APPENDIX G

CONTAINER STORAGE AND MANAGEMENT

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LIST OF ABBREVIATIONS/ACRONYMS

%	percent
20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CAM	continuous air monitor
CAS	Central Alarm Station
cm	centimeter
DOT	U.S. Department of Transportation
ft	feet/foot
gal	gallon
HAZMAT	hazardous materials
HENC	high efficiency neutron counter
HEPA	high-efficiency particulate air
HSGS	head space gas sampling
HVAC	heating, ventilating, and air conditioning
in.	inches
LACFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
m^3	cubic meters
NDT	non-destructive testing
PA	public address
PPE	personal protective equipment
ppmw	parts per million by weight
RTR	real-time radiography
sf	square feet
SWB	standard waste box
TA	technical area
TE	thermal equilibrium
TRU	transuranic

LIST OF ABBREVIATIONS/ACRONYMS (continued)

TRUPACT	Transuranic Waste Package Transporter
TRUWF	Transuranic Waste facility
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

APPENDIX G
CONTAINER STORAGE

The information provided in this section is submitted to address the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.15 and 20.4.1 NMAC, Subpart V, Part 264, Subpart I, revised October 1, 2003 [10-01-03] for the proposed Technical Area (TA) 52 Transuranic Waste Facility (TRUWF). The TRUWF will be a waste processing facility and its primary designed use will be for storing and preparing waste in containers for shipment to off-site facilities for final disposition. The main waste type managed will be non-liquid although activities at the TRUWF will include those necessary to prepare potentially liquid containing wastes to meet waste acceptance criteria (WAC) for off-site facilities.

This section provides detailed descriptions of the container storage/treatment unit to be located at the TRUWF and the waste management procedures to be used there. Detailed conceptual design engineering drawings are provided as Figures G-2, G-3, and G-4 for informational purposes only. Table G-1 summarizes applicable regulatory references for container storage and the corresponding location where the requirement is addressed in this document. As the TRUWF is a proposed unit, these descriptions represent those available at this point in the project and may be revised as determined to be necessary subject to approval before construction begins.

G.1. CONTAINER STORAGE AT THE TRANSURANIC WASTE FACILITY

The TRUWF will be located at TA-52, Building 190 in the north central portion of Los Alamos National Laboratory (LANL) on a mesa between a branch of Mortandad Canyon on the north and Pajarito Canyon on the south. Construction of the requested permitted building is currently scheduled to begin in 2010 to facilitate meeting the integrated near- and long-term waste management needs at LANL. Completion of the project is currently scheduled for 2012. This hazardous waste management unit will be located on approximately 7 acres and will be approximately 28,000 square feet (sf). The TRUWF will be located on a previously undeveloped parcel of land and in close proximity to facilities where wastes expected to be managed at the unit are generated. The following sections provide general information on hazardous waste container storage and treatment in containers, general dimensions of the unit, containment features, and materials of construction for the TRUWF to satisfy the requirements of 20.4.1 NMAC §270.15(a)(1) and (2) [10-01-03].

G.1.1. Container Storage Unit

The TRUWF will be capable of storing 105,875 gallons (gal) of waste. Figure 2-1 of this permit modification request provides a layout of the storage configuration and capacity for the TRUWF. The TRUWF will be made up of four general areas: the main staging and storage area; the characterization and certification area; the size reduction, decontamination, and repackaging area; and the shipping and receiving area. The following descriptions present each of the four areas.

G.1.1.1. Main Staging and Storage Area

The main staging and storage area will be the largest part of the TRUWF (Figure A-3 of this permit modification request). This area will serve as central storage for waste containers at the facility. From this area, containers may be transferred between the various other areas within the TRUWF and, potentially, to other LANL waste facilities as needed. Containers will be stored in this area between processes and before final shipment to off-site treatment or disposal facilities. The area will also be used to assemble and weigh containers as well as shrink-wrap drums prior to loading in the shipping area.

G.1.1.2. Characterization and Certification Area

A main function of the proposed TRUWF will be to characterize and certify all transuranic (TRU) waste and containers to meet Waste Isolation Pilot Plant (WIPP) WAC. Waste generators will provide characterization and records as required to meet the TRUWF WAC but the TRUWF will perform additional characterization and certification functions sufficient to ensure compliance with the WIPP WAC. These functions will be similar to those performed in the characterization trailers at TA-54 Area G Pad 10 and will involve the use of the same or similar trailer mounted characterization equipment. A trailer parking area will be located on the southern side outside the TRUWF to conduct characterization and certification activities (Figure A-3). This curbed and fenced area will have sufficient characterization capabilities to perform physical, radiological, and chemical content testing on TRU waste containers. Non-destructive testing (NDT) including real-time radiography (RTR), high efficiency neutron counter (HENC), and thermal equilibrium (TE)/ head space gas sampling (HSGS) will be performed in this area. Head space gas samples will be shipped off-site for analysis.

G.1.1.3. Size Reduction, Decontamination and Repackaging

The TRUWF will have the ability to repackage, size reduce, decontaminate, and treat waste in containers in a proper health and safety environment. These procedures will generally occur within this

area of the facility. These activities are necessary under the WIPP Certification Program because a percentage of the waste containers' contents will have to be visually examined for certification or NDT may suggest anomalies that require inspection to identify noncompliant materials that must be removed. Quality assurance based sampling on a random basis will also require opening and visual examination of container contents. Any of these operational functions will require container opening, sorting, and repackaging capabilities. A small number of waste containers may be too large to ship as they are and will require size reduction. Container based treatment activities may also be necessary to prepare individual containers to meet off-site waste acceptance criteria (See Section G.2). Activities involving treatment, repackaging, and size reduction may require glove bags, modular panelized containment systems, and special heating, ventilating, and air conditioning (HVAC)/ high-efficiency particulate air (HEPA) equipment. In some cases, some of these operations may occur within other areas of the facility if using proper portable anti-contamination equipment in addition to those which occur in this portion of the facility.

G.1.1.4. Shipping and Truck Staging Area

The shipping and truck staging area will be located within the western part of the TRUWF as well as on the asphalt area outside. The TRUWF will receive and load waste containers and prepare the certification paperwork and transport documentation required for shipment off-site. In the case of mixed transuranic waste shipped to WIPP, this area will receive empty Transuranic Waste Package Transporter (TRUPACT) II containers, load them with WIPP certified waste containers, and prepare the documentation for transport. A 10 ton bridge crane will be present to hoist and load container assemblies into waste containers. The outside truck staging area will be used to temporarily store waste transport trucks as required for shipping schedules or contingencies.

G.1.1.5. Facility Layout and Construction

The main storage area and the indoor portion of shipping and receiving operations will be within a pre-engineered metal building. The characterization trailer parking area will be outside the main storage area on the southern side of the building. The design concept for the areas where sealed waste containers are handled (the main storage area, the indoor shipping and receiving operations area, and the trailer parking area), will be about 23,000-sf of floor space. These operations will not have special HVAC equipment because the Type A waste containers and standard waste boxes (SWBs) will provide adequate confinement for storage operations. The waste containers will be stored with adequate aisle space and may be stacked as outlined in Section 2.3 of this permit modification submittal. The outdoor characterization and certification area, on the southern side of the building will

consist of a fenced and curbed area where characterization trailers will be parked to perform physical, radiological, and chemical content testing on TRU waste containers. The western portion of the outdoor storage area will be utilized for loaded waste truck parking, truck turn around, and receiving. Waste trucks will be parked in the paved area on the southwestern side of the TRUWF if a shipment of waste is delayed for departure after loading or other scheduling problems develop.

