RESOURCE CONSERVATION AND RECOVERY ACT FACILITY OPERATING PERMIT

ATTACHMENTS A THROUGH M

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issued to the

U.S. DEPARTMENT OF ENERGY/SANDIA CORPORATION

for the

SANDIA NATIONAL LABORATORIES
HAZARDOUS AND MIXED WASTE TREATMENT AND STORAGE UNITS AND POST-CLOSURE CARE OF THE CORRECTIVE ACTION MANAGEMENT UNIT

located in

BERNALILLO COUNTY, NEW MEXICO

prepared by the

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
2905 RODEO PARK DRIVE EAST, BUILDING 1
SANTA FE, NEW MEXICO 87505

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PERMIT ATTACHMENT A FACILITY DESCRIPTION

A.1 INTRODUCTION

This Permit Attachment contains general information pertaining to Sandia National Laboratories (SNL; the Facility) and the treatment and storage units covered by this Permit. The Facility is owned by the U.S. Department of Energy (DOE) and co-operated by Sandia Corporation and DOE.

The Facility is located on Kirtland Air Force Base (KAFB) immediately south and southeast of the Albuquerque city limits in Bernalillo County, New Mexico. The Facility occupies five Technical Areas and additional test areas as defined in Permit Section 1.6 (see Figure 1 in Permit Attachment L (*Figures*).

The Facility is a multidisciplinary laboratory engaged in research and development of weapons and alternative energy sources. The Facility is managed for the DOE by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation with work also performed for others.

The major Facility research and administration functions are located at five Technical Areas (TAs), designated I through V. TAs I, II, and IV are located north of the Tijeras Arroyo and Arroyo del Coyote (see Figure 2 in Permit Attachment L (*Figures*)). TAs III and V occupy contiguous tracts of land south of the Tijeras Arroyo and west of Arroyo del Coyote.

The individual units permitted under this Permit include: (1) the Hazardous Waste Handling Unit; (2) the Thermal Treatment Unit; (3) the Radioactive and Mixed Waste Management Unit; (4) the Auxiliary Hot Cell Unit; (5 through 9) Five Manzano Storage Bunkers; and (10) the Corrective Action Management Unit (CAMU). All the Permitted Units are shown on Figure 2 (*Unit Location Map*) in Permit Attachment L (*Figures*).

The following information contains unit descriptions, including the dimensions, materials of construction, and operational procedures and requirements. Additional information on the CAMU is presented in Permit Attachment H (*Post-Closure Care Plan*).

A.2 TA-I: HAZARDOUS WASTE HANDLING UNIT

The Hazardous Waste Handling Unit (HWHU) is located south of TA-I, north of the entrance to TA-II; and occupies 1.35 acres on Facility property between TA-I and TA-II (see Figure 2 in Permit Attachment L (*Figures*)). The HWHU is a fenced compound with several buildings and three hazardous waste management areas used for storage and packaging of hazardous and mixed wastes (see Figure 3 in Permit Attachment L (*Figures*)). Hazardous and mixed wastes are transported to off-site RCRA-permitted facilities for treatment or disposal.

A.2.1 HWHU Container Types

Waste containers that may be managed at the HWHU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off

bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. a large piece of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.2.2 HWHU Designated Waste Management Areas

Appendix A.1 in Permit Attachment L (*Figures*) contains photographs of the three designated hazardous and mixed waste management areas at the HWHU. The three hazardous or mixed waste management areas are shown on Figure 4 of Permit Attachment L (*Figures*). These include:

1. The Hazardous Waste Packaging Building (Building 959),
2. The Hazardous Waste Storage Building (Building 958), and
3. Two modular storage buildings - Buildings 958B and 958C.

Two covered, bermed, open concrete-lined areas that are not used for the management of hazardous or mixed wastes are located at the HWHU; one is located in the northeast corner of the Unit, and the other is located on the west side of Building 959.

The following sections provide descriptions of the storage layout, location, and secondary containment systems of each hazardous waste management area and the bermed areas. Storage capacities are listed in Attachment J, Table J-1.1.

A.2.3 TA-I: HWHU Hazardous Waste Packaging Building 959

The Hazardous Waste Packaging Building 959 is the easternmost hazardous waste management area and is a 1,800-square-foot (ft^2) pre-cast concrete building with an eave height of 12 feet (ft) (see Figure 4 in Permit Attachment L (*Figures*)). Eight waste-holding cells with half-height concrete masonry walls and a waste packaging area are located in the building. The packaging area contains a fume hood and flexible ventilation hoses attached to a local negative-pressure ventilation system that exhausts to the exterior of the building.

All the cells and part of the packaging area have recessed floors that are constructed of reinforced concrete and are covered with metal grating. Waste containers in the cells are placed on shelves over the metal grating or directly on the metal grating. The load-bearing capacities of the metal grating and the reinforced concrete floor are 450 and 2,000 pounds per ft^2, respectively. The floor and the bottom seven inches of wall surface in each recessed area are covered with an epoxy-based chemical-resistant coating or equivalent protective coating, and shall be maintained as needed to be free from cracks and gaps. Figures 5 and 6 in Permit Attachment L (*Figures*) are the floor plans of Buildings 959 and 958, respectively.

The individual shelves are covered with removable chemical-resistant grating, and they have edges to hold the containers in place. The shelves are not designed to provide secondary containment. The recessed areas provide secondary containment. The recessed area in each holding cell is 5 feet by 4.5 feet and 7 inches deep, with a capacity of 98 gallons. The recessed floor area under the packaging area is 5 feet by 12 feet and 7 inches deep, with an actual capacity

of 261 gallons. The capacity for each holding cell is limited to 71 gallons, and the capacity for the packaging area is limited to 191 gallons.

Wastes are stored in the Hazardous Waste Packaging Building. In addition, wastes are prepared for shipment to off-site treatment and disposal facilities (e.g., lab packs are prepared by placing small containers into larger containers filled with absorbent material).

Water reactive wastes are not managed in the Hazardous Waste Packaging Building, except on a temporary basis during receipt, repackaging, and staging activities which shall not exceed 3 days. Water reactive wastes shall be protected from contact with water when managed in Building 959.

A.2.4 TA-I: HWHU Hazardous Waste Storage Building 958

The Hazardous Waste Storage Building 958 is located west of the Hazardous Waste Packaging Building (see Figure 9 in Permit Attachment L (*Figures*)). The Hazardous Waste Storage Building is a 3,520-ft^2 precast concrete building with an eave height of 14 ft and contains eight separate and recessed waste storage cells for segregation of waste (see Figure 11 in Permit Attachment L (*Figures*)). The floors of Cells 1, 2, 3, 4, 6, 7, and 8 are constructed of reinforced concrete and metal grating. The floor of Cell 5 is constructed of reinforced concrete. The floor and bottom 5 inches of the walls are coated with an epoxy-based chemical-resistant coating, or equivalent protective coating, and shall be maintained as needed to be free from cracks and gaps. The load-bearing capacity of the metal grating and reinforced concrete are 450 and 2,000 pounds per ft^2, respectively. The storage cells vary in size, secondary-containment capacity, and waste-container capacity.

The recessed areas under the grating provide the secondary containment in Cells 1, 2, 3, 4, 6, 7, and 8. The volume of the entire recessed area provides the secondary containment capacity in Cell 5. For example, the recessed area in Cell 1 is 11.75 feet by 14.67 feet by 5 inches deep, with a capacity of 542 gallons.

Water reactive wastes shall not be managed in the Hazardous Waste Storage Building, except on a temporary basis during receipt, repackaging, and staging activities which shall not exceed 3 days. Water reactive wastes shall be protected from contact with water when managed in Building 958.

A.2.5 TA-I: HWHU Modular Storage Buildings 958B and 958C

The modular storage buildings are located west of Building 958 (see Figures 4 and 7 in Permit Attachment L (*Figures*)) and are used for storage of wastes such as ignitable solids and water reactives.

The exterior dimensions of each modular storage building are 22-ft long, 8-ft wide, and 8-ft high. The buildings are constructed of welded 10- and 12-gauge steel supported by structural steel sections. Each building has three doors, each with a three-point locking system to provide access and security. Each has a 6-inch-deep integral spill containment reservoir under the entire building; the containment capacity is 500 gallons. The secondary-containment sub-floor is constructed of continuously welded 10-gauge steel, which is painted to provide additional protection against degradation of the secondary containment. The floors are vinyl ester

fiberglass gratings. The load-bearing capacity of the floor for each structure is 250 pounds per square foot. The inside walls and ceiling are also painted. The sumps shall be maintained to be free from cracks and gaps. Each building rests on structural supports that elevate it and allow visual checks of the underside of the spill containment reservoir if there is evidence of deterioration on the interior surfaces noted during inspections performed according to the Inspection Plan in Permit Attachment E.

A.2.6 TA-I: HWHU Covered Open Storage Areas

A covered, open, bermed, concrete-lined area is located in the northeast corner of the HWHU. This area is not used for management of hazardous or mixed wastes.

An empty drum crusher is located within the covered area on the west side of Building 959. Only drums that meet the regulatory definition of empty will be crushed in the drum crusher. This area is not used for management of hazardous or mixed wastes.

A.2.7 TA-I: Unit Operations at the HWHU

The Permittees shall store at the HWHU only the hazardous and mixed wastes bearing U.S. EPA Hazardous Waste Numbers listed in Permit Attachment B (*Authorized Wastes*).

Containers shall be inspected for integrity when the wastes arrive at the HWHU, before they are placed in storage in either Building 959 or 958. Containers in poor condition shall not be placed in storage; the containers shall be over packed or the hazardous or mixed wastes in them shall be transferred to containers in good condition. The shelves in Building 959 shall be lined with absorbent pads under removable grating in areas where containers of liquids are stored. Containers shall be inspected regularly following the Inspection Plan contained in Permit Attachment E (*Inspection Plan*). Any liquids released from hazardous or mixed waste containers are to be contained in the absorbent pads under the removable grating on which the waste containers are placed and shall be cleaned up upon discovery.

Upon discovery of any accumulated liquids in a secondary containment system Unit personnel shall take action to evaluate and remove the liquids in accordance with Permit Section 3.6..

A.2.8 TA-I: Preventing Hazards in Unloading and Loading of Waste at the HWHU

Loading and unloading operations occur outdoors on the south side of Buildings 958 and 959 in the area immediately adjacent to a hazardous waste management area to minimize the distance that the waste must be moved. All loading and unloading areas shall be level, and the asphalt or concrete or other pavement shall be maintained in good condition. Loading and unloading areas shall be free of overhead and other obstructions to visibility and operations.

Containers too large to hand carry shall be transported within the HMWU with drum dollies, or pallet jacks, or other appropriate equipment. Containers shall be handled in a manner to prevent shifting or falling.

A.2.9 Preventing Run-Off or Run-On (Flooding) at the HWMU

The land around the HWHU is nearly level, sloping gently towards the south and west. The perimeter of the paved areas of the HWHU is higher than the surrounding land on all sides, preventing sheet-flow run-on of surface water from surrounding areas. The western edge of the paved area is steeply sloped at the edge, rising to a level at least 6 inches above the surface outside the Unit, further preventing run-on and run-off from the HWHU. Within the HWHU, the paved areas are sloped toward a 74,800-gallon catchment pond located at the northwest corner of the Unit. During normal operations, the catchment pond collects only storm water. The catchment pond is not intended to provide secondary containment for hazardous waste. Figure 8 in Permit Attachment L (*Figures*) shows the drainage control features at the HWHU.

A.2.9.1 TA-I: HWHU Catchment Pond Operating Procedures

A lined pond is located on the northwest side of the HWHU. The pond is capable of holding 10,000 cubic feet of liquid and is designed to receive storm water and snowmelt run-off from the HWHU. Run-off collected in the pond shall be evaluated before discharge. If the run-off is known or likely to be contaminated with hazardous waste constituents from a spill, leak, or other release, it will be sampled. The pond shall be inspected for evidence of contamination (e.g., surface sheen) during the weekly inspection. Inspection results and any remediation shall be recorded in the Operating Record. If there is no reason to suspect the storm water is contaminated with hazardous constituents based on the Unit Operating Record and the inspection, the storm water shall be managed in accordance with the current Unit storm water discharge permit.

If sampling and analysis are required due to known or suspected contamination, a water sample shall be collected within 5 days of when the Permittee becomes aware of the known or suspected contamination. The analytical results, together with information from the Operating Record, shall be used to characterize the water in accordance with Permit Attachment C (*Waste Analysis Plan*). If the run-off present in the pond is determined to be hazardous waste, the waste water shall be removed within 5 working days of the determination. The type and quantity of waste water present in the pond, the date of the incident, and the date of removal of the waste water shall be recorded in the Operating Record.

A.2.10 HWHU Container Management Practices

Requirements regarding the management of hazardous and mixed waste storage containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration are contained in Section 2.10 of Permit Part 2, and in Part 3 of this Permit.

In Building 958, if containers are stacked, they shall be in a stable configuration that does not exceed the load-bearing capacity of the reinforced concrete or the grating.

In Building 959, containers shall be stored in the holding cells. If containers are stacked, they will be in a stable configuration that does not exceed the load- bearing capacity of the reinforced concrete or the grating.

In Buildings 958B and 958C, if containers are stacked, they will be in a stable configuration that does not exceed the load-bearing capacity of the floor.

In all buildings, containers holding hazardous or mixed waste liquids without absorbent shall not be stacked without separation or some other means to allow Unit personnel to clearly identify the source of liquid, if liquid is discovered in the secondary containment area.

A.3 TA-III: THE THERMAL TREATMENT UNIT

The Thermal Treatment Unit (TTU) is located in a fenced area on a concrete pad outside the south end of Building 6715 in Technical Area (TA)-III, and occupies 196 square feet. The location of the TTU at the Facility is indicated in Figure 9 of Permit Attachment L (*Figures*). Figure 2 of Permit Attachment L (Figures) illustrates its location in Technical Area III. Figure 10 of Permit Attachment L (*Figures*) shows the TTU waste management area. The TTU loading and unloading areas are shown on Figure 11 in Permit Attachment L (*Figures*). The area surrounding the TTU is occupied by test areas and controlled operations (industrial land use). Drainage control features (e.g., run-on/run-off, drainage barriers) are shown on Figure 12 of Permit Attachment L (*Figures*). Figure 13 in Permit Attachment L (*Figures*) shows access control features at the TTU. Appendix A.2 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management area at the TTU.

The TTU is used for treatment of reactive and ignitable hazardous waste exhibiting the hazardous characteristic of reactivity (D003) and ignitability (D001) that is generated during operations in Building 6715, and may also bear EPA Hazardous Waste Numbers D002, D011 and F003, depending on the presence of nitric acid, silver, and spent solvents. Explosive silver acetylide/silver nitrate (SASN) slurry is formulated from raw ingredients as needed for tests. SASN is present in the solid and liquid wastes treated at the TTU. Pentaerythritol tetranitrate (PETN) (an explosive) is sometimes included in the tests and would also be present in the wastes. SASN is categorized as a primary explosive, and each discrete crystal (when dry) has the potential to detonate. SASN can be initiated by the energy of bright light (by raising the surface temperature to the auto-ignition temperature of 457 degrees Fahrenheit) or small contact shock. (Wilden, 1986).

A.3.1 TA-III: TTU Hazardous Waste Management Area

The TTU consists of a square burn pan constructed of 0.375-inch steel, 2 feet 6 inches on a side and 6 inches deep with ancillary equipment (see Figure 14 in Permit Attachment L (*Figures*)). The burn pan is located near the center of a square curbed slab of concrete 14 ft on a side lined with 0.5-in. steel, with a 4-in. high, steel-lined concrete curb around the edge. The bottom of the burn pan is elevated approximately 10 inches to 12 inches above the floor by steel beams. The burn pan is enclosed within a square cage approximately 4 ft on a side, consisting of expanded metal screen approximately 8-ft high with a nearly solid metal roof having slots for tracks and cables. An expanded metal screen door, remotely activated from inside Building 6715, provides access to the burn pan. Moveable steel panels are attached to the lower part of two sides of the cage to control airflow as needed.

An enclosure on the east side of the cage houses three propane burners, which are remotely activated from inside Building 6715. The burners shall be positioned to heat the burn pan and ignite the wastes in the burn pan and flammable vapors above the pan. An 8-foot earthen berm and a fence surround the burn cage of the TTU.

A.3.2 TA-III: Unit Operations at the TTU

The treatment of waste at the TTU is designed to deactivate reactive and ignitable components of the waste. The wastes treated at the TTU are generated as a result of the formulation of silver acetylide/silver nitrate (SASN) slurry, its application to test articles, and cleanup activities during and after the tests. The waste may also contain the explosive pentaerythritol tetranitrate (PETN); however, PETN is rarely used in the process. The TTU was specifically built to treat SASN slurry and SASN-contaminated waste because of the hazards associated with managing this waste.

Treatment residues may contain other constituents such as ash (carbon) produced from burned solid items (e.g., paper, filters), and treatment events may release gases (i.e., nitrogen, water vapor, carbon dioxide, carbon monoxide, diatomic oxygen, and traces of nitrous oxides) produced by the decomposition of SASN, PETN, acetone, and acetonitrile. Elemental silver is present in the treatment residues when SASN is treated at the TTU.

Liquid wastes to be treated may be transferred from Building 6715 to the TTU through flexible transfer hoses utilizing a remotely operated peristaltic pump. The hoses are contained inside a metal channel to provide secondary containment. The flexible hoses and channel terminate approximately 5 feet from the burn pan and metal tubing will be used to transfer the waste the final distance into the burn pan.

Liquids or solids to be treated may also be containerized and manually loaded into the burn pan. Solid items are saturated (wetted with or submerged) in water as needed to protect personnel from explosive hazards before transfer to the burn pan.

Liquids that might accumulate at the TTU will be contained within a secondary containment system (i.e., the entire steel-lined concrete pad that drains through a filter into a catch tank) as described in Section A.3.4.

A circular tank located north of the Unit and south of Building 6715 is primarily utilized as a process tank for collecting cleaning water from test operations. Water from this tank is sampled and analyzed. If this wastewater contains unreacted SASN explosive, then the contents of the tank will be treated at the TTU; otherwise, the wastewater collected in this tank is not treated at the TTU. This process tank is a part of building 6715 test operations but not part of the treatment unit.

Because the TTU is located outside, it is difficult to prevent equipment deterioration; however, the Unit and its ancillary equipment are inspected regularly according to the inspection schedule in Permit Attachment E (*Inspection Plan*) to ensure proper operation and waste management at the TTU. If deterioration sufficient to affect the operation, safety, or effectiveness of the TTU is identified, the affected equipment will either be repaired or replaced before any treatment of hazardous waste takes place.

A.3.3 Preventing Hazards in Unloading and Loading at the TTU

Loading activities include the placement of wastes into the burn pan, and may include loading containers of treatment residue and drums of water from the catch tank onto flatbed trucks or other suitable vehicles, as applicable. Vehicles that will transport wastes shall be loaded on the paved area south or southeast of Building 6715 as shown in Figure 11 of Permit Attachment L (*Figures*). This surface shall be maintained to be level and in good condition. There shall also be sufficient room for vehicles to safely maneuver in the loading area.

Liquid wastes may be pumped to the burn pan through the Waste Transfer Tubing. Solid and liquid waste that cannot be pumped to the TTU burn pan shall first be wetted with or submerged in water, then placed manually into the burn pan for treatment.

Unloading activities include removal of treatment residue from the burn pan. Treatment residues shall be managed in accordance with Section 5.5.4 of this Permit Part. Water from the catch tank may be pumped into 55-gallon drums or other suitable containers, characterized according to Permit Attachment C, and managed appropriately. If the water is contaminated with unreacted explosive, the water shall be treated at the TTU.

A.3.4 Operation of Containment Systems at the TTU

Liquids that might accumulate at the TTU will be contained within a secondary containment system (i.e., the entire steel-lined concrete pad that drains through a filter into a catch tank). The system is sufficiently impervious to contain spills or accumulated precipitation until the liquid is removed. The secondary containment system provided by the steel-lined concrete pad is designed to contain at least 21 gallons of waste, representing the maximum volume of hazardous waste in the TTU burn pan at any one time. The catch tank has a containment capacity of at least 157 gallons.

Because the TTU is located outside, the steel-lined concrete pad periodically collects water from precipitation events, and the water drains through a filter into a catch tank. The Permittees shall manage the water in the tank to prevent overflow and ensure that sufficient capacity is available to accommodate precipitation.

The pad shall be inspected and cleaned as needed, and maintained in accordance with Permit Attachment E. The water shall be managed as specified in Permit Section 5.6.1. The filter shall be characterized in accordance with Permit Attachment C (*Waste Analysis Plan*) and shall be managed accordingly. If the filter is known or suspected to contain unreacted explosive, it shall be treated in the TTU.

A.4 TA-III: RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

The Radioactive and Mixed Waste Management Unit (RMWMU) consists of several buildings within a fenced area located at the southeastern corner of Technical Area III (TA-III), west of the Chemical Waste Landfill, and occupies 135,472 square feet. The RMWMU is used for storage, treatment, and packaging of hazardous and mixed wastes generated as a result of Facility operations and corrective action activities. Hazardous and mixed wastes and treatment residues are transported to off-site permitted facilities for treatment, storage and disposal.

The location of the RMWMU at the Facility is indicated in Figure 15 of Permit Attachment L (*Figures*). Figure 2 of Permit Attachment L (*Figures*) illustrates its location in Technical Area III. Figure 16 of Permit Attachment L (Figures) illustrates the six hazardous and mixed waste management areas at the RMWMU. Appendix A.3 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the RMWMU.

Waste containers that may be managed at the RMWMU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. a large piece of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.4.1 RMWMU Designated Waste Management Areas

The RMWMU has six designated hazardous and mixed waste management areas. These include Buildings 6920, 6921, 6925, and 6926; two modular storage buildings; and the outdoor waste storage area (i.e., paved areas within the RMWMU fence to the north, east, and west of Building 6920).

In each waste management area (except where noted), containers holding liquid hazardous or mixed wastes shall be stored on portable spill pallets or pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The containers of liquids (up to and including 85-gallon overpack containers) will be stored on grating. Any liquids released from the containers drain through the grating into the tub. The pallets come in various sizes and capacities designed for use with 55-gallon drums or other standard containers, as required by 40 CFR § 264.175(b)(1-3).

