool (the cooling jacket will prevent the can from tipping while it is being lowered and moved out from under the melter). While the first can is cooling, another cooling jacket with a new melter can will be immediately moved under the melter, raised into the melter, and a new glass batch processed. The first can will be cooled to room temperature before the second batch is completed—modeling indicates that the can will be at cooling water temperatures after approximately 12-14 hours. When cooled, the first can will be lifted out of the cooling jacket and lowered into a standard 55-gal drum for bagout. A new can will be bagged in and will be ready to replace the second can once that glass batch is completed.

The lift for the can will consist of four screw lifts on anti-lock bearings. The four screws will be turned by a single electric motor to prevent binding. The lift will raise and lower the can and melter bottom assembly (can support, insulation, and bottom plate). All these will be contained within the cooling jacket. The cooling jacket, melter bottom assemble, can of glass, and lift will roll out from under the melter to a position where it can be lifted via glove box crane and lowered in the 55-gal drum through

the bagout port, once the can is cool. After the cooling jacket assembly is out from under the melter, an identical cooling jacket (with melter bottom assembly, empty can, and lift) will be rolled under the melter and the empty can and melter bottom assembly will be lifted into the melter. The rolling of the cooling jacket assembly will be powered and controlled by an electrically driven screw. Programming interlocks will allow only one can to be moved at any give time.

A 55-gal drum will be attached under the glove box in a bagout configuration. The drum will contain an inner liner of insulation or padding to keep the melter can from moving within the 55-gal drum and protect any plastic liners. The drum attachment and bagout configuration will be patterned after the current configuration being used in the cementation process being used to treat the evaporator bottoms. This configuration includes a scale to measure the weight of the drum and a mechanism for moving the drum from under the glove box.

5.3 Off-gas Subsystem

The function of the off-gas subsystem will be primarily to condense and neutralize acid-gas vapors exiting the melter, such that the remaining gases (primarily air and excess nitrogen) can be discharged into the facility wet/vacuum system through the off-gas subsystem. The primary elements of the off-gas subsystem will be a quencher, wet caustic scrubber, a scrubber recycle tank, a scrubber intermediate storage tank, flow control valve, ducting/piping between the individual components, and instrumentation.

During design basis melter operations, the off-gas subsystem will treat two radically different off-gas streams. The calcination of the waste will produce the larger volume of gas. The actual volumetric flow rate of the off-gas will depend on the feed rate of the liquid waste. The maximum rate used to size the off-gas subsystem was 50 L/hr of liquid waste into the melter. This feed rate will produce 18 SCFM at design basis of 500°C. The actual vitrification of the calcined waste will produce the minimum off-gas volumetric flow rate. This was assumed to be 2 SCFM (primarily air from melter view port purge lines). Further details on mass and energy flows through the entire system can be found in the appropriate appendix.

The off-gas subsystem is designed to exit the melter at 500°C during the calcination phase; it exits at 1,000–1,100°C during the vitrification step. The gas velocity in the exit pipe will not exceed 65 ft/s under normal operating conditions. Approximately, 30 in. from where this pipe enters the scrubber, caustic solution will be injected into the line via a T-connection from the scrubber recycle tank (700 L capacity). The two-phase mixture will be piped into the scrubber column where it is directed downward at a 90 degree angle and exits the pipe into the scrubber.

The scrubber tower has a 6-in. diameter with 5 ft of random packing. The tower sits on top of a small sump (95 L capacity). The total height of the tower and sump is just under 11 ft. The gas flow is countercurrent up the column. Caustic solution is injected at the top of the column. A distributor plate assures uniform distribution of the caustic liquid across the area of the column. The caustic solution is pumped from the scrubber recycle tank to the top of the column. The caustic from the scrubber and quencher and the condensate collects in the scrubber sump and is pumped back to the scrubber recycle tank. The scrubber recycle tank will be connected to the facility water and caustic line so the tanks can be flushed and washed as required. At the end of a batch, the scrubber recycle tank will be emptied into the intermediate storage tank (700 L capacity). The liquid is held in this tank until analysis is complete whereupon it is transferred to the treatment facility at TA 50.

The off-gas leaves the scrubber column via a 1-in. line and passes into facility wet/vacuum system. The wet/vacuum system provides the draft to move the off-gas from the melter, through the quencher and

scrubber, and out the top of the scrubber. This draft is controlled via a valve and an air velocity transducer.

In addition to the above-mentioned components, heat is removed from the system by passing the scrubber/quencher liquid through a heat exchanger as part of the quench/scrubber liquid recycle loop. The heat exchanger will be cooled by facility positive pressure chilled water.

5.4 Glove box Subsystem

The glove box subsystem will be the primary confinement for the vitrification system.[g] Figure 2 identifies the subsystems that will be contained within the glove box. A small cooling system will be used to maintain the temperature within the glove box to the required specification (<40°C). The standard alarms required of other glove boxes at LANL will be installed.

The basic layout of the glove box will be a "backwards L" configuration. The open side of the "L" will face the west north wall. This will allow another leg to be added (if needed in the future) to the glove box by moving the west wall. Overhead cranes will be located in the glove box to facilitate movement of equipment and cooled glass cans. Details of the glove box and equipment layout therein can be found in the drawing in Appendix A.

To insure that the glove box meets LANL requirements, the vendors used by LANL for glove boxes will be used to fabricate the glove box. The glove box will be shipped directly to LANL. A mocked up glove box will be used for system operability testing of the vitrification system at the INEEL before shipping the vitrification system to LANL for installation.

5.5 Control and Data Acquisition Subsystem

The control subsystem will be located outside of Room 434. The control subsystem will consist of a personal computer system, a video monitor, and rack mounted Allen-Bradley controls. The control subsystem is the interface from the operator to the process that will:

- Control and display the status of the all subsystems; this will entail turning various valves, pumps, motors, etc., on and off.
- Activate interlocks to prevent equipment damage and insure that process control is not lost.
- Alert the operator when process conditions have exceeded safe bounds via a separate alarm panel. An alarm indication may also happen simultaneously with interlock actions. Specific conditions that would trigger an alarm panel light include no power to the melter, heat exchanger water pump off, scrubber circulation pump off, melter over temperature, etc.
- Provide for process parameter data for waste form qualification.

A list of the inputs to the control subsystem can be found on the piping and instrumentation diagrams (P&IDs) in Appendix A. The control system and logic will use Allen-Bradley PLC-5 logic. The man-machine interface to the control system will be Intellution FIX Man Machine Interface (MMI)

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[g] The piping, tanks, scrubber, vessels, and storage containers of the feed and off-gas subsystems outside of the glove box can also be considered part of primary confinement.

automation software. The FIX MMI software will be run on a stand alone personal computer using the Window NT operating system. Interlocks will be established in the control subsystem to conform to the issues identified in the process hazards analysis (PHA).

5.6 Support Subsystems

Support subsystems include the camera and positive pressure cooling water subsystems.

5.6.1 Camera Subsystem

The camera subsystem will provide images to the operators to monitor the progress of the calcination and vitrification processes within the melter. The camera will view the inside of the melter through a window port located on the melter lid. The port window can be periodically removed and cleaned, while keeping the melter sealed, by closing a valve located directly under the window. The valve is rated for harsh service in chemical environments. An air purge will prevent vapors and dust from accumulating on the valve, or, in this application, on the window when the valve is open. The air purge will also act to cool the flange. Facility process air will be used as the purge gas.

Primary components of the melter camera subsystem will include a charge coupled device color camera, a neutral density filter, an infrared reflector, and a mount for the camera and filters. A manually focused camera lens with a wide depth of field has been chosen so that a surface at any depth within the can will be in focus. As the melter approaches operational temperatures, the neutral density filter will reduce the light intensity from the melt and protect the sensitive detector elements in the camera. The filter must move in and out of the optical path as lighting conditions require.

Lighting will need to be directed inside the melter during the calcination process through an additional port in the melter lid. This port will also have a valve to allow the window to be removed and cleaned while keeping the melter sealed and to supply purge air to keep the window clean during melter operation.

5.6.2 Cooling Water

Cooling water for the vitrification system will be provided by the existing positive pressure cooling water (PPCW) system in the facility. The PPCW system has a maximum capacity of 400 gpm of 45–50°F water at 50–60 psi. Cooling requirements for the vitrification system are expected to peak during the calcination phase of operation. The PPCW will be provided via a manifold in PF-4, Room 434. Two separate supply lines from this main manifold will provide cooling water to the systems enclosed in the glove box and the heat exchanger in the off-gas system.

The cooling water from the PPCW system will be supplied directly to the glove box subsystems through a manifold that will distribute water to the individual components that require it. Individual valves will control the water flow rate for each of the distribution lines. The return water will converge into an output manifold inside the glove box similar to the input manifold. Manual adjustments can be made in the flow rate going to the loops to optimize the performance of the cooling system.

The other supply line will provide cooling water for the heat exchanger in the off-gas subsystem and will have a manual main shutoff valve. The off-gas subsystem is expected to present the highest demand for water-cooling. Calculations have shown that for a 4°C temperature rise in the exchange water, 45 gpm of cooling water will be required. For a 10°C (18°F) rise, 38 L/min (18 gpm) will be required. See Subsection 5.3 for more information on the off-gas subsystem.

Most of the instrumentation discussed in this paragraph is for testing and characterizing the system prior to shipment to LANL. Much of it will be removed prior to shipment. This is reflected in the P&ID diagrams by note and/or special shading of the instrumentation that will not be sent to LANL. Each of the main cooling lines will have an in-line flow meter and an additional thermocouple on the return side to perform an energy balance on the glove box subsystems and the off-gas subsystem. In addition, the flow meter outputs will be interlocked so that the melter cannot be operated if there is insufficient cooling water going to the various subsystems. All of the thermocouple outputs on the return lines will generate an operator warning if the temperature exceeds a preset value. Additional information on the cooling subsystem can be found in the process flow and P&ID diagrams.

5.6.3 Electrical

The operating system will be controlled by the Allen-Bradley PLC with operator input from the MMI. The pumps will be controlled by the PLC and run by dc motors controlled by dc controllers fed by 120 V. The cart movement for the melter cans uses stepper motors and drives, which are controlled by the PLC. System interlocks are controlled by the PLC and system conditions are displayed by the MMI. The frit system is controlled by a vender supplied interface connect to the PLC. All critical systems are backed up with uninterruptible power supply (UPS) power.

6. PROCESS HAZARD ANALYSIS

The process hazards analysis (PHA) for vitrification of transuranic wastes at TA-55 provides important input to authorization-basis documentation at TA-55. The analysis addresses only those hazards associated with the proposed waste vitrification process. It does not cover risks associated with facility operations performed adjacent to the site of the proposed vitrification process, nor transportation of vitrified wastes to waste disposal facilities outside TA-55.

The PHA report received from LANL shows that the vitrification process proposed at TA-55 is not expected to increase hazards or accidents previously analyzed in current authorization basis documents. Comments provided in the PHA report have been incorporated into this design report, primarily in the interlocks and instrumentation found in the equipment lists.

7. DESIGN BASIS OPERATING PROCEDURE OUTLINE

The following is a general outline of the design basis operating procedures for the vitrification system being designed for the evaporator bottoms of TA-55 at LANL:

1. Monday Start

    1.1 Status—Start

        1.1.1 Melter is full of frit added Thursday night.

        1.1.2 Melter temperature has been ramped to 500°C prior to start of the shift.

        1.1.3 Feed tanks have been filled and Pu and composition analysis from evaporator tanks has been received.

        1.1.4 Scrubber recycle tank is fill with stoichiometric amount caustic needed to neutralize the acid waste.

    1.2 Activities

        1.2.1 The required amount of liquid waste (approximately 200 L) is fed to the melter at approximately 25–50 L/hr.

        1.2.2 Sample for analysis taken from evaporator tanks and feed tanks are filled.

        1.2.3 Frit feed hopper is reloaded with frit.

    1.3 Status—End

        1.3.1 Liquid portion of the waste has been evaporated into the off-gas system and has been cooled and collected in the scrubber storage tank.

        1.3.2 Melter is held at 500°C overnight with dried/calcined waste and frit inside.

        1.3.3 Feed tanks are full.

2 Tuesday Start

    2.1 Status—Start

        2.1.1 Liquid portion of the waste has been evaporated into the off-gas system and has been neutralized, cooled, and collected in the scrubber storage tank.

        2.1.2 Melter temperature is at 500°C with dried/calcined waste and frit inside.

        2.1.3 Feed tanks are full.

    2.2 Activities

2.2.1 Ramping of melter temperature to 1,000–1,100°C as required.

2.2.2 If additional frit is required, it is transferred to the melter.

2.2.3 Melter is held at temperature until 1.5 hours before end of shift.

2.2.4 At 1.5 hours before end of shift:

2.2.4.1 Melter power is turned off for approximately 1 hour to allow can to cool slightly within the melter prior to lowering into cooling jacket #1.

2.2.4.2 Melter bottom assembly #1 and can of hot glass is lowered into cooling jacket.

2.2.4.3 Cooling jacket assembly (#1) is moved from under melter to cooling position #1.

2.2.4.4 Cooling jacket assembly (#2) with an empty can is moved from cooling position #2 to under the melter.

2.2.4.5 Melter bottom assembly #2 and the empty can is raised into the melter.

2.2.4.6 Frit is added to empty can within the melter.

2.2.4.7 Melter power is set to 500°C setting.

2.2.4.8 Sample of scrubber storage tank is taken for analysis.

2.3 Status—End

2.3.1 Melter Can #1 is in the cooling jacket assembly at cooling station #1.

2.3.2 Frit for next batch is in the melter heating to 500°C.

2.3.3 Feed tanks are full.

3 Wednesday

3.1 Status—Start

3.1.1 Melter is full of frit added Tuesday night.

3.1.2 Feed tanks have been filled and Pu and composition analysis from evaporator tanks has been received.

3.1.3 Melter Can #1 is in the cooling jacket assembly at cooling station #1.

3.2 Activities

3.2.1 Excess solution in the scrubber recycle tank is transferred to intermediate storage tank to await disposition and analysis. Scrubber recycle tank is filled with stoichiometric amount caustic needed to neutralize the acid waste.

3.2.2 The required amount of liquid waste (approximately 200 L) is fed to the melter at from 25–50 L/hr.

3.2.3 Sample for analysis taken from evaporator tanks and feed tanks are filled.

3.2.4 Frit feed hopper is reloaded with frit.

3.2.5 Can from cooling jacket #1 at cooling station #1 is lifted, moved over bagout station #1, and lowered into the attached 55-gal drum.

3.2.6 A lid is placed on the metal can full of glass.

3.2.7 Insulation/padding is placed on top of metal can.

3.2.8 The weight of the drum is taken and the amount of glass determined.

3.2.9 The drum from the glove box is bagged-out at bagout station #1.

3.2.10 New drum with metal can is bagged to glove box.

3.3 Status—End

3.3.1 Liquid portion of the waste has been evaporated into the off-gas system and has been neutralized, cooled, and collected in the scrubber storage tank.

3.3.2 Melter is held at 500°C overnight with dried/calcined waste and frit inside.

3.3.3 Feed tanks are full.

3.3.4 An empty can is in bagout station #1.

4 Thursday

4.1 Status—Start

4.1.1 Liquid portion of the waste has been evaporated into the off-gas system and has been neutralized, cooled, and collected in the scrubber storage tank.

4.1.2 Melter is held at 500°C overnight with dried/calcined waste and frit inside.

4.1.3 Feed tanks are full.

4.1.4 An empty can is in the bagout station #1.

4.2 Activities

4.2.1 Ramping of melter temperature to 1,000–1,100°C as required.

4.2.2 If additional frit is required, it is transferred to the melter.

4.2.3 The empty can in bagout station #1 is transferred to cooling jacket #1 at cooling station #1.

4.2.4 Melter is held at temperature until 1.5 hours before end of shift.

4.2.5 At 1.5 hours before end of shift:

4.2.5.1 Melter power is turned off for approximately 1 hour to allow can to cool slightly within the melter prior to lowering into cooling jacket #2.