The metal building containing the main storage area and indoor shipping and receiving operations will be a pre-engineered structure constructed of a steel frame, steel wall/roof panels, with a concrete floor (sealed with a protective coating). Interior partitions will be concrete masonry unit block and drywall on metal studs. The building will be HEPA filtered and have monitoring systems to alert operations to contamination, but will not have special HVAC equipment engineered into the building. The overall features are meant to facilitate easy decontamination should a leak occur, and to prevent the spread of contamination to the environment.

The eastern portion of the facility will be a concrete containment building for treatment, size reduction, decontamination, and packaging operations and will be approximately 5000-sf. This area will include operations that open waste containers, sort and manipulate contents, and conduct all treatment activities as outlined in Section G.2. Operations in this area will pose a risk of release of radiological materials to the environment and workers resulting from a spill or other upset. Thus, the area will be provided with a nuclear safety qualified structure, fire suppression, and confinement HEPA ventilation systems. The structure will be constructed of reinforced concrete and contain a modular, steel and plastic panelized containment system to facilitate safe handling of the waste. Within the containment system, separate confinements (such as glove boxes, glove bags, and tents) will be constructed (during operations) where waste packages will be opened and the wastes will be sorted, treated, disassembled, sized reduced, decontaminated, and repackaged. This area will be HEPA filtered and also contain various monitoring systems.

G.1.2. Container Handling and Inspection [20.4.1 NMAC §§ 264.171, 264.173, and 264.174]

Handling and inspection requirements for containers stored within the TRUWF container storage/treatment unit are presented in Sections 2.5 and 2.7 respectively, of this permit modification submittal. This information is provided to meet the requirements of 20.4.1 NMAC §§ 264.171, 264.173, and 264.174 [10-01-03].

G.2. TREATMENT IN CONTAINERS

The information provided in this section is submitted to address the applicable treatment processes that will occur in the TRUWF for containerized waste. The TRUWF will accept waste containers from generators across the LANL site. These containerized wastes will be characterized and accepted at the TRUWF using generator knowledge of the waste and may be packaged in generator supplied containers. In some cases, the waste may need further management to meet the WAC for off-site facilities, to resolve waste item discrepancies, or to prepare waste and containers for acceptable transport. This may involve the use of relatively small scale treatment activities to be performed at the TRUWF. These treatment activities will typically be limited to individual waste items or only a portion of the waste contents in a container.

Treatment methods that will be used at the TRUWF may include absorption, neutralization, cementing or grouting, and puncturing of aerosol cans. The most common treatment method that is anticipated is absorption of liquids. These methods of treatment will be conducted at the TRUWF within waste containers and may be performed individually and in conjunction with each other to treat the waste in the most effective manner possible to meet off-site waste acceptance criteria. When more than one treatment will be performed on a waste, individual operations, as outlined below, may be combined. Treated waste may be consolidated with other treated waste provided that the wastes are compatible. These treatment processes may also be conducted during waste repackaging and/or resizing operations. All treatment will be conducted with the use of a glove bag, tent, and/or in the modular panelized containment system to provide containment. HVAC/HEPA equipment will also be used as necessary for containment purposes.

G.2.1. Absorption

The treatment objective of absorption will be to use a suitable absorbent material to absorb any free liquid waste in order to meet the WAC for the off-site facility. Prior to absorption, the compatibility of the liquid with absorbent being used will be addressed and documented, as required. Absorbent materials will also be checked for compatibility with waste types based on process knowledge and stored accordingly. The volume of liquid waste to be treated and amount of appropriate absorbent [selected based upon visual examination, process knowledge, acceptable knowledge, or other appropriate means (e.g., water miscibility)] will be estimated. The absorption/treatment processes are generally described below.

If treatment will be occurring for liquids that will not be removed from the original storage container, absorbent will be added directly to the container and the container will then be closed. If the free liquid will be transferred from the original container and placed in a second container, absorbent will be added to the second container either prior to or after the liquid waste is added to the container. A sufficient volume of free liquid will be removed so that the free liquid remaining in the original container can be treated through the addition of absorbent or will not need further treatment.

In some cases drum liners or other smaller containers located within the original waste container will have to be removed from the original container prior to treatment (e.g., condensate between the liner and the container). The addition of the absorbent will occur by placing it into the drum liner or the small container and then repackaging the liner or container into the original container or a new waste container.

Transfer of liquids will primarily be through the use of equipment (e.g., disposable pipettes, pumps, ladles, drip pans, etc.) or pouring to remove the liquid from the original container into another container. Waste transfer or adding absorbent to liners or small containers will occur in a drip pan or other type of secondary containment device. Standardized and approved procedures will be used to minimize the spread of hazardous waste components during waste transfer, removal of waste, or waste treatment. When absorbent is added to a container, the absorbent and waste may be mixed, if required. Any free liquid remaining in the original container will be treated via absorption, cementation, and/or neutralization as necessary. Treated waste will be visually inspected for signs of free liquids. If no free liquids are present, the treatment will be considered successful. If the absorption is not fully effective, the cause of the process failure will be evaluated. If insufficient absorbent was used, the process may be repeated with additional absorbent.

G.2.2. Neutralization

The treatment objective of neutralization will be to adjust the pH of liquid waste to a desired range for absorption or cementation. The desired pH, which depends on the waste type and determines the specific absorption agent(s) to be used, will be established prior to conducting treatment. The weight or volume of the waste will be determined and recorded and a pH measurement will be taken. The appropriate types and amounts of neutralizing agents will be weighed/measured out and added. The

primary acidic neutralizing agents will include acids, such as citric acid. The primary basic neutralizing agents will include bases, such as calcium carbonate. The treatment agents and waste will be mixed according to the method and duration specified in the operating instruction. A pH measurement will be taken to verify results against the pH end-point established as specified in the operating instruction and to confirm treatment effectiveness. If the neutralization is not effective, the cause of the process failure shall be evaluated. If insufficient reagents were used, the process may be repeated with additional reagents. Once neutralized, the liquid may be mixed with appropriate absorbents or cemented, unless the neutralizing agent is also an absorbent.

G.2.3. Cementation

The treatment objective of cementation will be to solidify a waste stream through the process of mixing the waste with cement or a cement material. In some cases, cement may be added to a previously cemented waste if the waste matrix has released liquids. Cementation may be performed within the original container or liquid/sludge waste may be transferred to another container where cement and other supplemental cementitious materials are added. The mixture of waste and cement material will be blended using a drum mixing unit or other approved method to create a grout. The grout solidification matrix that is formed will be allowed to cure for a sufficient period of time within a closed container and then prepared for shipment to an off-site facility for further treatment or disposal. The inert material that will generally be used will be Portland cement. Some waste containers may require that absorbent be added to the waste container prior to the addition of cement to provide a drier matrix and allow identification of the proper combination of ingredients to ensure a successful stabilization effort.

G.2.4. Can Puncture

The treatment objective of aerosol can puncturing will be to remove the potential for reactivity of the aerosol can and render it non-hazardous. Occasionally during RTR scans or visual examination, an aerosol can will be found within a waste container. The aerosol can will be removed and punctured using a waste puncturing system that will capture any liquids released from the punctured can as described below. The can will then be placed into the waste container that it was removed from or a new container. The resulting liquids will be captured within the puncturing system and will be consolidated with other liquids from the same puncturing process or other treated wastes at the TRUWF. The following presents the general steps that will be used in puncturing aerosol cans:

- Absorbent will be placed into the drum containing the puncturing unit prior to use.
- The puncturing unit will be threaded directly onto a drum where aerosol cans will be punctured.
- The can will be placed into the unit and will be punctured per manufacturer's specification.
- The resultant liquid will be collected within the drum and may be commingled with other compatible liquids resulting from the puncturing process.
- The punctured can will be removed from the puncturing unit when it has been given enough time to drain of liquids.
- The punctured can will be placed within the original waste drum or a new drum.
- Additional absorbent may be placed into the drum containing liquids from the puncturing unit to ensure that there are no free liquids present.
- Absorbed liquids from the puncturing process may be commingled with absorbed liquids from other treatment processes at the TRUFW, provided that the wastes are compatible.
- The drum will then be prepared for shipment to an off-site facility.