Each pallet will have sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight shall not exceed the load-bearing capacity of the grating or the pallet.

Hazardous and mixed wastes will be stored inside one of the buildings, inside transportainers in the outdoor storage area, or outside in the outdoor storage area. Transportainers are 10- to 40-cubic-yard transportable containers, which typically have doors at one end and can be lifted onto a large flatbed truck for transportation. Wastes in the containers will be protected from precipitation by the buildings, transportainers, or other appropriate means, and by the slope of the pavement and concrete pads outside the buildings that direct storm water toward the retention pond, in accordance with 40 CFR §264.175.

The following sections provide descriptions of each structure and the waste management areas. Storage capacities are listed in Attachment J, Table J-1.1.

A.4.1.1 TA-III: Building 6920 at the RMWMU

The principal structure at the RMWMU is Building 6920. The floor plan for Building 6920 is presented on Figure 17 in Permit Attachment L (*Figures*). The waste management areas in Building 6920 include waste staging, repackaging, and storage areas, and treatment areas. Building 6920 is a single-story concrete and steel structure housing approximately 5,800 square feet of waste management area. The floors are 6-inch reinforced, sealed concrete on compacted sub-grade sloped to sumps with no outlets. Walls are 8-inch load-bearing concrete masonry unit with pre-finished metal building panels in some areas. Non-grouted cells of the 8-inch concrete masonry unit exterior walls are filled with vermiculite insulation. The staging area at the east end of the building has 14-foot (ft) high reinforced concrete walls. Inner partitions are 8-inch reinforced concrete masonry unit.

A.4.1.1.i North Bay of Building 6920

In the RMWMU waste treatment, storage, and repackaging are performed in the north bay of Building 6920 (see Figure 17 in Permit Attachment L (*Figures*)). Treatment in the North Bay will be limited to physical treatment and macroencapsulation.

The floor in the North Bay slopes from the doorways toward one or more shallow (6-in.-deep) blind sumps, some of which are covered with grating. Containers of liquid hazardous and mixed wastes will be stored on portable spill pallets or pans. Floors, (including the sumps), and the walls in the waste management areas of Building 6920 are painted. The floors shall be maintained as needed to be free from cracks and gaps.

The RMWMU North Bay includes two enclosed areas that are equipped with a negative-pressure exhaust system. The exhaust passes through a high-efficiency particulate air (HEPA) filter train before being released to the environment through an exhaust stack. The filters remove particulates entrained in the airflow.

A.4.1.1.ii South Bay of Building 6920

In the RMWMU, waste treatment, storage, and repackaging are performed in the South Bay of Building 6920 (see Figure 17 in Permit Attachment L (*Figures*)). Wastes are stored in the main bay and in the airlocks at either end. Treatment in the South Bay will be limited to chemical and thermal deactivation, stabilization/solidification, amalgamation, macroencapsulation, and physical treatment.

The floor in the south bay slopes from the doorways toward shallow (6-inches-deep) blind sumps covered with grating along the south wall which provides secondary containment. Containers of liquid hazardous or mixed wastes are stored over the sump in the south bay or on portable spill pallets or pans. Floors (including the sumps), and the walls in the waste management areas of Building 6920 are painted. The floors and sump shall be maintained as needed to be free from cracks and gaps.

In the RMWMU, there are four small rooms in the South Bay. A commercially available fume hood with a negative-pressure ventilation system is located in one of these rooms. A second local ventilation system is located in another of the rooms. The exhaust from both of these systems is combined and passes through a HEPA filter train before being released to the

environment through the exhaust stack. The filters remove particulates entrained in the airflow of each system.

A.4.1.2 TA-III: Building 6921 at the RMWMU

Building 6921, the Waste Assay Unit, is located east of Building 6920 (see Figure 16 of Permit Attachment L (*Figures*)). The Permittees treat, repackage, and store hazardous and mixed wastes in the waste management areas. The Building 6921 floor plan is presented on Figure 18 of Permit Attachment L (*Figures*). Building 6921 is a single-story structure constructed with interior walls of 8-inch concrete masonry unit and metal studs. The roof is comprised of steel bar joists with metal decking, rigid insulation, and single-ply membrane roofing. The floors are 6 inches thick concrete slab-on-grade. The floors throughout the waste management areas shall be maintained as needed to be free from cracks and gaps. The total area of the waste management areas is approximately 1,450 ft^2.

Building 6921 waste treatment area, (see Figure 18 in Permit Attachment L (*Figures*)) is equipped with a commercially available fume hood with a negative-pressure ventilation system. The ventilation airflow from the hood passes through a HEPA filter train before being released to the environment through an exhaust stack. The filters remove particulates entrained in the airflow.

Treatment in Building 6921 is limited to chemical and thermal deactivation, stabilization/solidification, amalgamation, macroencapsulation, and physical treatment.

A.4.1.3 TA-III: Buildings 6925 and 6926 at the RMWMU

Buildings 6925 and 6926 are used for storage, repackaging, and some treatment of hazardous and mixed waste at the RMWMU. Treatment shall be limited to macroencapsulation in Building 6925.

The floor plans for RMWMU Buildings 6925 and 6926 are presented on Figure 19 of Permit Attachment L (*Figures*). Building 6925 has a total storage area of approximately 4,000 ft^2. Building 6926 also has a total storage area of approximately 4,000 ft^2.Each is a prefabricated steel building erected on a reinforced concrete slab floor and foundation. The concrete floors in both buildings will be maintained as needed to be free from cracks and gaps. Steel rollup doors are located on the south wall of each building, on the east wall of Building 6925 and on the west wall of Building 6926. Personnel doors are located on the east, south, and west sides of each building.

A.4.1.4 TA-III: RMWMU Modular Storage Buildings (TP150 and TP153)

There are two modular storage buildings located west of Building 6920 used for storage of reactive and ignitable hazardous and mixed wastes (see Figure 16 of Permit Attachment L (*Figures*)).

The exterior dimensions of each modular storage building are 23-ft long, 9-ft wide, and 8.6-ft high. The structures are constructed of welded 10- and 12-gauge steel supported by structural

steel. Each building has double doors with inside handle. The inside walls and ceiling of each building are painted..

Each modular storage building has a 5.5-inch deep integral spill containment reservoir constructed of welded 10-gauge steel under the entire building; the capacity is 650 gallons. The inside surfaces (bottom and sides) of each reservoir are painted to provide additional protection against degradation of the secondary containment. The sumps shall be maintained as needed to be free from cracks and gaps. Containers shall be stored on painted steel grating or equivalent over the sumps. The grating shall be maintained as needed to support the containers and elevate them above any accumulated liquid. Each building shall rest on structural supports that elevate it and allow visual checks of the underside of the spill containment reservoir if there is evidence of deterioration on the interior surfaces noted during inspections performed according to the Inspection Plan in Permit Attachment E.

A.4.1.5 TA-III: Outdoor Waste Storage Area of the RMWMU

The outdoor waste storage area consists of the asphalt-paved areas to the north, east, and west of Building 6920 and within the RMWMU fence (see Figure 16 of Permit Attachment L (*Figures*)). The outdoor waste storage area may be used for storage of containerized hazardous and mixed wastes. It has an area of approximately 48,500 ft^2. The area is curbed, and paved.

Containers of hazardous and mixed wastes may be stored inside enclosed steel transportainers. Containers that are stored outside shall meet the requirements of this Permit Attachment and Permit Parts 2 and 3.

A.4.2 TA-III: RMWMU Container Management Practices

Requirements for management of hazardous and mixed waste containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration at the RMWMU are described in Permit Section 2.10 and Permit Part 3.

Containers shall be stacked in a stable configuration that does not exceed the load-bearing capacity of the floor or secondary containment system. Containers holding hazardous or mixed waste liquids without absorbent shall not be stacked without separation or some other means to allow Unit personnel to clearly identify the source of liquid, if liquid is discovered in the secondary containment area.

A.4.3 TA-III: Preventing Hazards in Loading/Unloading at the RMWMU

Loading and unloading activities take place on paved areas, typically immediately outside the buildings. The ramp on the west side of Building 6926 slopes gently up to the dock, allowing forklift operators to drive onto trailers of trucks parked at the dock. The dock and ramp will be maintained in good condition and is covered to provide protection from weather. Unit personnel typically use the loading dock for loading and unloading waste from trucks.

All containers shall be handled in a manner to prevent shifting or falling. Containers too large to hand carry shall be transported using forklifts, drum dollies, pallet jacks, or other appropriate equipment.

A.4.4 TA-III: Preventing Run-On and Run-Off (or Flooding) at the RMWMU

The area around the RMWMU slopes gently toward the west. Sheet-flow run-on of surface water from surrounding areas outside the Unit will be prevented from entering the waste management areas. The elevated gravel road located outside the east fence of the Unit diverts water flowing from areas farther to the east. An 8-in. curb at the east edge of the pavement and an asphalt-lined drainage swale along the eastern edge of the Unit (inside the fence) divert run-on from the gravel road toward the south away from the Unit. On the south and west sides, the Unit is higher than the surrounding land. On the north side, the Unit and a narrow ledge of land outside the fence are higher than the surrounding land. Thus, run-on from all directions is prevented from entering the Unit.

The paved areas within the Unit are surrounded by an 8-inch curb, further preventing run-on and run-off. The outside storage area slopes toward the south and west. The concrete pads outside the doors and the pavement surrounding Buildings 6920, 6921, 6925, and 6926 all slope away from the doors and toward shallow drainage channels that run between buildings 6920, 6925, and 6926. The channels lead to the synthetic-material-lined water retention pond at the southwest corner of the Unit, and will divert storm water from roof downspouts and the paved areas in the RMWMU into the water retention pond. Normally, the water retention pond collects only storm water. It is not intended to provide secondary containment for waste.

A.4.5 TA-III: Treatment Operations at the RMWMU

Waste treatment is performed at the RMWMU for one or more of the following reasons:

1. To meet land disposal restrictions (LDRs);
2. To allow for the safe storage of the waste; and/or
3. To meet treatment, storage, or disposal facility (TSDF) requirements

Waste treatment practices currently involve various technologies at the RMWMU, and include the following methods.

1. Chemical deactivation: The Permittees may chemically deactivate wastes exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity in either Building 6920 or Building 6921.
2. Thermal deactivation: The Permittees may thermally deactivate wastes exhibiting the hazardous waste characteristics of ignitability or reactivity in either Building 6920 or Building 6921.
3. Stabilization: The Permittees may stabilize and solidify wastes in either Building 6920 or Building 6921.
4. Amalgamation: The Permittees may amalgamate elemental mixed mercury wastes in either Building 6920 or Building 6921.

5. Macro-encapsulation (performed in Buildings 6920, 6921, or 6925): The Permittees may macroencapsulate hazardous or mixed waste debris or other wastes subject to a variance from the treatment standards granted by the Department pursuant to 40 CFR 268.44.
6. Physical treatment: The Permittees may conduct physical treatment of hazardous or mixed wastes in either Building 6920 or Building 6921.

Treatment quantities are listed in Attachment J, Table J-1.2. All of the treatment at the RMWMU is batch treatment. Treatment will be conducted in containers unless the physical properties of the waste and the nature of the treatment process require treatment without containers (e.g., deactivation of thermal batteries and some physical treatment). Liquid wastes shall be treated in batches of 60 gallons or less.

Waste treatment may generate secondary waste streams (treatment residues). Treatment residues may undergo additional on-site treatment only by the methods described in this Section (A.4.5) to meet LDRs or may be sent to an appropriate off-site facility for additional treatment prior to disposal. The waste treatment processes described in this section are intended to address hazardous characteristics in hazardous and mixed wastes, including:

1. Wastes that are solid and exhibit the hazardous characteristics of ignitability or reactivity that may be chemically deactivated to eliminate the characteristic.
2. Debris, and wastes containing hazardous waste toxicity characteristic metals (excluding elemental and high mercury subcategories), that may be macroencapsulated to reduce or eliminate the leaching potential of the waste or hazardous constituent(s).
3. Wastes that are solid and with hazardous constituents that may be physically separated from larger items and the size of individual pieces reduced.
4. Pressurized containers that may be punctured or opened to release their contents.
5. Liquid waste exhibiting the characteristics of ignitability, corrosivity, and/or reactivity that may be chemically or thermally deactivated to remove the hazardous characteristic(s).
6. Liquid waste and particulates containing toxicity characteristic metals (excluding elemental mercury and high mercury subcategories) that may be stabilized and/or solidified to reduce or eliminate the leaching potential.
7. Reactive wastes (including explosive wastes) that may be treated using thermal deactivation techniques.
8. Elemental mercury that may undergo amalgamation to reduce or eliminate the leaching potential.

Each of the waste treatment technologies or processes listed above is described in the following sections.

A.4.5.1 Chemical Deactivation

Chemical Deactivation will be performed in containers in the treatment areas only in Buildings 6920 and 6921. Whenever possible, treatment will take place within the fume hoods that are present in each building, as appropriate to protect human health and the environment. Containers vary in size depending on the quantity of waste to be treated, and include laboratory glassware, 5-gallon buckets, and 55-gallon drums.

Chemical deactivation refers to a number of chemical processes that can eliminate the hazardous waste characteristics of ignitability, corrosivity, and/or reactivity. Chemical deactivation can be accomplished by several technologies, such as neutralization or chemical oxidation. The intent of this section is to identify and describe specific methods or treatment trains which may be used at the RMWMU to deactivate ignitable, corrosive, and reactive hazardous and mixed waste. Deactivation may or may not result in the final waste form, depending on the process, and may be used as the first method in a series of treatment steps.

Deactivation processes will be conducted under carefully controlled conditions so that hazardous and mixed waste with the characteristic of reactivity is allowed to react in a slow, nonviolent manner. Deactivation of reactive wastes shall be conducted in small batches such that process control can be easily maintained. Hydrides, deuterides, and tritides are deactivated by slow addition to an ice water bath. Deactivation of water-reactive metals such as elemental sodium and lithium involves the slow and controlled addition of an appropriate alcohol/water solution. Alcohol/water will be added until the water reactive potential of the waste has been eliminated. Deactivation of pyrophoric metal powders and particulates may be achieved by mixing waste in a Portland cement matrix.

Water-soluble oxidizers in particulate form will be slowly dissolved in water to deactivate them as the first step in the treatment process. The resulting solution may undergo further treatment (e.g., neutralization and stabilization). Water-soluble concentrated liquid oxidizers such as hydrogen peroxide will be diluted with water in a controlled manner to make them safer to handle before deactivation with an appropriate chemical agent such as iron filings.

The reactive material in thermal batteries may be deactivated through introduction of an electrical current that induces a chemical reaction in the material, deactivating it and generating heat. Batteries are treated one at a time in this manner; this process is not conducted in containers due to the need to dissipate the heat generated during the chemical reaction.

Chemical deactivation to remove the characteristic of corrosivity is the process of removing excess acidity or alkalinity from an aqueous liquid waste. Other uses may include pH (Potential Hydrogen - a measure of the acidity or basicity of an aqueous solution) adjustment to facilitate subsequent treatment; such pre-treatment through deactivation may be necessary to prevent corrosive damage to equipment, deter undesirable reactions, and preclude the formation of unwanted byproducts.

Reagents added to achieve a desired pH are combined with liquid waste in a mixing vessel or directly in the waste container. Common deactivating reagents include, but are not limited to, sodium hydroxide, for acid wastes; and phosphoric acid for alkaline wastes. The selection of reagents is dependent on the quantity of reagent required, cost, availability, and the potential byproduct(s). These deactivation processes are conducted under carefully controlled conditions in which the reagent is added to the waste slowly and mixed thoroughly. This allows the reaction to proceed in a nonviolent manner and allows the energy to be dissipated effectively. Ice may be used if needed to cool the mixture during the reaction. In the case of reactions that are expected to be strongly exothermic, wastes will be treated in small batches in containers (similar to the deactivation of reactive wastes) such that process control can be easier to maintain.

A.4.5.2 Thermal Deactivation

The Permittees shall perform thermal deactivation of reactive wastes, including batteries, explosives and explosive components in a Sandia National Laboratories-designed and tested portable deactivation device that meets the regulatory definition of a container. The device is a thick-walled stainless steel vacuum apparatus equipped with an internal heated covered tray and sensors to measure temperature and pressure. The device was designed to contain a detonation of 25 grams TNT-equivalents of reactive hazardous or mixed waste. The inside diameter of the cylinder is 8 inches, and it is 18 inches long. The thermal deactivation device is portable and may be used in any of the treatment areas in Building 6920 or 6921. It is shown in Figure 20 in Permit Attachment L (*Figures*).

Reactive waste is placed on the covered tray, inserted into the cold unit, the unit is sealed and filled with an inert atmosphere (e.g., nitrogen), and the temperature of the tray is slowly raised until reaching a temperature at which the reactive waste being treated decomposes. The Permittees will use waste characterization data and/or published chemical information (e.g., "DOE Explosives Safety Manual" [DOE, 2002] or other chemical or engineering handbook) as appropriate to determine the required temperature to decompose the reactive waste. The temperature will be maintained for two hours or longer as appropriate, to complete the decomposition of the waste. The unit will be cooled and decomposition gases will be vented to a fume hood with a high-efficiency particulate air filtration system.

A.4.5.3 Stabilization and Solidification

The Permittees will perform stabilization in containers in the treatment areas only in Buildings 6920 and 6921 at the RMWMU. Whenever possible, treatment will take place within the fume hoods that are present in each building to protect human health and the environment. Stabilization is the process of binding hazardous metals so that the metals become chemically part of the matrix or are physically bound within the matrix. The primary use of stabilization is to immobilize toxicity characteristic metals but many stabilization agents also eliminate free liquids. Typical waste forms often suitable for stabilization and/or solidification include liquids, sludge, soils, and particulate-type wastes.

Process equipment for mixing waste and binder materials depends on the type of reagents used and the volume of waste to be treated. In-drum mixing is typically used for large volume waste quantities. Once waste and binder have been thoroughly mixed in a container, the mass is allowed to cure and/or set. Smaller batches may be mixed by hand in smaller containers (e.g., 5-gallon pails, and tubs and trays of various sizes) and allowed to cure.

Development of appropriate formulas is waste specific. Stabilization agents for toxic metals may include Portland cement, pozzolans, thermoplastics, organic polymers, and clays. Other waste forms may require proprietary reagents that are available for specific applications. Additional reagents may be added to reduce constituent leachability, reduce cure or set time, and increase strength.

Waste characteristics that are important to the success of the stabilization and/or solidification process for liquids may include volume percent of water, oil, solvents, or other organics, pH and

hazardous constituents. Waste characterization data shall be used to determine whether waste is amenable to stabilization, any necessary pretreatment requirements, and the appropriate binding agent.

Once the stabilization or solidification method is selected, the binding agent is identified based on chemical compatibility with the waste form and hazardous constituents present. Pretreatment may be required to assure compatibility between the waste, the binding agent, and the containers (e.g., neutralization of liquid wastes to an acceptable pH range of 5.0 to 11.0). Once the proper binding agents have been identified, bench-scale testing is performed to determine optimum amounts of each agent. In the case of low volume waste streams (e.g., less than approximately 0.26 gallons), bench-scale testing may not be practical and treatment is performed without bench-scale testing using the manufacturer's suggested quantities or by estimating binding agent quantities from previous experience. Stabilization is performed by combining predetermined quantities of binding agents with the waste and mixing the combination thoroughly, as appropriate. The resulting mixture is staged to allow an appropriate cure time.

A.4.5.4 Amalgamation

The Permittees shall perform amalgamation of small quantities (about 2 ounces) of elemental mercury in small (e.g., laboratory) containers in the treatment areas only in Buildings 6920 and 6921 at the RMWMU. The amalgamation process for liquid elemental mercury involves mixing mercury waste with a powdered base metal. The amalgamation process is intended to immobilize elemental mercury into a solid leach-resistant form that has minimal potential for emission of mercury vapor.

The two important operating parameters for effective treatment are: (1) the ratio of base metal to mercury, and (2) the efficiency of mixing. Copper or zinc is typically used as a base metal, but tin, nickel, gold, and sulfur may also be used. The base metal may be pretreated with acid to improve the effectiveness of the amalgamation reaction. For the small quantities of mercury that are treated at the RMWMU, hand mixing the mercury and base metal using a mortar and pestle or mechanical mixing shall be used to create an amalgam with uniform properties.

A.4.5.5 Macro-Encapsulation

The Permittees will perform macroencapsulation in containers only in Buildings 6920, 6921, and 6925 at the RMWMU. Macro-encapsulation is the process of completely encasing waste within a polymer coating or concrete, or within a jacket of inert inorganic materials. The primary use of macroencapsulation is to immobilize wastes such as debris-type solids containing hazardous constituents by completely surrounding the waste with a leach-resistant coating.

The Permittees will perform macroencapsulation using one of three processes:

1. Encasing the waste in concrete, within a larger container that serves as a mold.
2. Coating the waste with polymer agents within a mold. Polymers used for macroencapsulation include, but are not limited to, asphalt, polyethylene, thermosetting plastics, and resins that can be polymerized under ambient temperatures in the presence of a catalyst. Equipment used for macroencapsulation may include molds, polymer extrusion equipment, and resin mixing equipment. In-drum macroencapsulation may also

be performed with the drum acting as the mold. Temperature control of polymer macroencapsulation processes is critical and will be carefully maintained to assure that adequate coating occurs.

3. For example, the Permittees perform macroencapsulation with a chemically inert resin (typically polyethylene), using 30-gallon containers (metal baskets). Each basket containing the solid waste items is placed in a 50-gallon mold (similar in size and shape to a 55-gallon drum). The basket is designed to fit into the mold with one to two inches of clearance on all sides, the top, and the bottom. The mold containing the basket and waste items is then filled with melted resin that is heated using a commercially available extrusion unit. Each basket is used only once because it becomes encapsulated within the inert resin and is part of the final waste form. After the resin cools and solidifies, the mold is removed, the waste form is turned over and more polyethylene is added to form final caps on the ends. The completed waste form is a cylinder slightly smaller than a 55-gallon drum.
4. Placing the waste inside a commercially available container made of inert or non-corroding materials such as polyethylene or stainless steel. Alternatively, the container may consist of an outer shell with a liner of inert or non-corroding material such as polyethylene resin or stainless steel. After the wastes and inert void-filler materials are placed in the container, the resin is heated to seal the container and lid (e.g. using a resistance-heated wire system embedded in the container lid). Non-corroding materials such as stainless steel are also available as containers and liners; the stainless steel is welded closed to seal the container and encapsulate the wastes. The Permittees use containers of various sizes, depending on the volume and dimensions of waste items to be macroencapsulated.