4.2.5.2 Melter bottom assemble #2 and can of hot glass is lowered into cooling jacket.

4.2.5.3 Cooling jacket assembly (#2) is moved from under melter to cooling position #2.

4.2.5.4 Cooling jacket assembly (#1) with an empty can is moved from cooling position #1 to under the melter.

4.2.5.5 Melter bottom assembly #1 and the empty can is raised into the melter.

4.2.5.6 Frit is added to empty can within the melter.

4.2.5.7 Melter power is set to 500°C setting.

4.2.5.8 Take sample of scrubber storage tank or analysis.

4.3 Status—End

4.3.1 Melter Can #2 is in the cooling jacket assembly at cooling station #2.

4.3.2 Can #1 with frit is in the melter and heating to 500°C.

4.3.3 Feed tanks are full.

5 Friday

5.1 Status—Start

5.1.1 Melter Can #2 is in the cooling jacket assembly at cooling station #2 and cooled to cooling water temperature.

5.1.2 Can #1 with frit is in the melter and heating to 500°C.

5.1.3 Feed tanks are full.

5.1.4 Scrubber storage tank is being analyzed.

5.2 Activities

5.2.1 None Required.

5.2.2 Routine maintenance, if required.

5.3 Status—End

5.3.1 Melter Can #2 is in the cooling jacket assemble at cooling station #2 and cooled to cooling water temperature.

5.3.2 Can #1 with frit is in the melter and heated to 500°C.

5.3.3 Feed tanks are full.

5.3.4 Scrubber storage tank is being analyzed.

6 Saturday/Sunday

6.1 Status is same as Friday end of shift status.

8. DESIGN BASIS MELTER WASTE THROUGHPUT AND SIZING CALCULATIONS

Below are the calculations of the required volume for the melters. These are based on projected waste volumes and the glass development work at Pacific Northwest Laboratory (PNL).

Waste Input Variables	
g/L PU	—
L/day	100
Day/week	4
g/L oxide	200
kg/week waste	80
Waste loading	0.25

Waste values	
kg of frit required	240
Frit bulk density kg/L	1.16
L of frit	207
Max. grams Pu/drum -2 sigma	185
Pu/week	340
Min. number of drums per week	1.84

Glass/week (kg)	Glass density	L of glass/batch	Can fill (%)	Can volume (l) required
320	2.5	64	80%	80

Cylinder Melter	cm.	in.
Height	70	27.5
Diameter (ID)	39.4	15.5
Volume (mL)	85035	
Volume (L)	85	
Cans/week	1.51	
Whole can/week	2	
Pu/can		

Appendix A

Drawings

Drawing are in an attached package.

Appendix B

Mass and Energy Balance

Mass and Energy Balance

1. Melter Unit

The set of calculations in Table B1 represents maximum mass flows in an attempt to set an upper bound on the system. Actual flows of mass and energy in the system will, in general, be less than the values shown here—significantly in many cases. The design basis uses a throughput of 50 L/hr of waste for a total of 200 L of waste per batch. Assuming a 26% waste loading (solids) in the final glass requires 129 kg of frit per 200 L of waste to produce 174 kg of glass.

The energy balance requires electrical energy from resistance heating units to supply energy to "calcine" the liquid waste by boiling off the water and nitric acid and decomposing the transition metal compounds to metal oxides. The frit and the residual metal oxides from the waste must then be heated to above the liquids temperature (1,100°C in this case) and fused into a glass. The energy requirements were calculated per L of liquid waste basis (see Table B3).

The energy required to heat the liquid waste from room temperature (20°C) to the evaporation/decomposition temperature is 84 kcal/L.

Nitric acid boils at 150°C; water boils at 100°C. Although the metal nitrates decompose at a variety of temperatures, 150°C was used as the basis for this calculation.

The energy required to evaporate the liquids (primarily water and nitric acid) and decompose the metal nitrates was calculated to be 810 kcal/L.

Table B1. Feed (per L).

Compound	Molecular Weight	Moles/L	Grams/L
$Fe(NO_3)_3 \cdot 9H_2O$	403.85	0.15	61.4
KNO_3	101.1	0.09	8.6
$NaNO_3$	85	0.30	25.3
$Ca(NO_3)_2 \cdot 4H_2O$	236.08	1.46	344.1
$Mg(NO_3)_2 \cdot 6H_2O$	256.31	2.24	573.6
$Al(NO_3)_3 \cdot 9H_2O$	374.98	0.18	66.0
NH_4NO_3	80	0.001	0.1
KF	58.1	0.32	18.4
$K_2C_2O_4 \cdot H_2O$	184.22	0.04	6.7
$FeCl_3 \cdot 6H_2O$	270.2	0.01	2.6
$MgSO_4$	120.37	0.02	1.9
HNO_3	63	2.09	131.4
H_2O	18	14.53	261.8

Table B2. Energy requirements per liter of liquid waste.

Waste Oxide	Amount (g/L of Liquid Waste)
Al_2O_3	9.0
CaO	81.7
Fe_2O_3	12.9
MgO	90.8
K_2O	22.3
Na_2O	9.2
Total	226

The hydrated compounds were assumed to decompose to the anhydrous compound and water vapor. The metal nitrates were assumed to decompose to solid metal oxide, NO_2, and oxygen. $K_2C_2O_4$ was assumed to react to the solid oxide and carbon dioxide. NH_4NO_3 was assumed to react to form ammonia and nitric acid. No reaction or decomposition was assumed for water and nitric acid.

The planned outlet temperature for the off-gas is 500°C. The energy required to heat the gaseous products to that temperature is 159 kcal/L of liquid waste.

The energy required to heat the metal oxides in the waste from 150°C to 1,100°C was 56 kcal/L. No phase transformations were assumed.

Assuming a 26% solid oxide waste loading in the final glass, 600 g of frit is required per L of liquid waste. The energy required to heat the frit from room temperature (20°C) to 1,100°C is 174 kcal/L assuming a heat capacity of 0.25 cal/g°C.

The actual vitrification reactions are a complex series of solid state reactions, congruent and incongruent melting, and dissolution reactions. In order to approximate the energy requirements for the vitrification of the solid oxides and frit, a heat of fusion of 100 cal/g was assumed. This value is typical for many complex silicate compounds. It is most likely a conservative estimate, i.e., more energy than actually required. Based on the fusion of 869g of total glass/L of liquid waste, 87 kcal/L of energy is required to fuse the glass.

Table B3. Summary of energy requirements.

Step	Energy (kcal/L of liquid waste)
Heating liquid waste to evap/decomp T	84
Evaporation/Decomposition	810
Heat off-gas to 500°C	159
Heating waste oxides to 1,100°C	56
Heating frit to 1,100°C	174
Fusing glass	87
Total	1,371

2. Off-gas

The off-gas exiting the melter will have two distinct regimes: (1) during "calcining" of the waste, and (2) during the melting/vitrification of the waste oxides and frit. The off-gas composition during calcining is given in Table B4 below (the volumetric flows assume feeding 50 L of liquid waste per hour).

The off-gas flow during melter vitrification operations will be approximately 2 SCFM of air used for purging view ports etc., in the melter system.

3. Quencher

After exiting the melter, the off-gas is quenched in a venturi-type quench unit using caustic scrubber solution. The scrubber liquor is a design basis 25% NaOH solution that enters the quench unit at 80°F (27°C) and exits at 100°F (38°C). The off-gas enters the quencher at 500°C and exits at 38°C (100°F). This causes a great deal of the nitric acid and water to condense into liquid form. The nitric acid is neutralized by the scrubber liquor. This generates additional heat that must be removed by the quenching process. In total, 12.65 gpm of scrubber liquor is required during the calcination phase of melter operations. The off-gas composition exiting the quencher is shown in Table B5.

The liquid effluent enters the common sump of the quencher/scrubber. This includes the 12.65 gpm of caustic liquor plus condensed water (0.14 gpm) and nitric acid (0.03 gpm). The condensed nitric acid will react with the caustic to produce 138 g/min of $NaNO_3$ and 0.110 gpm of water while consuming 64.8 g/min of NaOH. The liquid effluent from the quencher is approximately 13 gpm.

Table B4. Off-gas composition during calcining.

Compound	Quantity (g/L of liquid waste)	SCFM (50 L/hr)	ACFM (500°C)
H_2O	664	26.1	68.7
NO_2	403	6.2	16.3
HNO_3	131	1.5	3.9
O_2	65	1.4	3.8
CO_2	3.2	0.05	0.14
HCl	1.1	0.02	0.05
SO_3	1.3	0.01	0.03
air	NA	2	5.3
NH_3	0.02	0.001	0.002
TOTAL	1269	37.3	98.2

Table B5. Off-gas composition exiting the quencher.

Off-gas Components Exiting Quench	SCFM (50L/m)	g/L of liquid water
H_2O	0.37	10
NO_2	5.77	403
HNO_3	0.09	9
O_2	1.3	65
CO_2	0.05	3.2
HCl	0.02	1.1
SO_3	0.01	1.3
air	2.0	NA
NH_3	0.001	0.02
TOTAL	9.65	492

3. Scrubber

Upon exiting the quencher, off-gas enters the caustic scrubber to remove acid vapors and react the NO_2 to NO. The scrubber is designed for 99.9% removal of acid gases and 99% conversion of NO_2 to NO. HCl is removed with 99.9% efficiency and SO_3 is reduced by 80%. The gas exiting the scrubber has the composition shown in Table B6.

Table B6. Composition of gas exiting the scrubber.

Off-gas Components Exiting Scrubber	SCFM (at 50L/min)	g/L of liquid water
H_2O	0.37	10
NO_2	0.06	4.0
HNO_3	0	0.009
O_2	1.3	65
CO_2	0.05	3.2
HCl	0	0.001
SO_3	0.002	0.3
air	2	NA
NO	1.9	87.6
NH_3	0.0008	0.02
TOTAL	5.7	170

At 50 L/hr of waste feed, the scrubber will require one L/min (0.25 gpm) of caustic (25% NaOH) from the common sump (common with the quench) to remove the acid gases. However, the energy liberated by the neutralization of the acid gases increases the exiting temperature of both effluent streams to an unacceptable level. If the caustic flow is increased to 14.4 L/min (3.8 gpm), the exit temperature of both the liquid and gaseous streams is 37°C (99°F).

4. Heat Exchanger

The quencher and scrubber inputs are maintained at 80°F (by passing these streams through a common heat exchanger prior to entering the respective units. Assuming a cooling circuit input temperature of 50°F and a desired temperature rise of 4°C in the cooling circuit, the water flow in the cooling circuit of this heat exchanger necessary to maintain the combined quench and scrubber flows (47.9 L/mi [12.65 gpm] quench + 14.4 L/min [3.8 gpm] scrubber) at 27°C (80°F) is 175 L/min (46 gpm). If a temperature rise in the cooling circuit of 10°C is used the flow requirement drops to 70 L/min (18 gpm).

5. Sodium Hydroxide Solution Consumption

The neutralization of condensed HNO_3 in the quench and the neutralization of HNO_3 vapor and reaction of NO_2 to NO in the scrubber will consume NaOH solution. Based on the above calculations, for every 200 L of waste processed approximately 200 L (53 gallons) of 25% NaOH solution will be consumed. For 9 molar (36% by weight) NaOH solution, the amount of caustic solution consumed per 200 L of waste is 127 L (34 gallons).

ATTACHMENT C

Typical Storage Container Utilized at TA-55

Table C-1
Storage Containers

Non-Bulk Performance-Oriented Packaging for Which the Manufacturer has Provided the Required UN Marking in Accordance with 49 CFR § 178.503	Intermediate Bulk Performance-Oriented Containers for Which the Container has been Marked by the Manufacturer in Accordance with 49 CFR § 178.703	Cylinders for Which the Cylinder has been Properly Marked with the Applicable DOT Specification Number in Accordance with 49 CFR § 178.35	Containers Used for Transport of Radioactive Materials
Steel drums meeting the standards of 49 CFR § 178.504. Maximum capacity will not exceed 119 gallons (gal); maximum net mass will not exceed 882 pounds (lbs).	Metal intermediate bulk containers meeting the standards of 49 CFR § 178.705.	Seamless steel cylinders meeting the requirements of DOT Specification 3A, 3AX, 3AA, 3AAX, 3B, 3E, or 3T in 49 CFR, Part 178, Subpart C.	Containers meeting the requirements of DOT Specification 7A in 49 CFR § 178.350.
Aluminum drums meeting the standards of 49 CFR § 178.505. Maximum capacity will not exceed 119 gal; maximum net mass will not exceed 882 lbs.	Rigid plastic intermediate bulk containers meeting the standards of 49 CFR § 178.706.	Welded or brazed steel cylinders meeting the requirements of DOT Specification 4B, 4BA, 4B240ET, 4AA480, 4L, or 4BW in 49 CFR, Part 178, Subpart C.	Containers meeting the requirement of Industrial Packaging IP-1, IP-2, or IP-3 in 49 CFR § 173.411.
Metal drums other than steel or aluminum meeting the standards of 49 CFR § 178.506. Maximum capacity will not exceed 119 gal; maximum net mass will not exceed 882 lbs.	Composite intermediate bulk containers meeting the standards of 49 CFR § 178.707.	Seamless or welded aluminum cylinders meeting the requirements of DOT Specification 3AL or 4E in 49 CFR, Part 178, Subpart C.	Containers meeting the requirements of excepted packaging and the requirements of 49 CFR § 173.410.
Fiber drums meeting the standards of 49 CFR § 178.508. Maximum capacity will not exceed 119 gal; maximum net mass will not exceed 882 lbs.	Fiberboard intermediate bulk containers meeting the standards of 49 CFR § 178.708.	Seamless nickel cylinders meeting the requirements of DOT Specification 3BN in 49 CFR, Part 178, Subpart C.	
Plastic drums meeting the standards of 49 CFR § 178.509. Maximum capacity will not exceed 119 gal; maximum net mass will not exceed 882 lbs.	Wooden intermediate bulk containers meeting the standards of 49 CFR § 178.709.		
Plastic Jerricans meeting the standards of 49 CFR § 178.509. Maximum capacity will not exceed 16 gal; maximum net mass will not exceed 265 lbs.	Flexible intermediate bulk containers meeting the standards of 49 CFR § 178.710.		
Steel or aluminum boxes meeting the standards of 49 CFR § 178.512. Maximum net mass will not exceed 882 lbs.			

Table C-1 (continued)

Storage Containers

Non-Bulk Performance-Oriented Packaging for Which the Manufacturer has Provided the Required UN Marking in Accordance with 49 CFR § 178.503	Intermediate Bulk Performance-Oriented Containers for Which the Container has been Marked by the Manufacturer in Accordance with 49 CFR § 178.703	Cylinders for Which the Cylinder has been Properly Marked with the Applicable DOT Specification Number in Accordance with 49 CFR § 178.35	Containers Used for Transport of Radioactive Materials
Aluminum or steel Jerricans meeting the standards of 49 CFR 178.511. Maximum capacity will not exceed 16 gal; maximum net mass will not exceed 265 lbs.			
Plywood boxes meeting the standards of 49 CFR § 178.514. Maximum net mass will not exceed 882 lbs.			
Fiberboard boxes meeting the standards of 49 CFR § 178.516. Maximum net mass will not exceed 882 lbs.			
Composite packaging with inner receptacles meeting the standards of 49 CFR § 178.522. Maximum capacity is 66 gallons; maximum net mass is 882 lbs.			
Composite packaging with inner glass, porcelain, or stone receptacles meeting the standards of 49 CFR § 178.523. Maximum net capacity for liquids is 16 gal; maximum net mass for solids is 165 lbs.			