G.3. SECURITY AND ACCESS CONTROL AT TRANSURANIC WASTE FACILITY [20.4.1 NMAC §270.14(B)(4) AND §270.14(B)(19)(VIII) AND 20.4.1 NMAC §264.14]

The hazardous waste management unit at TA-52, Building 190 will be provided security by both its location on the mesa north of Puye Road and because the facility will be contained within a security fenced area with gates. Security within the facility will be provided by a system of facility access controls (badge readers and administrative controls) to ensure that only authorized personnel are granted access. These access controls will also ensure that all facility personnel can be identified and located in an emergency. Guard stations will control public access on Pajarito Road east and west of TA-52. Therefore, only properly identified LANL and Department of Energy employees authorized to enter the facility or individuals under their escort will have access to the TRUWF.

Any access to the TRUWF will be limited by an access control station where check-in or badge-in will be required prior to entrance. The security fence will be at least 8 feet (ft) high and be a chain link type fence with steel pipe fence posts. Fence tops will have at least three strands of barbed wire angled away from the protected area to prevent a person from scaling the fence. At least two vehicle access gates will be integrated into the fence line. These gates, when opened, shall provide at least a 16 foot wide clearance to enable vehicle access. Gates will be locked when the facility is not operational. TA-52 will be patrolled by LANL security personnel during both operational and non-operational hours to ensure that the gates are locked and that unauthorized entry does not occur. In accordance with 20.4.1 NMAC §270.14(b)(19)(viii) [10-01-03], the proposed locations of the security fences, entry gates, and entry stations are shown on Figure G-1. In addition to the fence and entry gates, cliffs and canyons on the northern side of TA-52 will provide natural barriers to discourage unauthorized entry.

Warning signs stating "Danger – Unauthorized Personnel Keep Out," will be posted on the perimeter fences at approximately 40 to 110- foot intervals and will be able to be seen from any approach to TA-52. The legends on the signs will be bilingual (i.e., English and Spanish) and will also indicate "No Trespassing by Order of the United States Department of Energy." The signs will be legible from a distance of 25 feet. Signs for any confined areas, if necessary, may be reduced in size, but will be legible to personnel who require access to these areas.

G.4. PREPAREDNESS AND PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C]

The following sections present waste management techniques that will be used at TA-52 to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [10-01-03]. Additional information on the communication and alarm equipment available at LANL is presented in Appendix E of this submittal and in the LANL permit renewal documentation. A list of the emergency equipment available for use at the hazardous waste management unit at the TRUWF is provided in Tables E-2 and E-3 of Appendix E of this document. The TRUWF will be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, in accordance with 20.4.1 NMAC § 264.31.

G.4.1. Required Equipment [20.4.1 NMAC §264.32]

The TRUWF will be equipped with multiple audible and visual safety-alarm systems to alert personnel in the event of an emergency and to evacuate the area. These alarm systems will be located both inside and outside the facility and will be monitored and controlled by the facility monitor/control system. The facility monitor/control system will be in operation 24 hours a day and will be located in the access control station at the TRUWF. Specific facility monitor/control system equipment to be located at the TRUWF is discussed below.

Emergency equipment will be located throughout the TRUWF and will include internal communications, alarm systems, fire alarms, spill kits, and decontamination equipment. Detailed information on the required emergency and safety equipment located at the TRUWF is provided below. For additional information on equipment that will be located at the TRUWF, see Table E-3 in Appendix

E of this permit modification application. Water flow, valve tamper switches, manual pull stations, smoke detection and trouble signals will all be monitored.

Fire-alarm pull boxes and/or drop box push-button alarms will be located pursuant to National Fire Protection Association (NFPA) standards in the TRUWF where waste management activities will be conducted. Fire-alarm pull boxes may be used by personnel to activate a local fire alarm when a fire or other emergency is discovered. Once manually activated, an alarm will sound in the TRUWF access control station and at the Los Alamos County Fire Department (LACFD).

The TRUWF will be equipped with fire-suppression alarm systems and/or smoke detectors. The fire-suppression alarms will be activated when water flow is detected in the sprinkler pipes of the fire-suppression system. The smoke detectors, once activated, also sound an alarm. Upon activation of the fire-alarm system, an alarm will sound and red lights will flash to alert personnel of emergency conditions. All fire-alarm pull boxes, heat and smoke detection systems, and automatic fire-suppression systems that will be located at the TRUWF will be connected to the LACFD through LANL's Central Alarm Station (CAS).

A general evacuation alarm will also be present at the TRUWF for other emergencies requiring evacuation. In addition to the alarms described above, a public address (PA) system may also be used to announce an evacuation at the TRUWF. The PA system will be able to be heard throughout the TRUWF and will be activated by the access control station.

Continuous air monitors (CAM) will be located at various locations throughout the TRUWF. CAMs will be used as additional leak detection for the waste management unit addressed in this permit application by detecting any airborne alpha contamination that would be present if a spill or leak of mixed waste were to occur. Fixed head monitors and personnel monitors may also be used to detect contamination.

TA-52, Building 190 will be equipped with both local paging and conventional telephones to provide adequate communication and to summon external emergency assistance, if necessary. Local paging telephones and speakers and/or conventional telephones will be located at or near the hazardous waste management unit addressed in this permit application. Local paging telephones will be used to page on-site personnel within the local paging area and may be used in the event of an emergency to communicate the location and nature of hazardous conditions to personnel in the area. Personnel

working within any area of the TRUWF will also have the ability to use conventional telephones or cellular telephones to call the access control station to summon emergency assistance from the Emergency Management and Response Office, local police and fire departments, and state emergency response teams, if necessary.

Fire control equipment will be readily available for the waste management unit addressed in this permit application. Depending on the size of the fire and the fuel source, portable fire extinguishers will be available and may be used by trained on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. The TRUWF will be equipped with heat and smoke detection systems and/or automatic, heat-activated fire-suppression systems to aid in the timely response in the event of fires in the TRUWF.

Fire hydrants are located in accordance with NFPA standards. Water will be supplied to the fire hydrants by a municipal water system which will provide adequate volume and pressure (i.e., greater than 1,000 gal per minute and 90 pounds per square inch static pressure) to multiple water hoses in the event of a fire. The LACFD will supply all water hoses needed in the event of a fire at the TRUWF.

There will be several spill kits available at the TRUWF to mitigate containable spills. These kits will typically contain sorbents, neutralizers, personal protective equipment (PPE), and other equipment essential for containment of spills. Trained personnel will use the spill kits only if they know what has been spilled and they are sure their actions will not put themselves or others at risk. In addition to the spill kits, shovels for cleanup will be available at the TRUWF. Oversized drums and sorbents will also be stored at various locations throughout the TRUWF. Emergency personnel will provide additional spill control equipment and assistance upon request depending on the size and severity of the spill.

Personnel decontamination equipment that will be available at the TRUWF will include safety showers and eye wash stations located inside and outside the TRUWF. Additional decontamination equipment may be provided by emergency personnel. Material safety data sheets will be available at operations areas and will provide useful exposure information.

G.4.2. Testing and Maintenance of Equipment [20.4.1 NMAC §264.33]

All communications and alarm systems, fire protection, and decontamination equipment at TRUWF will be inspected, tested, and/or maintained as provided according to the inspection schedule detailed in

Appendix C of this permit modification submittal. The frequency of inspection will be adequate to ensure proper operation in the event of an emergency. Maintenance, repair and replacement of emergency equipment will be performed as required.