A.4.5.6 Physical Treatment

The Permittees will perform physical treatment (volume reduction) of hazardous or mixed waste only in Buildings 6920 and 6921. Such treatment includes:

1. Reducing waste volume by using commercially available tools (e.g., hammers, screwdrivers, wrenches, pliers, saws, drills, cutters, etc.) to separate items with hazardous constituents from larger items or from each other, including removal of coating and filler materials.
2. Removing coating and filler materials (e.g. resins) by dissolution in containers (e.g., trays or pails) in order to facilitate separation of items with hazardous waste constituents from each other or from other items. Whenever possible, dissolution will take place within the fume hood(s) that are present in each building.
3. Reducing the size of waste items by using tools (e.g. mallets, cutters, etc.) to crush or cut items into smaller pieces.
4. Puncturing aerosol cans within a container to allow recovery of the contents. The liquid contents of the aerosol cans are collected in the container, and any gaseous propellants are filtered through a carbon filter attached to the container.
5. Releasing pressurized contents of containers other than aerosol cans (e.g., gas cylinders). Organic gaseous contents are filtered through a carbon or other appropriate filter. All contents will be vented to a chemical fume hood with a high-efficiency particulate air filtration system.

A.4.6 Treatment Effectiveness

Treatment effectiveness will be verified through evaluation of the treated waste in accordance with Permit Attachment C (*Waste Analysis Plan*).

The Permittees will evaluate treatment effectiveness by appropriate methods for each batch of waste treated. In many cases (e.g. stabilization), the Permittees treat small samples of a batch of waste using a single agent in various proportions or using various agents to determine which is most effective. That process is then used in treating the rest of the waste, and the data demonstrating that the treatment is effective for the samples may be used to demonstrate effectiveness for the rest of the waste, when appropriate.

A.4.6.1 Chemical Deactivation

The Permittees will also verify treatment effectiveness using one or more of the following methods, as appropriate:

1. Visual check for completeness of chemical reaction for solid items of waste that were treated to remove the characteristic of reactivity (e.g., color change or structural change).
2. Visual check or ignitability test for liquid wastes that were treated to remove the characteristic of ignitability.
3. Document check to determine whether treated waste is an oxidizer as defined in 40 CFR Part 173.
4. Visual check for liquid wastes that were treated to remove the characteristic of reactivity.
5. Fingerprint chemical check for the presence of sulfides and cyanides if their presence caused the waste to be reactive.
6. Fingerprint check for pH of liquid wastes that were treated to remove the characteristic of corrosivity.
7. Knowledge of process to determine whether chemical reaction(s) were completed. Such knowledge of process shall be based on stoichiometry or the measurement of other properties (e.g., temperature or time). The Permittees shall attempt to use the applicable methods listed above before using knowledge of process as the sole means of verifying treatment effectiveness.

A.4.6.2 Thermal Deactivation

The Permittees will also verify treatment effectiveness through proper operation of the unit (maintaining specified decomposition temperature for specified length of time). In some cases, personnel may visually check for evidence of chemical reaction (e.g., color change or structural change) in a waste solid.

A.4.6.3 Stabilization and Solidification

The Permittees will also verify treatment effectiveness using one or more of the following methods, as appropriate:

1. Visual check for the presence of free liquids.
2. Paint filter test to determine whether free liquids are present if the treated waste is amorphous and may contain some liquids.

3. Laboratory analysis of samples of the treated waste using the TCLP for hazardous waste toxicity characteristic metals. If the stabilization is intended to meet the treatment standards in 40 CFR § 268.40, the analysis will include underlying hazardous constituents as described in Permit Attachment C (*Waste Analysis Plan*).

A.4.6.4 Amalgamation

Treatment is effective by using the specified method as discussed in Permit Attachment A, Section A.4.5.4.

A.4.6.5 Macro-encapsulation

The Permittees will verify treatment effectiveness by visually checking each macroencapsulated item to verify that it is completely encased in the inert resin or concrete. For containers with inert liners, the Permittees shall check the seal of the liner and/or container.

A.4.6.6 Physical Treatment

The Permittees will also verify treatment effectiveness by one or more of the following methods, as appropriate:

1. Visual inspection that items with hazardous waste constituents have been completely separated from other items.
2. Visual inspection that pieces are the desired size.
3. Visual inspection that punctured aerosol cans are empty and the contents are containerized.
4. Leaving a container for a time to allow it to continue venting after visual and/or audible evidence indicates it is empty. The length of time would be determined by the size of the container, the contents, and the strength of the evidence.

A.5 TA-V: THE AUXILIARY HOT CELL UNIT

The auxiliary hot cell unit (AHCU) within the Facility is shown in Figure 21-A of Permit Attachment L (*Figures*). The location of the AHCU at TA-V is shown on Figure 21-B in Permit Attachment L (*Figures*). Appendix A.4 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the AHCU.

A.5.1 TA-V: Designated Waste Management Areas at the AHCU

The AHCU is located within the high bay of Building 6597 and comprises four designated waste management areas, which are shown on Figure 22 of Permit Attachment L (*Figures*). These waste management areas include:

1. The Auxiliary Hot Cell;
2. The work area near the hot cell, which includes the fume hood;
3. The storage silos; and
4. The container storage area.

Storage capacities are listed in Attachment J, Table J-1.1. Treatment quantities are listed in Table J-1.2.

A.5.1.1 TA-V: AHCU Hot Cell

The Auxiliary Hot Cell is located in the high bay area of Building 6597. Waste management activities are repackaging hazardous and mixed wastes for shipment to off-site Treatment, Storage, or Disposal Facilities (TSDFs), and treatment of hazardous and mixed wastes by reducing waste volumes using tools to separate items with hazardous waste constituents from larger items. The outside dimensions of the hot cell are 16 feet (ft) 8 inches square and 16 ft 2 inches high. Inside space dimensions are 100 square feet with a height of 13-ft 10 inches. The inside surfaces are lined with stainless steel. An 18-inch thick concrete foundation mat supports the hot cell. The hot cell walls are constructed of inner and outer pre-cast concrete panels that are held apart by threaded rods. The space between the panels is filled with sand. The roof sections are also constructed of reinforced concrete panels with sand between them. Each individual roof panel is designed to structurally support one 5,000-pound point load. Each roof section supports a roof port and roof plug. The hot cell is equipped with manipulator arms that allow personnel to handle items remotely.

A.5.1.2 TA-V: AHCU Work Area and Fume Hood

The work area is located in the corner of the high bay, north and east of the hot cell and the permanent shield wall. Activities include treatment and storage. Treatment methods will be limited to deactivation, stabilization/solidification, macroencapsulation, and physical treatment. Personnel also repackage wastes for shipment to off-site TSDFs. From time to time, a temporary tent-like room may be erected in the work area north of the hot cell and east of the permanent shield wall to accommodate containerized mixed wastes or large mixed waste items. If the mixed waste item or container must be handled remotely, the temporary room will be built directly against the permanent shield wall to allow the use of the manipulators at the shield wall. Each time the temporary room is erected, package-specific considerations will determine details of the design; however, basic construction will consist of polyvinyl chloride or metal framing, clear or translucent plastic roof and walls, and plastic doors. The temporary room will operate at a slight negative pressure.

A 6-ft-wide walk-in fume hood is located in the work area northeast of the Auxiliary Hot Cell. It can accommodate two 55-gallon drums placed side by side. Unit personnel treat and repackage hazardous and mixed wastes in the fume hood. The fume hood is included in the maximum storage capacity for the overall work area.

A.5.1.3 TA-V: AHCU Storage Silos

Four 10-inch inside-diameter, 15-ft deep floor silos and two 30-inch inside-diameter, 15-ft deep floor silos are located in the work area north of the hot cell and east of the permanent shield wall. These silos have removable locking-type shield plugs. The tops of the silos are raised slightly above the floor level to reduce the possibility of water entry into the silo.

Two additional storage silos are located within the hot cell. Each silo is 10-inch inside diameter. One silo is 15-ft deep and the other is 11-ft 8-inch deep.

Each silo is constructed of concrete, and each is lined with a removable welded stainless steel sleeve. The sleeves do not provide secondary containment for the small quantities of liquid (about 2 ounces) wastes that may be stored in the silos. Secondary containment is provided by outer storage containers. The silos are used only for storage of mixed wastes that exhibit high external radiation dose rates that are hazards to personnel.

A.5.1.4 TA-V: AHCU Container Storage

Containers of hazardous and mixed wastes may be stored in the high bay, south and west of the hot cell. The floor of the storage area is painted and shall be maintained as needed to be free from cracks and gaps.

Container storage practices applicable to the AHCU, which include container types and labeling, container handling, and the condition of containers, compatibility of waste with containers, the presence of liquids in containers, and the condition of containers are presented in Part 3 of this Permit.

Waste containers that may be managed at the AHCU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. large pieces of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

In the work area and storage areas, containers holding liquid hazardous or mixed wastes shall be stored on portable spill pallets or pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The containers of liquids (up to and including 85-gallon overpack containers) will be stored on grating. Any liquids released from the containers drain through the grating into the tub. The pallets come in various sizes and capacities designed for use with 55-gallon drums or other standard containers, as required by 40 CFR § 264.175(b)(1-3).

Each pallet will have sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight shall not exceed the load-bearing capacity of the grating or the pallet.

A.5.1.5 TA-V: AHCU Container Management Practices

Requirements for management of ignitable, reactive, or incompatible wastes at the AHCU are described in Permit Section 2.10. Requirements regarding the management of hazardous and mixed waste storage containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration are contained in Part 3 of this Permit.

A.5.2 TA-V: Preventing Hazards in Loading/Unloading at the AHCU

Loading and unloading activities are performed just inside the rollup door on the north side of Building 6597 and may also be performed just inside the rollup door on the south side of the high bay (see Figure 23 in Permit Attachment L (*Figures*)). The floor is level and maintained in good condition. There also is sufficient room for safely operating vehicles and equipment. All containers shall be handled in a manner to prevent shifting and falling. Containers too large to hand carry shall be transported using forklifts, drum dollies, pallet jacks, or other appropriate equipment.

A.5.3 TA-V: Preventing Run-on and Run-Off (or Flooding) at the AHCU

The land surrounding the AHCU slopes gently toward the west. Sheet-flow run-on of surface water from surrounding areas outside TA-V is prevented from entering TA-V by a diversion berm. The diversion berm lies east of TA-V and diverts storm water to the north and south.

The floor of the high bay in Building 6597 is slightly higher than the surrounding ground, and should direct storm water away from the building. The asphalt and concrete pavement around the AHCU slope toward a storm drain that directs storm water toward the west.

Drainage control features (e.g., run-on/run-off, drainage barriers) at the AHCU are shown on Figure 24 of Permit Attachment L (*Figures*).

A.5.4 TA-V: Treatment Operations at the AHCU

Treatment methods for hazardous and mixed wastes that will be treated in containers at the AHCU are:

1. Chemical deactivation of wastes exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity will be performed in the work area, including the fume hood and hot cell.
2. Stabilization and solidification of hazardous or mixed wastes will be performed in the work area, including the fume hood and hot cell.
3. Macro-encapsulation of hazardous or mixed waste debris or other wastes subject to a variance from the treatment standards granted by the Department according to 40 CFR 268.44 will be performed in the work area, including the fume hood, or the hot cell.
4. Physical treatment will be performed in the work area, including the fume hood, or the hot cell.

The waste treatment processes described in this section are intended to address hazardous waste characteristics in hazardous and mixed wastes, including the following:

1. Solid items of waste exhibiting the hazardous waste characteristics of ignitability or reactivity that may be chemically deactivated to eliminate the characteristic(s).
2. Debris, and wastes exhibiting toxicity characteristic metals (excluding elemental and high mercury subcategories), that may be macroencapsulated to reduce or eliminate the leaching potential of the hazardous waste constituent(s).
3. Liquid waste exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity that may be chemically deactivated to remove the characteristic(s).

4. Liquid wastes and particulates exhibiting toxicity characteristic metals (excluding elemental mercury and high mercury subcategories) that may be stabilized and/or solidified to reduce or eliminate the leaching potential of the hazardous waste constituents.
5. Solid items of waste with hazardous constituents that may be physically separated from larger items and the size of individual pieces may be reduced.

The following will be managed as hazardous or mixed wastes (in accordance with LDRs).

1. Treatment residue derived from the treatment of listed hazardous or mixed wastes.
2. Treated waste containing listed hazardous or mixed wastes.
3. Treated waste, which continues to exhibit hazardous waste characteristics, or does not meet treatment standards for underlying hazardous waste constituents.

The description of each waste treatment technology or process to be applied at the AHCU, are identical to those presented in Section A.4.5 of this Attachment (i.e., Chemical Deactivation, Stabilization/Solidification, Macroencapsulation, and Physical Treatment).

A.6 MANZANO BASE: MANZANO STORAGE BUNKERS

The Manzano Bunkers (MSBs), which are owned by Department of Defense and leased to the Department of Energy, are located at the Manzano Base on Kirtland Air Force Base, approximately one mile east of the exit road leading to the entrance of TA-III and TA-V and at the end of Pennsylvania Avenue. The location of the MSBs within the Facility is shown on Figures 2 and 25 in Permit Attachment L (*Figures*).

The Manzano Storage Bunkers (MSBs) comprise five Units, each with approximately 1600 to 2400 square feet of space, and are used for storage of hazardous and mixed wastes. These are Bunkers 37034, 37045, 37055, 37057, and 38118. Figure 26 of Permit Attachment L (*Figures*) shows the general layout of the MSBs and their location at the Manzano Base and depicts the locations of the waste management areas at the MSBs. Appendix A.5 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the MSBs.

A.6.1 Manzano Base: Designated Waste Management Areas at the MSB

The walls, roof, and floor of each bunker are constructed of concrete and are covered by earthen materials. The walls and roof of each bunker are rounded. There are three types of bunkers at the Manzano Base. These include Type B (37034); Type C (37118); and Type D bunkers (37045, 37055, and 37057). The following sections provide descriptions of the specific bunker storage structures, and their locations. Storage capacities are listed in Attachment J, Table J-1.1.

A.6.2 Manzano Base: MSB Type B Bunker (37034)

The Type B bunker consists of an access tunnel leading to a main chamber that is used for storage of hazardous and mixed wastes. Figure 27 of Permit Attachment L (*Figures*) illustrates the floor plan for the subject Type B bunker. The Type B bunker access tunnel is approximately 20 feet (ft) long, 12 ft wide and 12.5 ft high. The main chamber is approximately 81 ft long, 26.5 ft wide and 12.8 ft high. The bunker is covered by at least 2 ft of earthen fill over a 6-in. thick

concrete roof. The soil surface above and around the bunker is sloped for water to drain away from the bunker. Access to the waste management area of the bunker is through two sets of double doors that are 9 ft high and 9 ft wide. One set is at the entrance to the access tunnel, and the other set is at the entrance to the main chamber.

A.6.3 Manzano Base: MSB Type C Bunker (37118)

Bunker 37118 does not have an access tunnel and consists entirely of a main chamber used for storage of hazardous and mixed wastes. Figure 28 of Permit Attachment L (*Figures*) shows the floor plan of Type C Bunker 37118. The main chamber is approximately 83 ft long, 29 ft wide and 12.8 ft high. A 6-in. drain tile is located outside the bunker perimeter. Access to the main chamber is through a set of double doors 8 ft wide and 9.5 ft high. The bunker is covered by at least 2 ft of earthen fill over a 6-in. thick concrete roof. The soil surface over and around the bunker is sloped for water to drain away from the bunker.

A.6.4 Manzano Base: MSB Type D Bunkers (37045, 37055, and 37057)

The Type D bunkers being permitted consist of an access tunnel leading to a main chamber. Only the main chamber is used for storage of hazardous and mixed wastes. Figure 29 of Permit Attachment L (*Figures*) is a typical floor plan of a Type D bunker. The access tunnels vary in length from 76 feet to 110 feet and are 9 ft wide and 11 to 12 ft high. The main chamber in each Type D bunker is approximately 61 ft long, 26.5 ft wide and 12.5 ft high. Access to the waste management area of each bunker is through two sets of double doors that are 9 ft high and 9 ft wide. One set is at the entrance to the access tunnel, and the other set is at the entrance to the main chamber. Each bunker is covered by at least 2 ft of earthen fill over a 6-in. thick concrete roof. The soil surface over and around each bunker is sloped so that water drains away from each bunker.

A.6.5 Manzano Base: Unit Operations at the Manzano Storage Bunkers

The Manzano Storage Bunkers are used to store any of the hazardous and mixed wastes bearing EPA's Hazardous Waste Numbers listed in Permit Attachment B (*Authorized Wastes*).

The MSB are not occupied by any SNL personnel except when managing waste or performing inspections. All personnel will sign in on a log before entering each bunker and will sign out when they leave. Waste handling personnel work in pairs and maintain contact with each other. All personnel will be trained to check that during each visit to the MSB everyone has signed out and exited the bunker before turning off the lights and closing and locking the doors.

In each Manzano Storage Bunker, containers holding liquid hazardous or mixed wastes will be stored on portable spill pallets and pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The pallets come in various sizes and capacities. They are designed for use with 55-gallon drums or other standard containers, and meet the requirements of 40 CFR § 270.15(a-b) and 40 CFR § 264.175(b)(1-3). The pallets and pans are designed to be resistant and impervious to corrosives and other liquids. Containers of liquids (up to and including 85-gallon overpack containers) shall be stored on the grating. Any liquids released from the containers drain through the grating into a tub.

Each pallet has sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight will not exceed the load-bearing capacity of the grating or the pallet.

Waste containers that may be managed at the MSB include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. large pieces of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.6.6 Manzano Base: MSB Container Management Practices

Other requirements for management of containers, and methods employed for storage of hazardous and mixed waste at the MSB are described in detail under Permit Section 2.10 and in Permit Part 3.

A.6.7 Manzano Base: Preventing Hazards During Loading/Unloading at the MSB

Loading and unloading activities take place on the paved areas immediately outside each of the bunker Units. The surface is sloped gently away from the door, and the pavement is maintained in good condition at each bunker. There is sufficient room for safely operating vehicles. All containers shall be handled in a manner to prevent shifting and falling. Containers too large to hand carry shall be transported using a forklift, drum dolly, hand truck, or other appropriate equipment.

A.6.8 Manzano Base: Preventing Run-on and Run-Off (or Flooding) at the MSB

Sheet-flow run-on of surface water from surrounding areas and run-off from each of the MSB bunkers is prevented from entering or leaving the waste management areas by the design and construction of the bunkers. The MSB are constructed of concrete and covered by earthen materials. The slope of the earthen materials covering each of the bunkers prevents run-on of storm water. The concrete provides a barrier to moisture. In Type B and Type C bunkers, a 6-ft drain tile is located on the exterior perimeter, so that any water that percolates through the earthen fill is drained away from the bunkers. The drive at the front of each bunker is level or sloped gently away from the bunker doors. Drainage control features (e.g., run-on/run-off, drainage barriers) are shown on Figure 30 in Permit Attachment L (*Figures*).

A.7 THE CORRECTIVE ACTION MANAGEMENT UNIT

The CAMU is a 3.75-acre area located in the southeast corner of TA-III at SNL as shown in Figure 2 and Figure 31 of Permit Attachment L (*Figures*). The CAMU was used for treatment, storage, and containment of RCRA Subtitle C- and Toxic Substances Control Act (TSCA)-regulated wastes that were generated during remediation work at the Chemical Waste Landfill located adjacent to and at the southeast portion of the Unit. The Unit was closed with wastes remaining in place in the containment cell. All aboveground facilities, including the Bulk Waste

Staging Area, Containerized Waste Staging Area, Treatment Pad, and the Sprung™ Structures have been clean-closed. The CAMU containment cell contains approximately 31,800 cubic yards of hazardous and toxic wastes. The CAMU containment cell also contains soils having low levels of tritium (up to 20,000 picocuries per liter soil moisture). The containment cell is covered with a 5-foot-thick cover system consisting of a layer of 60-mil high-density polyethylene on top of the waste, which, in turn, is covered by bedding sand, pea gravel, filter sand, a native soil blend, and a topsoil layer.

The CAMU incorporates a less-than-90-day waste accumulation area (leachate storage area) north of the containment cell. This area is used to store leachate periodically pumped from the containment cell leachate collection and removal system (LCRS). The leachate is placed into 55-gallon drums. The leachate consists of wastewater containing low levels of hazardous constituents, polychlorinated biphenyls (PCBs), and tritium.

A.7.1 CAMU Access

Figure 32 of Permit Attachment L (*Figures*) presents the configuration of the CAMU and delineates the containment cell, which is subject to post-closure care. A contiguous four-strand, barbed-wire fence delineates this boundary. Locked gates located at the northern and southern perimeter boundaries provide access to the CAMU containment cell and leachate storage area. A complete description of the security procedures applied at the CAMU is in Section H.4 of Permit Attachment H (*Post-Closure Care Plan for the Corrective Action Management Unit*).

A.7.2 General Description of the CAMU

Prior to closure, the CAMU consisted of four waste staging areas: the bulk waste staging area; the Sprung™ structures, the containerized waste staging area, and the treated waste staging area. Operating areas also included a treatment pad with two temporary treatment systems, and a containment cell. Support areas at the CAMU included an equipment decontamination pad, storm-water retention ponds, and less-than-90-day storage areas for the containment-cell leachate collection tanks and the decontamination-pad wash water storage tanks. All hazardous waste and hazardous waste residues were removed from the waste staging areas, treatment pad, and support areas at the CAMU, and the pad and areas were closed under the New Mexico Hazardous Waste Management Regulations. The CAMU containment cell was closed with waste remaining in place. The containment cell and supporting infrastructure are subject to the post-closure requirements contained in Permit Part 7 of this Permit, and are subject to the regulations at 20.4.1.500 NMAC, incorporating 40 CFR §§ 264.117 through 264.120 and 264.552(e)(6).

A.7.3 CAMU Leachate Management

Whenever leachate is being pumped, poured, or otherwise handled, Unit personnel shall meet all applicable preparedness and prevention requirements in Permit Part 2. Unit personnel shall implement the Contingency Plan (Permit Attachment D) in response to emergencies.