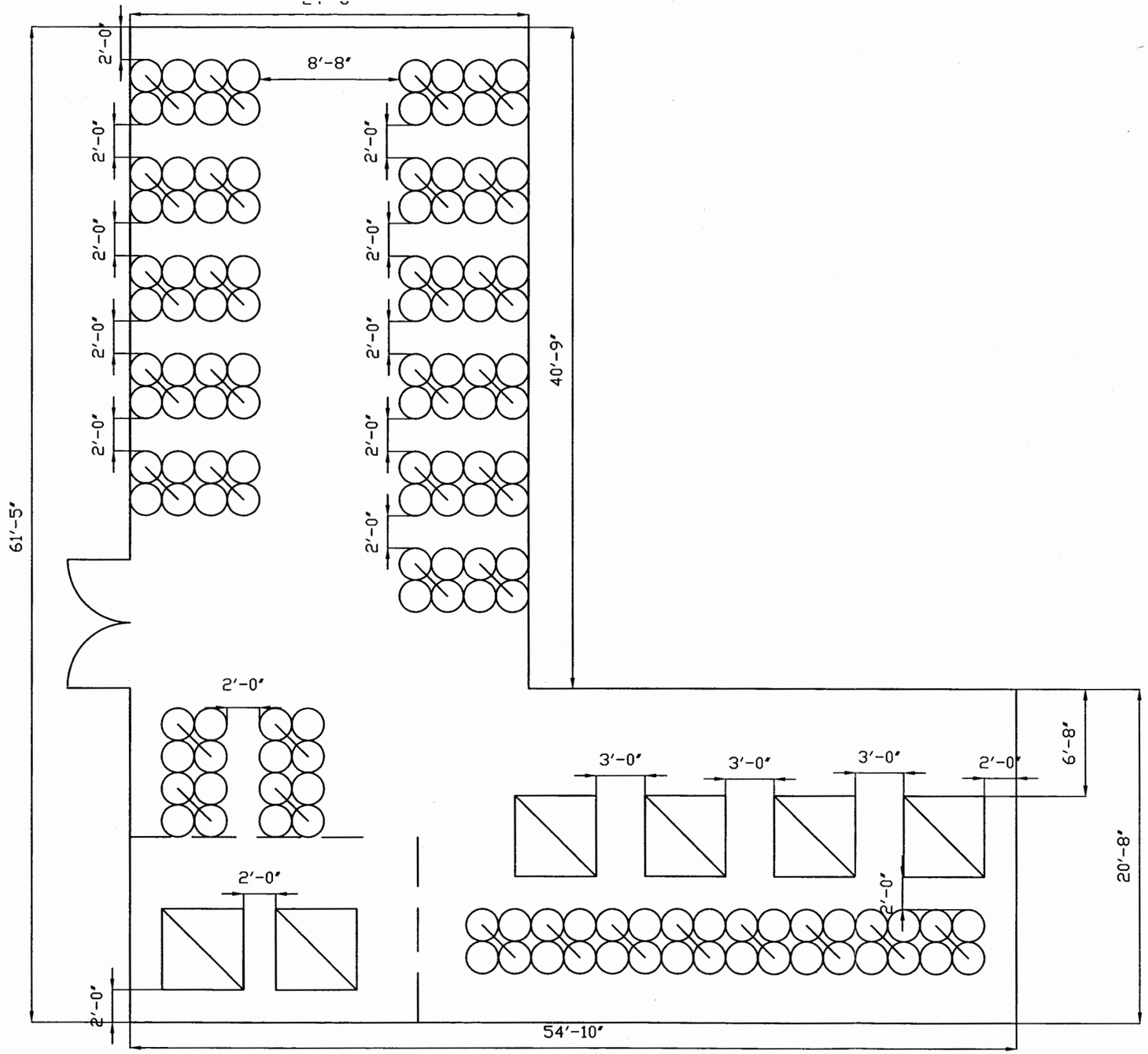
Table C-2

Storage Containers Used at TA-55 for Mixed Transuranic Waste Awaiting Characterization and Transport to the Waste Isolation Pilot Plant (WIPP)

Standard 55-gallon (208-liter) Drum	Standard Waste Box	Standard 85-gallon (322-liter) Drum Over Pack	Oversized Waste Box
Gross internal volume of 7.3 cubic feet (ft^3) (0.21 cubic meters [m^3]) constructed of mild steel. May also contain ridge, molded polyethylene (or other compatible material) liner. Must meet requirements of DOT Specification &7A in 49 CFR § 178.350.	Gross internal volume of 66 ft^3 (1.88 m^3). Must meet requirements of DOT Specification 7A in 49 CFR § 178.350.	Gross internal volume of 11.3 ft^3 (0.32 m^3). Used for overpacking contaminated 55-gallon drums containing mixed transuranic waste.	Gross internal volume greater than 11.3 ft3 (0.32 m3). Used for oversized mixed transuranic waste.
One or more filter vents installed on top of the container. Vents are high-efficiency particulate air (HEPA) 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 (e.g., composite carbon, sintered metal).	One or more filter vents installed on top of the container. Vents are HEPA-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 mm) in diameter through which internally generated gas may pass. Filter media can be any material (e.g., composite carbon, sintered metal).	One or more filter vents installed on top of the container. Vents are HEPA-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 mm) in diameter through which internally generated gas may pass. Filter media can be any material (e.g., composite carbon, sintered metal).	Two or more filter vents installed on sides of container. Vents are HEPA-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 mm) in diameter through which internally generated gas may pass. Filter media can be any material (e.g., composite carbon, sintered metal).

ATTACHMENT D

Potential Storage Configurations for the TA-55 Container Storage Units



POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT, B40 CSU

MAXIMUM STORAGE CAPACITY = 21,500 GALLONS

GENERAL NOTES:

1. DRAWING REPRESENTS ONE POTENTIAL STORAGE CONFIGURATION OF WASTE CONTAINERS IN THE CONTAINER STORAGE UNIT. THE ACTUAL CONFIGURATION MAY VARY.
2. SEE THE TABLE BELOW FOR A LIST OF WASTE AND CONTAINER TYPES THAT ARE STORED AT THE CONTAINER STORAGE UNIT.
3. THE MAXIMUM CAPACITY WAS CALCULATED BASED ON FULL 55-GALLON DRUMS AND/OR STANDARD WASTE BOXES, DOUBLE STACKED, WITH A MINIMUM 2' AISLE SPACE.

CONTAINER STORAGE UNIT (CSU) DETAILS

CSU	MAX CAPACITY (GALLONS)	WASTE TYPES	CONTAINER TYPES
B40	21,500	SOLID/LIQUID HAZARDOUS AND MIXED WASTE	15-, 30-, 55-, AND 85-GALLON DRUMS; LARGE WASTE BOXES; AND STANDARD WASTE BOXES

LEGEND

STANDARD WASTE BOX (SWB) – 72 CUBIC FT (~538 GALLONS) DOUBLE STACKED

55 GALLON DRUMS DOUBLE STACKED

NO.	DATE	DWN	DES	CHKD	APP	REVISIONS

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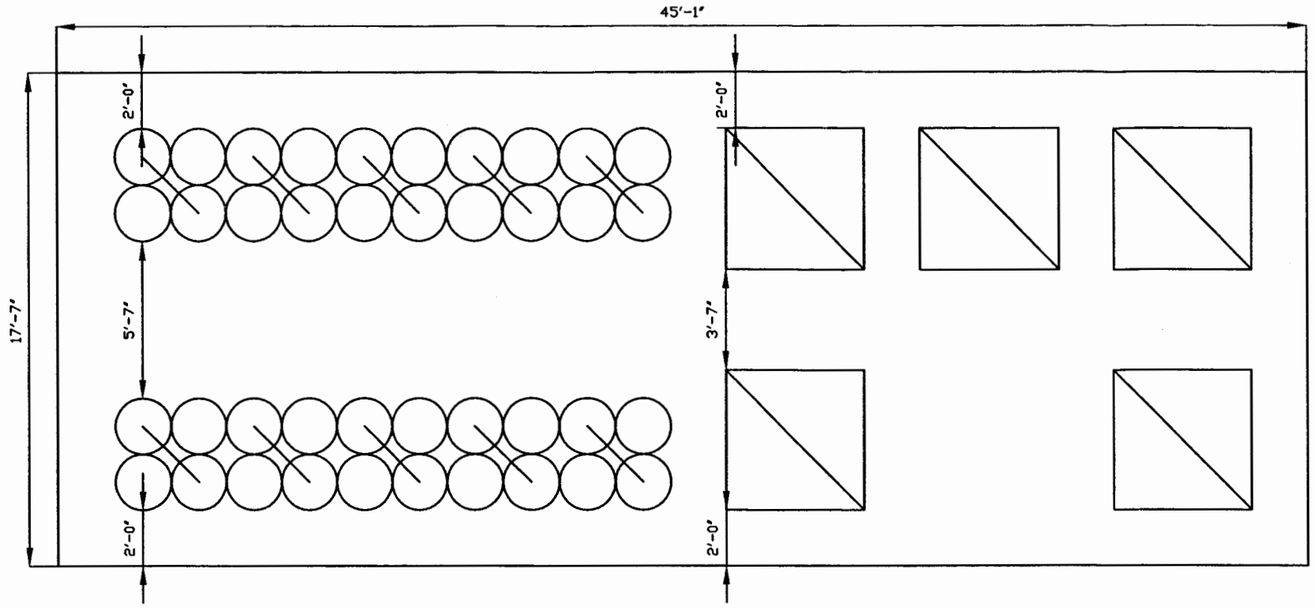
TA-55 NOD RESPONSE

POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT, B40 CSU

BLDG. 4 — TA- 55

DESIGNED			CHECKED	J. CARMICHAEL	8/8/02	APPROVED	J. CARMICHAEL	8/8/02
DRAWN	J. GRIFFIN	8/8/02	SUBMITTED	J. GRIFFIN	8/8/02	SHEET NO. M1	1 OF 5	REVISION NO. 0
PROJECT ID 819592			DRAWING NO. B40					



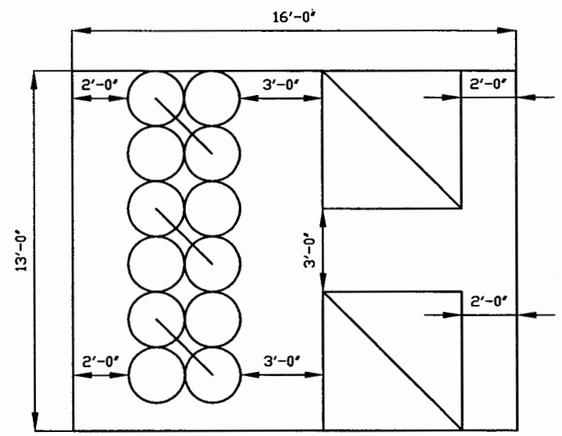
POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT, B45 CSU
MAX CAPACITY = 11,000 GALLONS

GENERAL NOTES:

1. DRAWING REPRESENTS ONE POTENTIAL STORAGE CONFIGURATION OF WASTE CONTAINERS FOR EACH CONTAINER STORAGE UNIT. THE ACTUAL CONFIGURATION MAY VARY.
2. SEE THE TABLE BELOW FOR A LIST OF WASTE AND CONTAINER TYPES THAT ARE STORED AT EACH CONTAINER STORAGE UNIT.
3. THE MAXIMUM CAPACITIES WERE CALCULATED BASED ON FULL 55-GALLON DRUMS AND/OR STANDARD WASTE BOXES, DOUBLE STACKED, WITH A MINIMUM 2' AISLE SPACE.

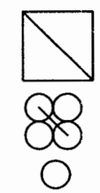
CONTAINER STORAGE UNIT (CSU) DETAILS

CSU	MAX CAPACITY (GALLONS)	WASTE TYPES	CONTAINER TYPES
B05	3,600	SOLID HAZARDOUS AND MIXED WASTE	30-, 55-, AND 85-GALLON DRUMS
B45	11,000	SOLID HAZARDOUS AND MIXED WASTE	STEEL CANS; 55- AND 85-GALLON DRUM; AND STANDARD WASTE BOXES (SWB)
K13	2,500	SOLID/LIQUID HAZARDOUS AND MIXED WASTE	STEEL CANS; 30-, 55-, AND 85-GALLON DRUMS; SWB; AND LARGE WASTE BOXES
FL01	600	SOLID/LIQUID HAZARDOUS AND MIXED WASTE	30-, 55-, AND 85-GALLON DRUMS



POTENTIAL STORAGE CONFIGURATION FOR TA-55-4, BASEMENT, K13 CSU
MAX CAPACITY = 3,400 GALLONS

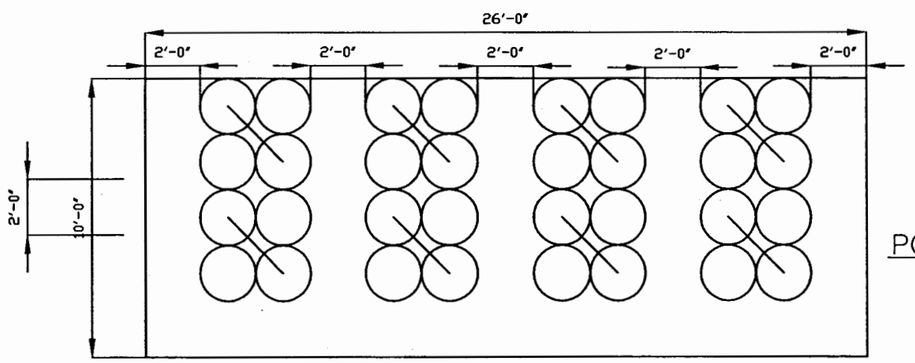
LEGEND



STANDARD WASTE BOX (SWB) - 72 CUBIC FT (~538 GALLONS) DOUBLE STACKED

55 GALLON DRUMS DOUBLE STACKED

SINGLE 55 GALLON DRUM



POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT B05 CSU
MAXIMUM CAPACITY = 3,600 GALLONS

NO.	DATE	DWN	DES	CHKD	APP	REVISIONS

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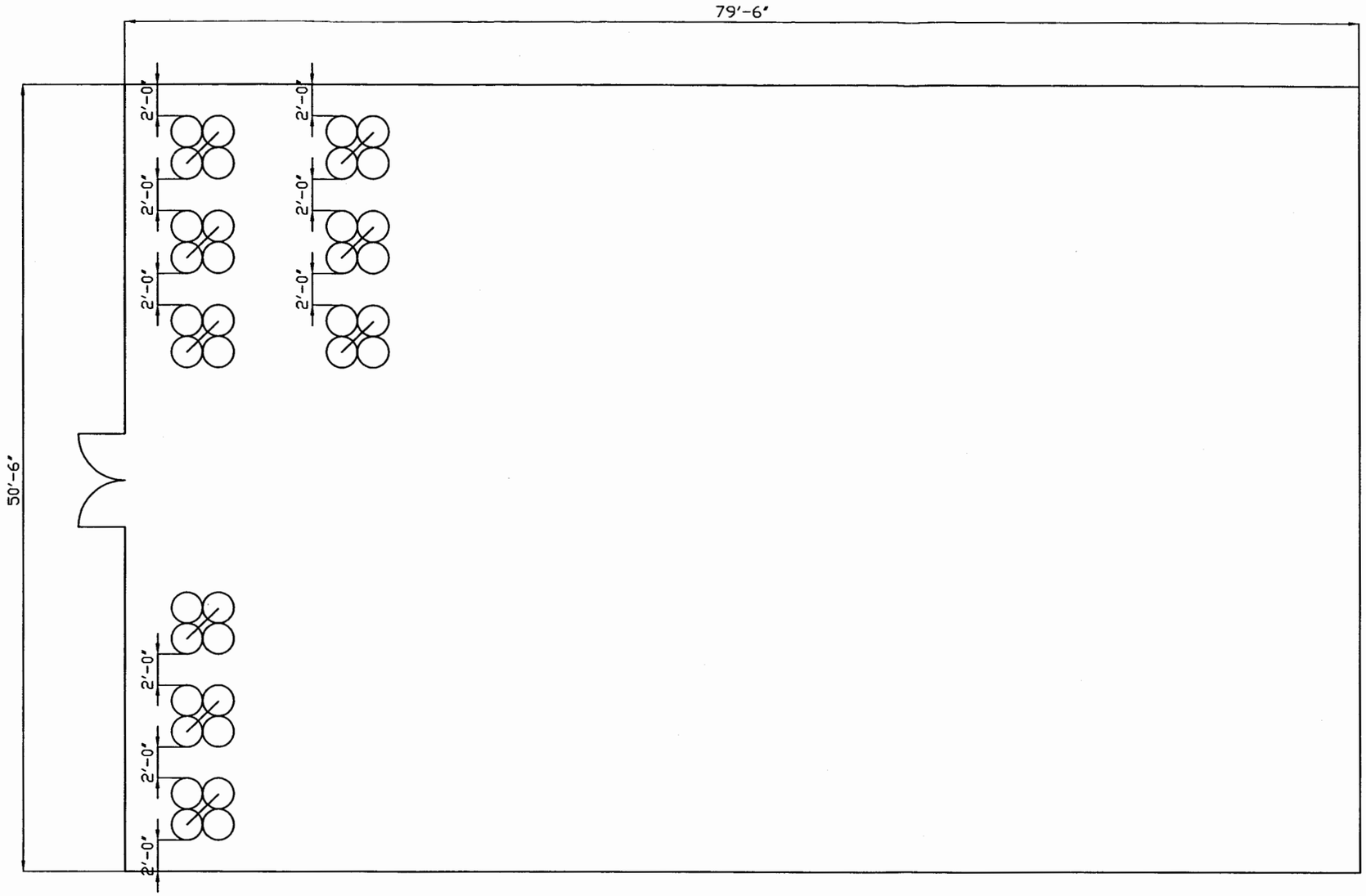
TA-55 NOD RESPONSE

POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT B05, B45, AND K13 CSUs

BLDG. 4 — TA- 55

DESIGNED			CHECKED	J. CARMICHAEL	8/8/02	APPROVED	J. CARMICHAEL	8/8/02
DRAWN	J. GRIFFIN	8/8/02	SUBMITTED	J. GRIFFIN	8/8/02	SHEET NO. M2	2 OF 5	REVISION NO. 0
PROJECT ID 819592			DRAWING NO. B45, B05, K13,					



POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-4, BASEMENT, VAULT CSU
MAXIMUM STORAGE CAPACITY = 4,000 GALLONS

GENERAL NOTES:

1. DRAWING REPRESENTS ONE POTENTIAL STORAGE CONFIGURATION OF WASTE CONTAINERS IN THE CONTAINER STORAGE UNIT. THE ACTUAL CONFIGURATION MAY VARY.
2. SEE THE TABLE BELOW FOR A LIST OF WASTE AND CONTAINER TYPES THAT ARE STORED AT THE CONTAINER STORAGE UNIT.
3. THE MAXIMUM CAPACITY WAS CALCULATED BASED ON FULL 55-GALLON DRUMS, DOUBLE STACKED, WITH A MINIMUM 2' AISLE SPACE.

CONTAINER STORAGE UNIT (CSU) DETAILS

CSU	MAX CAPACITY (GALLONS)	WASTE TYPES	CONTAINER TYPES
VAULT	4,000	SOLID HAZARDOUS AND MIXED WASTE	GLASS OR PLASTIC BOTTLES; STEEL CANS; AND 30-, AND 55-GALLON DRUMS

LEGEND

55 GALLON DRUMS DOUBLE STACKED

NO.	DATE	DWN	DES	CHKD	APP	REVISIONS

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LOS ALAMOS NATIONAL LABORATORY
TA-55 NOD RESPONSE

POTENTIAL STORAGE CONGIFURATION FOR THE TA-55-4, BASEMENT, VAULT CSU

BLDG. 4 — TA- 55

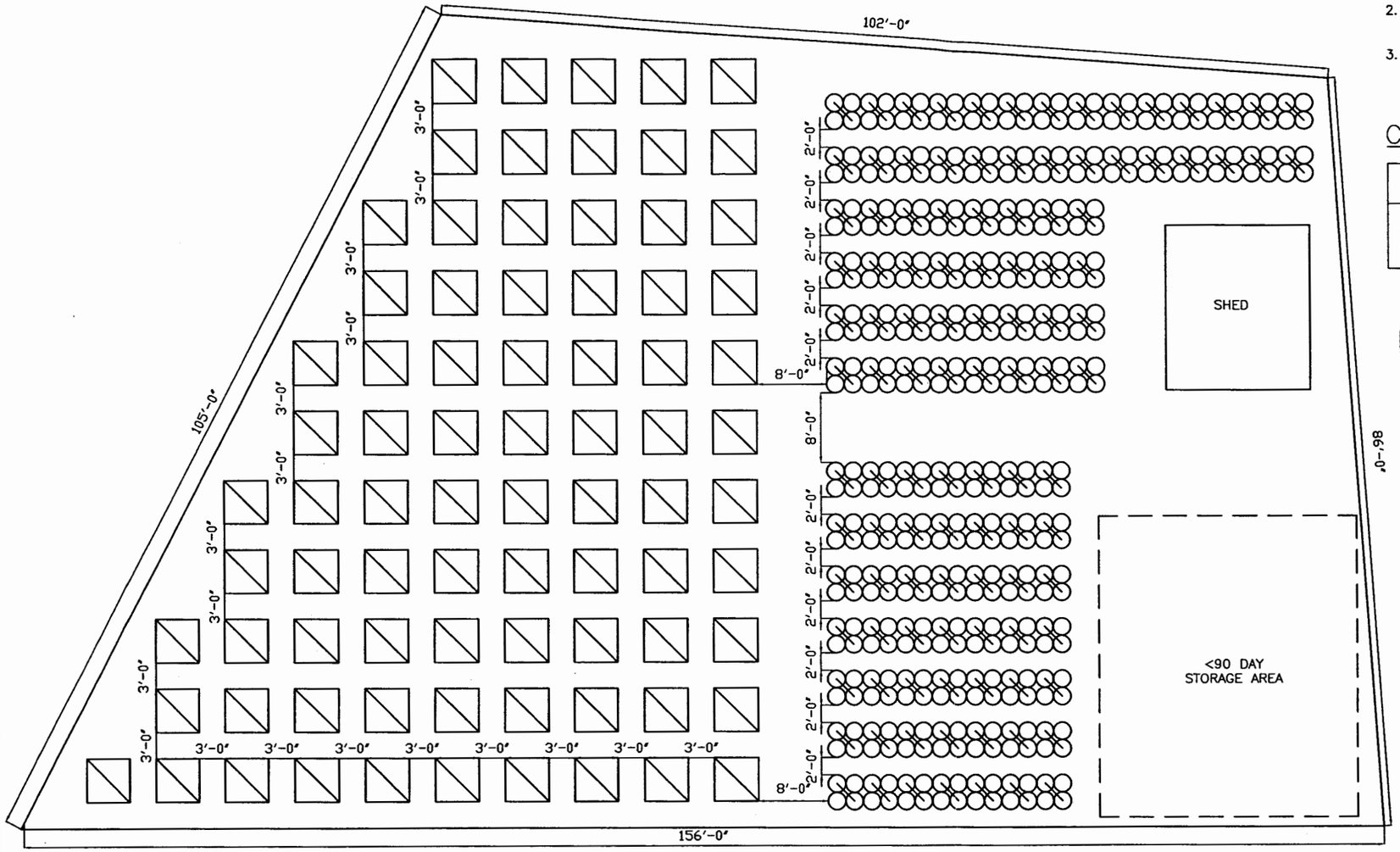
DESIGNED			CHECKED	J. CARMICHAEL	8/8/02	APPROVED	J. CARMICHAEL	8/8/02
DRAWN	J. GRIFFIN	8/8/02	SUBMITTED	J. GRIFFIN	8/8/02	SHEET NO. M3	3 OF 5	REVISION NO. 0
PROJECT ID 819592			DRAWING NO. VAULT					

GENERAL NOTES:

1. DRAWING REPRESENTS ONE POTENTIAL STORAGE CONFIGURATION OF WASTE CONTAINERS IN THE CONTAINER STORAGE UNIT. THE ACTUAL CONFIGURATION MAY VARY.
2. SEE THE TABLE BELOW FOR WASTE AND CONTAINER TYPES THAT ARE STORED IN THE CONTAINER STORAGE UNIT.
3. THE MAXIMUM CAPACITY WAS CALCULATED BASED ON FULL 55-GALLON DRUMS AND/OR STANDARD WASTE BOXES, DOUBLE STACKED, WITH A MINIMUM 2' AISLE SPACE.

CONTAINER STORAGE UNIT (CSU) DETAILS

CSU	MAX CAPACITY (GALLONS)	WASTE TYPES	CONTAINER TYPES
STORAGE PAD	135,000	SOLID/LIQUID HAZARDOUS AND MIXED WASTE	30-, 55-, AND 85-GALLON DRUMS; STANDARD WASTE BOXES; LARGE WASTE BOXES; VARIOUS SMALL CONTAINERS



POTENTIAL STORAGE CONFIGURATION FOR THE TA-55, STORAGE PAD CSU

MAXIMUM STORAGE CAPACITY = 135,000 GALLONS

LEGEND

STANDARD WASTE BOX (SWB) - 72 CUBIC FT (~538 GALLONS) DOUBLE STACKED

55 GALLON DRUMS DOUBLE STACKED

NO.	DATE	DWN	DES	CHKD	APP	REVISIONS

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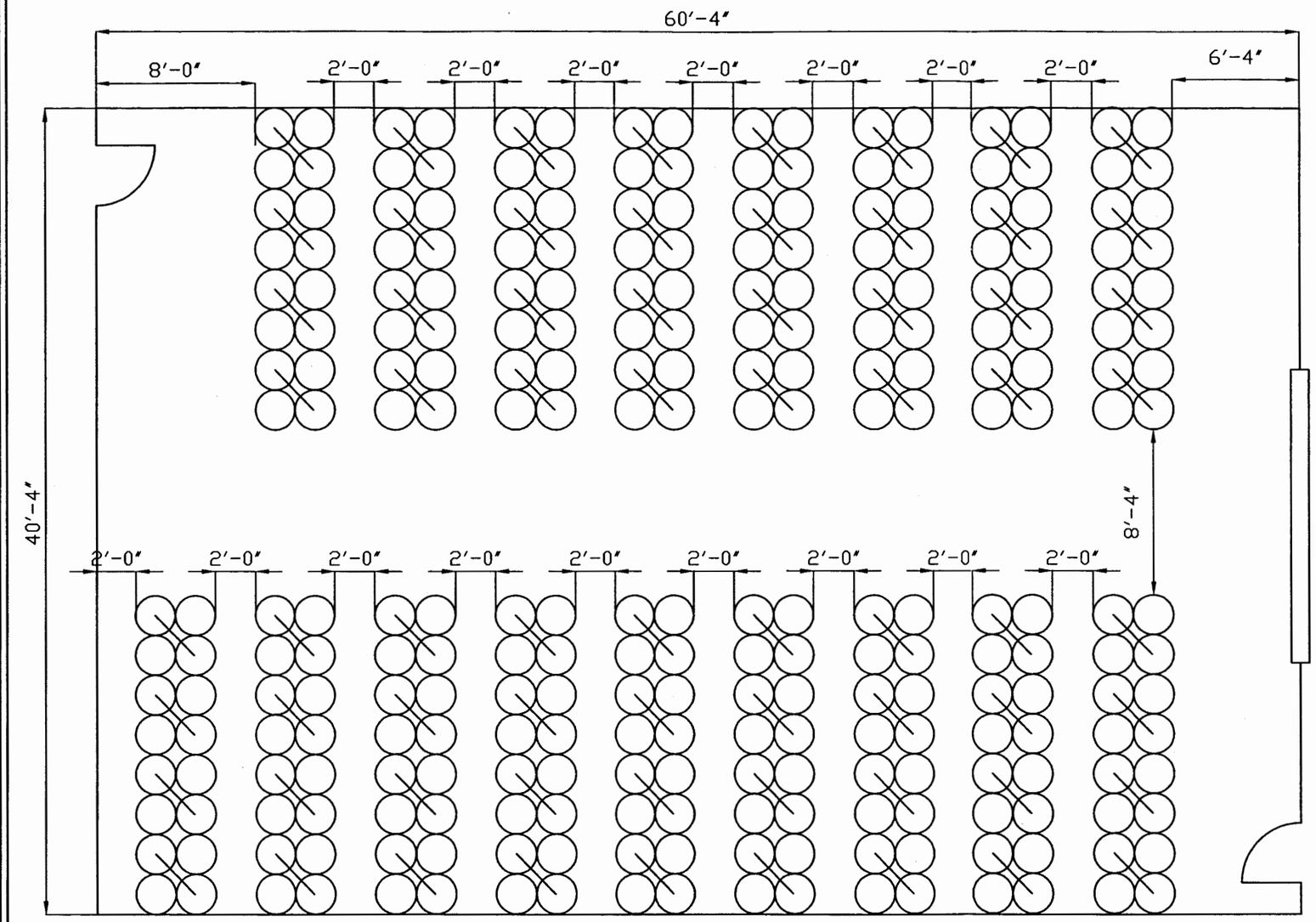
LOS ALAMOS NATIONAL LABORATORY
TA-55 NOD RESPONSE

POTENTIAL STORAGE CONFIGURATION FOR THE TA-55, STORAGE PAD CSU

BLDG. TA- 55

DESIGNED			CHECKED	J. CARMICHAEL	8/8/02	APPROVED	J. CARMICHAEL	8/8/02
DRAWN	J. GRIFFIN	8/8/02	SUBMITTED	J. GRIFFIN	8/8/02	SHEET NO. M4	4 OF 5	REVISION NO. 0
PROJECT ID 819592			DRAWING NO. 55PAD					



POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-185 CSU
MAXIMUM STORAGE CAPACITY = 30,000 GALLONS

GENERAL NOTES:

1. DRAWING REPRESENTS ONE POTENTIAL STORAGE CONFIGURATION OF WASTE CONTAINERS IN THE CONTAINER STORAGE UNIT. THE ACTUAL CONFIGURATION MAY VARY.
2. SEE THE TABLE BELOW FOR A LIST OF WASTE AND CONTAINER TYPES THAT ARE STORED IN THE CONTAINER STORAGE UNIT.
3. THE MAXIMUM CAPACITY WAS CALCULATED BASED ON FULL 55-GALLON DRUMS, DOUBLE STACKED, WITH A MINIMUM 2' AISLE SPACE.

CONTAINER STORAGE UNIT (CSU) DETAILS

CSU	MAX CAPACITY (GALLONS)	WASTE TYPES	CONTAINER TYPES
TA-55-185	30,000	SOLID HAZARDOUS AND MIXED WASTE	30-, 55-, AND 85-GALLON DRUMS

LEGEND

55 GALLON DRUMS DOUBLE STACKED

NO.	DATE	DWN	DES	CHKD	APP	REVISIONS

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TA-55 NOD RESPONSE

POTENTIAL STORAGE CONFIGURATION FOR THE TA-55-185 CSU

BLDG. 185 TA- 55

DESIGNED			CHECKED	J. CARMICHAEL	8/8/02	APPROVED	J. CARMICHAEL	8/8/02
DRAWN	J. GRIFFIN	8/8/02	SUBMITTED	J. GRIFFIN	8/8/02	SHEET NO. M5	5 OF 5	REVISION NO. 0
PROJECT ID 819592			DRAWING NO. 185					

ATTACHMENT E

Waste Profile Form

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WASTE PROFILE FORM

Contact (if other than given below)	For rapid processing, complete all sections in black or blue ink and mail to: EM-SWO at **MS J595.** For assistance with completing this form, call EM-SWO at **5-4000.**	Reference Number (For EM-SWO use only.)

Generator's Z Number	Waste Generator's Name (print)	WMC's Z Number	WMC's Name (print)

Generator's Telephone	Generator's Mail Stop	Waste Generating Group	Waste Stream Technical Area	Building	Room

Waste Accumulation (Check only one.)

- ☐ Satellite Accumulation Area — Site no: _____
- ☐ Less-than-90-days Storage Area — Site no: _____
- ☐ TSDF — Site no: _____
- ☐ Universal Waste Storage Area — Site no: _____
- ☐ None of the Above

ER Use Only
- ☐ ER Site — PRS #: _____

Method of Characterization (Check as many as apply.)