G.4.3. Access to Communications or Alarm Systems [20.4.1 NMAC §264.34]

Whenever waste is being handled in the TRUWF hazardous waste management unit, all personnel involved will have immediate access to an internal alarm or emergency communication devices, either directly or through visual or voice contact with another individual. These devices will include fire alarms, evacuation alarms, paging telephones, radios, and cellular telephones. In the event of an emergency, communication equipment at the TRUWF will allow personnel to contact the access control station, the operating group management, HAZMAT personnel, and/or the CAS operator. In addition to communications and alarm systems, the TRUWF personnel may carry pagers so that they can be contacted by the access control station and other LANL emergency support personnel at all times.

G.4.4. Aisle Space Requirements [20.4.1 NMAC §264.35]

Waste containers in the TRUWF storage units will be arranged in rows with a minimum aisle space of 24 inches (in.). Storage configuration within a row will depend upon the type of container, its size, and its weight restrictions. Fifty-five-gal. drums and larger containers will be arranged in rows on pallets and may be stacked to a maximum of three containers high, unless size and weight restrictions prohibit stacking due to safety concerns. Smaller containers will be stacked to a maximum of ten ft high.

G.4.5. Support Agreements with Outside Agencies [20.4.1 NMAC §264.37(a)]

LANL maintains support agreements with outside agencies for emergency response assistance. Information regarding these support agreements is provided in the most recent General Part B Permit Application (LANL, 2003).

G.5. HAZARDS PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C; 20.4.1 NMAC §270.14(B)(8)]

A description of the preventive procedures, structures, and equipment that will be located at the TRUWF is presented below. This information is provided in accordance with the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C, and 20.4.1 NMAC §270.14(b)(8) [10-01-03].

Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards, undue exposure of personnel to hazardous and mixed waste, and releases to the environment.

G.5.1. Preventing Hazards in Unloading [20.4.1 NMAC §270.14(b)(8)(i)]

Flatbed trucks, trailers, forklifts, or other appropriate vehicles may be used to transport waste containers to and from the waste management unit at the TRUWF. Forklift operators may use a boom, if necessary, to improve handling capabilities. Small containers may be handled manually or with a dolly. The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while moving containers.

G.5.2. Preventing Runoff [20.4.1 NMAC §270.14(b)(8)(ii)]

Runoff from the indoor waste management unit at the TRUWF to other areas of the facility or to the environment will be prevented. Secondary containment will be provided where potential liquid-bearing containers are stored. Secondary containment systems (e.g. pallets) will be utilized, as needed, and will have sufficient capacity to contain at least 10 percent (%) of the volume of potential liquid-bearing containers or the volume of the largest container stored in the system, whichever is greater, pursuant to the requirements of 20.4.1 NMAC §264.175(b)(3) [10-01-03]. 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 HEPA vacuum, and/or sorbents, depending on the volume and location of accumulated liquid. Accumulated liquids will be removed or managed as soon as necessary to prevent overflow of the collection system. For leaks and spills, liquid volumes should be sufficiently controlled through the use of secondary containment systems as described above to prevent run-off from the facility. In the event of potentially large amounts of run-off liquids from fire suppression activities, the building fire water collection system and outside fire water collection tank will be designed in accordance with NFPA and U.S. Department of Energy standards.

The outside characterization trailers will provide for waste storage in built-in secondary containment or secondary containment pallets during characterization activities and thus, any waste spills or leaks will be contained within the trailers. Waste stored in the outside shipping and truck staging area will be protected within covered secondary containment pallets or in shipping containers. All containers of waste that will be stored within the outdoor shipping area will be covered by a canopy or tarp to prevent contact with precipitation. Loaded TRUPACT II containers or waste trucks may also be stored

in the outdoor shipping area until shipment to the off-site facility occurs. TRUPACT II containers are leak-resistant containers with an acceptable leak rate of 2.6×10^{-7} cubic centimeters of helium per second, which prevents the containerized waste within the TRUPACT II containers from contact with precipitation. Any leaks or spills which escape this containment will be mitigated as soon as possible in accordance with the facility's inspection and contingency plan. Run-off from precipitation or fire suppression activities from these two outside areas will be collected by a central drain and directed to a storm water sampling station.

G.5.3. Preventing Water Supply Contamination [20.4.1 NMAC §270.14(b)(8)(iii)]

The waste management unit at the TRUWF will be located, designed, constructed, operated, and maintained in a manner that will ensure the prevention of water supply contamination. The unit will be located mostly inside the building and outside storage of liquids will occur only with secondary containment. In the event of a release, the materials in question will be removed as quickly as possible and packaged in an appropriate container. Given these conditions, there is little or no potential for deposition or migration of waste constituents into the groundwater or other water supplies as a result of waste-handling operations that will occur at the TRUWF. In addition, the depth to groundwater at the nearby TA-55 is approximately 1,200 ft (LANL, 1998) and the average annual precipitation in the Los Alamos area (including both rain and water equivalent or frozen precipitation) is 48 centimeters (cm). The evaporation of freestanding water exceeds the annual precipitation. Permeability rates for soils at TA-55 range from 1.5 to 5.0 cm per hour (cm/hr) in the top layers to 0.15 to 5.0 cm/hr in the lower layers. Available water-holding capacity ranges from 0.14 to 0.21 percent (Nyhan et al., 1978). Collectively, the depth to the regional aquifer and the annual moisture deficit significantly limit the potential for contaminants to migrate to the groundwater in the unlikely event that contaminants reach the permeable ground surface surrounding the TRUWF. In addition, all water supply lines to the TRUWF will be under pressure and will be equipped with backflow prevention devices. Pursuant to the requirements of 20.4.1 NMAC §270.14(b)(8)(iii) [10-01-03], no impact to water supplies is expected.

G.5.4. Mitigating Effects of Power Outages [20.4.1 NMAC §270.14(b)(8)(iv)]

Electrical power will be supplied at the TRUWF to operate ventilation systems, the PA system, various instruments, and other electrical equipment. In the event of a power failure, portable generators will be available. These generators may be used as temporary power sources at the waste management unit at the TRUWF. Evacuation alarms, equipped with a battery backup, will be located throughout the TRUWF and will continue to operate for eight hours during a power failure. Operations at the waste

management unit will be discontinued temporarily if electrical power is not restored quickly or if container-handling equipment fails. Neither a power nor an equipment failure would affect containment at the TRUWF waste management unit.

The facility will have a standby generator that will provide power to the necessary equipment to put the facility into a safe mode in the event of a power outage. Systems attached to the generator include the breathing air skid, HEPA filtration systems, exhaust fans, any modular paneled containment system, lighting, fire alarm system, area alarms, and freeze protection for the fire water skids.

G.5.5. Preventing Undue Exposure [20.4.1 NMAC §270.14(b)(8)(v)]

To prevent undue exposure of personnel to hazardous or mixed waste, personal protective equipment appropriate for the waste being handled will be worn by all on-site personnel at the TRUWF involved in waste management activities. Workers involved in waste handling at the TRUWF will be required to wear protective work uniforms and steel-toed/composite-toed shoes, as appropriate. Hard hats and gloves may also be worn while equipment is being operated and when containers are being loaded or unloaded. The different levels of PPE are defined by the Occupational Safety and Health Administration as follows:

- *Level D*: Coveralls; safety boots; safety glasses or goggles; hard hat; and appropriate gloves
- *Level C*: Full-face, air-purifying respirator with appropriate cartridges for the chemicals or hazards present; chemical-resistant suits; chemical-resistant safety boots or booties; and inner and outer gloves
- *Level B*: All Level C equipment plus self-contained breathing apparatus in place of a Level C full-face respirator
- *Level A*: All Level B equipment, plus a fully-encapsulating chemical-resistant suit.