The Permittees shall clean up spills promptly in accordance with Permit Section 2.12, and shall notify the Department in accordance with Permit Part 2. At least two verification samples shall be collected and analyzed to ensure complete cleanup has been achieved. Additional verification samples may be required by the Department depending on the magnitude of the spill. Quality

control samples shall also be collected in accordance with the applicable requirements in Permit Part 8.

A.7.4 CAMU Leachate Collection and Removal

The LCRS sump shall be inspected on a quarterly basis for the presence of leachate in accordance with Permit Attachment Section E.9.4. Leachate shall be pumped into 55-gallon drums or other suitable containers, characterized according to Permit Attachment C, and managed appropriately.

A.7.5 CAMU Less-Than-90-Day Accumulation Area

Hazardous waste managed at the CAMU includes leachate generated from the LCRS and personal protective equipment (PPE) waste generated during the management and sampling of leachate. Hazardous constituents may include, but are not limited to, organic compounds, semivolatile organic compounds, and toxic and heavy metals. The leachate may also be contaminated with low levels of PCBs and tritium. The U.S. EPA Hazardous Waste Number for leachate is F039. Containers of hazardous waste managed within the CAMU less-than-90-day waste accumulation area shall be managed in accordance with applicable regulations in 20 NMAC 4.1.300, incorporating 40 CFR Part 262.34(a).

The less-than-90-day waste accumulation area consists of a rectangular area covered with aggregate. Containerized leachate shall be accumulated in 55-gallon drums or other suitable containers on spill containment pallets to prevent the accidental discharge of leachate to the ground surface. The containers shall be staged in a manner that maintains sufficient aisle space to allow the unobstructed movement of personnel and equipment to any portion of the less-than-90-day waste accumulation area. No more than 100 containers of leachate shall be accumulated in the area at any given time.

A.7.6 Description of the CAMU Containment Cell

The CAMU containment cell consists of an engineered liner and final cover systems that are designed to minimize the migration of hazardous waste and constituents into the environment. In addition to the cell liner and final cover systems, the containment cell incorporates a vadose zone monitoring system (VZMS) and a leachate collection and removal system (LCRS). Details of the CAMU containment cell size plan, liner details and associated features are presented in Figures 33, 34, and 35 of Permit Attachment L (*Figures*).

The CAMU containment cell contains approximately 31,800 cubic yards of remediation wastes that were generated as part of corrective action activities at the chemical waste landfill (CWL), a hazardous waste landfill located adjacent to the CAMU.

A.7.6.1 Containment Cell Liner System

The containment cell liner system includes bottom liner and sidewall liner components.

A.7.6.2 Bottom Liner Components

The bottom liner components include the following in descending order:

1. Leachate Collection and Removal System
2. Geomembrane liner
3. Geosynthetic clay liner

Each of these bottom liner components is discussed in detail as follows.

A.7.6.3 The Leachate Collection and Removal System

The leachate collection and removal system **(LCRS)** is designed to collect and withdraw leachate from the cell. The LCRS includes a lined sump in the north end of the containment cell, a collection pipe in a central trench located above the geomembrane liner, a pump that removes leachate that collects in the sump, and a geocomposite drainage layer.

The central trench traverses the bottom of the containment cell from the south to the north and is sloped approximately 1 percent toward the north. The bottom of the containment cell is sloped approximately 2 percent to drain toward the central trench. The trench receives leachate from the geocomposite drainage layer. The collection pipe in the bottom of the trench is constructed of slotted 4-inch-diameter polyvinyl chloride (PVC) pipe and provides access for a portable pump to the LCRS sump. The pump delivers leachate to 55-gallon drums or other suitable containers. Additional details of the leachate collection process and system inspection/maintenance/repair are presented in Sections E.9 and H.4.3 of Permit Attachments E and H.

A.7.6.4 Geomembrane Liner

A 60-mil high-density polyethylene (HDPE) geomembrane liner lies across the entire containment cell and below the LCRS and acts as the initial barrier to minimize leachate migration from the CAMU. A second 60-mil HDPE liner is located in the LCRS sump area to provide redundant protection in this area.

A.7.6.5 Geosynthetic Clay Liner

A Geosynthetic clay liner (GCL**)** underlies the geomembrane and functions as a leachate barrier layer in the event that the overlying HDPE geomembrane fails. The GCL is located directly above the prepared wicking materials in the bottom of the cell and over the prepared side slopes. The GCL consists of non-woven, geotextile with its outer layers needle-punched through an inner layer of low-permeability sodium bentonite.

A.7.6.6 Sidewall Liner Components

The sidewall liner components include the following in descending order:

1. Protective cover sheet
2. Geomembrane
3. GCL

4. Prepared subgrade

A.7.6.7 Protective Cover Sheet

A 60-mil HDPE cover sheet lies above the LCRS trench on the north and south side slopes of the cell. The protective cover sheet is field-welded to the geomembrane liner at the edges of the LCRS trench.

A.7.6.8 Geomembrane

A 60-mil HDPE geomembrane liner comprises the uppermost layer on the sidewalls of the cell. The geomembrane provides the initial barrier to minimize leachate migration from the CAMU.

A.7.6.9 GCL

The sidewall liner GCL is identical to the bottom liner GCL described in Section A.7.8.5 of this Permit Attachment.

A.7.6.10 Prepared Subgrade

The prepared subgrade lies below and in direct contact with the GCL. The base below the subgrade was compacted and was constructed to be free of roots, debris, large voids, and rocks greater than 0.5 inch in diameter.

A.7.6.11 Final Cover System

The final cover system design incorporates a capillary barrier and vegetative cover. A HDPE liner is positioned at the base of the final cover system. In addition to the vegetative cover component, engineering controls will be applied to minimize erosion of the final cover. These include slope, surface-water runoff, and perimeter surface-water flow control. The crown of the final cover slopes to the north, south, east, and west at a 3-percent grade. Transition slopes range from 8:1 to 4:1. This design facilitates low-profile mounding and gentle slopes that enhance resistance to erosion caused by wind and precipitation. A plan-view drawing of the completed containment cell showing the final cover configuration and associated perimeter drainage pathways is presented on Figure 36 in Permit Attachment L (*Figures).*

The final cover system components, as shown on Figure 37 of Permit Attachment L (*Figures*), include the following in descending order:

1. Topsoil and native soil blend
2. Filter sand and pea gravel
3. Bedding sand and HDPE liner

A.7.6.12 Topsoil and Native Soil Blend Layers

The purpose of the topsoil and native soil blend layers is to provide a growing media for the vegetative cover, which consists of native plants. This enhances evapotranspiration and reduces infiltration. The 6-inch-thick topsoil layer is comprised of existing surface soil stripped from the containment cell area during CAMU construction, other surface soil from the Facility, and

surface soil from off-site locations with properties similar to the soil in the vicinity of the CAMU. The uppermost portion of the topsoil layer contains a 1-inch-thick gravel mulch layer used to armor the cover surface and reduce the effects of erosion.

The 36-inch-thick native soil blend layer underlies the topsoil layer and was constructed to be free of organic matter, rubble, trash, and deleterious substances. The topsoil layer provides a suitable root bed for the vegetative cover while the underlying native soil blend layer allows for more moisture storage and facilitates further root penetration.

A.7.6.13 Filter Sand/Pea Gravel Layers

A capillary barrier, comprised of a 4-inch-thick filter sand layer and a 6-inch-thick pea gravel layer, lies beneath the native soil blend. The sand layer beneath the native soil blend promotes lateral movement of percolating water and reduces the migration of fines from the native soil blend into the underlying pea gravel layer.

A.7.6.14 Bedding Sand Layer and HDPE Liner

An 8-inch-thick bedding sand layer underlies the pea gravel layer and provides protection to the underlying HDPE liner. The HDPE liner is included in the final cover design as an additional measure of protection. The flexible HDPE membrane liner consists of a 60-mil-thick, textured HDPE produced from specially formulated polyethylene resin. The HDPE liner lies over the waste material, buttress soil, and extended slope, and is keyed into an anchor trench along the perimeter of the containment cell.

A.7.6.15 Vadose Zone Monitoring System (VZMS)

The VZMS is designed to provide real-time information on containment cell performance with respect to early detection of any leaks from the containment cell.

The VZMS consists of the following three subsystems:

1. The Primary Subliner (PSL) Monitoring Subsystem
2. The Vertical Sensor Array (VSA) Monitoring Subsystem
3. The CWL and Sanitary Sewer Line (CSS) Monitoring Subsystem

The three subsystems, shown on Figures 38 and 39 of Permit Attachment L (*Figures*), are used in an integrated fashion to detect any leakage from the containment cell, and to provide information that can be used to distinguish false detections caused by leakage from the sanitary sewer line or constituent migration from the CWL.

A.7.6.16 Primary Subliner Monitoring Subsystem

The Primary Subliner (PSL) Monitoring Subsystem is the primary monitoring subsystem of the VZMS and is designed to provide early leak-detection capability. It consists of five parallel-trending, sub-horizontal, vitrified clay pipes (VCPs) located 5 feet below the containment cell bottom liner, with horizontal spacing of 17 to 27 feet (see Figures 38 and 39 in Permit Attachment L (*Figures*)). A PVC access tube is connected to the ends of each VCP to facilitate

the deployment of a neutron probe for moisture monitoring. The neutron probe is manually moved through the VCP during monitoring events. Figure 40 of Permit Attachment L (*Figures*) presents a cross-sectional view of the PSL monitoring subsystem components.

A.7.6.17 VSA Monitoring Subsystem

The VSA Monitoring Subsystem will be used to monitor both lateral and vertical soil gradient information on *in situ* soil moisture, temperature, and soil gas, as required (see Table H-1 of Permit Attachment H). It consists of 11 vertical boreholes located below the containment cell, including one beneath the LCRS sump (see Figure 38 and Figure 39 in Permit Attachment L (*Figures*)). Each borehole contains a sampling point at 5 and 15 feet below the containment cell liner, as well as the following three components: a time-domain reflectometry soil-moisture content probe, a temperature sensor, and an active soil-gas sampler. Instrumentation cabling and tubing is ducted to the surface outside of the containment cell liner perimeter. Figure 41 of Permit Attachment L (*Figures*) presents a cross-sectional view of the VSA Monitoring Subsystem components.

A.7.6.18 Chemical Waste Landfill and Sanitary Sewer Line Monitoring Subsystem

The Chemical Waste Landfill and Sanitary Sewer Line (CSS) Monitoring Subsystem is designed to detect and identify leakage of moisture and hazardous constituents from the sanitary sewer line should such leakage occur, as well as volatile organic compounds that could potentially migrate from the CWL toward the containment cell. The CSS subsystem consists of six vertical, 20-foot-deep boreholes, spaced approximately 100 feet apart in a line parallel to the sanitary sewer line (see Figures 38 and 39 in Permit Attachment L (*Figures*)). Each borehole is equipped with a well screen suitable for soil gas sampling or for deployment of a neutron probe for soil moisture monitoring. Figure 42 of Permit Attachment L (*Figures*) presents a cross-sectional view of the CSS monitoring subsystem components.

PERMIT ATTACHMENT B AUTHORIZED WASTES

B.1 INTRODUCTION

This Permit Attachment authorizes the types and quantities of wastes that the Permittees are allowed to manage, treat and/or store at the Permitted Units.

B.2 AUTHORIZED WASTES FOR THE THERMAL TREATMENT UNIT

Table B-1 below lists the wastes that the Permittees are authorized to manage and treat at the Thermal Treatment Unit (TTU) by open burning. Additional treatment requirements are presented in Permit Part 5. The maximum annual quantity of waste treated at the TTU is limited to 9,500 pounds.

TABLE B-1
Types of Hazardous Wastes Allowed for Treatment at the TTU

Solid or Hazardous Waste	EPA Hazardous Waste Number	Process Code[a]
Acetone	F003	X01
Acetonitrile	D001	X01
Nitric acid	D002	X01
Silver nitrate	D001, D011	X01
SASN	D001, D003, D011	X01
PETN	D003	X01

a X01 – open burning/open detonation

B.3 AUTHORIZED WASTES FOR TREATMENT AND/OR STORAGE AT THE HAZARDOUS WASTE HANDLING UNIT, THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT, THE AUXILIARY HOT CELL UNIT, AND THE MANZANO STORAGE BUNKERS

Table B-2 below lists the wastes, process codes, and estimated annual quantities that the Permittees are authorized to manage, treat and/or store at the Hazardous Waste Handling Unit (HWHU), the Radioactive and Mixed Waste Management Unit (RMWMU), the Auxiliary Hot Cell Unit (AHCU), and the five Manzano Storage Bunkers (MSB). Additional storage and treatment requirements are presented in Permit Parts 3 and 4. Waste listed in Table B-2 that must be treated using a technology specified in the table of 40 C.F.R. §

If the amount of any waste code handled (i.e., managed, treated, or stored) in a calendar year exceeds the amount listed for that waste code in this Permit Attachment (B), the Permittees shall submit a report explaining the situation to the Department and, if the increase in annual quantity is expected to be repeated, shall submit a revised Part A application by April 1 of the following year and shall request a permit modification to revise this Permit Attachment to update the estimated annual quantity for the waste code.

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
1	P001	S01	100
2	P002	S01	100
3	P003	S01	100
4	P004	S01	100
5	P005	S01	100
6	P006	S01	100
7	P007	S01	100
8	P008	S01	100
9	P009	S01	100
10	P010	S01	100
11	P011	S01	100
12	P012	S01	100
13	P013	S01	100
14	P014	S01	100
15	P015	S01	100
16	P016	S01	100
17	P017	S01	100
18	P018	S01	100
19	P020	S01	100
20	P021	S01	100
21	P022	S01	100
22	P023	S01	100
23	P024	S01	100
24	P026	S01	100
25	P027	S01	100
26	P028	S01	100
27	P029	S01	100
28	P030	S01	100
29	P031	S01	100
30	P033	S01	100
31	PO34	S01	100
32	P036	S01	100
33	P037	S01	100
34	P038	S01	100
35	P039	S01	100
36	P040	S01	100
37	P041	S01	100
38	P042	S01	100
39	P043	S01	100
40	P044	S01	100
41	P045	S01	100
42	P046	S01	100
43	P047	S01	100
44	P048	S01	100
45	P049	S01	100
46	P050	S01	100
47	P051	S01	100
48	P054	S01	100
49	P056	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
50	P057	S01	100
51	P058	S01	100
52	P059	S01	100
53	P060	S01	100
54	P062	S01	100
55	P063	S01	100
56	P064	S01	100
57	P065	S01	100
58	P066	S01	100
59	P067	S01	100
60	P068	S01	100
61	P069	S01	100
62	P070	S01	100
63	P071	S01	100
64	P072	S01	100
65	P073	S01	100
66	P074	S01	100
67	P075	S01	100
68	P076	S01	100
69	P077	S01	100
70	P078	S01	100
71	P081	S01	100
72	P082	S01	100
73	P084	S01	100
74	P085	S01	100
75	P087	S01	100
76	P088	S01	100
77	P089	S01	100
78	P092	S01	100
79	P093	S01	100
80	P094	S01	100
81	P095	S01	100
82	P096	S01	100
83	P097	S01	100
84	P098	S01, T04 - Chemical deactivation	150
85	P099	S01	100
86	P101	S01	100
87	P102	S01	100
88	P103	S01	100
89	P104	S01	100
90	P105	S01	100
91	P106	S01	100
92	P108	S01	100
93	P109	S01	100
94	P110	S01	100
95	P111	S01	100
96	P112	S01	100
97	P113	S01	150

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
98	P114	S01	100
99	P115	S01	100
100	P116	S01	100
101	P118	S01	100
102	P119	S01	100
103	P120	S01	100
104	P121	S01	100
105	P122	S01	100
106	P123	S01	100
107	P127	S01	100
108	P128	S01	100
109	P185	S01	100
110	P188	S01	100
111	P189	S01	100
112	P190	S01	100
113	P191	S01	100
114	P192	S01	100
115	P194	S01	100
116	P196	S01	100
117	P197	S01	100
118	P198	S01	100
119	P199	S01	100
120	P201	S01	100
121	P202	S01	100
122	P203	S01	100
123	P204	S01	100
124	P205	S01	100
125	U001	S01	100
126	U002	S01	500
127	U003	S01	500
128	U004	S01	100
129	U005	S01	100
130	U006	S01	100
131	U007	S01	100
132	U008	S01	100
133	U009	S01	100
134	U010	S01	100
135	U011	S01	100
136	U012	S01	100
137	U014	S01	100
138	U015	S01	100
139	U016	S01	100
140	U017	S01	100
141	U018	S01	100
142	U019	S01	100
143	U020	S01	100
144	U021	S01	100
145	U022	S01	100
146	U023	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
147	U024	S01	100
148	U025	S01	100
149	U026	S01	100
150	U027	S01	100
151	U028	S01	5,000
152	U029	S01	100
153	U030	S01	100
154	U031	S01	500
155	U032	S01	100
156	U033	S01	100
157	U034	S01	100
158	U035	S01	100
159	U036	S01	100
160	U037	S01	500
161	U038	S01	100
162	U039	S01	100
163	U041	S01	100
164	U042	S01	100
165	U043	S01	100
166	U044	S01	1,000
167	U045	S01	100
168	U046	S01	100
169	U047	S01	100
170	U048	S01	100
171	U049	S01	100
172	U050	S01	100
173	U051	S01	100
174	U052	S01	100
175	U053	S01	100
176	U055	S01	100
177	U056	S01	500
178	U057	S01	500
179	U058	S01	100
180	U059	S01	100
181	U060	S01	100
182	U061	S01	2,000
183	U062	S01	100
184	U063	S01	100
185	U064	S01	100
186	U066	S01	100
187	U067	S01	100
188	U068	S01	100
189	U069	S01	100
190	U070	S01	500
191	U071	S01	100
192	U072	S01	100
193	U073	S01	100
194	U074	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
195	U075	S01, T04 – Physical treatment	150
196	U076	S01	100
197	U077	S01	100
198	U078	S01	100
199	U079	S01	100
200	U080	S01	500
201	U081	S01	100
202	U082	S01	100
203	U083	S01	100
204	U084	S01	100
205	U085	S01	100
206	U086	S01	100
207	U087	S01	100
208	U088	S01	100
209	U089	S01	100
210	U090	S01	100
211	U091	S01	100
212	U092	S01	100
213	U093	S01	100
214	U094	S01	100
215	U095	S01	100
216	U096	S01	100
217	U097	S01	100
218	U098	S01	100
219	U099	S01	100
220	U101	S01	100
221	U102	S01, T04 – Stabilization/solidification	100
222	U103	S01	100
223	U105	S01, T04 - Physical treatment	100
224	U106	S01	100
225	U107	S01, T04 – Stabilization/solidification	100
226	U108	S01	100
227	U109	S01	100
228	U110	S01	100
229	U111	S01	100
230	U112	S01	500
231	U113	S01	100
232	U114	S01	100
233	U115	S01	100
234	U116	S01	100
235	U117	S01	500
236	U118	S01	100
237	U119	S01	100
238	U120	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
239	U121	S01	100
240	U122	S01	100
241	U123	S01	100
242	U124	S01	100
243	U125	S01	150
244	U126	S01	100
245	U127	S01	100
246	U128	S01	100
247	U129	S01	100
248	U130	S01	100
249	U131	S01	100
250	U132	S01	100
251	U133	S01	500
252	U134	S01	150
253	U135	S01	100
254	U136	S01	100
255	U137	S01	100
256	U138	S01	100
257	U140	S01	500
258	U141	S01	100
259	U142	S01	100
260	U143	S01	100
261	U144	S01	150
262	U145	S01	100
263	U146	S01	100
264	U147	S01	100
265	U148	S01	100
266	U149	S01	100
267	U150	S01	100
268	U151	S01, T04 - Amalgamation, physical treatment	5,000
269	U152	S01	100
270	U153	S01	100
271	U154	S01	500
272	U155	S01	100
273	U156	S01	100
274	U157	S01	100
275	U158	S01	100
276	U159	S01	500
277	U160	S01	100
278	U161	S01	500
279	U162	S01	100
280	U163	S01	100
281	U164	S01	100
282	U165	S01	100
283	U166	S01	100
284	U167	S01	100
285	U168	S01	100
286	U169	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
287	U170	S01	100
288	U171	S01	100
289	U172	S01	100
290	U173	S01	100
291	U174	S01	100
292	U176	S01	100
293	U177	S01	100
294	U178	S01	100
295	U179	S01	100
296	U180	S01	100
297	U181	S01	100
298	U182	S01	100
299	U183	S01	100
300	U184	S01	100
301	U185	S01	100
302	U186	S01	100
303	U187	S01	100
304	U188	S01	100
305	U189	S01	100
306	U190	S01	100
307	U191	S01	100
308	U192	S01	100
309	U193	S01	100
310	U194	S01	100
311	U196	S01	100
312	U197	S01	100
313	U200	S01	100
314	U201	S01	100
315	U202	S01	100
316	U203	S01	100
317	U204	S01	100
318	U205	S01	100
319	U206	S01	100
320	U207	S01	100
321	U208	S01	100
322	U209	S01	100
323	U210	S01	500
324	U211	S01	500
325	U213	S01	150
326	U214	S01	100
327	U215	S01	100
328	U216	S01	100
329	U217	S01	100
330	U218	S01	100
331	U219	S01	100
332	U220	S01	500
333	U221	S01	100
334	U222	S01	100
335	U223	S01	150

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
336	U225	S01	100
337	U226	S01	500
338	U227	S01	100
339	U228	S01	500
340	U234	S01, T04 - Physical treatment	100
341	U235	S01	100
342	U236	S01	100
343	U237	S01	100
344	U238	S01	100
345	U239	S01	500
346	U240	S01	100
347	U243	S01	100
348	U244	S01	100
349	U246	S01	100
350	U247	S01	100
351	U248	S01	100
352	U249	S01	100
353	U271	S01	100
354	U278	S01	100
355	U279	S01	100
356	U280	S01	100
357	U328	S01	100
358	U353	S01	100
359	U359	S01	100
360	U364	S01	100
361	U367	S01	100
362	U372	S01	100
363	U373	S01	100
364	U387	S01	100
365	U389	S01	100
366	U394	S01	100
367	U395	S01	100
368	U404	S01	100
369	U409	S01	100
370	U410	S01	100
371	U411	S01	100
372	F001	S01, T04 – Macro-encapsulation, physical treatment	200,000
373	F002	S01, T04 – Macro-encapsulation, physical treatment	250,000
374	F003	S01, T04 - Macro-encapsulation, physical treatment	275,000
375	F004	S01, T04 – Macro-encapsulation, physical treatment	7,500