☐ Analysis/Documents Attached

- ☐ Chemical/Physical Analysis — Sample #: _____
- ☐ Radiological Analysis — Sample #: _____
- ☐ PCB Analysis — Sample #: _____
- ☐ Acceptable Knowledge Documentation — Documentation #: _____
- ☐ MSDS

FOR INFORMATION ONLY

Section 1 - Chemical and Physical Information

Waste Type (Check only one.)

- ☐ Unused/Unspent Chemical (Complete all sections as appropriate.)
- ☐ Process Waste/Spent Chemical/ other (Complete all sections.)
- ☐ Green is Clean Waste (Complete all sections as appropriate.)

Waste Classes

Radiological Information

Was Waste Generated in a RCA?
☐ Yes ☐ No

- ☐ Non-radioactive
- ☐ Radioactive
  - ☐ Low-Level
  - ☐ Transuranic

Wastewater Information

- ☐ Wastewater for SWSC (TA-46) **(Complete Attachment 1)**
- ☐ Wastewater for RLWTF (TA-50/TA-21) **(Complete Attachment 2)**
- ☐ Wastewater for TA-16 (HE)

Classification Information

- ☐ Unclassified
- ☐ Classified/Sensitive

Waste Category (Check as many as apply.)

- ☐ Inorganic
- ☐ Organic
- Volatile Organics ☐ < 500 ppm ☐ ≥ 500 ppm
- ☐ Solvent *
- ☐ Degreaser *
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated Hazardous waste residue
- ☐ Explosive process
- ☐ Infectious/Medical
- ☐ Biological
- ☐ Beryllium
- ☐ Empty Container (See instructions)
- ☐ Battery (See instructions)
- Asbestos ☐ friable ☐ non-friable
- PCB Source Concentration
  - ☐ PCB < 50 ppm
  - ☐ PCB ≥ 50 - < 500 ppm
  - ☐ PCB ≥ 500 ppm
  - ☐ Other (Describe below)

* Concentrations 10% or greater before use.

Waste Source (Check only one.)

Routine Waste

- ☐ Decon
- ☐ Materials Processing/Production
- ☐ Research/Development/Testing
- ☐ Scheduled Maintenance
- ☐ Housekeeping - Routine
- ☐ Spill Cleanup - Routine
- ☐ Sampling - Routine Monitoring
- ☐ Other (Describe below)

Non-routine Waste

- ☐ Abatement
- ☐ Construction/Upgrades
- ☐ Demolition
- ☐ Decon/Decom
- ☐ Investigative Derived
- ☐ Orphan/Legacy
- ☐ Remediation/Restoration
- ☐ Repacking (Secondary)
- ☐ Unscheduled Maintenance
- ☐ Housekeeping - Non-routine
- ☐ Spill Cleanup - Non-routine
- ☐ UST - Non-petroleum
- ☐ UST - Petroleum
- ☐ Other (Describe below)

Waste Matrix (Check only one.)

Gas

- ☐ ≤ 1.5 Atmospheres pressure
- ☐ > 1.5 Atmospheres pressure
- ☐ Liquefied compressed gas

Liquid

- ☐ Aqueous
- ☐ Non-aqueous
- ☐ Suspended Solids/ Aqueous
- ☐ Suspended Solids/ Non-aqueous

Solid

- ☐ Powder/Ash
- ☐ Solid
- ☐ Sludge
- ☐ Absorbed liquid

Matrix Type (Check only one.)

- ☐ Homogeneous
- ☐ Heterogeneous (Describe below)

Waste/Process Description (Chemical formulas may be used in this field.)

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WASTE PROFILE FORM

Section 2 - Characteristics

Ignitability (Check only one.) (°F)	(°C)	Corrosivity (Check only one.) (pH)	Reactivity (Check as many as apply.)	Boiling Point (Check only one.) (°F)	(°C)
☐ < 73	< 22.8	☐ ≤ 2.0	☐ RCRA Unstable	☐ ≤ 95	≤ 35
☐ 73 - 99	22.8 - 37.2	☐ 2.1 - 4.0	☐ Water Reactive	☐ > 95	> 35
☐ 100 - 139	37.8 - 59.4	☐ 4.1 - 6.0	☐ Cyanide Bearing (> 250 ppm)		
☐ 140 -200	60.0 - 99.3	☐ 6.1 - 9.0	☐ Sulfide Bearing (> 500 ppm)		
☐ > 200	> 99.3	☐ 9.1 - 12.4	☐ Pyrophoric		
☐ EPA Ignitable - Non-liquid		☐ ≥ 12.5	☐ Shock Sensitive		
☐ DOT Flammable Gas		☐ Liquid corrosive to steel	☐ Explosive - DOT Div. _____		
☐ DOT Oxidizer					
☐ Not ignitable		☐ Non-aqueous	☐ Non-reactive	☐ Not applicable	

Identify for all contaminants listed.	Characterization Method: AK	TCLP	Total	Concentration of Contaminants: None or Non-detect	Present Below Regulatory Limit	Above Regulatory Limit: Minimum	Maximum
Toxicity Characteristic Metals						(Concentration in ppm only.)	
Arsenic	☐	☐	☐	☐	☐ < 5.0 ppm	_____	to ____ ppm
Barium	☐	☐	☐	☐	☐ < 100.0 ppm	_____	to ____ ppm
Cadmium	☐	☐	☐	☐	☐ < 1.0 ppm	_____	to ____ ppm
Chromium (Total)	☐	☐	☐	☐	☐ < 5.0 ppm	_____	to ____ ppm
Lead	☐	☐	☐	☐	☐ < 5.0 ppm	_____	to ____ ppm
Mercury	☐	☐	☐	☐	☐ < 0.2 ppm	_____	to ____ ppm
Selenium	☐	☐	☐	☐	☐ < 1.0 ppm	_____	to ____ ppm
Silver	☐	☐	☐	☐	☐ < 5.0 ppm	_____	to ____ ppm
Toxicity Characteristic Organics							
Benzene	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
Carbon tetrachloride	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
Chlorodane	☐	☐	☐	☐	☐ < 0.03 ppm	_____	to ____ ppm
Chlorobenzene	☐	☐	☐	☐	☐ < 100.0 ppm	_____	to ____ ppm
Chloroform	☐	☐	☐	☐	☐ < 6.0 ppm	_____	to ____ ppm
o - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____	to ____ ppm
m - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____	to ____ ppm
p - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____	to ____ ppm
Cresol - mixed	☐	☐	☐	☐	☐ < 200.0 ppm	_____	to ____ ppm
2,4-D	☐	☐	☐	☐	☐ < 10.0 ppm	_____	to ____ ppm
1,4-Dichlorobenzene	☐	☐	☐	☐	☐ < 7.5 ppm	_____	to ____ ppm
1,2-Dichloroethane	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
1,1-Dichloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____	to ____ ppm
2,4-Dinitrotoluene	☐	☐	☐	☐	☐ < 0.13 ppm	_____	to ____ ppm
Endrin	☐	☐	☐	☐	☐ < 0.02 ppm	_____	to ____ ppm
Heptachlor (& its epoxide)	☐	☐	☐	☐	☐ < 0.008 ppm	_____	to ____ ppm
Hexchlorobenzene	☐	☐	☐	☐	☐ < 0.13 ppm	_____	to ____ ppm
Hexchlorobutadiene	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
Hexchloroethane	☐	☐	☐	☐	☐ < 3.0 ppm	_____	to ____ ppm
Lindane	☐	☐	☐	☐	☐ < 0.4 ppm	_____	to ____ ppm
Methoxychlor	☐	☐	☐	☐	☐ < 10.0 ppm	_____	to ____ ppm
Methyl ethyl ketone	☐	☐	☐	☐	☐ < 200.0 ppm	_____	to ____ ppm
Nitrobenzene	☐	☐	☐	☐	☐ < 2.0 ppm	_____	to ____ ppm
Pentachlorophenol	☐	☐	☐	☐	☐ < 100.0 ppm	_____	to ____ ppm
Pyridine	☐	☐	☐	☐	☐ < 5.0 ppm	_____	to ____ ppm
Tetrachloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____	to ____ ppm
Toxaphene	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
Trichloroethylene	☐	☐	☐	☐	☐ < 0.5 ppm	_____	to ____ ppm
2,4,5-Trichlorophenol	☐	☐	☐	☐	☐ < 400.0 ppm	_____	to ____ ppm
2,4,6-Trichlorophenol	☐	☐	☐	☐	☐ < 2.0 ppm	_____	to ____ ppm
2,4,5-TP (Silvex)	☐	☐	☐	☐	☐ < 1.0 ppm	_____	to ____ ppm
Vinyl chloride	☐	☐	☐	☐	☐ < 0.2 ppm	_____	to ____ ppm

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National Laboratory

WASTE PROFILE FORM

Section 3 - Additional Constituents

Additional Constituents and Contaminates. Please account for 100% of waste. Ranges should be given within guidelines of LIG 404-00-03 of individual constituents. List all other constituents (including inerts) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 3 Additional Information as necessary. CAS Numbers are needed for all chemical constituents, for material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4000 for assistance.

CAS No.	Name of constituent	Minimum	Maximum
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
		_____ to	_____ %
	Total of max ranges of this section	_____	**in %**
	Total of max ranges from page 2.	_____	**in ppm**

FOR INFORMATION ONLY

Additional Information (Use additional sheet if necessary.)

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature	Date

WASTE MANAGEMENT COORDINATOR: I have reviewed this form and to the best of my knowledge, the information is complete and accurate.

Signature	Date

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WASTE PROFILE FORM

Attachment 1 - Wastewater Characteristics for SWSC (TA-46)

For help in completing this section, call ESH -18 at 7-4882. Identify presence of any constituents listed below.
Use of Acceptable Knowledge in lieu of analytical data must be pre-approved by ESH-18.

Microtox Analysis #: _____ NOTE: Microtox analysis **must be** performed. Contact JCI/ENV to schedule analysis.

Are there any detectable levels of gross Alpha, gross Beta, gross Gamma, and/or Tritium? ☐ No ☐ Yes

All methods of analysis must conform to those approved pursuant to 40 CFR 136 unless an alternative method has been approved by ESH-18.
All metal concentrations are for the dissolved fraction present in the sample unless otherwise indicated.

	☐ Flow Rate of 100 gallons/day or less			☐ Flow Rate of greater than 100 gallons/day		
Flow Rate Parameters	None/ Non-detect	Within Regulatory Limits	Above Limit	None/ Non-detect	Within Regulatory Limits	Above Limit
pH		☐ 5 -11 SU	☐		☐ 5 -11 SU	☐
Chemical Oxygen Demand (COD)		☐ ≤ 750 mg/l	☐		☐ ≤ 500 mg/l	☐
Microtox results (a)		☐ < 55% screen	☐		☐ < 50% screen	☐
(b)		☐ > 20% EC50	☐		☐ > 25% EC50	☐
Temperature		☐ ≤ 180 °F	☐		☐ ≤ 140 °F	☐
Cyanide (Total)	☐	☐ < 5.0 mg/l	☐	☐	☐ < 1.0 mg/l	☐
Fluoride	☐	☐ < 200.0 mg/l	☐	☐	☐ < 50.0 mg/l	☐
Iron	☐	☐ < 100.0 mg/l	☐	☐	☐ < 35.0 mg/l	☐
Magnesium	☐	☐ < 100.0 mg/l	☐	☐	☐ < 50.0 mg/l	☐
Manganese	☐	☐ < 5.0 mg/l	☐	☐	☐ < 1.0 mg/l	☐
Metals (Total)	☐	☐ < 40.0 mg/l	☐	☐	☐ < 10.0 mg/l	☐
Nickel	☐	☐ < 50.0 mg/l	☐	☐	☐ ≤ 3.0 mg/l	☐
Nitrogen (Total)	☐	☐ ≤ 100.0 mg/l	☐	☐	☐ ≤ 50.0 mg/l	☐
Oil and Greases	☐	☐ < 100.0 mg/l	☐	☐	☐ < 50.0 mg/l	☐
Phosphorus (Total)	☐	☐ [illegible] mg/l	☐	☐	☐ < 50.0 mg/l	☐
Silver	☐	☐ 5.0 mg/l	☐	☐	☐ < 0.5 mg/l	☐
Total Suspended Solids (TSS)	☐	☐ ≤ 400.0 mg/l	☐	☐	☐ ≤ 300.0 mg/l	☐
Zinc	☐	☐ < 25.0 mg/l	☐	☐	☐ < 5.0 mg/l	☐

FOR INFORMATION ONLY

Wastewater contaminants **Identify for all constituents listed**	None/Non-detect	Present within Regulatory Limits	Above Limit
Dissolved Aluminum	☐	☐ < 5.0 mg/l	☐
Dissolved Arsenic	☐	☐ < 0.2 mg/l	☐
Barium	☐	☐ < 100.0 mg/l	☐
Beryllium	☐	☐ < 5.3 mg/l	☐
Dissolved Boron	☐	☐ < 5.0 mg/l	☐
Dissolved Cadmium	☐	☐ < 0.05 mg/l	☐
Chlorine (Total Residual)	☐	☐ < 3.0 mg/l	☐
Dissolved Chromium	☐	☐ < 1.0 mg/l	☐
Dissolved Cobalt	☐	☐ < 1.0 mg/l	☐
Dissolved Copper	☐	☐ < 0.5 mg/l	☐
Dissolved Lead	☐	☐ < 0.1 mg/l	☐
Total Mercury	☐	☐ < 0.01 mg/l	☐
Molybdenum	☐	☐ < 75.0 mg/l	☐
Polychlorinated Biphenyls (PCB)	☐	None Detected	☐
Dissolved Selenium	☐	☐ < 0.05 mg/l	☐
Dissolved Vanadium	☐	☐ < 0.1 mg/l	☐
Dissolved Zinc	☐	☐ < 25.0 mg/l	☐

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WASTE PROFILE FORM

Attachment 2 - Wastewater Characteristics for RLWTF (TA-50 & TA-21)

For help in completing this section, call 7-4301.

Indicate if waste was: ☐ Accelerator produced ☐ Reactor produced ☐ Other (Describe in WPF Section 1 "Waste/Process Description.")