Most waste-handling operations at the TRUWF container storage/treatment unit will require that personnel handling wastes or working in the unit will wear modified Level D PPE, (safety glasses and hard hats are not always required depending on the associated work hazards identified in job-specific hazard control plans). Modified Level D may include any item in Level D. There are instances where an increased level of PPE is required, such as during treatment activities, an emergency, or an unusual hazardous situation. If a situation arises during an emergency and an increased level of PPE is required, the PPE will be compatible with the wastes present. All personnel that use PPE are trained and qualified to use the equipment properly.

All personnel involved in waste-handling operations in the TRUWF will be required to have training appropriate for their work. Training requirements are presented in Appendix D of this permit modification submittal. Personnel will also be required to review job hazards prior to performing waste-handling activities. Sampling plans, hazard control plans (which address monitoring equipment), and work authorizations will be required, in accordance with LANL safety procedures. Personal monitoring equipment will be established using the job hazard review process. Together, the required training, plans, and work authorizations will help to prevent undue exposure to personnel.

G.5.6. Preventing Releases to the Atmosphere [20.4.1 NMAC §270.14(b)(8)(vi)]

Releases to the atmosphere are not anticipated from the TRUWF container storage/treatment unit addressed in this permit modification submittal. Containers will be kept closed during handling and storage except when, upon inspection, it is determined that a container currently in storage needs to be over packed or repackaged in a new container, or during waste characterization, waste treatment, or verification activities or when it is necessary to add or remove waste. Inspections will be conducted to ensure the integrity of all stored containers as described in Appendix C of this document.

Treatment and repackaging operations will be contained in pre-engineered metal or plastic structures to provide containment. An external secondary confinement structure will surround the internal primary confinement structure. Both primary and secondary confinement structures will be equipped with an air filtration system that includes a HEPA ventilation system that will prevent the release of particulates to the environment.

Waste characterization trailers that will be located in the southern portion of the TRUWF container storage/treatment unit will include glove boxes and hoods for managing waste. The waste characterization facilities transportainers will provide external confinement for those operations. The equipment and the transportainers will have HEPA filtration systems to contain potential releases.

Mixed transuranic waste containers will be vented with one or more filters to allow any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization within the container. The HEPA-grade vent filters will prevent the escape of any radioactive particulates. A ventilation alarm system and/or other air monitoring equipment will be located in the vicinity of waste management activities located in the TRUWF. In the event of an

unexpected release, all personnel working within or near the area will be notified immediately to evacuate.

The facility will have an active HEPA filtration system to control potential releases to the atmosphere. The ventilation technique used to prevent accidental contamination releases from the building will be to maintain a negative pressure. This will be achieved by providing exhaust ventilation only or to exhaust more air (approximately 5%) than is being supplied where air conditioning is required. In both instances, leakage through the building envelope is maintained inward by the negative pressure and all air leaving the building envelope is treated prior to release, typically with a HEPA filter train. To prevent releases when doors are opened, airlocks are provided at each entrance to the building and between various sections of the building (i.e.; between the main storage area, the shipping area, and the treatment/repackaging/size-reduction area). These airlocks are constructed by building a room at the entry door. Besides the entry door located on the exterior wall of the building, a second door from the room leads into the building interior. These doors are interlocked to ensure that both doors cannot be opened simultaneously which, in conjunction with the negative pressure in the building, prevents potential releases when a door is opened.

The air leakage around the door cracks is also accounted for in the design of airlocks. To ensure the ventilation system adjusts to changes in leakage rates, a variable frequency drive will be used on the exhaust fans. The drive will increase the speed of the fan if the negative pressure in the building rises above the appropriate set point which maintains the required face velocity at openings to prevent release of contaminants.

G.6. CONTAINMENT SYSTEMS [20.4.1 NMAC §§270.15(A)(1-5) AND 270.15(B)(1-2)]

Liquid that might accumulate at the TRUWF container storage/treatment unit will be contained within a secondary containment system such as a secondary containment pallet until the liquid is removed. All secondary containment systems are designed to contain at least 10% of the volume of potential liquid-bearing waste containers or the volume of the largest container, whichever is greater, pursuant to the requirements of 20.4.1 NMAC § 264.175(b)(3) [10-01-03]. Any accumulated liquids are removed in as timely a manner as is necessary to prevent overflow of the collection system, pursuant to 20.4.1 NMAC § 264.175(b)(5). Any accumulated liquids are removed with a vacuum truck, a HEPA vacuum, a portable pump, or by other means, as appropriate and depending on the waste type and volume. The collected liquids are then transferred to appropriate containers and characterized. If the accumulated liquids are from an identified source or from precipitation, snowmelt, or water generated during fire-

suppression activities, the resulting material will be characterized as a newly-generated waste using acceptable knowledge or will be analyzed, as applicable, for the hazardous waste constituents known to be components of the source. If the accumulated liquids are from an unidentified source, the resulting material will be analyzed for the appropriate potential parameters listed in Table E-4 of Appendix E in this permit modification request package. Containers of collected liquids will be stored with secondary containment, pending analytical results that determine how the liquids will be managed. This method of removal and analysis of accumulated liquids fulfills the requirements of 20.4.1 NMAC § 270.15(a)(5) [10-01-03], for prevention of overflow.

Secondary containment at the TRUWF container storage/treatment unit will primarily be provided by self-containment pallets, covered self-containment pallets, or single-drum pallets. Each containment system is described below.

- Self-Containment Pallet: Molded high-density polyethylene base with a fiberglass grating that elevates the containers over a reservoir that is capable of containing leaks and spills from the containers.
- Covered Self-Containment Pallet: Molded, chemical-resistant, high density polyethylene with a removable polyethylene grating and a hinged two-part cover, which is impervious to precipitation. Supplement G-1 provides detailed information on the covered self-containment pallets.
- Single-Drum Containment Pallet: An 85-gal container made of heavy-duty polyethylene designed to hold one 55-gal drum.

Containers holding hazardous waste in the storage/treatment unit will be protected from potential contact with accumulated liquids by either being elevated or stored in an area that is designed and operated to remove accumulated liquids. Drummed waste containers are placed on pallets or stored in self-containment structures. Standard waste boxes may be placed on pallets. Large waste boxes are typically elevated by design. All waste items in TRUWF will either be placed on pallets, elevated with blocks, or are elevated by design.

G.7. SPECIAL REQUIREMENTS FOR IGNITIBLE, REACTIVE, AND INCOMPATIBLE WASTES [20.4.1 NMAC §§ 264.17(A) AND (B), 264.176, AND 264.177(A),(B), AND (C); 20.4.1 NMAC §§ 270.14(B)(9) AND 270.15(D)]

Containers holding ignitable or reactive wastes will be located at least 50 ft from the LANL property line at all times and will be protected from sources of ignition or reaction. The distance to the nearest

facility boundary is approximately 2,500 ft. Waste management practices at the TRUWF container storage/treatment unit will minimize the possibility of accidental ignition. There will be no sources of open flames allowed within the unit. Cutting and welding activities will not be conducted in the vicinity of waste containers. Ignitable and reactive wastes will be segregated and separated by distance to minimize the possibility of spontaneous ignition and will be stored inside the building to minimize exposure to hot surfaces and radiant heat. Only non-sparking tools are used in handling ignitable waste containers, and lightning protection will be installed for the building. Smoking will not be allowed in the TRUWF. "No Smoking" signs will be conspicuously placed wherever there is a potential hazard from ignitable or reactive waste, as required by 20.4.1 NMAC § 264.17(a) [10-01-03]. Precautions will be taken to prevent reactions that may generate extreme heat or pressure, fire or explosions, or violent reactions and to prevent reactions that may damage the structural integrity of the TRUWF including segregating and separating (by distance) ignitable and reactive wastes that will be stored in the building. Precautions will be taken to prevent reactions that may produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment, or produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions including keeping containers closed during storage and venting containers of mixed transuranic waste. Together, these measures will meet the requirements of 20.4.1 NMAC §§ 264.17(a) and (b) and 264.176 [10-01-03].