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
376	F005	S01, T04, – Macro-encapsulation, physical treatment	275,000
377	F006	S01	2,000
378	F007	S01	2,000
379	F008	S01	2,000
380	F009	S01	100
381	F010	S01	100
382	F011	S01	100
383	F012	S01	100
384	F027	S01	100
385	F039	S01	50,000
386	D001	S01, T04 - Thermal deactivation, chemical deactivation, physical treatment	75,000
387	D002	S01, T04 - Chemical deactivation, physical treatment	75,000
388	D003	S01, T04 - Thermal deactivation, chemical deactivation, physical treatment	100,000
389	D004	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	100,000
390	D005	S01, T04 - Chemical deactivation, stabilization/solidification, macroencapsulation, physical treatment	100,000
391	D006	S01, T04 – Stabilization/solidification, macroencapsulation, physical treatment	100,000
392	D007	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	200,000
393	D008	S01, T04 – Stabilization/solidification, macroencapsulation, physical treatment	250,000
394	D009	S01, T04 Stabilization/solidification, macroencapsulation, amalgamation, physical treatment	100,000

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
395	D010	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	50,000
396	D011	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	100,000
397	D012	S01	100
398	D013	S01	100
399	D014	S01	100
400	D015	S01	100
401	D016	S01	100
402	D017	S01	100
403	D018	S01, T04 - Physical treatment, macro-encapsulation	5,000
404	D019	S01, T04 - Physical treatment, macro-encapsulation	2,000
405	D020	S01, T04 - Physical treatment, macro-encapsulation	2,000
406	D021	S01, T04 - Physical treatment, macro-encapsulation	2,000
407	D022	S01, T04 - Physical treatment, macro-encapsulation	5,000
408	D023	S01, T04 - Physical treatment, macro-encapsulation	2,000
409	D024	S01, T04 Physical treatment, macro-encapsulation	2,000
410	D025	S01, T04 Physical treatment, macro-encapsulation	2,000
411	D026	S01, T04 Physical treatment, macro-encapsulation	2,000
412	D027	S01, T04 Physical treatment, macro-encapsulation	5,000
413	D028	S01, T04 Physical treatment, macro-encapsulation	5,000
414	D029	S01, T04 Physical treatment, macro-encapsulation	2,000

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
415	D030	S01, T04 Physical treatment, macro-encapsulation	2,000
416	D031	S01, T04 Physical treatment, macro-encapsulation	2,000
417	D032	S01, T04 Physical treatment, macro-encapsulation	15,000
418	D033	S01, T04 Physical treatment, macro-encapsulation	5,000
419	D034	S01, T04 Physical treatment, macro-encapsulation	5,000
420	D035	S01, T04 Physical treatment, macro-encapsulation	5,000
421	D036	S01, T04 Physical treatment, macro-encapsulation	5,000
422	D037	S01, T04 Physical treatment, macro-encapsulation	2,000
423	D038	S01, T04 Physical treatment, macro-encapsulation	5,000
424	D039	S01, T04 Physical treatment, macro-encapsulation	15,000
425	D040	S01, T04 Physical treatment, macro-encapsulation	25,000
426	D041	S01, T04 Physical treatment, macro-encapsulation	2,000
427	D042	S01, T04 Physical treatment, macro-encapsulation	5,000
428	D043	S01, T04 Physical treatment, macro-encapsulation	5,000

a. S01 – storage in containers
T04 – other treatment, method indicated

NOTE 1 (applicable to Lines 1-428): Waste types and volumes are highly variable due to the large number of one-time activities and the nature of the research and development activities at the Facility. For clarity, each waste number is listed only once. Individual wastes may have more than one number.

NOTE 2 (applicable to lines 1-428): The estimated annual quantity of waste with a particular waste number includes the full quantity of each waste with that number, even if the waste also has other applicable numbers. For example, 10 kg of waste F001 F002 and 10 kg of waste F002 would be listed on this form as 10 kg of F001 and 20 kg of F002.

NOTE 3 (applicable to lines 1-428): The treatment methods listed for each hazardous waste number are the methods that are appropriate for that waste number. Wastes with multiple numbers may undergo one or more types of treatment at the Permitted Units for some or all of the characteristics and/or constituents. For example, wastes containing explosives and metals (e.g., barium, chromium, and lead) with numbers D001, D003, D005, D007, and D008 are treated on site to deactivate the explosive and render them non-ignitable. The quantities of these wastes are included in the quantities shown for D001, D003, D005, D007, and D008. Thermal deactivation is listed as a process for D001 and D003 because on-site treatment at the RMWMU and AHCU addresses these hazardous waste constituents and characteristics. Thermal deactivation is not listed as a process for D005, D007, or D008 because these hazardous waste constituents and characteristics are not treated when the waste is subjected to thermal deactivation.

PERMIT ATTACHMENT C WASTE ANALYSIS PLAN

C.1 INTRODUCTION

This waste analysis plan (WAP) contains requirements and procedures for the characterization of the chemical and physical nature of hazardous and mixed wastes generated, stored or treated at the Permitted Units. These include the Hazardous Waste Handling Unit, the Thermal Treatment Unit, the Radioactive and Mixed Waste Management Unit, the Auxiliary Hot Cell Unit, and the Manzano Storage Bunkers, and the Corrective Action Management Unit (CAMU), which are described in Permit Attachment A (*Facility Description*).

C.2 WASTE TYPES GENERATED AT THE FACILITY

Table C-1 summarizes general information on hazardous and mixed waste types generated at the Facility. The following sections contain general descriptions of the waste types, the major associated waste-generating processes and/or activities, and the general waste forms associated with each type. For the purposes of this WAP, a waste type is a general category used to describe one or more wastes that share key features (e.g., type of waste-generating process, waste form, basis for general characterization).

Hazardous and mixed waste types may be of uniform composition (i.e., homogeneous) or of dissimilar and diverse composition (i.e., heterogeneous). Table C-1 includes brief waste type descriptions, the associated waste-generating process or activity, and the characterization basis for hazardous and mixed waste designation. Table C-1 also addresses the variability of each waste type by listing the potential EPA Hazardous Waste Numbers and potential hazardous and mixed waste constituents and/or characteristics associated with each waste type. Each type of waste may include one or more wastes.

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
Laboratory Chemical Waste	Weapon systems and components design, development, fabrication, and testing and material research	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003 D004-D043 All P- and U- EPA Hazardous Waste Numbers	Ignitability Corrosivity Reactivity Toxicity Discarded commercial chemical products and off-specification species
Contaminated Used Oil	Weapon systems and components design, development, fabrication, and testing, material research, pulsed-power research, reactor safety research, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate, Fingerprint Analysis[a]	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Process Wastes	Weapon systems and components design, development, fabrication, and testing, material research, ER Project activities, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate, Fingerprint Analysis	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Explosive Waste	Weapon systems and components design, development, fabrication, and testing	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003 D004-D011 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Batteries	Weapon systems and components design, development, and testing	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003	Ignitability Corrosivity Reactivity

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
			D005 D006 D007 D008 D009 D011	Barium Cadmium Chromium Lead Mercury Silver
Elemental Lead	Pulsed-power research, reactor safety research, ER[b] Project and D&D[c] activities, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate Fingerprint Analysis	D008	Lead
Unknown Liquids and Solids	Legacy wastes from historical weapons system design, development and testing, materials research, ER Project, and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate.	D001 D002 D003 D004-D043	Ignitability Corrosivity Reactivity Toxicity
Contaminated Soil	ER Project and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate Fingerprint Analysis	D001 D003 D004-D043 F001-F005 F039	Ignitability Reactivity Toxicity Spent solvents Leachate
Debris	Weapon systems and components design, development, and testing, material research, pulsed-power research, reactor safety research, support activities, ER Project and D&D activities	Acceptable Knowledge and Sampling and Analysis, as needed Fingerprint Analysis	D001 D003 D004-D043 F001-F005 F039	Ignitability Reactivity Toxicity Spent solvents Leachate
Leachate and Decontaminati on, Purge, and	ER Project, post-closure care, and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate	D002 D004-D043	Corrosivity Toxicity

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
Treatment Waters			F001-F005 F039	Spent solvents CAMU Leachate
Treated Waste and Treatment Residues	Support activities (radiation protection and waste management)	Acceptable Knowledge and Sampling and Analysis, as needed	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent -solvents
Containment System Liquids	Support activities (waste management)	Acceptable Knowledge and Sampling and Analysis, as needed	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents

a "Fingerprint analysis" refers to checks and field methods designed to quickly identify chemical properties (e.g., pH, density, chlorine content, etc). Laboratory analysis may be required to fully and properly characterize a waste.
b ER = Environmental Restoration
c D&D =Decontamination and Decommissioning

C.2.1 Laboratory Chemical Waste

Laboratory chemical waste includes used commercial chemical products or manufacturing chemical intermediates (in solid, liquid, or contained gas forms) declared to be waste, such as reagents, metal powders, oxidizers, reactive metals, elemental mercury, elemental sodium, spent or discarded solvents and other materials. Material Safety Data Sheets (MSDSs) or other product documentation may be available for these wastes. The Permittees initial generators generally produce this type of waste during various research, development and testing operations. Some of these laboratory chemical wastes also exhibit the hazardous waste characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

C.2.2 Contaminated Used Oil

Used oils from vacuum pumps and other machinery may be contaminated with listed hazardous and mixed wastes or may exhibit hazardous waste characteristics of ignitability or toxicity. Specific constituents depend on the processes that generated the contaminated used oil.

C.2.3 Process Wastes

Process wastes, which can be liquid or solid chemicals, solutions, mixtures, waste waters, or manufactured items, are generated as a result of various activities, including experiments and routine operational processes. Typical process hazardous and mixed wastes include, but are not limited to, acidic solutions, alkaline solutions, oxidizers, and wastewaters. These wastes exhibit hazardous waste characteristics (e.g., ignitability, corrosivity, reactivity, toxicity) or are listed waste from nonspecific sources (e.g., spent solvents).

C.2.4 Explosive (Reactive) Waste

An explosive material is defined as a chemical compound or mixture containing any oxidizing and combustible substances, or other ingredients in such proportions, quantities, or packing that ignition by fire, friction, concussion, percussion or detonation of any part thereof causes decomposition with the production of a considerable quantity of heat and gas. Explosive wastes and explosive-contaminated wastes exhibit the hazardous waste characteristic of reactivity if they are capable of detonation or explosive reaction when subjected to a strong initiating source or if heated under confinement. Examples of explosive (reactive) wastes include components and test units that contain an explosive or explosive fragments, powders, and residues. Some of these wastes also exhibit hazardous waste characteristics of ignitability and/or toxicity and may contain spent solvents.

Explosive wastes and explosive-contaminated wastes are generated at the Facility primarily from research and development, fabrication, testing, and Environmental Restoration (ER) Project activities. Explosive waste generally consists of discrete pieces of a solid explosive substance, whereas explosive-contaminated waste typically consists of solid or liquid wastes that have been contaminated with an explosive substance. A specific type of explosive waste is managed at the TTU and is described in greater detail below in Section C.3.4.1.

C.2.5 Batteries

Batteries, in solid or liquid form, or both, are used in numerous Facility activities, and waste batteries may exhibit the hazardous waste characteristics of reactivity, corrosivity, or toxicity (due to the presence of metals such as cadmium, mercury, and lead). Information about the battery content, hazards, and EPA Hazardous Waste Numbers is determined using manufacturer's data. For example, thermal batteries (specialized single-use batteries) contain metals and may exhibit the hazardous waste characteristics of reactivity and toxicity. Lithium batteries exhibit the characteristic of reactivity, while mercury batteries, silver batteries, and nickel-cadmium batteries exhibit the characteristic of toxicity.

C.2.6 Elemental Lead

Elemental lead items that cannot be reused (e.g., for radiation shielding or containment) or are in a form that is unsuitable for recycling may be declared waste. These wastes exhibit the hazardous waste characteristic of toxicity.

C.2.7 Unknown Liquids and Solids

Unknown liquids and solids consist largely of legacy wastes from historical weapons systems design, development and testing, material research, ER Project, and Decontamination and Decommissioning (D&D) activities. Typical unknown hazardous and mixed wastes include, but are not limited to, unlabeled laboratory chemicals, residues in equipment and containers, and solid items that are smaller than debris (as defined in 40 CFR § 268.2). These wastes exhibit the hazardous waste characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

C.2.8 Contaminated Soil

This waste type includes soil from ER Project activities, or other cleanup and excavation operations. Soil may be contaminated with or contain listed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, ignitability, and/or toxicity).

C.2.9 Debris

This waste type includes waste generated during cleaning operations, D&D operations, ER Project activities, emergency response, waste management, and protection of personnel. These wastes are solid, usually heterogeneous, compactable and non-compactable materials that meet the regulatory definition of hazardous debris. Compactable materials include, but are not limited to, items such as personal protective equipment, rags, wipes, swipes, paper, and filters. Non-compactable materials include, but are not limited to equipment, components, electronic hardware, experimental remnants, cables, tools, machining parts, building materials, and glassware. Debris may be contaminated with or contain listed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, corrosivity, ignitability, and/or toxicity).

C.2.10 Leachate and Decontamination, Purge, and Treatment Waters

This waste type includes CAMU leachate, and decontamination, purge, and treatment water (i.e., wastewater) from ER Project, D&D activities, and waste management. Decontamination, purge,

or treatment waters may be listed wastes (e.g., CAMU leachate); be contaminated with or contain listed waste(s); or may exhibit a hazardous waste characteristic (i.e., corrosivity and/or toxicity).

C.2.11 Treated Waste and Treatment Residues

Treated waste and treatment residues, which form secondary waste types (i.e., solids, liquids, or contained gases), are generated by treatment operations at Permitted Units. The wastes may be stored on-site at a Permitted Unit and in accordance with this Permit pending determination of success in meeting treatment goals, subsequent treatment, and/or transportation to appropriate off-site Treatment, Storage, and Disposal Facilities (TSDFs).

C.2.12 Containment System Liquids

This waste type includes liquids that accumulate in containment system structures (e.g., spill pallets, trenches, catch tank). Containment system liquids may be contaminated with or contain listed hazardous and mixed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, corrosivity, ignitability, or toxicity).

C.3 WASTE CHARACTERIZATION PROCEDURES

The approach to waste characterization is based on process knowledge and sampling and analysis data, as appropriate. The following sections describe the characterization procedures that shall apply to hazardous and mixed wastes managed at the Permitted Units.

C.3.1 Waste Characterization Process

The Permittees shall, in accordance with this WAP and the requirements of this Permit, determine what characterization is required. Waste information is submitted using a disposal request (DR) or equivalent form. Waste Characterization shall include identifying physical form, accurately assigning EPA Hazardous Waste Numbers, determining treatment requirements for wastes to be treated at the Permitted Units, and obtaining all information needed for safely handling, storing, and transporting, or otherwise managing the waste.

Waste characterization information includes: the quantity, physical form of the waste (e.g., solid, liquid, gas, wastewater), origin (e.g., research and testing, ER Project, unused commercial chemical product, activity that generated the waste), waste characteristics (e.g., ignitability, corrosivity), hazardous constituents (including reactive or explosive constituents) that are contained in the waste, concentrations and proportions of constituents as needed, and other information as needed or applicable (e.g., materials in contact with the waste such as paper or plastic, and the presence of free liquids in containers).

The Permittees shall review the disposal request forms and associated documentation (e.g., waste process documentation, technical information about the waste, and analytical results) for adequacy, completeness, data reliability, and acceptability.

The Permittees shall consider each waste individually. Each waste is one of the general types listed in Table C-1 and described in Section C.2 of this Permit Attachment. The Permittees shall

use waste type identification in part to determine whether and what kind of additional information is needed to adequately and properly characterize waste. Types of additional information are discussed in Section C.2 of this Permit Attachment. If analytical data are needed to supplement the available information, they shall be obtained through sampling and analysis. A general summary of the characterization methods and parameters and the rationale for characterization are found in Table C-2 of this Permit Attachment.

If the Permittees determine that documentation is incomplete or inadequate for waste characterization, or find or suspect changes in the waste-generating process, they shall obtain the necessary information to properly complete waste characterization.

Using the waste characterization information, the Permittees shall make a hazardous waste determination in accordance with 40 CFR Part 262.11. Before accepting the waste at the appropriate Permitted Unit, the Permittees shall visually check to verify that the waste container(s) matches the information on the disposal request form. If the Permittees detect discrepancies between the shipping documentation and the waste at pickup, the Permittees shall amend the documentation with the correct information. Upon receipt of the waste at a Permitted Unit, the characterization documentation shall become part of the Operating Record. Data from additional waste characterization activities also shall be made part of the Operating Record.

C.3.2 Characterization of Unknown Wastes

Occasionally, wastes of an unknown nature are encountered. For example, unknown wastes may be generated as a result of a container label becoming detached or illegible. Most unknown wastes are contained in small containers (less than 1 gallon or 1 pound) and are related to research or testing projects. These wastes shall be managed on a case-by-case basis. The waste will be tentatively characterized by knowledge of the operations and activities that were performed in the specific area in which the waste was generated. An on-site visual investigation of an unknown waste is another method utilized to help tentatively characterize the waste. The visual investigation includes the assessment of the unknown waste for various properties, such as:

1. Physical state,
2. Color,
3. Age,
4. Storage and container conditions,
5. Changes in substance,
6. Phase separations,
7. Quantity of waste,
8. Any labeling, and
9. Type of operations in the nearby area.

The waste and its proper management shall be identified through this investigation, as appropriate. If identification is made, a disposal request shall be prepared and the waste shall be characterized as described above in Section C.3.1 of this Permit Attachment. If the unknown waste cannot be identified, a HazCat™ or comparable test shall be performed to determine the hazard class. Once the hazard class is determined and the waste is known to be safe to transport, the information shall be recorded on the disposal request form. Additional waste

characterization shall be conducted to whatever extent is necessary to ensure full, accurate, and proper characterization of the waste as described in Section C.3.1.

C.3.3 Characterization of Blended Wastes

Waste may be blended on a limited basis. Liquid hazardous or mixed wastes and non-hazardous wastes may be blended together in a single container. These blending activities shall be limited to compatible wastes, such as oils or process wastes. The Permittees may also combine compatible liquids drained from aerosol cans (e.g., commercial chemical products or characteristic liquids) into a single container.

The Permittees will document the following information for containers with blended wastes:

1. The approximate amounts of each waste type in the mixture;
2. List of hazardous waste characteristics, and underlying hazardous constituents (UHCs) as defined in 40 CFR 268.2(i) in each waste in the mixture; and
3. Whether the wastes in the mixture include listed hazardous wastes such as spent solvents.

The Permittees shall consider the above information when they characterize the waste using the process described in Section C.5 and shall assign the applicable EPA Hazardous Waste Numbers and determine proper management of the waste, including treatment and disposal. The Permittees shall not blend wastes in violation of 40 CFR § 268.3.

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
Laboratory Chemical Waste	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic
Contaminated Used Oil	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability characteristic Determine waste compatibility information Determine toxicity characteristic
Process Wastes	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
Explosive Waste	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Batteries	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) pH (for liquids) Stability, DOT hazard class Hazardous waste metals	Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Elemental Lead	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Hazardous waste metals	Determine waste form Determine toxicity characteristic
Unknown Liquids and Solids	Physical Examination, Acceptable Knowledge, and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class	Determine waste form Determine presence of free liquids Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
		pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	
Contaminated Soil	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Debris	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Leachate and Decontamination Purge, and Treatment Waters	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point pH	Determine whether waste meets listing criteria Determine waste form Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
		Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine toxicity characteristic or constituent concentrations
Treated Waste and Treatment Residues	Acceptable Knowledge and Sampling and analysis, as appropriate	See Table C-3	See Table C-3
Containment System Liquids	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point pH Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine ignitability and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic

Note:The first three items in the parameter column for each waste type are mandatory and constitute the minimum acceptable knowledge. The remaining parameters are optional and will be selected for each waste type as necessary, if the results of the first three parameters indicate additional information is needed.

C.3.4 Characterization of Wastes Treated at the Permitted Units

Wastes treated at Permitted Units shall be characterized according to the process described in Sections C.3.4.1 through C.3.4.5 of this Permit Attachment. Treated wastes shall be characterized to determine one or more of the following, as appropriate, for each waste:

1. Applicable treatment standards, including standards for both characteristic and listed hazardous wastes in accordance with 40 CFR Part 268, Subpart D;
2. Appropriate treatment methods to meet the standards;
3. Underlying hazardous constituents (UHCs) and their appropriate treatment standards, if applicable;
4. Compliance with applicable treatment standards;
5. Suitability for treatment by one or more methods available on-site to meet treatment standards; and
6. Suitability for treatment by one or more methods available on-site to make the waste safer and more amenable to further management on-site or off-site.

These characterization criteria are summarized in Table C-3.

C.3.4.1 Characterization of Waste to be treated at the Thermal Treatment Unit

Reactive hazardous waste to be treated at the TTU shall be characterized through the use of process knowledge:

1. Explosive (e.g., SASN) and ignitable (e.g., acetone) components of the waste are known as a result of knowledge of process and a well-defined and documented procedure for formulating SASN. Variability occurs in the relative amounts of non-explosive liquid and solid items. Some variability occurs in the relative amounts of explosives (SASN and PETN),
2. The waste constituents shall be documented in the Operating Record for any given formulation of SASN. Prior to formulating the explosive slurry, the Permittees shall screen the formulation instructions to identify any changes. If the formulation has changed, the Permittees shall evaluate the constituents to determine if the wastes generated by producing the formulation are acceptable for treatment at the TTU. Properties evaluated shall include the weight of explosives in the waste, and the non-explosive constituents in the waste.

C.3.4.2 Characterization of Wastes to be treated at the RMWMU and AHCU

Wastes to be treated at the RMWMU and AHCU shall be characterized based on acceptable knowledge and supplemented by sampling and analysis, as appropriate, before treatment takes place. For wastes that will be treated to meet treatment standards in 40 CFR 268 Subpart D that include UHCs, characterization shall include any UHCs that are reasonably expected to be present.