Radionuclide Contaminants

Identify for the following:	Present At Or Below LOC (in Ci/l)	Range if above LOC in Ci/l Min. / Max.	Identify for the following:	Present At Or Below LOC (in Ci/l)	Range if above LOC in Ci/l Min. / Max.
As-74	☐ ≤ 4.0 E -8	_____ / _____	Rb-84	☐ ≤ 1.0 E -8	_____ / _____
Be-7	☐ ≤ 1.0 E -6	_____ / _____	Sc-46	☐ ≤ 2.0 E -8	_____ / _____
Ce-141	☐ ≤ 5.0 E -8	_____ / _____	Sc-48	☐ ≤ 2.0 E -8	_____ / _____
Cs-134	☐ ≤ 2.0 E -9	_____ / _____	Se-75	☐ ≤ 2.0 E -8	_____ / _____
Cs-137	☐ ≤ 3.0 E -9	_____ / _____	Na-22	☐ ≤ 1.0 E -8	_____ / _____
Co-56	☐ ≤ 1.0 E -8	_____ / _____	Sr-85	☐ ≤ 7.0 E -8	_____ / _____
Co-57	☐ ≤ 1.0 E -7	_____ / _____	Sr-89	☐ ≤ 2.0 E -8	_____ / _____
Co-58	☐ ≤ 4.0 E -8	_____ / _____	Sr-90	☐ ≤ 1.0 E -9	_____ / _____
Co-60	☐ ≤ 5.0 E -9	_____ / _____	Sn-113	☐ ≤ 5.0 E -8	_____ / _____
Eu-152	☐ ≤ 2.0 E -8	_____ / _____	V-48	☐ ≤ 2.0 E -8	_____ / _____
H-3	☐ ≤ 2.0 E -8	_____ / _____	Y-88	☐ ≤ 3.0 E -8	_____ / _____
I-133	☐ ≤ 1.0 E -8	_____ / _____	Zn-65	☐ ≤ 9.0 E -9	_____ / _____
Mn-52	☐ ≤ 2.0 E -8	_____ / _____	Am-241	☐ ≤ 0.1 E -6	_____ / _____
Mn-54	☐ ≤ 5.0 E -8	_____ / _____	Pu-238	☐ ≤ 0.1 E -6	_____ / _____
Ra-226 + 228	☐ ≤ 3.0 E -11	_____ / _____	Pu-239	☐ ≤ 0.1 E -6	_____ / _____
Rb-83	☐ ≤ 2.0 E -8	_____ / _____	U-234	☐ ≤ 5.0 E -8	_____ / _____
Others:			**Others:**		
_____		_____ / _____	_____		_____ / _____
_____		_____ / _____	_____		_____ / _____
_____		_____ / _____	_____		_____ / _____

FOR INFORMATION ONLY

Other Contaminants

Metal Contaminants	Present Below LOC (in ppm)	Range above LOC (in ppm) Min. / Max.
Aluminum	☐ ≤ 5.0	_____ to _____ ppm
Boron	☐ ≤ 5.0	_____ to _____ ppm
Cobalt	☐ ≤ 1.0	_____ to _____ ppm
Copper	☐ ≤ 1.0	_____ to _____ ppm
Vanadium	☐ ≤ 0.10	_____ to _____ ppm
Zinc	☐ ≤ 95.40	_____ to _____ ppm

Additional Contaminants	Min. / Max
Chemical Oxygen Demand (COD)	_____ to _____ mg/l
Total Suspended Solids (TSS)	_____ to _____ mg/l
☐ Total Nitrogen or (only one	_____ to _____ mg/l
☐ Total Nitrates entry needed)	_____ to _____ mg/l

Radioactive Contaminant Totals:

Total Alpha _____ Ci/l
Total Beta _____ Ci/l
Total Gamma _____ Ci/l

For TA-55 use only.
Wastewater will be discharged through one of the following:

☐ Acid Line ☐ Caustic Line ☐ Industrial Waste Line

☐ Yes ☐ No Scintillation Cocktail Brand Name _____ Volume _____ Unit ____

☐ Yes ☐ No Chemical Treatment for Boilers / Water Chillers

☐ Yes ☐ No Industrial Cleaner Type _____ Volume _____ Unit ____

Average daily volume when discharge occurs: _____ ☐ Gallons/day ☐ Liters/day

Maximum daily volume when discharge occurs: _____ ☐ Gallons/day ☐ Liters/day

Estimated number of days per year discharge will occur: _____

Estimated total volume per year discharged to the Radioactive Liquid Waste Collection System at TA-50 / TA-21: _____ ☐ Gallons ☐ Liters

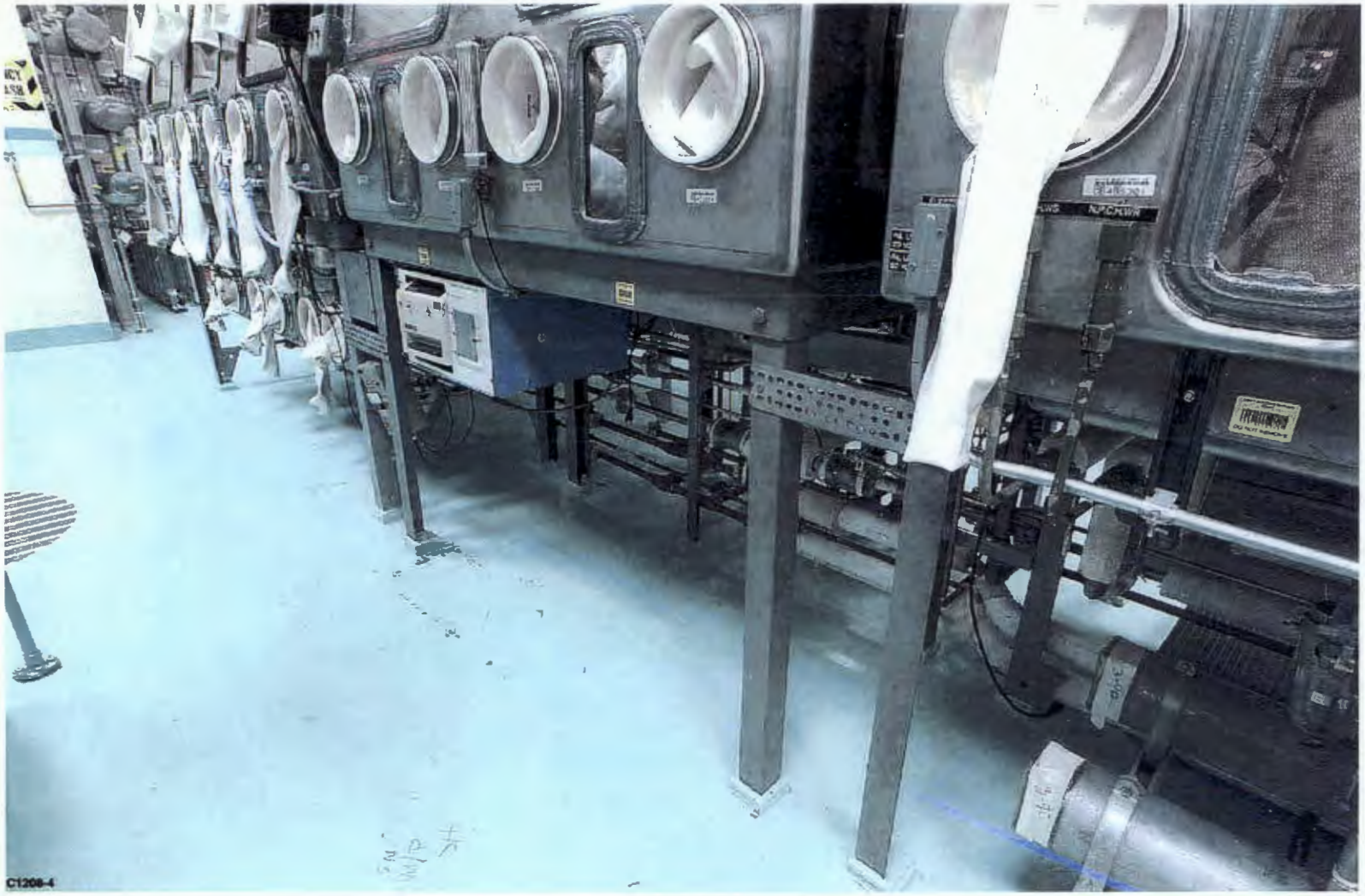
ATTACHMENT F

Photos of the Secondary Containment for the TA-55 Waste Management Units

Technical Area 55, Room 401
Secondary Containment
(July 2002)

Technical Area 55, Room 401
Secondary Containment
(July 2002)

Technical Area 55, Room 401
Secondary Containment
(July 2002)



Technical Area 55, Room 401
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit B40
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit B05
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit B05
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit K13
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit K13
Secondary Containment
(July 2002)

Technical Area 55, Container Storage Unit B45
Secondary Containment
(July 2002)

ATTACHMENT G

Spreadsheet for the Calculation of Secondary Containment Capacities at the TA-55 Waste Management Units

Maximum Storage Capacity verses Secondary Containment Capacity for the Technical Area 55 Waste Management Units

Units and Tank System Components	Waste Type	Individual Capacity (gallons)	Location	Combined Maximum Liquid Capacity (gallons) [a]	Secondary Containment Identification	Secondary Containment Dimensions (feet)	Area (ft^2)	Depth (in.)	Secondary Containment Capacity (gallons)
B05	Solid	3,600	TA-55-4, Basement	28,000	TA-55-4, Basement	280 x 265	74,200	1	46,258
B40	Solid & Liquid	21,500							
B45	Solid	11,000							
K13	Solid & Liquid	2,500							
Vault	Solid & Liquid	4,000							
FLO1	Solid & Liquid	550	TA-55-4, Room 401	966	TA-55-4, Room 401	144 x 120	17,280	1	10,773
Evaporator Glovebox Tank	Liquid	71							
Cementation Unit Pencil Tanks	Liquid	65							
Pencil Tanks	Liquid	130							
Cementation Unit	Liquid	150							
Vitrification Unit Slab Tanks	Liquid	66	TA-55-4, Room 434A	83.7	TA-55-4, Room 434A	49 x 44	2,156	1	1,344
Vitrification Unit	Liquid	17.7							
TA-55-185	Solid	30,000	West of TA-55-4	NA	NA	60 x 40	2,400	NA	NA
Storage Pad	Solid & Liquid	135,000	Northwest of TA-55-4	NA [b]	Covered Self-Containment Pallets	4.3 x 2.1	9.1	20	112

a Assumes that the entire capacity of the unit is liquid (if applicable) for comparison to the secondary containment capacity.

b Container with liquid and/or potentially liquid-bearing wastes at the storage pad are stored in covered self-containment pallets. The approximate capacity of these pallets is 220 gallons each (i.e. 4, 55-gallons drums).

Secondary Containment Calculations for TA-55

Waste Management Unit	Location	Waste Type(s)	Total Capacity (gallons)	Combined Liquid Capacity (gallons)[a]
Storage Pad	Northwest of TA-55-4	Solid and Liquid	135,000	NA[b]
B40	TA-55-4, Basement	Solid and Liquid	21,500	28,000
Vault		Solid and Liquid	4,000	
K13		Solid and Liquid	2,500	
B45		Solid	11,000	
B05		Solid	3,600	
FLO1	TA-55-4, Room 401	Solid and Liquid	550	966
Evaporator Glovebox Tank		Liquid	71	
Cementation Pencil Tanks		Liquid	65	
Pencil Tanks		Liquid	130	
Cementation Unit		Liquid	150	
Vitrification Unit Slab Tanks	TA-55-4, Room 434A	Liquid	66	83.7
Vitrification Unit		Liquid	17.7	
TA-55-185	West of TA-55-4	Solid	30,000	NA

a Assumes that the entire capacity of the unit is liquid (if applicable) for comparison to secondary containment capacity.

b Containers with liquid and/or potentially liquid -bearing wastes at the storage pad are stored in covered self-containment units. The approximate capacity of these units is 220 gallons each (i.e. 4, 55-gallon drums).

Secondary Containment	Length (feet)	Width (feet)	Depth (inches)	Capacity (ft3)	Capacity (gallons)
TA-55-4, Room 401	144	120	1	1440	10772.64
TA-55-4, Room 434A	49	44	1	179.666667	1344.086
TA-55-4, Basement	280	265	1	6183.33333	46257.52
Covered Self-containment Units	4.33	2.083	20	15.0323167	112.4568
TA-55-185	60	40	1	200	1496.2

ATTACHMENT H

TA-55 and TA-42 Solid Waste Management Units Reports

TA-55, Plutonium Facility Site

The Plutonium Facility at TA-55 occupies about 40 acres of the total 90 acres at TA-55 approximately 1 mi southeast of the central technical area (TA-03). The Plutonium Facility is situated inside a restricted zone surrounded by a double security fence. The main complex has five connected buildings: the Administration Building (Building 1), the Support Office Building (Building 2), the Support Building (Building 3), the Plutonium Building (Building 4), and the Warehouse (Building 5). The Nuclear Materials Storage Facility (Building 41) is separate from the main complex but shares an underground transfer tunnel with Building 4. Various support, storage, security, and training structures are located throughout the main complex.

To meet the varied needs of research and development and plutonium-processing programs at the Laboratory, TA-55 provides chemical and metallurgical processes for recovering, purifying, and converting plutonium and other actinides into many compounds and forms. Additional capabilities include the means to safely and securely ship, receive, handle, and store nuclear materials, as well as manage the wastes and residues produced by TA-55 operations. A core capability is basic and applied research in plutonium and actinide chemistry.

Core competencies are maintained in the Plutonium Facility for each type of plutonium processing activity. Extensive plutonium recovery processes are maintained, as well as the ability to convert the recovered material into plutonium metal. A separate portion of the facility is dedicated to fabricating ceramic-based reactor fuels and to processing plutonium-238 used to produce radioisotope heat sources. In addition, analytical capabilities, materials control and accountability techniques, and a substantial research and development base are available to support these core capabilities.

A sophisticated nuclear materials measurement and accountability system is used at TA-55. The system includes nuclear materials accounting, nuclear materials management and modeling, a measurement support operation, operation of a nondestructive assay laboratory, nuclear materials packaging and transfer, and nuclear materials storage. All nuclear materials that are in process or are stored onsite are monitored to ensure that material balances are properly maintained and inventoried on a real-time basis. The nuclear materials packaging and transfer operation receives nuclear material into the facility and transfers shipments out of the facility. The nuclear materials storage operation provides a safe storage location for the actinide materials at the Plutonium Facility.

The Plutonium Facility has extensive capabilities for treating, packaging, storing, and transporting the radioactive waste produced by TA-55 operations. Liquid wastes are converted to solids or are piped to the RLWTF at TA-50. Some solid transuranic wastes are immobilized in cement in 55-gallon drums. Other transuranic waste is consolidated in 15-gallon or 30-gallon drums or is packaged in waste boxes. Low-level wastes are also packaged at this facility. Solid wastes of all types are stored at TA-55 until they are shipped to Laboratory waste storage or disposal locations, primarily at TA-54.

TA-55 — Plutonium Facility Site

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SWMU 55-008 – Sumps and tanks

Administrative Authority	NMED	**Former Operable Unit**	OU 1129
Technical Area	TA-55	**Dates of Operation**	1973-Present
Has ER Sampled the Site?	No	**ER Remedial Action Conducted?**	No
Structure Number	N/A	**Other Remedial Action Conducted?**	No

Unit Description

SWMU 55-008 consists of sumps, tanks, and pumps in the basement of the plutonium building (Building 55-4), which is the primary site for plutonium processing, fabrication, and research at LANL. Six sumps/pumps collect spills and mop-water generated in the building; the sump/pump capacity of each is 3 cubic feet. Four 8-in.-diameter x 4-ft-long condensate tank pumps receive condensate from cooling coils. Eight 8-in.-diameter x 4-ft-long blowdown tanks receive condensate from cooling coils. The liquids discharged to these units may have contained small amounts of hazardous and/or radioactive constituents. All liquids collected and contained within these units are transferred via direct pipeline to the radioactive liquid waste treatment facility at TA-50, and none of these units release liquids to the environment.

ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

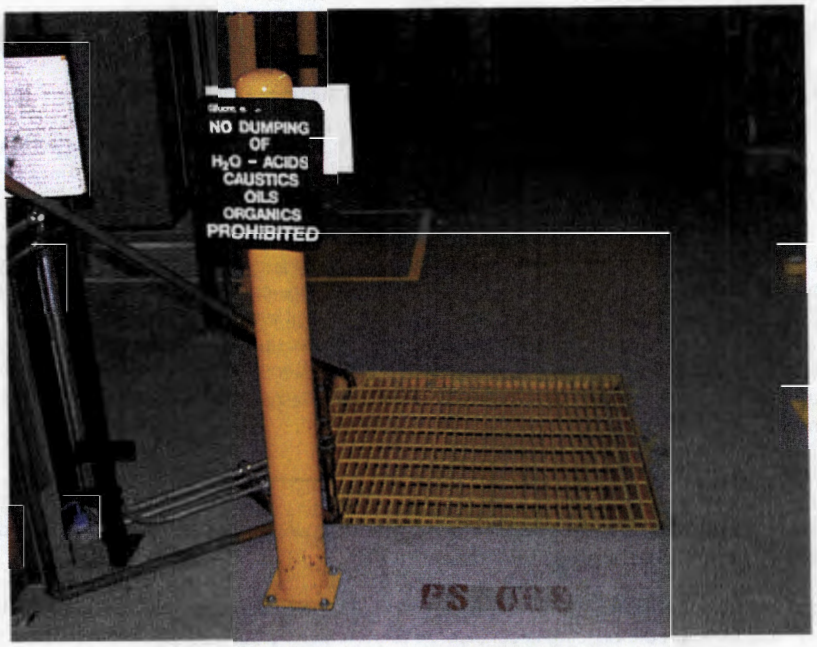
SWMU 55-008 was recommended for NFA in the RFI work plan. The site design of Building 55-4 precludes contaminant migration. Any contamination that may exist beneath the building is considered to be under institutional control and will be addressed when Building 55-4 undergoes decontamination and decommissioning.