Incompatible wastes will be segregated and separated during storage in accordance with 20.4.1 NMAC § 264.177(c) [10-01-03]. All waste will be segregated and stored in accordance with DOT compatibility groups. These DOT compatibility groups are: flammables (Class 3), oxidizers (Class 5.1), combustible and noncombustible miscellaneous hazardous material (Class 9), corrosives (Class 8), poisons (Class 6), radioactive (Class 7), acids (Class 8), reactives (Class 4), and non-regulated materials. Incompatible wastes will be separated and segregated from other wastes and materials by means of a berm, dike, wall, or other specific means (e.g., secondary containment pallets, modular sheds, 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 §§ 264.177(a) and (b), and 20.4.1 NMAC § 270.15(d) [10-01-03].

G.8. AIR EMISSION STANDARDS FOR CONTAINERS

The hazardous wastes that will be stored in containers at the TRUWF may be subject to 20.4.1.500 NMAC (incorporating the Code of Federal Regulations [CFR], Title 40, Part 264, Subpart CC, "Air

Emission Standards for Tanks, Surface Impoundments, and Containers") based on the applicability criteria specified in 40 CFR § 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so that there are no detectable emissions of volatile organic compounds to the air. Inspection and monitoring requirements are also specified.

As indicated in 40 CFR § 264.1080(b)(6), these standards are not currently applicable to containers that are used solely for management of radioactive mixed waste in accordance with all regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gal) capacity, or that have received waste prior to the effective date of the regulation (December 6, 1996). The following management standards apply for hazardous wastes managed at LANL that do not meet any of the exemptions listed in 40 CFR §264.1080(b).

Generator information will be used to determine whether the concentration of volatile organics in a waste stream at the point of generation is less than 500 ppmw, or is equal to or greater than 500 ppmw, which is the threshold concentration for Subpart CC requirements. In the event that this information is not available, the waste will be characterized in accordance with Appendix B of this permit modification submittal prior to being received at the TRUWF. Any hazardous waste that is newly-generated through the treatment or re-characterization of waste at the TRUWF will be characterized for the volatile organic content in accordance with Appendix B of this permit modification request submittal.

Three levels of air emission controls based on container design capacity are established in 40 CFR § 264.1086(b). The TRUWF hazardous waste storage procedures will require Level 1 controls based upon container design capacities. Containers of greater than 0.1 m^3 and less than 0.46 m^3 (approximately 119 gal.) capacity and that meet U.S. Department of Transportation (DOT) specifications under 49 CFR, Part 178, will be kept closed during storage pursuant to 40 CFR § 264.1086(c)(3). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR § 264.1086(c)(3). As required by 40 CFR § 264.1086(c)(4), these containers are subject to a visual inspection and monitoring program. On or before acceptance of the waste container at the TRUWF, the container will be inspected to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured

in the closed position, in accordance with 40 CFR § 264.1086(c)(1)(ii). This inspection will be documented in uniform hazardous waste manifests. Pursuant to the Inspection Plan in Appendix C of this permit modification submittal, containers will be inspected at least weekly at the TRUWF to ensure that the containers remain closed during storage, thereby exceeding the requirements of 40 CFR § 264.1086(c)(4)(ii).

G.9. RECORDKEEPING REQUIREMENTS

Recordkeeping requirements applicable to the container storage/treatment unit at the TRUWF, will consist of the biennial report, unmanifested waste report, and additional reports. These reports are discussed in the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

G.10. REFERENCES

LANL, 1998, "Hydrogeologic Workplan," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

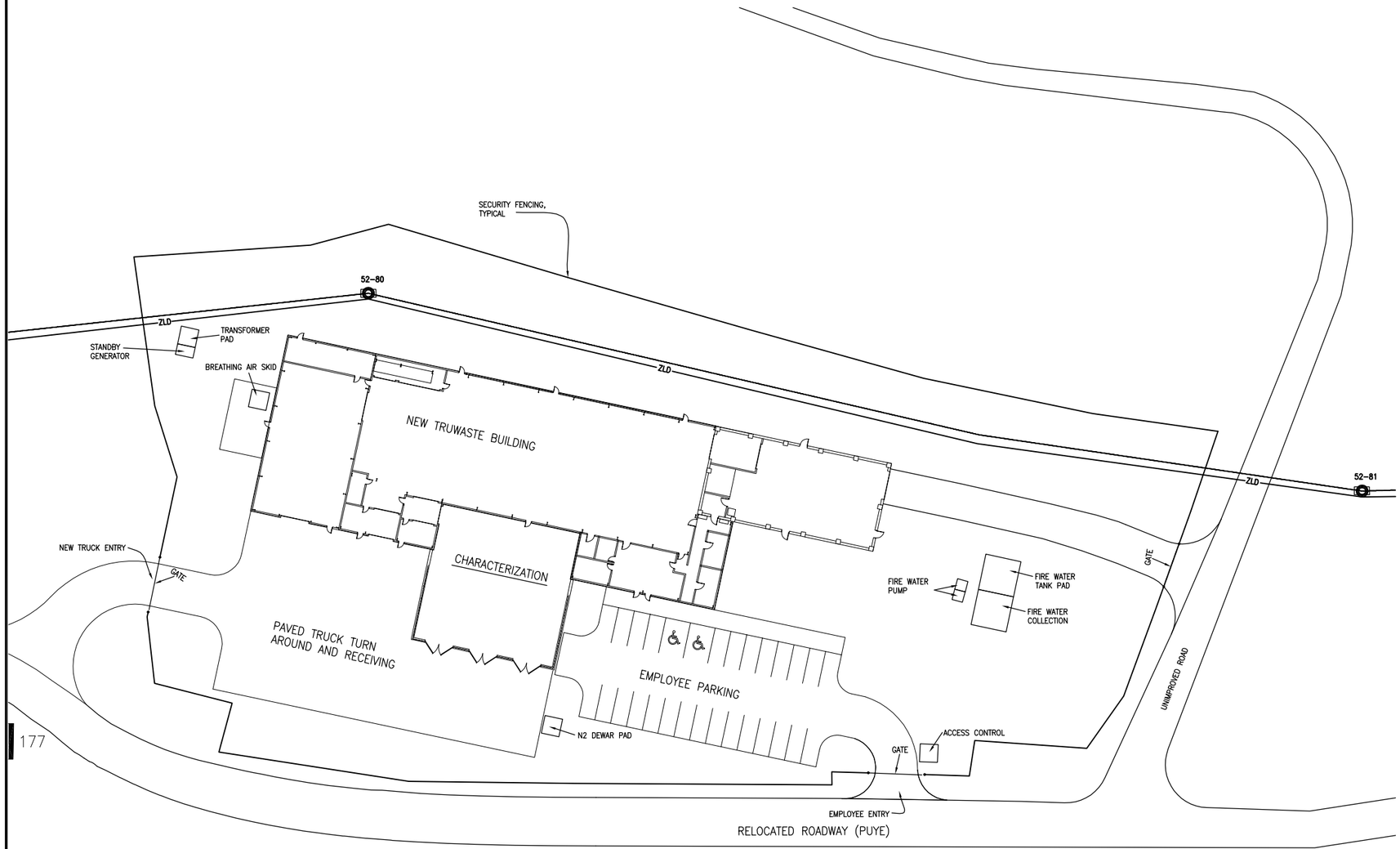
LANL, 2003, "Los Alamos National Laboratory General Part B Permit Renewal Application, Revision 2.0," LA-UR-03-5923, August 2003, Los Alamos National Laboratory, Los Alamos New Mexico.