C.3.4.3 Characterization of Treated Wastes and Treatment Residues

Treated wastes and treatment residues shall be characterized through knowledge of process and supplemented by sampling and analysis data, as appropriate, using the process described in Section C.3.1 of this Permit Attachment. Treated wastes and treatment residues shall be characterized to determine each of the following, as applicable, for each waste:

1. Whether the treatment effectively met the treatment-specific goals;
2. Whether the treated waste or residue meets the applicable treatment standards (including requirements and standards for UHCs if applicable) associated with the treatment performed;
3. If the treated waste or residue will not undergo further treatment prior to disposal, whether the treated waste or residue meets all applicable treatment standards (including requirements and standards for UHCs if applicable);
4. The presence of hazardous waste constituents and characteristics that could have been introduced during treatment;
5. Whether the treated waste or residue requires further management as a hazardous or mixed waste; and
6. The suitability for further treatment by one or more methods available on-site to make the waste safer and more amenable to further management on- or off-site.

These characterization criteria are summarized in Table C-3. All treated waste and treatment residues shall be characterized by the process described in Section C.3.1 of this Permit Attachment. Characterization of treated wastes and treatment residues shall include consideration of both listed and characteristic wastes that were present in the untreated wastes. The Permittees shall also follow the appropriate regulatory requirements for characterizing wastes that are listed solely because they exhibit one or more of the characteristics of ignitability, reactivity, or corrosivity.

Wastes that are treated using technologies specified in 40 CFR §§ 268.40-45 are not necessarily subjected to sampling and analysis. Such treatment technologies include physical treatment, and macroencapsulation. Other treated wastes shall be subject to sampling and analysis to characterize the waste and determine the effectiveness of the treatment, as appropriate.

C.3.4.4 Characterization of Treated Waste Residues at the TTU

Treatment residues from the thermal treatment of SASN mixed with other hazardous and solid waste include products of combustion. The principal constituents are ash (carbon) produced from burned solid items (e.g., paper, filters) inert non-combustible solid items (e.g.,. metal clips and pieces that were part of the solid waste) and gases (i.e., nitrogen, water vapor, carbon dioxide, carbon monoxide, diatomic oxygen, and traces of nitrous oxides) produced by decomposition of these wastes. Elemental silver is present in the ash when SASN is treated.

The treatment residue at the TTU shall be assessed by visually observing it for the presence of any untreated waste.

Treatment residue is hazardous waste (D011) based on process knowledge. Alternatively, the Permittees may use sampling and analysis to determine the silver content of the treatment

residue. The Permittees shall characterize the treatment residue as appropriate for further treatment and disposal at a permitted off-site TSDF.

C.3.4.5 Characterization of Treated Wastes and Treatment Residues Generated at the RMWMU and the AHCU

Effectiveness of treatment is determined in one or more ways that are specific to the type of treatment and the waste undergoing treatment. Evaluation of the treatment effectiveness is described in detail in Permit Part 4. Treated wastes and treatment residues generated from the treatment of hazardous and mixed wastes at the RMWMU and AHCU shall be characterized using one or more of the following methods:

1. The Permittees may use process knowledge, as appropriate, to determine whether treated waste or treatment residues exhibit characteristics of reactivity or ignitability, and the flash point test, as appropriate, for determination of ignitability.
2. Treated corrosive aqueous liquid wastes and their liquid treatment residues, if any, shall be characterized for corrosivity by measuring pH.
3. Treated reactive wastes and their treatment residues, if any, shall be characterized for the presence of sulfides and cyanides if their presence caused the waste to be reactive.
4. Treated reactive batteries and other reactive/explosive items and their treatment residues, if any, shall be characterized for reactivity through process knowledge, as appropriate. Such wastes may also exhibit the characteristic of toxicity.
5. Elemental mercury treated by amalgamation at the RMWMU may be characterized by process knowledge.
6. Treated aqueous liquids that have been solidified (including liquids that have previously been neutralized) shall be checked for the presence of free liquids.
7. Treated oils and organic liquids exhibiting the characteristics of toxicity shall be characterized through process knowledge and sampling and analysis, as appropriate.
8. Treated soils and particulates exhibiting one or more characteristics of ignitability, reactivity, and toxicity may contain UHCs. Treated wastes that were toxic shall be characterized for toxicity by sampling and analysis, as appropriate.
9. Wastes treated by physical treatment include components containing listed wastes or exhibiting hazardous characteristics. After items are separated from larger items they shall be characterized as described in Section C.3.4 of this Permit Attachment.
10. Pressurized containers treated by physical treatment shall be characterized following treatment. If the containers are empty as defined in 40 CFR § 261.7, the containers are not hazardous waste. The collected liquids shall be characterized.

Treated wastes and treatment residues that will not undergo further treatment at the RMWMU and the AHCU shall be characterized as appropriate to determine compliance with applicable treatment standards for UHCs (*See* 40 CFR § 268.2(i) and 268.40(e)).

C.4 VERIFICATION AND RE-EVALUATION FREQUENCIES

The Permittees' waste verification process shall be designed to provide assurance that wastes are adequately characterized. Personnel involved in verification activities shall be trained and qualified for the activities they perform.

The Permittees shall review whether hazardous wastes are being stored in compliance with 40 CFR Part 264, Subpart CC at least once every 12 months. Such reviews shall be documented in the Operating Record.

C.4.1 Verification of Wastes

Wastes shall be selected for further evaluation as part of the verification program using one or more of the following criteria:

1. Random selection;
2. Adequacy of waste characterization information;
3. Recommendations from personnel;
4. Incomplete or inconsistent documentation; and
5. Other waste-specific criteria.

During each calendar year, the Permittees shall verify the characterization for ten percent (10%) by volume.

C.4.2 Re-evaluation of Waste Streams

If there is any information that indicates a change in the process that generates a waste that may affect the waste, the waste shall be re-characterized no later than the next time the waste is generated from the changed process.

C.5 USE OF ACCEPTABLE KNOWLEDGE

According to the EPA guidance, acceptable knowledge is defined to include process knowledge, supplemental waste analysis data, and facility records of analysis (EPA, 1994, "*Waste Analysis at Facilities That Generate, Treat, Store, And Dispose of Hazardous Wastes*). Process knowledge is described as data developed under 40 CFR Part 264 and existing published or documented data on a specific hazardous waste or a waste generated from similar processes. Supplemental waste analysis data include concentration(s) of hazardous waste constituents and/or results of tests for hazardous waste characteristics to determine whether or how wastes are regulated under RCRA Subtitle C.

Examples that are presented in the 1994 EPA guidance as to when the application of acceptable knowledge may be appropriate include:

1. Wastes containing hazardous waste constituents from specific processes that are well documented such as F and K listed wastes; and
2. Wastes consisting of discarded commercial chemical products, reagents, or chemicals containing known physical and chemical constituents (such as, spent solvents and P and U listed wastes).
3. Health and safety risks to personnel would not justify sampling and analysis (e.g., radioactive mixed waste).
4. Physical nature of the waste does not lend itself to taking a laboratory sample.

Documentation of acceptable knowledge shall be maintained in the Operating Record. [*See* 40 CFR §§ 264.13(a)(2) and (b)(5), and 264.73(b)(3)].

C.5.1 Process Knowledge

Process knowledge, a subset of acceptable knowledge, consists of one or more of the following:

1. Detailed information on a waste obtained from published or documented waste analysis data;
2. Studies conducted on hazardous or mixed waste generated by processes similar to that which generated the waste; and
3. Knowledge of the materials and operations that generated the waste and that demonstrates the potential for hazardous waste constituents in the waste.

Documentation of process knowledge for each waste shall be maintained in the Operating Record. The documentation shall be traceable to a given waste. There are many sources of documentation that can be used to substantiate process knowledge for a specific waste. Examples include but are not limited to the following:

1. Material safety data sheets (MSDSs), product labels, vendor information and manufacturer's literature and other product package information;
2. Information from operating procedures and research projects, which can include a list of the raw materials or reagents, a description of the process/experiment that uses the materials, and a description of the wastes generated and how the wastes are handled;
3. Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements);
4. Industry reports and analytical data on a similar process when there is a clear connection between the Facility's process/experiment and the industry's similar process/experiment;
5. Previous analytical data relevant to the waste;
6. Documented visual inspections to confirm or identify the physical characteristics and packaging of a waste; and
7. ER Project site and waste characterization data.

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Explosive waste to be treated by open burning	Knowledge of Process	All characterization information previously obtained Knowledge of treatment process	Verify that waste has same characteristics and constituents as previous wastes treated at TTU Determine treatment standards Identify UHCs reasonably expected to be present in characteristic waste
Residues from treatment of reactive hazardous wastes through open burning	Acceptable Knowledge and by Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals UHCs	Determine whether treated waste meets listing criteria Determine waste form Determine presence of free liquids Determine waste compatibility information Determine toxicity characteristics Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through chemical deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process Cyanides and sulfides UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste
Wastes that have been treated through chemical deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) pH (for liquids) Stability, DOT hazard class Cyanides and sulfides UHCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Waste to be treated through thermal deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste
Wastes that have been treated through thermal deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process DOT hazard class Stability, DOT hazard class UHCs	Determine waste form Determine ignitability and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through amalgamation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process	Verify that waste is suitable for treatment by planned process Determine treatment standards
Wastes that have been treated through amalgamation	Knowledge of Process	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process	Determine waste form Determine whether waste meets treatment standards
Waste to be treated through stabilization/ solidification	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Wastes that have been treated through stabilization/ solidification	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class UHCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through macroencapsulation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process	Verify that waste is suitable for treatment by planned process Determine treatment standards
Waste that have been treated through macroencapsulation	Knowledge of Process	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process	Determine waste form Determine whether waste meets treatment standards
Waste to be treated through physical treatment	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Wastes that have been treated through physical treatment	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste VOCs Hazardous waste SVOCs Hazardous waste metals UHCs	Determine whether waste meets listing criteria Determine waste form, including size Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic Determine whether waste meets treatment standards, including standards for UHCs

[a] Parameters listed are in addition to those shown in Table C-2. Parameters shown in *italics* are mandatory; the others are selected based on obtaining additional information necessary for treatment or for characterizing the treated waste.

C.6 WASTE SAMPLING AND ANALYSIS

Sampling and analysis shall be performed to provide supplemental information when acceptable knowledge does not provide sufficient information to adequately and properly characterize a hazardous or mixed waste as needed for the activities conducted under this Permit. Characterization methods, analytical parameters, and rationale are summarized in Tables C-2 and C-3.

Pursuant to 40 CFR 264.13(b)(1 and 2), Table C-4 identifies analytical testing requirements and test methods for parameters of interest, including UHCs that are reasonably expected to be present in the waste at the point of generation, as defined in 40 CFR 268.2(i).

C.6.1 Quality Assurance/Quality Control

The Permittees shall implement sampling quality assurance/quality control (QA)/QC) procedures to assure that analytical results are adequate for their intended purpose(s). The QA/QC program shall be designed by adhering to the EPA sampling protocol and analytical procedures specified in this section; documenting sampling activities and sample custody; using controlled and standard equipment and materials; and collecting, analyzing, and evaluating field and laboratory QA/QC samples, to meet the requirements of EPA Office of Solid Waste publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA, 1986) and all approved updates,(SW-846), Chapter 1.0.

C.6.2 Waste Sampling

The objective of waste sampling shall be to obtain a sample representative of a waste and shall consider the waste-generating and -handling processes. Some wastes separate into distinct layers, and representative samples must include aliquots or portions from each layer. In some cases, it shall be necessary to use a statistical or random sampling scheme for the collection of representative samples.

A number of criteria shall be considered by the Permittees in determining the number, location, and frequency of samples that should be collected. If the waste is uniform and from a single process location, one grab sample collected periodically may be sufficient. If a waste is a mixture of materials, more samples shall be required, and composite sampling may be appropriate. Sampling shall be repeated if the waste-generating process changes in a substantial way, or if inspection of the waste reveals the waste has changed such that the previous determination is no longer applicable.

The Permittees shall comply with SW-846, other approved EPA or American Society for Testing and Materials (ASTM) methods. The Permittees shall obtain prior approval by the Department to use other methods.

Samples of waste shall be collected and handled in a manner that preserves their original physical form and composition.

When sampling is required for waste characterization, the following strategies shall be used unless an alternative sampling strategy that meets the requirements of SW-846 is determined to be more appropriate for a specific waste:

1. Sampling shall be conducted in a manner that minimizes the generation of waste;
2. The Permittees shall consider personnel safety in determining how and whether to collect samples. If sampling of a waste would pose an unacceptable risk to human health, a non-waste item similar in chemical and physical properties to the waste may be sampled as a surrogate;
3. For heterogeneous solid items, such as contaminated debris, samples shall be obtained from areas that are most likely to be contaminated;
4. For solid items whose surfaces are suspected to be contaminated with hazardous or mixed wastes, the sampling method employed shall be appropriate for detecting surface contamination and may include, but is not limited to, surface wipe samples, crushing, grinding, and shredding, depending on the physical form of the waste and the suspected contaminants; and
5. Samples shall include portions or aliquots from each phase of a waste if more than one phase is present.

The Permittees may propose an alternative sampling strategy by submitting a sampling and analysis plan (SAP) to the Department for approval. If the Department does not notify the Permittees of the SAP's approval, conditional approval, or denial within 45 days of receipt of the SAP, the Permittees may implement the SAP provided that all applicable requirements of 40 CFR Parts 264 and 268 and this Permit are met; releases of waste are prevented; and the health and safety of workers and the public are protected from harm related to implementation of the plan.

C.6.3 Sample Handling, Preservation, and Storage

Use of appropriate sample container types and preservation are necessary to prevent some hazardous constituents from chemically, physically, or biologically altering other substances prior to analysis. Typical preservation techniques shall include the addition of appropriate chemicals, refrigeration, and adhering to holding time limitations between sampling and analysis. The Permittees shall use current EPA-approved preservation and container types, such as those presented in Table C-5 of this Permit Attachment, or in SW-846.

Field duplicate samples shall be collected at a rate of ten percent, and shall be analyzed for the same parameters as the associated waste samples. If disposable sampling equipment is not used, an equipment rinsate blank shall also be prepared and analyzed at a rate of ten percent, with at least one for each sampling event. If VOCs are included in the analyses, a trip blank shall be prepared and analyzed for volatile organic compounds (VOCs), and shall accompany VOC samples.

After a sample is collected, a label providing the following information at a minimum shall be immediately affixed to the sample container:

1. Sample number;
2. Date and time of collection;

3. Sampling location or container number(s) for composite samples;
4. Type of sample media (e.g., liquid, solid); and
5. Name of sample collector.

Sample numbers shall be unique to each sample. The sample number shall also be recorded on a sample collection log, which shall include the following information for each sample:

1. Sample number;
2. Sample and analysis request number;
3. Date and time of sample collection;
4. Sampling location or container number(s) for composite samples;
5. Type of sample media (e.g., solid, liquid);
6. Purpose of sample collection;
7. Number and volume of samples;
8. Sample type (e.g., grab, composite);
9. Results of field observations or measurements;
10. Name of sample collector; and
11. Signature of sample collector.

To assure that the sample is traceable from the time of collection to the time of analysis, an analysis request/chain-of-custody (AR/COC) form or equivalent shall be completed and maintained by the Permittees for each sample. The form shall include the following information at a minimum:

1. Sample number;
2. Date and time of sample collection;
3. Sampling location or container number(s) for composite samples;
4. Type of sample media (e.g., solid, liquid);
5. Required analytical testing;
6. Sample description (e.g., grab, composite);
7. Name of sample collector;
8. Signature of sample collector;
9. Signatures of persons involved in the chain of custody; and
10. Dates of possession.

Table C-5 lists requirements for sample containers, preservation techniques, and holding times for the Active Units listed in Table J-1 of Permit Attachment J (*Hazardous Waste Management Units*).

Sampling shall be performed with an appropriate device.

C.6.4 Analytical Laboratory Selection and Analytical Methods

The Permittees shall perform the chemical and physical analyses specified in SW-846 as necessary to adequately characterize waste. Laboratories conducting the analyses must have:

1. A documented comprehensive QA/QC program,
2. Technical analytical expertise,
3. A document control/records management plan, and

4. The capability to perform data reduction, validation, and reporting.

The selection of analytical testing methods for waste shall be based on the following considerations:

1. The physical form of the waste,
2. Chemical composition, and
3. Required detection limits (e.g., regulatory thresholds).

TABLE C-4
Summary of Analytical Methods

Parameter	Method Numbers [b]	Rationale
Volatile Organic Compounds Spent halogenated and non-halogenated solvents	American Society for Testing and Materials (ASTM) Method D4547-91[c] or equivalent method EPA/540/4-91/001[d] or equivalent methods[e] EPA Methods SW-846 (1311, 8260, 8261)[f] or equivalent methods[e] Methods included in 20 NMAC 4.1.600/40 CFR §§ 265.1084(a)(2), (a)(3), and (a)(4)	Determine total and/or TCLP concentration in samples of solids or liquids, to characterize wastes, evaluate air emissions, or determine whether treated wastes meet treatment standards[a]
Semivolatile Organic Compounds	EPA Methods SW-846 (1311 and 8270)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Metals Arsenic Antimony Barium Beryllium Cadmium Chromium Lead Mercury Nickel Selenium Silver Thallium	EPA Methods SW-846[f]: (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 7470, 7471)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010, 7741, 7742)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids, or determine whether treated wastes meet treatment standards[a]
Reactive Sulfide	EPA Methods SW-846, Test Method to Determine Hydrogen Sulfide Released from Wastes[g] or equivalent methods[e] EPA Methods SW-846 (9030, 9031, 9034)[f] or equivalent methods[e]	Determine concentration of reactive sulfides
Cyanide (total and amenable)	(1311, 9010, 9012)[e]	Determine concentration of cyanides

TABLE C-4 Summary of Analytical Methods		
Parameter	**Method Numbers [b]**	**Rationale**
Paint Filter Liquids Test	EPA Methods SW-846 (9095)[f] or equivalent methods[e]	Determine presence of free liquids
Flash Point	EPA Methods SW-846 (1010, 1020, 1030)[f] or equivalent methods[e]	Determine ignitability
pH	EPA Methods SW-846 (9040, 9041, 9045)[f] or equivalent methods[e]	Determine corrosivity
Explosives in waste	EPA Methods SW-846 (Appropriate analytical method from the Method 8300 series - e.g., 8330)[f]	Determine reactivity
Dioxin/Furan Congeners	EPA Methods SW-846 (8280, 8290) [f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Polychlorinated Biphenyls	EPA Methods SW-846 (8082, 8275) [f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Pesticides	EPA Methods SW-846 (8140, 8141, 8081, 8085) [f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Herbicides	EPA Methods SW-846 (8150, 8151) [f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]

[a] For treated wastes, analyses are limited to determining whether treated wastes meet the treatment standards in 40 CFR § 268.40 or the universal treatment standards for the underlying hazardous constituents that can reasonably be expected to be present at the point of generation of the hazardous waste, as provided in 40 CFR § 268.48

[b] The Permittees shall use the most current methods for analysis. Method numbers shown in this table are subject to change through future updates and may differ from those shown here.

[c] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials. (ASTM, 1991)

[d] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 1/540/4-91/001, Office of Research and Development. (EPA, 1991)

[e] Equivalent methods not listed in one of the references in this Permit Attachment may be substituted to accommodate waste-specific properties if approved in advance by the Department.

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

[g] SW-846, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic.

TABLE C-5
Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Volatile Organic Compounds			
Concentrated Waste Samples	Method 5035[b]:See method. Method 5021: See method. Methods 5031 & 5032: See methods. Use polytetrafluoroethylene (PTFE)-lined lids for all procedures.	Cool to 4º degrees Celsius (ºC) and adjust pH[e] to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Soil/Sediments and Sludges	Method 5035: See method. Method 5021: See method. Methods 5031 & 5032: See methods.	See the individual method	14 days
Liquid Samples: No Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-milliliter (Ml) vials with PTFE-lined septum caps.	Cool to 4ºC and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Liquid Samples: Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-mL vials with PTFE-lined septum caps.	Collect sample in a 125-mL container, which has been pre-preserved with 4 drops of 10% sodium thiosulfate solution. Gently swirl to mix sample and transfer to a 40-mL volatile organic analysis (VOA) vial. Cool to 4ºC and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Liquid Samples: Acrolein and Acrylonitrile	Methods 5030, 5031, & 5032: 2 x 40-mL vials with PTFE-lined septum caps.	Adjust to pH of 4-5. Cool to 4ºC	14 days
Semivolatile Organic Compounds/Organochlorine Pesticides and Herbicides			
Concentrated Waste Samples	125 mL WM[c]-G[d] with PTFE-lined lid	None	14 days
Soil/Sediments and Sludges	250 mL WM[c]-G[d] with PTFE-lined lid	Cool to 4ºC	14 days
Liquid Samples, No Residual Chlorine Present	4 x 1 liter (L) AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Cool to 4ºC	14 days
Liquid Samples, Residual Chlorine Present	4 x 1-L AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Cool to 4ºC.	14 days
Polychlorinated Biphenyls, Polychlorinated Dibenzo–p-dioxins, and Polychlorinated Dibenzofurans			
Concentrated waste samples	125-mL WM[c]-G[d]	None	14 days
Soil/Sediments and Sludges	250 mL WM[c]-G[d] with PTFE-lined lid	Cool to 4ºC	14 days
Liquid Samples, No Residual Chlorine Present	4 x 1 liter (L) AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis	Cool to 4ºC	14 days
Liquid Samples, Residual Chlorine Present	4 x 1-L AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Cool to 4ºC.	14 days

TABLE C-5
Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Metals and Inorganic Compounds			
Soil/Sediments and Sludges: Metals (except hexavalent chromium and mercury)	500-mL WM[c]-P[g] or G[d]	Cool to 4ºC	180 days
Soil/Sediments and Sludges: Hexavalent chromium	500-mL WM[c]-P[g] or G[d]	Cool to 4ºC	Not established - analyze as soon as possible.
Soil/Sediments and Sludges: Mercury	500-mL WM[c]-P[g] or G[d]	Cool to 4ºC	28 days
Liquid Samples: Metals (except hexavalent chromium and mercury)	1-L P[g] or G[d]	Add nitric acid to adjust pH to less than 2.	180 days
Liquid Samples: Hexavalent chromium	500-mL P[g] or G[d]	Cool to 4ºC	24 hours
Liquid Samples: Mercury	500-mL P[g] or G[d]	Add nitric acid to adjust pH to less than 2.	28 days
Cyanide	500-mL WM[c]-P[g] or G[d]	Cool to 4ºC. See method for preservation if oxidizing agents or interferences are present.	14 days

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations. Permittees shall comply with EPA requirements for container types, preservatives, and holding times as specified under the current version of SW-846 or other applicable regulations.