ER Project Sampling Summary

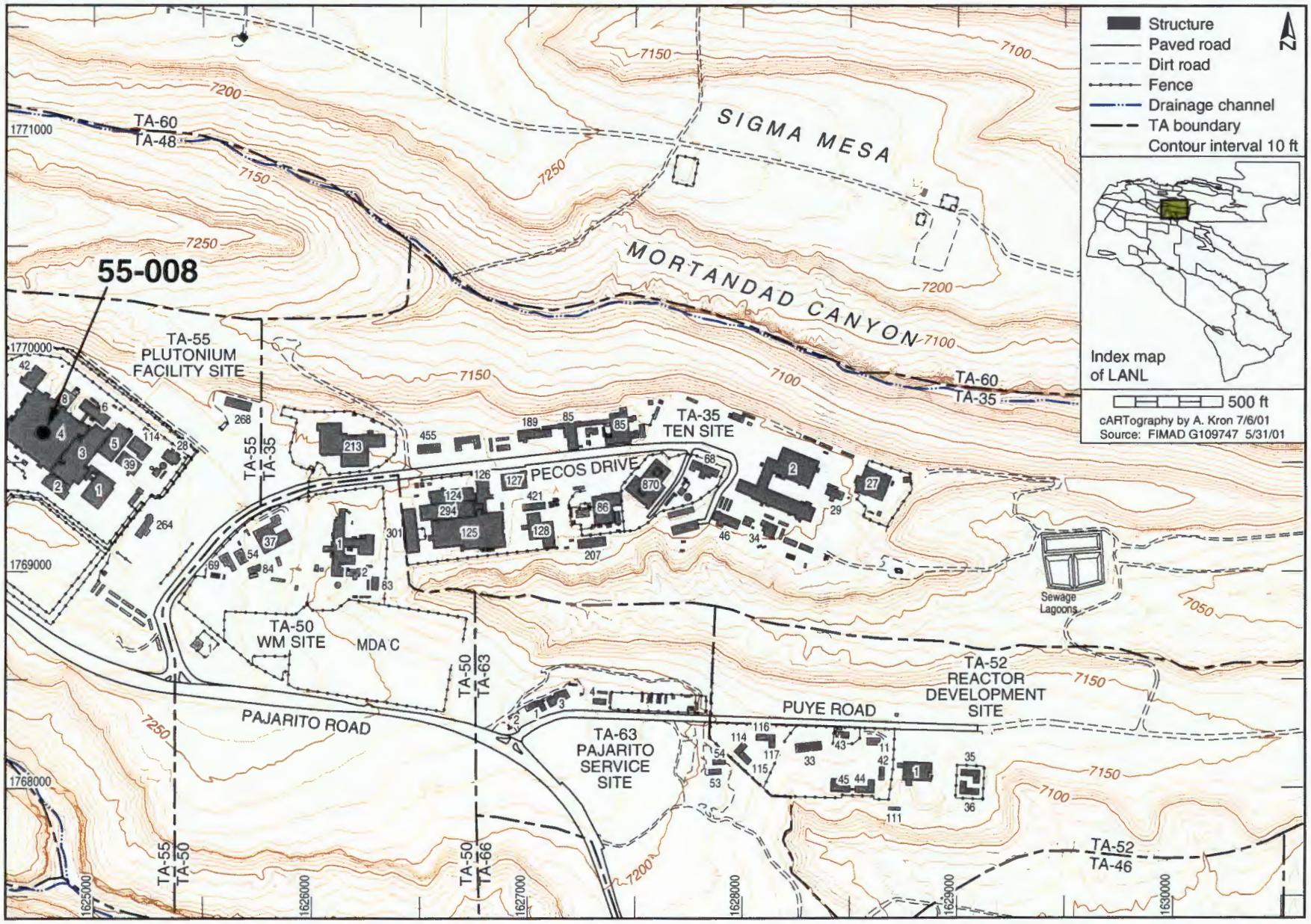
No analytical samples were collected at this site.

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



View of SWMU 55-008


Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
500 ft
cARTography by A. Kron 7/6/01
Source: FIMAD G109747 5/31/01
55-008
SIGMA MESA
MORTANDAD CANYON
TA-60
TA-48
TA-60
TA-35
TA-55 PLUTONIUM FACILITY SITE
TA-35 TEN SITE
PECOS DRIVE
TA-50 WM SITE
MDA C
PAJARITO ROAD
TA-63 PAJARITO SERVICE SITE
PUYE ROAD
TA-52 REACTOR DEVELOPMENT SITE
Sewage Lagoons
TA-52
TA-46
TA-55
TA-35
TA-55
TA-50
TA-50
TA-63
TA-50
TA-66
1771000
1770000
1769000
1768000
1625000
1626000
1627000
1628000
1629000
1630000
7200
7150
7250
7100
7050

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SWMU 55-009 – Concrete enclosures

Administrative Authority	NMED	**Former Operable Unit**	OU 1129
Technical Area	TA-55	**Dates of Operation**	1973-Unknown
Has ER Sampled the Site?	Yes	**ER Remedial Action Conducted?**	No
Structure Number	55-263	**Other Remedial Action Conducted?**	No

Unit Description

SWMU 55-009 is an inactive sanitary sewer monitoring station (structure 55-263) consisting of a concrete-lined pit (9 ft x 9 ft x 6 ft deep) located in the LANL high-security, highly access-controlled TA-55 plutonium complex. The walls and floor of the monitoring station consist of 6-in.-thick reinforced concrete. The TA-55 sanitary waste line runs through this structure and carries sanitary wastewater from Buildings 55-3 and 55-4 to the LANL sanitary wastewater treatment facility located at TA-46. The TA-55 Operations Center (Building 55-3) functions as a general support facility and contains a chemical laboratory. Building 55-4 is the main plutonium-processing facility at TA-55. The 1990 SWMU report identified SWMU 55-009 as an inactive monitoring "sump." The term "sump" denotes an engineered, below-ground-level containment reservoir that receives liquid before it is pumped (or drained) to another location. However, this unit not only has never contained a drain, it has never served as a reservoir to manage liquids of any type; therefore, the SWMU report's identification of this unit as a sump is incorrect. In actuality, this unit was designed and installed solely as a station to house radiological monitoring equipment and to shield the equipment from adverse weather conditions. The monitoring equipment and surrounding concrete structure were installed in approximately 1975, when the TA-55 complex was originally constructed. The monitoring equipment was installed at this portion of the sanitary waste line solely as a security measure to prevent the theft of valuable radioactive materials (such as plutonium) from the TA-55 complex. This equipment was intended to detect any stolen radioactive materials covertly targeted to leave the TA-55 complex by flushing them down sanitary drains such as sinks or toilets. Should any stolen radiological materials be detected in the sewer pipe, the monitoring device was designed to activate a compressor (housed within the concrete structure) that controlled a cut-off valve within the pipe. The activated valve was intended to immediately block passage of the stolen materials further through the pipe, thus thwarting the attempted theft. However, the monitoring equipment never functioned as originally intended. It failed because of high humidity caused by moisture condensation in the concrete structure in which it was housed. After several failed attempts to make the detection equipment perform properly, in May 1983, DOE and TA-55 personnel agreed to discontinue further attempts to monitor the waste line. The monitoring equipment was removed later that year, but the concrete-lined pit was left in place. The structure was used solely for security monitoring purposes and it is not known or thought to have received contaminants or released contaminants to the environment.

ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

After a site visit by the NMED and review of the radiological screening data, this SWMU was recommended for NFA. Hazardous wastes were not generated, treated, stored, or disposed at the site, and radioactivity was never detected in the waste stream.

ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities that 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. 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	No. of Chemicals Detected	No. of Chemicals >CY2002 BV/FV (If Applicable)	No. of Chemicals >CY2002 SAL (Residential)
Inorganic chemicals	19	0	1
Radionuclides	4	1	0
VOCs	2	N/A	0

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

Analytical Suite	Analyte	Maximum Concentration	CY2002 SAL (Residential)
Inorganic chemicals	Arsenic	4.1 mg/kg	0.39 mg/kg

References

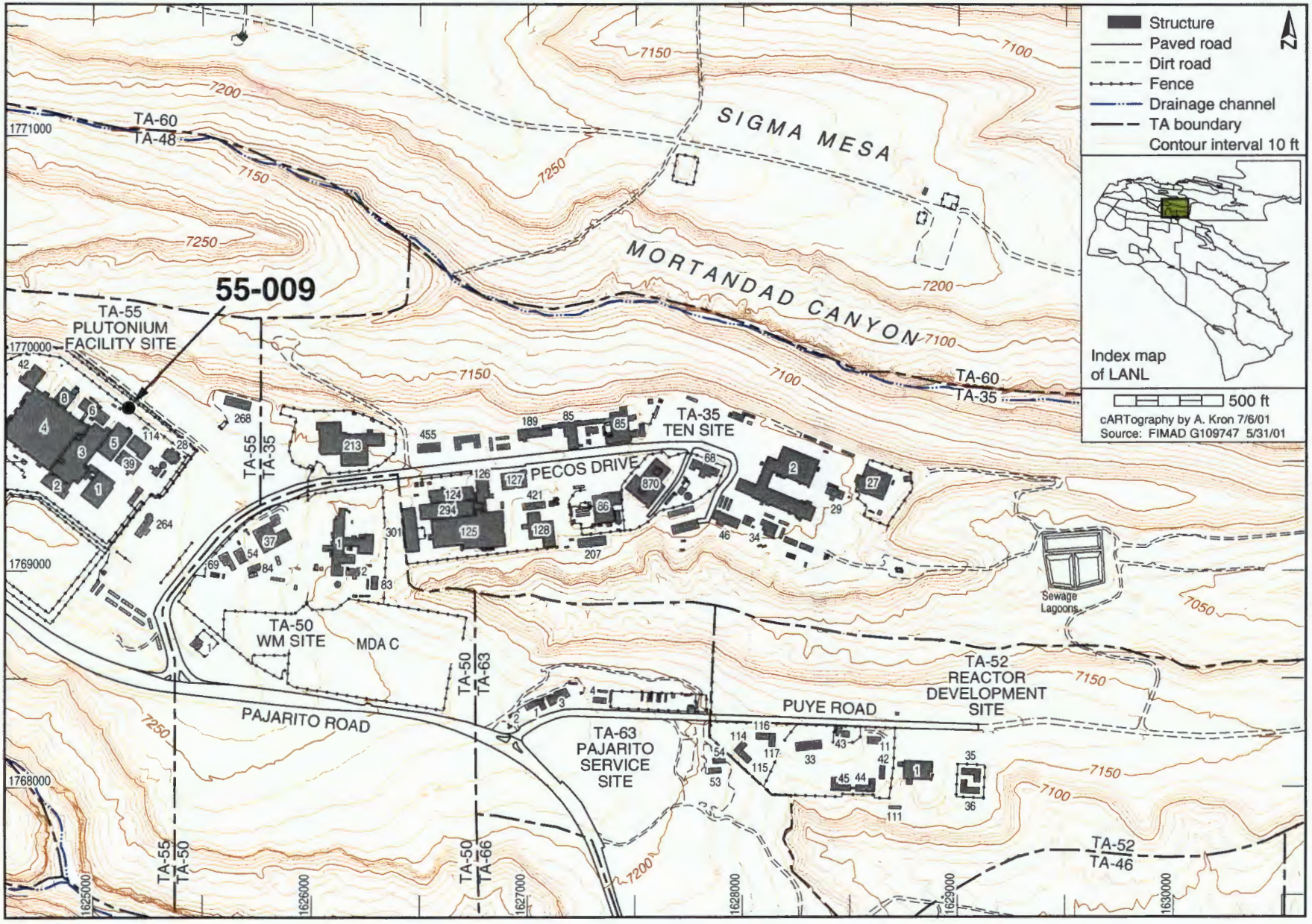
Request for Permit Modification, Units Proposed for NFA, March 1995 — LA-UR Number: 95-0767

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

Monitoring station with cover removed (SWMU 55-009)

Valve (SWMU 55-009)


55-009
TA-55
PLUTONIUM
FACILITY SITE
TA-60
TA-48
SIGMA MESA
MORTANDAD CANYON
TA-60
TA-35
TA-35
TEN SITE
PECOS DRIVE
TA-55
TA-35
TA-50
WM SITE
MDA C
TA-50
TA-63
PAJARITO ROAD
TA-63
PAJARITO
SERVICE
SITE
PUYE ROAD
TA-52
REACTOR
DEVELOPMENT
SITE
Sewage
Lagoons
TA-55
TA-50
TA-50
TA-66
TA-52
TA-46
1771000
1770000
1769000
1768000
1625000
1626000
1627000
1628000
1629000
1630000
7200
7150
7250
7100
7050
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL
500 ft
cARTography by A. Kron 7/6/01
Source: FIMAD G109747 5/31/01

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TA-42, Operations and Environmental Setting

Former TA-42 was designed and built in 1951 as an incinerator site for radionuclide-contaminated waste. It was never fully operational, and all buildings were removed in 1978. In the interim, the area was used for storage and decontamination work. The former site of TA-42 lies within the current boundaries of TA-55, on the narrow mesa formed between Mortandad Canyon on the north and Twomile Canyon, a branch of Pajarito Canyon, on the south. The former site is near the north edge of the mesa.

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SWMU 42-001(a)-99 — TA-42 incinerator complex

Administrative Authority	NMED	**Former Operable Unit**	N/A
Technical Area	TA-42	**Dates of Operation**	1951-1970
Has ER Sampled the Site?	Yes	**ER Remedial Action Conducted?**	No
Structure Number	42-1, 42-2, 42-3, 42-4	**Other Remedial Action Conducted?**	Yes

Unit Description

Consolidated SWMU 42-001(a)-99 consists of former SWMUs 42-001(a), 42-001(b), 42-001(c), 42-002(b), and 42-003 and former AOC 42-002(a). TA-42 was the site of a radioactive waste incinerator that operated in 1951 and 1952. The incinerator facility was used to store and decontaminate radioactively contaminated equipment from 1957 to 1969. In 1969, uncontaminated classified wastes were burned at the incinerator, but the operation was discontinued by 1970 and all combustibles were removed from the building. The facilities were decommissioned in 1977, and the site was decontaminated in 1978. Contamination remaining after the 1978 D&D of this consolidated SWMU is believed to be associated with radionuclide decontamination operations from 1957 to 1969. Former TA-42 is located within the boundaries of TA-55, the Plutonium Processing Facility.

Former SWMU 42-001(a) is the historical location of the incinerator and control building (Building 42-1). The complex was built to reduce the amount of radionuclide-contaminated waste produced at LANL. The incinerator, which was never fully operational and was shut down about a year after it was built, was a steel-frame structure covered with corrugated metal. The facility consisted of a 2000-sq-ft floor area control building, incinerator, cyclone dust collector, spray cooler, Venturi scrubber, filter bank, and ash separator. Combustion products passed through an off-gas cleanup system before discharge through an exhaust stack. The off-gas system consisted of a Venturi scrubber, a filter bank, and an ash separator. Ash trapped in the off-gas system and incinerator was transported by underground drainlines to two holding tanks [former SWMUs 42-001(b) and 42-001(c)] located immediately north of the incinerator.

Former SWMUs 42-001(b) and 42-001(c) are the locations of two former ash holding tanks (structures 42-2 and 42-3) at the incinerator complex. They were each 22 ft in diameter and approximately 13 ft high, with a volume of 37,000 gal. The tanks were built in 1951 and removed in 1978. Some ash from the incinerator reportedly was discharged to Mortandad Canyon in 1952; the contaminant was thought to be lanthanum-140. Samples taken in the canyon downstream from TA-42 after the discharge showed radioactive contamination. When the tanks were decommissioned in 1978, the contents were assayed and measured for plutonium. Contaminated sludge was removed, mixed with cement, and taken to MDA G for storage. The tanks were excavated and taken to TA-54 for disposal. The drainlines were filled with hot asphalt to contain radioactive contamination. It is not known if the drainlines were removed.