Nyhan, J.W., L.W. Hacker, T.E. Calhoun, and D.L. Young, 1978, "Soil Survey of Los Alamos County, New Mexico," LA-G779-MS, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table G-1
Use and Management of Containers
Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification
§270.15	Specific information requirements for containers:	G.0
§270.15(a)	A description of the containment system to demonstrate compliance with §264.175 including at a minimum:	G.1
§270.15(a)(1)	Basic design parameters, dimensions, and materials of construction	G.1
§270.15(a)(2)	How the design promotes drainage or how containers are kept from contact with standing liquids in the containment system	G.2
§270.15(a)(3)	Capacity of the containment system relative to the number and volume of containers to be stored	G.1
§270.15(a)(4)	Provisions for preventing or managing run-on	G.7
§270.15(a)(5)	How accumulated liquids can be analyzed and removed to prevent overflow	G.6
§270.15(b)	For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with §264.175(c) including:	G.1
§270.15(b)(1)	Test procedures and results or other documentation or information to show that the wastes do not contain free liquids	G.1
§270.15(b)(2)	A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids	G.1
§270.15(c)	Sketches, drawings, or data demonstrating compliance with §264.176 (location of buffer zone and containers holding ignitable or reactive wastes) and §264.177(c) (location of incompatible wastes), where applicable	G.8
§270.15(d)	Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with §264.177(a) and (b) and §264.17(b) and (c)	G.8
§270.15(e)	Information on air emission control equipment as required in §270.27	G.9
§270.27(a)	Specific information requirements for air emission controls	G.9
§270.27(a)(2)	Identification of each container area subject to the requirements of §264, Subpart CC and certification by the owner or operator that the requirements are met	G.9
§270.27(a)(3)	Documentation that each enclosure used to control air emissions from containers are in accordance with the requirements of §264.1086(b)(2)(I) includes information prepared by the owner or operator or manufacturer or vendor describing the enclosure design and certification that the enclosure meets the specifications listed in §265.1087(b)(2)(ii)	NA[a]
§270.27(a)(5)	Documentation for each closed-vent system and control device installed in accordance with the requirements of §264.1087 that includes design and performance information as specified in §270.24 (c) and (d)	NA
§270.27(a)(6)	An emission monitoring plan for both Method 21 and control device monitoring methods. The plan must include:	NA
§270.27(a)(7)	Implementation schedule	NA

a NA = not applicable



LEGEND OF SYMBOLS

SECURITY FENCE

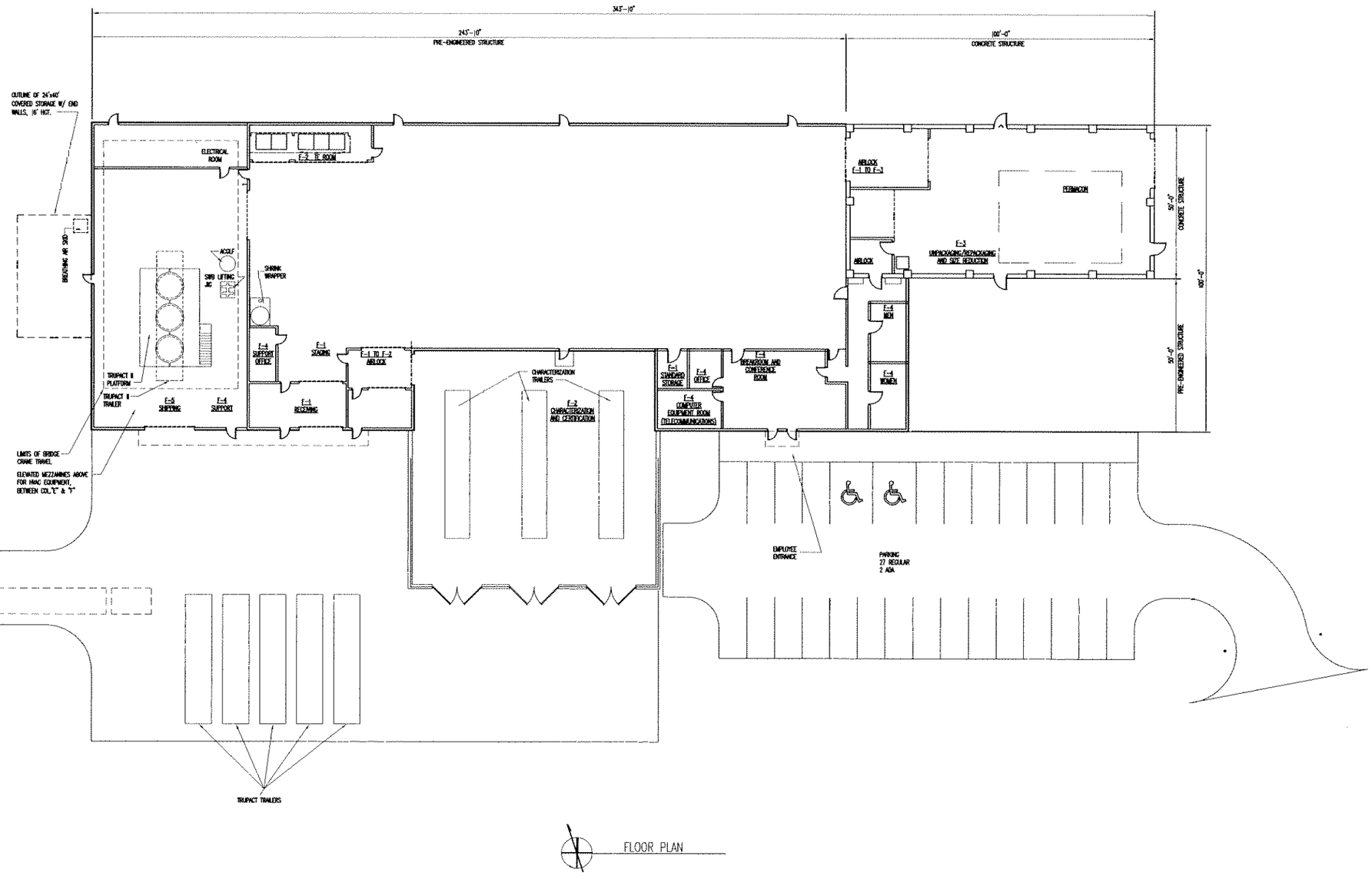
N

SITE LAYOUT

0 30' 60'

1"=30'–0"