[b] Information primarily from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*, U.S. Environmental Protection Agency, 1986 and all approved updates. The Permittees shall use the most current containers and preservation methods. Containers and preservatives shown in this table are subject to change through future updates and may differ from those shown here.

[c] WM = Wide-mouth

[d] G = Glass

[e] A term used to describe the hydrogen-ion activity of a system.

[f] AG = Amber glass

[g] P = Polyethylene

C.7 ORGANIC AIR EMISSION REQUIREMENTS

The Permittees manage wastes that are subject to organic air emissions requirements of 40 CFR Part 264, Subpart CC. For wastes that are not eligible for exemption, the Permittees shall address the applicable requirements for control of air pollutant emissions as follows:

1. In lieu of determining the concentration of VOCs in a waste at the point of generation, the Permittees may declare that a container holding the waste is subject to the requirements of 40 CFR Part 264, Subpart CC.
2. To determine the VOC concentration, the Permittees shall follow the waste determination procedures specified in 40 CFR 264.1083(a). If sampling and analysis is necessary, it shall be performed in accordance with the methods specified in this Permit Attachment.
3. Whenever changes to the source generating the waste are reasonably likely to or may potentially cause the average VOC concentration of the hazardous waste to increase to a level that is equal to or greater than the applicable VOC concentration limits specified in 40 C.F.R. § 264.1082, a new waste evaluation shall be performed by the Permittees, as specified in 40 C.F.R. § 264.1083(a)(1)(ii).
4. The Permittees shall review the characterization documentation for VOCs as part of the characterization process discussed in Section C.3 of this Permit Attachment.
5. Hazardous wastes containing VOCs that are newly generated through treatment and treatment residues shall be characterized for VOC content if the waste being treated contains VOCs, and/or the treatment process involves VOCs.
6. Characterization of routinely generated hazardous and mixed wastes that are subject to 40 C.F.R. Part 264, Subpart CC shall be reviewed and updated at least once every 12 months to determine whether Subpart CC requirements continue to apply.

C.8 PROCEDURES FOR ACCEPTANCE OF WASTE FROM OFF-SITE SOURCES

Hazardous and mixed wastes from off-site sources listed in Section 2.2.3 of Permit Part 2 may be accepted at the Facility.

The Permittees shall meet the requirements of 40 CFR §§, 264.13(a)(3)(ii), 264.13(a)(4), 264.13(b)(5), and 264.13(c).

Prior to accepting waste from an off-site source, the Permittees shall obtain a request and waste characterization data from the off-site source. The Permittees shall review the request and characterization data for completeness and consistency with the characterization process in Section C.3.1. The Permittees shall require large-quantity and small-quantity off-site sources to provide land disposal restriction (LDR) notification that addresses LDR requirements applicable to the wastes in the proposed shipment. The Permittees shall provide written notice to the source as required by 40 CFR 264.12(b).

The Permittees shall visually inspect each shipment to ensure that the number and type of container(s) and container labels match the manifest or other shipping papers. Discrepancies shall be addressed in compliance with 40 CFR 264.72 and Permit Section 1.9.9.8.

Documentation regarding wastes received from off-site sources shall be maintained in the Operating Record.

C.9 RECORDS

The Permittees shall enter characterization information into the Operating Record. Each package (the smallest discrete waste item) shall be assigned a unique identification and tracking number no later than its arrival at a Permitted Unit. Characterization information associated with the package shall be either in paper or electronic format. The Permittees shall document information related to activities that affect a waste package (e.g., repackaging, additional characterization, treatment).

C.10 REFERENCES

ASTM, 1991 American Society for Testing and Materials, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," 1991

ASTM, 1991 *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials, 1991.

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

EPA, 1991 "Soil Sampling and Analysis for Volatile Organic Compounds," *EPA 1/540/4-91/001*, Office of Research and Development, 1991

EPA, 1994 "Waste Analysis at Facilities That Generate, Treat, Store, And Dispose of Hazardous Wastes, A Guidance Manual," *OSWER 9938.4-03*, 1994.

PERMIT ATTACHMENT D CONTINGENCY PLAN

D.1 INTRODUCTION

This Permit Attachment describes Facility and site-specific contingency plans for the Permitted Units (*See* 40 CFR Part 264, Subpart D) including the Corrective Action Management Unit (CAMU). The Permitted Units covered by this Contingency Plan are listed in Permit Attachment J (*Hazardous Waste Management* Units) and described in Permit Attachment A (*Facility Description*).

Facility security personnel shall monitor each Unit periodically during non-operating hours. If an emergency is discovered during this monitoring, the Facility Emergency Operations Center (EOC) and the Unit-specific Emergency Coordinator (EC) shall be notified immediately.

D.2 DISTRIBUTION OF CONTINGENCY PLAN AND AMENDMENTS

Copies of the current Contingency Plan, including the applicable Unit-specific information shall be maintained: (1) at each Permitted Unit, (2) at the Facility Emergency Operations Center (EOC), and (3) in the Operating Record. The Permittees shall also provide copies of the Contingency Plan and any amendments and updates of it to the KAFB Fire Department and the New Mexico Environment Department (the Department).

The Emergency Coordinators (ECs) and Facility Emergency Response Organization (ERO) personnel shall review this Contingency Plan at least annually. The Contingency Plan shall be amended, if necessary, whenever one or more of the following occurs:

1. Applicable regulations or RCRA permit conditions that affect the Plan are revised;
2. There is a significant change in Facility or Permitted Unit design, construction, maintenance, operation, or other circumstance that increases the potential for emergencies or changes the response necessary in an emergency;
3. The list of designated ECs changes;
4. The list of required emergency equipment changes; or
5. Actual implementation of the Contingency Plan during an emergency demonstrates inadequacies or the Contingency Plan fails.

D.3 EMERGENCY RESPONSE PERSONNEL AND SUPPORT AGREEMENTS

The Permittees shall ensure that emergency response personnel and support agreements are available for each Permitted Unit at the Facility as described in this section.

D.3.1 Emergency Coordinator and Responsibilities

The EC shall have thorough familiarity with this Contingency Plan, including the applicable Unit-specific information, Unit layout and operations, the location of records, the locations and characteristics of the hazardous or mixed waste managed at the Unit, and the emergency equipment and supplies. The EC shall have the authority through the Permittees' management to

commit the necessary resources (including personnel, materials, and funds) to respond to an emergency at the Permitted Unit.

During emergencies or until the Facility Emergency Response Incident Commander (IC) arrives and takes control, the EC has three primary responsibilities:

1. **Assess the Situation.** By observing the scene, interviewing personnel, and reviewing records as appropriate, the EC shall gather information relevant to the response, such as the type of event, quantity and type of released material or waste, and actual or potential hazards to human health or the environment.
2. **Protect Personnel.** The EC shall take all reasonable measures to ensure the safety of personnel, such as activating the fire alarm, accounting for personnel, attending to injuries, or coordinating the evacuation of personnel, if necessary. If evacuation is indicated for other personnel outside of a Permitted Unit, the IC must be informed.
3. **Contain or Mitigate the Hazards.** The EC shall take reasonable measures to ensure that fires, explosions, or releases do not occur, recur, or spread.

After emergencies, the EC shall ensure that the Unit and equipment are cleaned, waste is properly managed and disposed of, the Unit is safe to resume operation, and all notifications and reports are provided to the Department, as outlined in Sections D.8, D. 9, and D.13 of this Permit Attachment.

In the event that the EC is not on site or immediately available during an emergency, an alternate EC shall be responsible for conducting the duties of the EC. The names, addresses, and phone numbers of the primary and alternate ECs for each Permitted Unit are included in each Unit-specific Section of this Permit Attachment. A Unit-specific EC or alternate EC shall be on-site or immediately available during the operating hours of each Unit and shall be on call the rest of the time. The ECs shall also be available during non-routine hazardous or mixed waste management operations that may be conducted outside normal operating hours.

D.3.2 Emergency Response Groups

The Facility emergency response organization (ERO) consists of two response groups that respond to an emergency situation: (1) a field response group led by an IC under the Incident Command System and (2) the EOC. The Incident Command System includes Facility security, the KAFB Fire Department, and Facility Permitted Unit personnel; any of these will be deployed in an emergency response as required by the circumstances of the emergency. An IC shall be on site at the Facility at all times (24 hours per day, 7 days per week). Facility security and the KAFB Fire Department personnel are available at all times. Waste management personnel shall be available on-site at the Facility during operating hours at the Permitted Units. The Facility EOC staff shall include personnel who are responsible for the management decisions and notifications to outside parties that are required during an emergency response. Such personnel shall be available on-site at the Facility during operating hours at the Permitted Units, and shall be on call the rest of the time.

In the field, the IC shall maintain overall management and control of response operations at the emergency site once control is relinquished by the EC. The IC shall work in a unified command with the KAFB Fire Department and in concert with safety personnel, the EC, other emergency

responders and waste management personnel to develop and execute response plans, including on-site protective actions and recommendations for off-site protective actions. The Incident Command System or equivalent system shall be implemented at the time an emergency occurs and shall remain in effect until the need for emergency management no longer exists.

D.3.3 Emergency Chain of Command

When the EC is notified of or discovers an incident, he shall first determine if the procedures for emergencies should be implemented. The EC shall manage the emergency response until the IC arrives at the Unit and will relinquish control to the arriving IC. If possible, the EC shall maintain communication with the IC by telephone or radio before the IC arrives at the Unit. The EC shall remain at the Unit as necessary and assist in emergency response as directed by the IC. The EC shall advise the IC, as needed, on Unit operations, Unit layout, characteristics of hazardous or mixed waste on-site, location of records, radio and cellular communication systems, and other information as necessary to respond to the emergency.

The IC is the liaison for communications with other emergency response organizations and functions, including medical and fire protection support. The EC can request both medical and fire protection services, if necessary, at the same time that he notifies the IC of an emergency.

D.3.4 Support Agreements and Coordination with Outside Agencies

The Permittees shall maintain sufficient response resources to handle emergencies arising from hazardous waste management activities as described in this Contingency Plan. These response resources include personnel, emergency equipment, medical facilities, communications systems, and support agreements with off-site agencies and facilities. Permittees shall attempt to establish mutual aid agreements and memoranda of understanding with several off-site agencies and facilities for additional response capabilities for the Facility. Such agencies and facilities include the establishments listed in Table D-1. If the Permittees cannot establish mutual aid agreements or memoranda of understanding through no fault of their own, the Permittees shall maintain in the Operating Record demonstration of the failed attempt.

D.4 EMERGENCY EQUIPMENT

A list of equipment that shall be available through the Facility emergency response system is provided in Table D-2. Lists of emergency equipment that shall be available for use at each Unit are presented below under the Unit-specific Sections of this Permit Attachment.

TABLE D-1 Agreements and Memoranda of Understanding for Emergency Response	
Agency or Facility	**Type of Service**
The New Mexico Department of Public Safety	Mutual aid involving an actual or potential emergency, assistance in training and emergency response for local and tribal governments.
The 377th Air Base Wing, Kirtland Air Force Base	Various types of support, including fire protection, police services, communications, and utilities.
The U.S. Forest Service	Cooperative fire fighting arrangement between the USFS and KAFB for wild land fires.
The City of Albuquerque	Mutual support and responsibilities during a potential or actual emergency requiring the combined resources of DOE and the City of Albuquerque.
Lovelace Medical Center	Mutual cooperation and assistance in providing timely and effective emergency medical services.
Presbyterian Health Care Services	Mutual cooperation and assistance in providing timely and effective emergency medical services.

D.5 CONTINGENCY PLAN IMPLEMENTATION

Anyone who becomes aware of an incident or emergency shall contact facility personnel or the EC immediately. If an incident is determined to be an emergency, the Permittees shall implement evacuation procedures, as appropriate, as described in Section D.7 of this Permit Attachment.

If the EC determines that an emergency situation exists or is imminent at the Unit, the EC shall immediately notify the EOC and activate this Contingency Plan. The methods for contacting emergency response representatives are listed in Table D-2.

TABLE D-2 Facility -Wide Emergency Response Equipment	
Item or Equipment	**Description/Telephone**
Emergency Vehicles (owned by DOE/SNL unless noted)	
Emergency Response Vehicle	Mobile Command Post equipped with communications equipment, located at the Facility. Facility Emergency Response System — Call 911 or (505) 844-0911
Ambulance	Typically located at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Security Vehicles	Vans and trucks equipped with communications equipment and utilized for transportation of personnel and equipment, located throughout SNL. SNL Emergency Response System — Call 911 or (505) 844-0911
Fire Trucks (owned by KAFB Fire Department)	Fire-fighting vehicles outfitted with equipment for fighting fires, located at KAFB fire stations. SNL Emergency Response System — Call 911 or (505) 844-0911
Medical Supplies	
Stretchers/Stokes Litter	Equipment for movement of injured personnel. Stokes litter will immobilize personnel so they may be moved vertically. Typically located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Blankets	Normal blankets, located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Medical Kits	Emergency first-aid supplies, located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Safety Supplies	
Air Packs	Self-contained breathing apparatus for use by personnel entering hazardous atmospheres, located in ambulance or response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911
Monitoring Instruments	Typically located in ambulance or emergency response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911

Note: The Facility EOC is located at Technical Area I (TA-I).

TABLE D-3 Emergency Response System Notification	
Method	**Emergency Number**
Telephone (at Unit)	911
Mobile Telephone	(505)-844-0911
Portable Radio	NA
Automatic notification of emergency response when smoke detector or pull station is activated and/or water flows in sprinkler system, except as noted	NA

Note: Any person in any Unit is authorized to implement the evacuation procedures, notify the Unit-specific EC or alternate EC, or contact the emergency response representatives in the unlikely event that the Unit-specific EC or alternate EC cannot be contacted or respond in a timely manner.

D.6 EMERGENCIES

In the event of an emergency, the EC, a designee, or waste management personnel shall immediately telephone the EOC (by calling 911 or 844-0911) or notify them in some other way. The EC and the IC shall:

1. Determine the extent of the emergency;
2. Identify the character, source, amount, and extent of released materials or waste by observation, records reviews, or chemical analysis;
3. Assess possible resulting hazards to human health or the environment, considering both direct and indirect effects;
4. Take all reasonable measures necessary to ensure fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed waste at the Unit, including collecting and containing released waste, and removing or isolating containers; and
5. Monitor for leaks, pressure buildup, gas generation, and ruptures in equipment.

D.6.1 Fire

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing fire that could threaten human health or the environment:

1. All non-essential personnel shall evacuate following the evacuation routes described in each of the Unit-specific Sections of this Permit Attachment or to an alternate assembly location as directed by the EC. All personnel may evacuate at this time.
2. The EC (or waste management personnel) shall immediately notify the Facility ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and Facility ERO are also notified by activation of automatic fire alarms at the Units.
3. Waste management personnel may consider taking action to put out the fire or minimize its spread only if safe. These actions may be taken only after the IC and KAFB Fire

Department have been notified. Personnel must not jeopardize their own safety or the safety of other personnel.

4. If the fire is small and the fuel source is small, portable fire extinguishers may be used to put out the fire.
5. Fire extinguishers shall only be used by personnel trained in their use, and only for very small fires.
6. Flammable materials shall be removed from the area of fire if safe.
7. Only appropriate fire extinguishers and/or fire extinguishing agents shall be used for water-reactive waste (e.g., Met-L-X, Lith-X, or equivalent).
8. If the fire spreads or increases in intensity, all remaining personnel must evacuate.
9. The EC shall take actions as directed by the IC. Unless directed otherwise, the EC shall remain near the Unit, but at a safe distance, so he can advise personnel responding to the fire of the known hazards.
10. Upon arrival at a fire, the KAFB Fire Department officer-in-charge is in command of fire fighting. DOE/Sandia emergency response and waste management personnel shall advise and assist the KAFB Fire Department, but the officer-in-charge retains the responsibility of selecting the fire-fighting methods and tactics.
11. Hazardous or mixed wastes involved in a fire can be identified in the following ways:
    a) The location of the container may indicate the contents.
    b) If the location does not indicate its contents, the label number can be used to identify the waste.
    c) Records on the contents of each container can be accessed from outside the Unit or in the Unit office.
    d) If the label has been burned and the container cannot be identified, the material or waste shall be treated as an unknown and analyzed according to the methods described in the Waste Analysis Plan under Permit Attachment C.
12. Spills of hazardous or mixed wastes shall be collected and contained by stabilizing or neutralizing the spilled waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.
13. Surfaces affected by released hazardous or mixed wastes shall be cleaned using cleaners appropriate to the wastes.
14. If possible and safe, responding personnel shall take measures to contain potentially hazardous run-off and keep it away from storm drains or sewers (for example, by building dikes around storm drains).
15. Any fire-fighting waters collected in the storm water catchment and retention ponds at the HWHU and RMWMU, the storm water retention tank at the TTU, or the floor trenches at the AHCU shall be analyzed to determine the appropriate method for management and subsequent disposal of the waste water.

D.6.2 Explosion

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing explosion that could threaten human health or the environment:

1. Personnel shall immediately evacuate the area.
2. The EC (or personnel) shall immediately notify the Facility ERO and KAFB Fire

Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO are also notified by activation of automatic fire alarms at the Units.

3. The EC shall take actions as directed by the IC. Unless directed otherwise, the EC shall remain near the Unit, but at a safe distance, so that he or she can advise the response personnel of the hazards involved and the degree and location of the explosion and any fires.
4. Upon arrival at the site, the KAFB Fire Department officer-in-charge is in command of fire fighting. The EC shall advise and assist the KAFB Fire Department, but the officer-in-charge retains the responsibility of selecting the fire-fighting methods and tactics.
5. The IC shall be in overall control of Facility emergency response efforts until the emergency is terminated.
6. Wastes may be stabilized or neutralized, as appropriate; pouring an absorbent over the waste; and sweeping or shoveling the absorbed waste into drums or appropriate containers.
7. Surfaces affected by released hazardous or mixed wastes shall be cleaned using cleaners appropriate to the wastes involved.
8. If possible and safe, personnel shall take measures to contain potentially hazardous runoff and prevent it from entering storm drains, sewers, ditches, or drop inlets(for example, by building dikes around storm drains).
9. Any potentially contaminated waters collected in storm water catchment and retention ponds and tanks or floor trenches shall be analyzed to determine the appropriate treatment and disposal method, as applicable.
10. The EC shall secure all equipment (e.g., process equipment, ventilation equipment) that may be affected by the explosion and any fire once entry has been determined to be safe by the IC or a safety officer.

D.6.3 Uncontrolled Release

The following steps shall be implemented by the EC and Unit personnel in the event of an emergency involving an imminent or existing release of hazardous or mixed waste or hazardous waste constituents that could threaten human health or the environment:

1. Evacuate the immediate area.
2. The EC (or Unit personnel) shall immediately notify the ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and ERO are also notified by activation of automatic fire alarms at the Units.
3. Take actions to minimize, contain, and clean up the release only if safe.
4. Review Facility records (e.g., waste inventory database) to determine the identity and chemical nature of the released material or waste.
5. Wear appropriate personal protective equipment for exposure to the material or waste.
6. If possible, secure the source of the release.
7. If necessary and possible, build a dike to contain runoff.
8. Take measures to contain potentially hazardous runoff and keep it away from storm drains or sewers and if possible, build dikes around the storm drains.
9. Released wastes shall be collected and contained by stabilizing or neutralizing the spilled

waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.

10. No waste that may be incompatible with a released waste shall be treated, stored, or disposed of in the vicinity of the release location until the released waste is cleaned up or stabilized.
11. After collection of a released waste, the release site shall be sampled and evaluated. If contamination is present, the contaminated media shall be characterized and remediated to achieve clean closure as defined in Section 6.2.1 of Permit Part 6. The Permittees may choose to implement an alternative decontamination method for contaminated media such as surface cleaning or in-situ neutralization or stabilization. Any such alternative shall be approved by the Department prior to implementation. If the contaminated media cannot be remediated to achieve clean closure, the contaminated media shall be subject to corrective action as required under Permit Part 8.

D.7 EVACUATION

During an emergency that threatens the health or safety of personnel within a Permitted Unit, the following steps shall be taken to facilitate safe coordinated evacuation:

1. Stop work.
2. If safe, close containers and shut down equipment or otherwise place it in a safe mode.
3. Alert personnel in the affected area by announcing the evacuation by voice command, “Evacuate the area.”
4. Activate the internal communications and alarm systems.
5. Notify the Facility ERO by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO are also notified by activation of automatic fire alarms at the Units.
6. Check whether the evacuation route is safe.
7. If there is no evidence of danger or obstacles, exit the Permitted Unit according to the evacuation routes.
8. If there is evidence of danger or obstacles, exit the Permitted Unit by any safe route available.
9. If safe, check for other personnel in other areas.
10. Proceed to the designated assembly area for roll call to be taken by the EC.
11. If the EC and personnel are assembling at an alternate location, proceed to that location.
12. Inform the EC about any people that may still be inside the Permitted Unit.
13. Do not re-enter the Permitted Unit until the IC determines that is safe.

D.8 COORDINATION WITH OFF-SITE PARTIES AND EMERGENCY NOTIFICATION

The Permittees shall verbally inform the City of Albuquerque, KAFB command, and Isleta Pueblo immediately, in the event that residents of Albuquerque or Isleta Pueblo, or workers at KAFB could be affected. The notification shall include available information about the nature and location of the emergency, the materials and wastes involved, and the recommended protective actions and any relevant information listed in Section 1.9.9 of Permit Part 1 and

Section 2.13 of Permit Part 2. Protective actions may include evacuation or sheltering indoors with doors and windows closed and ventilation systems shut off.