Former AOC 42-002(a) is the historical location of an indoor storage and decontamination area, and SWMU 42-002(b) is the location of a historical outdoor decontamination area. Between 1956 and 1969, the main floor of Building 42-1 was used to store and decontaminate equipment. During decontamination, a "vacublaster" removed radionuclides and other contaminants from various pieces of equipment. The process generated wastes that are believed to have been discharged to the building's septic system (former SWMU 42-003). It is believed that fine solid residues were bagged and disposed of at an MDA. Objects that were too large to take inside the building (such as vehicles) were cleaned at the end of the asphalt driveway located west and north of Building 42-1. Wash water flowed down an embankment on the northwest side of the parking lot. Contaminated soils in that area were not sampled or removed during the 1978 D&D activities.

Former SWMU 42-003 is the historical location of a septic system that served the incinerator complex. The system was composed of a 565-gal. septic tank (structure 42-4), a drainline from Building 42-1 to the tank, a filter trench, a tile leach field, and an outfall to Mortandad Canyon. The septic tank received radioactive liquid wastes from Building 42-1. According to the OU 1129 work plan, the system probably also received solvents, acids, and grease. Radioactively contaminated liquids periodically were removed from the septic tank and disposed of at pit 4 at MDA L. Samples taken downstream from TA-42 in Mortandad Canyon in 1952 showed radioactive contamination in the canyon. The septic tank was observed to contain water and possibly to have overflowed in 1973. At that time, the tank slurry was sampled and was found to be radioactively contaminated. The system was installed in 1951 and the system and associated contaminated soils were removed as part of the 1978 D&D activities. When it was decommissioned, liquid in the tank was pumped and treated at Building 50-1, the radioactive liquid waste treatment facility [SWMU 50-001(a)]. The tank sludge was solidified by adding cement, and the tank and sludge were taken to MDA G. Contaminated soils around the tank also were taken to MDA G, and the excavated area was backfilled. Contaminated soils in the drainfield were excavated.

In 1978, following D&D, the Environmental Surveillance Group collected soil samples and analyzed them for radionuclides. Low levels of contamination were found, but the group considered the area decontaminated to ALARA standards. After concurrence from DOE-LAAO, the area was contoured and revegetated to minimize erosion. In 1991, LANL's Environmental Protection Group performed a reconnaissance survey. Soil samples were collected and analyzed for radionuclides, PCBs, organic chemicals, and inorganic chemicals. Results from the analyses, which showed elevated concentrations of plutonium and lead, were used by the ER Project to design its SAP for the 1992 RFI.

ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

In 1992, the ER Project conducted an RFI at the former sites that make up consolidated SWMU 42-001(a)-99. The purpose of the RFI was to determine whether potential contamination at the site would be exposed during construction of a new facility. Sampling was conducted to detect and to quantify contaminants and to estimate the extent of contamination at former TA-42. The DOE-Albuquerque Operations Office used the RFI results for construction validation of the NSTL that was to be constructed at the site of former TA-42. Sample locations were selected to bound the extent of contaminants detected during the 1991 reconnaissance study and to include locations where construction activities might adversely affect residual contamination around the NSTL structures or utility lines. Fifty-one surface and subsurface soil samples were collected from 19 locations around the location of the former incinerator complex. Samples were field-screened for organic chemicals and radionuclides. No elevated chemical concentrations were detected during field-screening. Samples were analyzed for radionuclides and lead because the analytical suite was based on the results of the 1991 reconnaissance study. Elevated levels of plutonium-238, plutonium-239/-240, and uranium-235 were found. Data indicated that the levels of radionuclides did not pose an unacceptable risk to human health. The RFI report recommended NFA at the former sites in this consolidated unit. NMED determined the report to be insufficient in the characterization of the site, and LANL formally withdrew the RFI report in 1997.

ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities that 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. 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	No. of Chemicals Detected	No. of Chemicals >CY2002 BV/FV (If Applicable)	No. of Chemicals >CY2002 SAL (Residential)
Inorganic chemicals	1	1	0
Radionuclides	6	4	1

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

Analytical Suite	Analyte	Maximum Concentration	CY2002 SAL (Residential)
Radionuclides	Thorium-228	2.59 pCi/g	2 pCi/g

References

RFI Report for TA-42: PRSs 42-001(a,b,c), 42-002(a,b), 42-003 — LA-UR Number: 95-2881

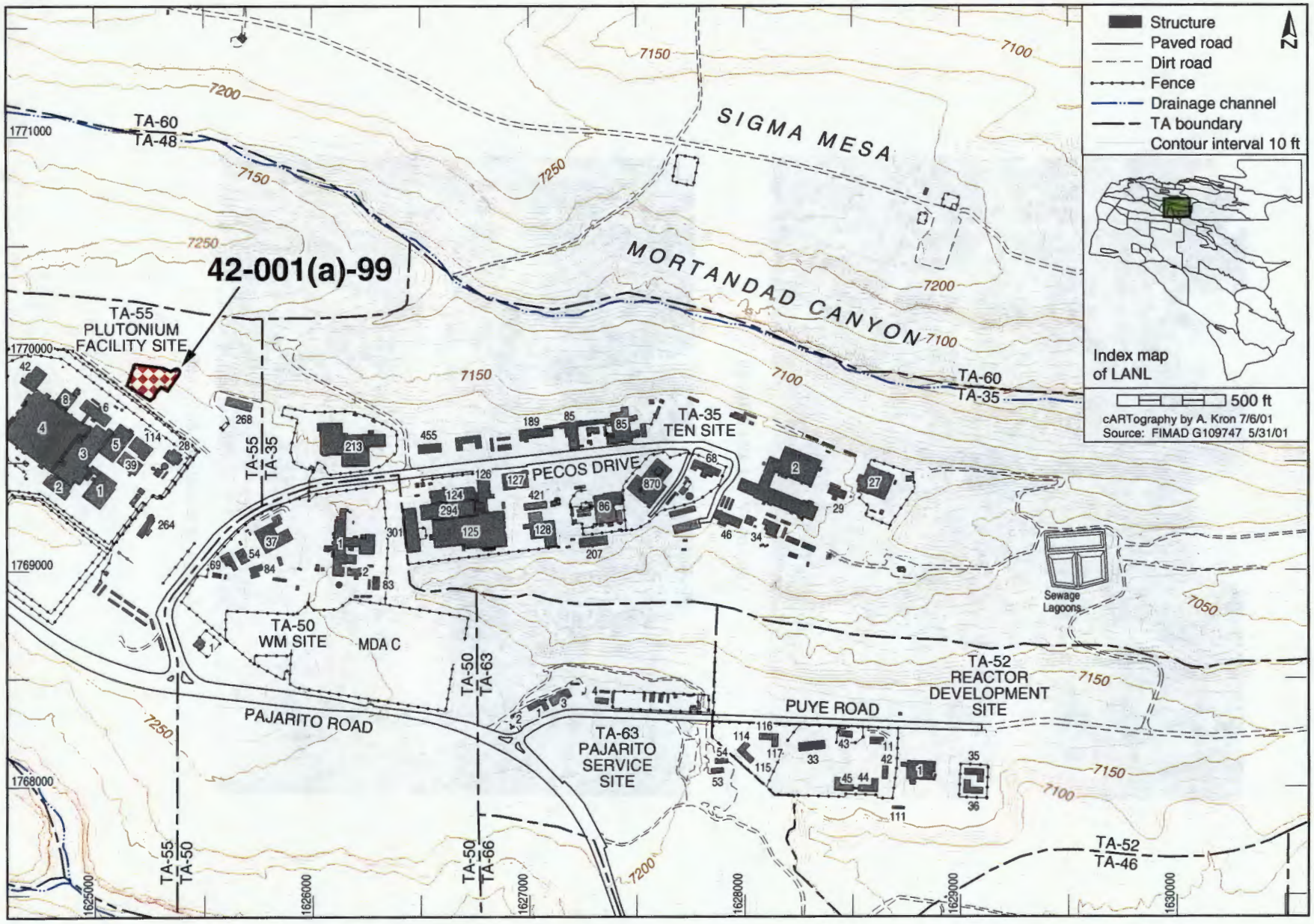
Preliminary Draft of OU 1129 Accelerated Characterization at Former TA-42 in Support of Construction Validation Project at Los Alamos National Laboratory (LANL) — LA-UR Number: N/A

Revised Sampling and Analysis Plan for OU 1129 Aggregate J — LA-UR Number: 92-2120

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

View of SWMU 42-001(a)-99

View of SWMU 42-001(a)-99


42-001(a)-99
TA-55
PLUTONIUM
FACILITY SITE
TA-60
TA-48
SIGMA MESA
MORTANDAD CANYON
TA-60
TA-35
TA-35
TEN SITE
PECOS DRIVE
TA-50
WM SITE
MDA C
PAJARITO ROAD
TA-63
PAJARITO
SERVICE
SITE
PUYE ROAD
TA-52
REACTOR
DEVELOPMENT
SITE
Sewage
Lagoons
TA-52
TA-46
TA-55
TA-35
TA-55
TA-50
TA-50
TA-63
TA-50
TA-66
1771000
1770000
1769000
1768000
1625000
1626000
1627000
1628000
1629000
1630000
7200
7150
7250
7100
7050
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL
500 ft
cARTography by A. Kron 7/6/01
Source: FIMAD G109747 5/31/01

AOC 42-004 – Canyon disposal

Administrative Authority	DOE	**Former Operable Unit**	OU 1129
Technical Area	TA-42	**Dates of Operation**	1950s
Has ER Sampled the Site?	No	**ER Remedial Action Conducted?**	No
Structure Number	N/A	**Other Remedial Action Conducted?**	No

Unit Description

AOC 42-004 is the location where building debris was discarded over the canyon edge north of former TA-42, which is located within the boundaries of TA-55. It is not known if the debris contained hazardous or radioactive constituents. Sampling conducted in 1991 during a reconnaissance study indicated background radioactivity levels and no organic or inorganic chemicals or PCBs.

ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

AOC 42-004 was proposed for NFA in a permit modification request because contaminants were not present in concentrations that would pose a threat to human health or the environment.

ER Project Sampling Summary

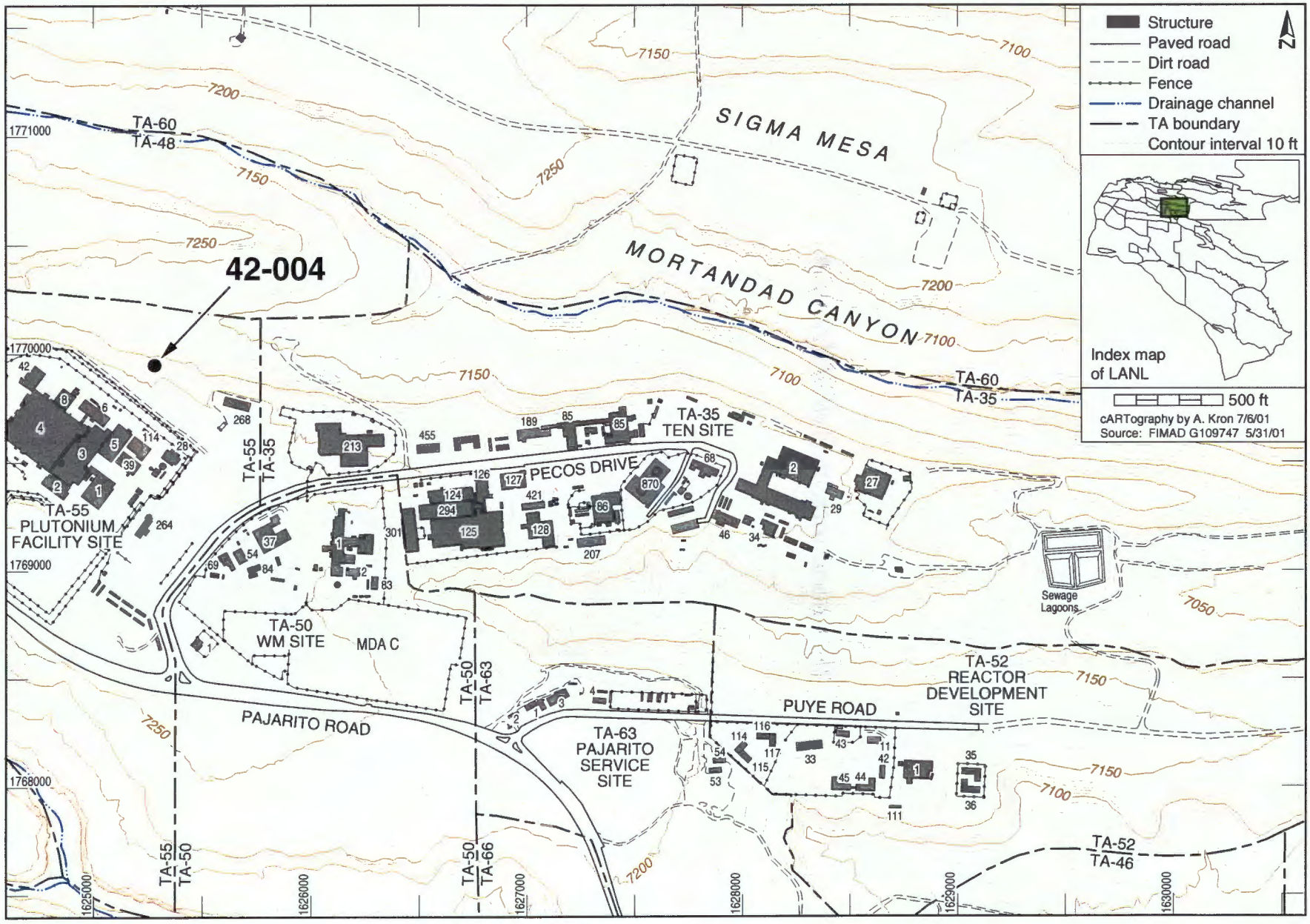
No analytical samples were collected at this site.

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
Preliminary Draft of OU 1129 Accelerated Characterization at Former TA-42 in Support of Construction Validation Project at Los Alamos National Laboratory (LANL)	LA-UR Number: N/A
Revised Sampling and Analysis Plan for OU 1129 Aggregate J	LA-UR Number: 92-2120
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800

View of AOC 42-004

View of AOC 42-004


Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
500 ft
cARTography by A. Kron 7/6/01
Source: FIMAD G109747 5/31/01
42-004
SIGMA MESA
MORTANDAD CANYON
TA-60
TA-48
TA-60
TA-35
TA-35
TEN SITE
PECOS DRIVE
TA-55
PLUTONIUM
FACILITY SITE
TA-55
TA-35
TA-50
WM SITE
MDA C
TA-50
TA-63
PAJARITO ROAD
TA-63
PAJARITO
SERVICE
SITE
PUYE ROAD
TA-52
REACTOR
DEVELOPMENT
SITE
Sewage
Lagoons
TA-52
TA-46
TA-55
TA-50
TA-50
TA-66
1771000
1770000
1769000
1768000
1625000
1626000
1627000
1628000
1629000
1630000
7200
7150
7250
7100
7050

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ATTACHMENT I

Cross Reference Table for the TA-55 and TA-42 SWMU Report and Section 4.1.1 and 4.1.2 of the TA-55 Part B Permit Application

Cross Reference of SWMUs in the Application to the TA-55 and TA-42 SWMU Reports

Section 4.1.1, SWMUs Identified for Corrective Action in Module VIII	
SWMU No.	**Location in SWMU Report**
42-001(a)	Now consolidated SWMU 42-001(a)-99, pages 42-3 – 42-6
42-001(b) and (c)	Now consolidated SWMU 42-001(a)-99, pages 42-3 – 42-6
42-002(b)	Now consolidated SWMU 42-001(a)-99, pages 42-3 – 42-6
42-003	Now consolidated SWMU 42-001(a)-99, pages 42-3 – 42-6
55-008	Pages 55-3 – 55-5
55-009	Pages 55-7 - 55-9
Section 4.1.2, Active Hazardous/Mixed Waste Management Units Not Identified in Module VIII	**Location in SWMU Report**
SWMU No.	
55-001	Not in SWMU Report - Active waste management site
55-004	Not in SWMU Report - Active waste management site
TBD (8 container storage areas)	Not in SWMU Report - Active waste management site