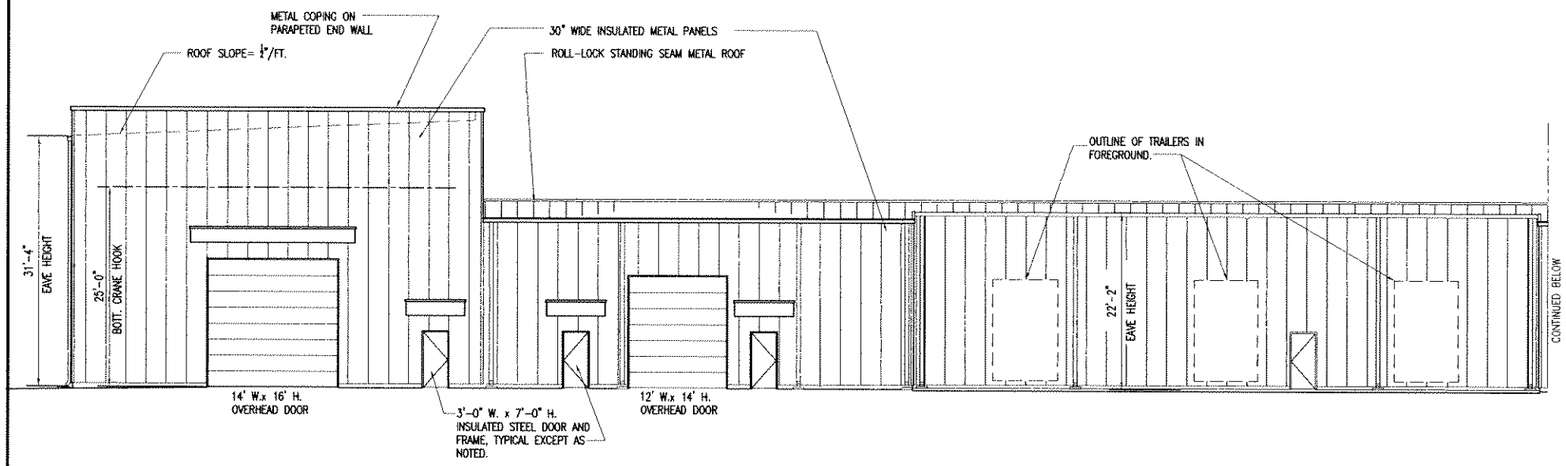
FIGURE G–1
LOCATION MAP SHOWING SECURITY FENCES, ENTRY GATES, AND ACCESS CONTROL AT THE PROPOSED TRANSURANIC WASTE FACILITY



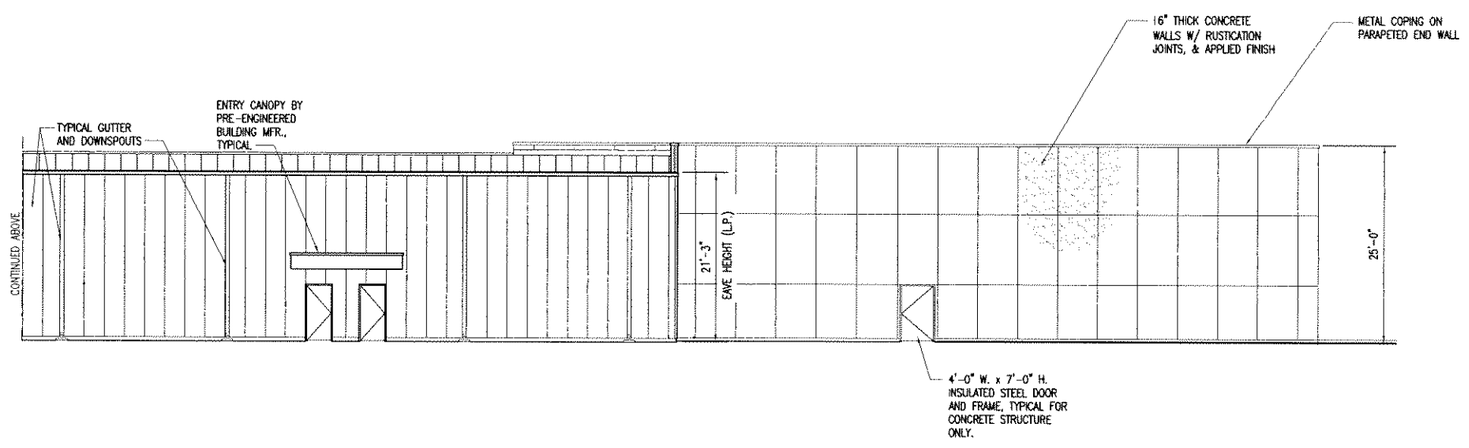
FLOOR PLAN

JAMES A. ANDEREGG, JR.
NEW MEXICO
16063
LICENSED PROFESSIONAL ENGINEER
8-3-07

FIGURE G-2
PROPOSED TRANSURANIC WASTE
FACILITY CONTAINER
STORAGE/TREATMENT UNIT FLOOR PLAN



SOUTH EXTERIOR ELEVATION



SOUTH EXTERIOR ELEVATION

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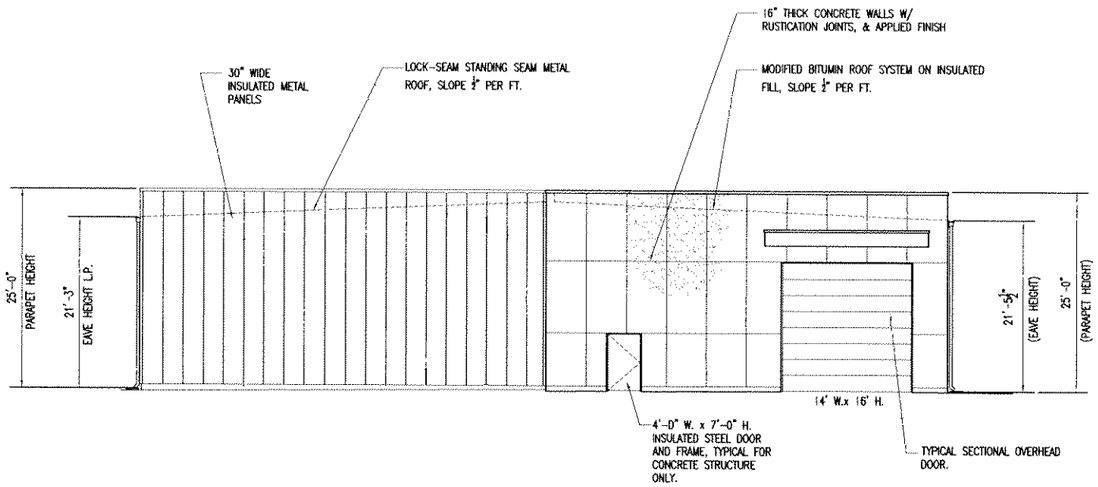
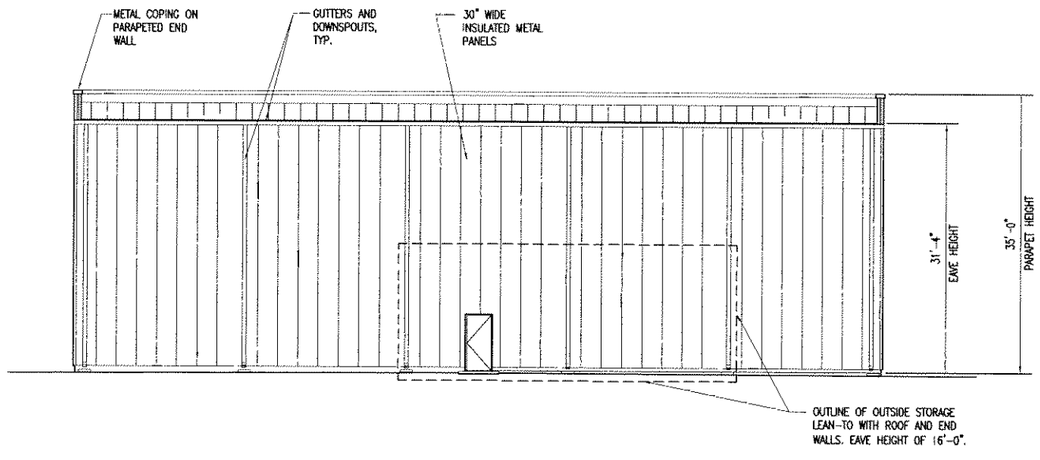
FIGURE G-3
PROPOSED TRANSURANIC WASTE FACILITY STORAGE BUILDING ELEVATIONS (SOUTH)



EAST EXTERIOR ELEVATION



WEST EXTERIOR ELEVATION

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FIGURE G-4
PROPOSED TRANSURANIC WASTE FACILITY STORAGE BUILDING ELEVATIONS (EAST AND WEST)