The Permittees shall verbally notify the New Mexico Department of Public Safety (1-505-827-9329) and the National Response Center (1-800-424-8802) in accordance with 40 CFR 264.56(d) if human health or the environment outside the SNL Facility is threatened. The notification shall include a description of the emergency with the following information:

1. Name, address, and telephone number of the owner or operator, and name and telephone number of person making the report;
2. Name and address of the Facility;
   c). time and type of incident;
   d). name and quantity of material(s) involved, to the extent known;
   e). the extent of injuries, if any;
   f). the possible hazards to human health, or the environment, outside the Facility.

Further, the Permittees shall also provide this information to the Department.

D.8.1 Post-Emergency Actions

Immediately after an emergency, the EC and when present, the IC, shall:

1. Continue to monitor for leaks, pressure buildup, gas generation, and ruptures in valves, pipes, or other equipment as appropriate until normal operations are resumed;
2. Provide for proper treatment, storage, or disposal of recovered material or waste, contaminated soil or surface water, or any other media or material;
3. Ensure that no waste that may be incompatible with the released material or waste is transferred to, treated at, or stored at the Permitted Unit in the vicinity of the release location until normal operations are resumed; and
4. Ensure that all equipment that is listed in this Permit Attachment is fit for its intended use.

Before resuming hazardous waste management operations at the Permitted Unit after an emergency, the Permittees shall notify the Department.

D.9 EMERGENCY RESPONSE RECORDS AND REPORTS

The time, date, and details of an emergency that require implementation of this Contingency Plan shall be noted in the Operating Record maintained for the affected Unit. Within fifteen (15) calendar days following the emergency, a written report shall be submitted to the Department in hard copy or via e-mail identifying:

1. Name, address, and telephone number of the reporter;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of the emergency (e.g., fire, explosion, release);
4. Name and quantity of material(s) and wastes involved;
5. Extent of injuries (if any);
6. Assessment of actual or potential hazards to human health or the environment, where applicable; and

7. Estimated quantity and disposition of recovered material, contaminated media, and wastes that resulted from the emergency.

D.10 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE HAZARDOUS WASTE HANDLING UNIT

This Section contains additional information for the Hazardous Waste Handling Unit (HWHU). Current copies of this Contingency Plan shall be maintained at the HWHU and at the Facility EOC.

Figure 43 of Permit Attachment L (*Figures*) presents the evacuation routes for the HWHU. Figure 44 of Permit Attachment L (*Figures*), illustrates the HWHU emergency response and access information locations. The Permittees shall maintain at the HWHU the emergency equipment listed in Table D-4 of this Permit Attachment. The Permittees shall keep current the list of ECs for the HWHU in Table D-5 of this Permit Attachment.

TABLE D-4
Emergency Equipment to be Maintained at the HWHU

Category	Description	Location
Building 958		
Spill Control and Decontamination Equipment	Fixed shower / eyewash	Near south entrance
	Recovery drums and containers	In equipment storage at the HWHU
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In equipment storage at the HWHU
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the HWHU
	Self-contained breathing apparatus (SCBA)	At south entrance
	Miscellaneous personal protective equipment (protective suits, goggles, and/or safety glasses, gloves)	In equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	On the walls near north and south personnel doors
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	One on the interior walls near the north and south entrances
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	On the walls near north and south personnel doors
Fire Extinguishers	Portable (A-B-C)	One at both the north and south entrances
Fire Suppression	Automatic wet-pipe water sprinkler system, with heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	One hydrant, location shown in Figure 44 of Permit Attachment L (*Figures*)

TABLE D-4 Emergency Equipment to be Maintained at the HWHU		
Category	**Description**	**Location**
Building 959		
Spill Control and Decontamination Equipment	Fixed shower/eyewash	Near south entrance
	Recovery drums and containers	In equipment storage at the HWHU
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In equipment storage at the HWHU
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the HWHU
	SCBA	In equipment storage at the HWHU
	Miscellaneous personal protective equipment (protective suits, goggles, and/or safety glasses, gloves)	In equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers).	On the walls near each personnel door and one inside the office area
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	One in the office
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers).	On the walls near each personnel door
Fire Extinguishers	Portable (A-B-C)	One at both the north and south entrances
	Portable (D)	One in the general use area, one in the office
Fire Suppression	Automatic wet-pipe water sprinkler system, heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	One hydrant, location shown in Figure 44 of Permit Attachment L (*Figures*)
Modular Storage Buildings (958B and 958C)		
Spill Control and Decontamination Equipment	Personal protective equipment Recovery drums and containers Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present) and spill cleanup items	Buildings 958 and 959, equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull-boxes (pulling handle sends signal to KAFB fire department, does not actuate system).	Buildings 958 and 959
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	Buildings 958 and 959
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 958 and 959

TABLE D-4 Emergency Equipment to be Maintained at the HWHU		
Category	**Description**	**Location**
Fire Suppression	Ansul automatic dry chemical system	Coverage throughout the building

TABLE D-5 Emergency Coordinator List for the HWHU			
HWHU Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	David Castillo Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 284-4192 (office) (505) 269-1705 (cell) (505) 951-6340 (pager)	(505) 269-1705
First Alternate Office Address:	Ken Tetreault Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 844-1346 (office) (505) 270-4089 (cell) (505) 283-1949 (pager)	(505) 822-6336
Second Alternate Office Address	Chris Dean Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 284-8083 (office) (505) 350-4982 (cell) (505) 283-1942 (pager)	(505) 268-8913
Third Alternate Office Address	Mary Ann Krauss Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 845-9997 (office) (505) 250-2422 (cell) (505) 951-6335 (pager)	(505) 299-0793

D.11 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE THERMAL TREATMENT UNIT

This Section contains additional information for the Thermal Treatment Unit (TTU). Current copies of this Contingency Plan shall be maintained at the TTU and at the Facility EOC.

Figure 45 of Permit Attachment L (*Figures*) presents the evacuation routes for the TTU. The Permittees shall maintain at the TTU the emergency equipment listed in Table D-6 of this Permit Attachment. The Permittees shall keep current the list of ECs for the TTU in Table D-7 of this Permit Attachment.

D.12 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

This Section contains additional information for the Radioactive and Mixed Waste Management Unit (RMWMU). Current copies of this Contingency Plan shall be maintained at the RMWMU and at the Facility EOC.

Figure 46 of Permit Attachment L (*Figures*) presents the evacuation routes for the RMWMU. The Permittees shall maintain at the RMWMU the emergency equipment listed in Table D-8 of this Permit Attachment. The Permittees shall keep current the list of ECs for the RMWMU in Table D-9 of this Permit Attachment.

TABLE D-6
Emergency Equipment to be Maintained at the TTU Building 6715

Category	Description	Location
Safety and Decontamination Equipment	Permanent eyewash/hand-held deluge showers	Building 6715
	First aid kit	Building 6715
	Absorbent (sufficient absorbent for 20.8 gallons of liquid that could be present in the burn pan)	Building 6715
	Recovery drums and containers	In equipment storage at Building 6715
	Spill cleanup items (mops, brooms, and/or shovels)	Building 6715 equipment storage
	Miscellaneous PPE (protective suits, goggles, gloves)	Building 6715
Internal Communication and Alarm System	Fire alarm pull station (pulling handle sends signal to KAFB fire department)	One on east wall inside Building 6715 near personnel door
	Public address system	Microphone in Building 6715
External Communication System	Telephones	Building 6715
	Fire alarm pull station (pulling handle sends signal to KAFB fire department)	Near personnel doors in Building 6715.
Fire Extinguishers	Portable (A-B-C)	One at or near each personnel door in Buildings 6715, one located at the TTU fence.
Fire Suppression	Water supplied by fire hydrant	One hydrant, location is shown in Figure 45, Attachment L (*Figures*)

TABLE D-7
Emergency Coordinator List for the TTU

TTU Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Tim Covert Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-4664 (office) (505) 951-7315 (pager)	(505) 506-5907
First Alternate Office Address:	David Castillo Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-4192 (office) (505) 951-6340 (pager)	(505) 269-1705
Second Alternate Office Address:	Daniel Dow Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1622 (505) 951-6781 (pager)	(505) 892-0497

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
Building 6920		
Spill Control and Decontamination Equipment	Eyewash Stations/ Showers	On north wall in south bay Near office in north bay
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In hallway between north and south bays
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	In hallway between north and south bays
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay In southwest corner of southwest airlock By personnel door in west mechanical room By personnel door on north wall of north bay By personnel door in entryway west of office
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Control room, south and north bays
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay In southwest corner of southwest airlock By personnel door in west mechanical room By personnel door on north wall of north bay By entryway west of office
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay By personnel door in southwest corner of south bay In hallway between north and south bays By personnel door in west mechanical room
	Portable (D)	In northwest corner of north bay
	Portable (A-B-C)(D)	By personnel door on north wall of north bay
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the building

TABLE D-8 Emergency Response Equipment to be Maintained at the RMWMU		
Category	**Description**	**Location**
	Water supplied by fire hydrants	Three hydrants, Figure 47 of Permit Attachment L (*Figures*)
Building 6921		
Spill Control and Decontamination Equipment	Eyewash Station/Shower	On north wall of assay area
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By north wall of assay area
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	By north wall of assay area
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in electrical/mechanical room In central hallway outside restrooms In northwest corner of assay area By east personnel door in southeast counting room By east personnel door in middle east office area
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Office and lab areas
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in electrical/mechanical room In central hallway outside restrooms In northwest corner of assay area By east personnel door in southeast counting room By east personnel door in middle east office area
Fire Extinguishers	Portable (A-B-C)	By north personnel door in electrical/mechanical room In hallway between assay area and north office area By northwest personnel door of assay area By east personnel door in southeast counting room
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 (*Figures*) of Permit Attachment L
Building 6925		
Spill Control and	Portable Eyewash	By personnel door near center of south wall

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
Decontamination Equipment	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By personnel door near center of south wall
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	By personnel door near center of south wall
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southwest corner of building By personnel door near center of south wall
	Audible fire alarms	Located on east and west wall
External Communication System	Telephone	By personnel door in southwest corner of building
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southwest corner of building By personnel door near center of south wall
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door in southwest corner of building
	Portable (A-B-C)(D)	By personnel door near center of south wall
Fire Suppression	Automatic dry-pipe sprinkler system with heat-actuated sprinklers	Sprinklers located throughout building
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 of Permit Attachment L (*Figures*)
Building 6926		
Spill Control and Decontamination Equipment	Eyewash Station/Shower	In southeast area of building
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In southeast area of building 6926
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	In southeast area of building 6926
Internal Communication	Voice command	

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
and Alarm System	Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door on west wall of building By personnel door on south wall of building
	Audible fire alarms	Located on east wall and west wall
External Communication System	Telephone	In southeast area of building 6926
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door on west wall of the building By personnel door on south wall of the building
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door on west wall of the building
	Portable (A-B-C)(D)	By personnel door on south wall of building
Fire Suppression	Automatic dry-pipe sprinkler system with heat-actuated sprinklers	Sprinklers located throughout building 6926
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 of Permit Attachment L (*Figures*)
Modular Storage Buildings		
Spill Control and Decontamination Equipment	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	Buildings 6920 and 6926
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	Buildings 6920 and 6926
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 6920, 6921, 6925, and 6926
	Audible fire alarms	Buildings 6920, 6921, 6925, and 6926
External Communication System	Telephones	Buildings 6920 and 6926
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 6920, 6921, 6925, and 6926
Fire Suppression	Automatic dry chemical system	Coverage throughout the building

TABLE D-9 Emergency Coordinator List for the RMWMU			
RMWMU Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	Leroy Duran Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1488 (office) (505) 951-6297 (pager)	(505) 980-4401
First Alternate Office Address:	Phil Zelle Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-2486 (office) (505) 951-6248 (pager)	(505) 615-7445
Second Alternate Office Address:	Jesse Farr Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3041 (office) (505) 951-6336 (pager)	(505) 379-8913
Third Alternate Office Address:	Jeff Jarry Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3080 (office) (505) 951-6332 (pager)	(505) 697-2108

D.13 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE AUXILIARY HOT CELL UNIT

This Section contains additional information for the Auxiliary Hot Cell Unit (AHCU). Current copies of this Contingency Plan shall be maintained at the AHCU and at the Facility EOC.

Figure 48 of Permit Attachment L (*Figures*) presents the evacuation routes for the AHCU. The Permittees shall maintain at the AHCU the emergency equipment listed in Table D-10 of this Permit Attachment. The Permittees shall keep current the list of ECs for the AHCU in Table D-11 of this Permit Attachment. Facility security officers shall provide unimpeded access to the AHCU for authorized personnel as directed by the IC.

TABLE D-10 Emergency Equipment to be Maintained at the AHCU		
Category	**Description**	**Location**
Building 6597		
Spill Control and Decontamination Equipment	Fixed shower/eyewash	Near north entrance to Building 6597 high bay
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	Near north entrance to Building 6597 high bay
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage in Building 6597
	Recovery drums and containers	In equipment storage in Building 6597
	Personal protective equipment (goggles and/or safety glasses, gloves)	Near north entrance to Building 6597 high bay
Internal Communication and Alarm System	Voice communication	
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	One near each exit door Building 6597 high bay
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Near north entrance to Building 6597 high bay
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	One near each exit door to Building 6597 high bay
Fire Extinguishers	Portable (A-B-C)	By personnel doors on the east, south, and west walls
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the high-bay in Building 6597
	Sprinkler head	Hot Cell
	Sprinkler head	In fume hood
	Branch line from the Building 6597 sprinkler system	Temporary Room
	Water supplied by fire hydrant	One hydrant, location shown on Figure 49 of Permit Attachment L (*Figures*)

TABLE D-11 Emergency Coordinator List for the AHCU			
AHCU Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	David Siddoway Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 844-2713- (office) (505) 343-9316 (pager)	(505) 867-0828
First Alternate Office Address:	Michael Torneby Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 845-3254 (office) (800) 343-9371 (pager)	(505) 823-2451

TABLE D-12 Emergency Equipment to be Maintained at the MSBs		
Category	**Description**	**Location**
Spill Control and Decontamination Equipment	Portable Eyewash	By inner door inside each bunker
	Personal protective equipment (chemical-resistant gloves and safety glasses)	By inner door inside each bunker
	Absorbents (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By inner door inside each bunker
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel.
	Smoke Detectors	Smoke detectors inside each bunker Strobe light on front outside each bunker
External Communication System	Mobile telephone or portable radio	Available to all operating personnel at the bunkers
Fire Extinguishers	Portable (A-B-C)	By entrance door outside each bunker
Fire Suppression	Water to extinguish fires	KAFB tanker truck at the KAFB fire station in the Manzano administrative area

TABLE D-13 Emergency Coordinator List for the MSBs			
MSB Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	Leroy Duran Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1488 (office) (505) 951-6297 (pager)	(505) 980-4401
First Alternate Office Address:	Phil Zelle Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-2486 (office) (505) 951-6248 (pager)	(505) 615-7445
Second Alternate Office Address:	Jesse Farr Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3041 (office) (505) 951-6336 (pager)	(505) 379-8913
Third Alternate Office Address:	Jeff Jarry Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3080 (office) (505) 951-6332 (pager)	(505) 697-2108

D.14 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE MANZANO STORAGE BUNKERS

This Section contains additional information for the Manzano Storage Bunkers (MSBs). Current copies of this Contingency Plan shall be maintained at each MSB and at the Facility EOC.

Figure 50 of Permit Attachment L (*Figures*) presents the evacuation routes for each MSB. The Permittees shall maintain at each MSB the emergency equipment listed in Table D-12 of this Permit Attachment. The Permittees shall keep current the list of ECs for each MSB in Table D-13 of this Permit Attachment.

D.15 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE CAMU

This Section contains additional information for the Corrective Action Management Unit (CAMU). Current copies of this Contingency Plan shall be maintained at the CAMU administrative trailer and the Facility EOC.

The CAMU is a remediation-waste management unit that is located about 100 yards northwest of the adjacent chemical waste landfill (CWL). Emergency response resources for the CAMU are shared with the CWL.

Figure 51 of Permit Attachment L (*Figures*) presents the evacuation routes for the CAMU. The Permittees shall maintain at the CAMU the emergency equipment listed in Table D-14 of this Permit Attachment. The Permittees shall keep current the list of ECs for the CAMU in Table D-15 of this Permit Attachment.

TABLE D-14
Emergency Equipment to be Maintained at the CAMU

Category	Description	Location
Spill Control Equipment	Spill control materials, including sorbent material, brooms and shovels	Leachate Storage Area Shed
Fire Extinguisher	Portable, Multi-Class	One near the Leachate Storage Area and Containment Cell, and one in CAMU office
Communications: (Internal/External)	Mobile telephone or portable radio or equivalent	Carried by personnel as needed
	Telephone	CAMU office
Water Supply	Fire Hydrant	One outside the southeast entrance to the CAMU
Environmental Safety and Health	Portable eyewash station	Leachate Storage Area Shed (during waste handling activities)
Evacuation	Voice command by on-site personnel or signaled by three blasts of a vehicle warning horn.	Designated Assembly Area (See Figure 51 in Permit Attachment L (*Figures*)

TABLE D-15
Emergency Coordinator List for the CAMU

CAMU Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Don Schofield Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-4088 (office) (505) 259-7098 (cell) (505) 951-6153 (pager)	(505) 268-6888
First Alternate Office Address:	Robert Ziock Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 845-0485 (office) (505) 238-3668 (cell) (505) 951-6160 (pager)	(505) 255-4714
Second Alternate Office Address:	Daneille Nieto Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 845-7706 (office) (505) 239-3989 (cell) (505) 951-6537 (pager)	(505) 239-3989

PERMIT ATTACHMENT E INSPECTION PLAN

E.1 INTRODUCTION

In accordance with the requirements of 40 CFR §§ 264.15, 264.174, and 264.602 the Permitted Units shall be inspected for malfunctions and deterioration, operator errors, and discharges that may be causing, or may lead to, a release of hazardous or mixed waste or hazardous waste constituents to the environment or a threat to human health. Inspections shall be of items including, but not limited to, monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment important to prevent, detect, and respond to environmental and human health hazards. Containers of hazardous and mixed waste stored at a Permitted Unit shall also be routinely inspected to assess, secondary containment, location with respect to incompatible wastes, and compatibility of waste with containers. Unit-specific inspection requirements for all units are found below.

A copy of this Permit Attachment shall be maintained at each Permitted Unit.

1. Hazardous Waste Handling Unit (HWHU),
2. Thermal Treatment Unit (TTU) (records in Building 6715),
3. Radioactive and Mixed Waste Management Unit (RMWMU),
4. Auxiliary Hot Cell Unit (AHCU), and
5. Each Manzano Storage Bunker (MSB, 37034, 37045, 37055, 37057 and 37118).
6. The Corrective Action Management Unit (CAMU) main office.

E.2 INSPECTION RECORDS

The Permittees shall conduct inspections and record the results on inspection forms. The inspection forms shall identify the items to be inspected, and at a minimum, must include the items or parameters specified for each of the permitted units as shown in Tables E-1 through E-6. The following information shall also be recorded on inspection forms.

1. Name of the inspector,
2. The date and time of inspection,
3. Notation of observations and results of the inspection, and
4. The date and nature of any repairs or remedial actions.

Inspection records shall be maintained at the Facility for the active life of the Facility, except as provided by 20.4.1.501.A(5) NMAC, Permit Section 7.2.2 and Permit Attachment H (Post-Closure Care Plans for the Corrective Action Management Unit). Current calendar year inspection records for each Permitted Unit shall be maintained at that Unit. All other inspection records shall be maintained in the Operating Record.

E.3 REMEDIAL ACTION

A response indicating the condition of each item subject to inspection requirements shall be entered in the appropriate column on an inspection form. If any defects, deterioration, damage, release of hazardous or mixed waste or constituents, or potential hazards are discovered during an inspection, the Permittees shall take corrective action in a timely manner upon discovery to

ensure that the problem does not lead to an environmental or human health hazard or noncompliance with this Permit. Actions taken shall, as appropriate, include evaluation and removal of accumulated liquids from secondary containment, transfer of waste from a defective container to an appropriate container in good condition, and repair or replacement of nonfunctioning equipment or systems. If an inspection reveals that a non-emergency problem has developed, corrective action including repairs, maintenance, and replacement shall be completed as soon as practical to preclude further damage.

Corrective action taken (along with time, date, results, and other pertinent information) in response to conditions discovered during an inspection shall be recorded in the appropriate section of the inspection form on which the condition requiring corrective action was first noted or the first inspection form completed following implementation of the corrective action.

E.4 INSPECTION SCHEDULE AND REQUIREMENTS FOR PERMITTED UNITS

The schedules described in this section and indicated on Tables E-1 through E-6 shall be followed for the inspection of the Units noted in Section E.1 of this Permit Attachment.

E.4.1 Daily Inspection

During each day that hazardous wastes or mixed wastes are handled (e.g., containers are opened or moved) at a Permitted Unit the Permittees shall inspect:

1. The loading/unloading areas that were used, including waste handling equipment, and the containers loaded/unloaded;
2. Treatment areas that were used, including treatment equipment and monitoring equipment.

E.4.2 Weekly Inspection

During each week that hazardous waste or mixed waste management (including storage) occurs at a Permitted Unit the Permittees shall at least inspect once weekly: container storage, including container placement, integrity, sealing, labeling, dates of storage, condition of storage area (i.e., floors, walls), secondary containment (liquid waste), waste compatibility and container compatibility storage conditions.

E.4.3 Monthly Inspection

During each month that hazardous waste or mixed waste management occurs at a Permitted Unit the Permittees shall at least once inspect monthly:

1. Safety & Emergency Equipment, including spill control equipment, fire extinguishers, decontamination equipment, external communication systems, internal communication and alarm systems, and fire suppression systems;
2. Security devices, including the perimeter fence, gates and doors, warning signs, locks and tamper indication devices;
3. Unit operation and structural equipment, including the floors, walls, ceilings;
4. Treatment areas, including general conditions (floors, walls), treatment equipment and tools, and monitoring equipment.

E.5 INSPECTION PLAN FOR THE HAZARDOUS WASTE HANDLING UNIT

Specific items and areas that shall be inspected at the HWHU, and the inspection criteria and frequency are listed in Table E-1 of this Permit Attachment. The items listed in the subject Table shall be inspected in each HWMU waste management area.

TABLE E-1
Inspection Schedule for the Hazardous Waste Handling Unit

ITEM OR PARAMETER	INSPECTION CRITERIA	INSPECTION FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT **See Table D-4 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, and in good condition	Monthly
Self-contained breathing apparatus	Present and in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly
OPERATING AND STRUCTURAL EQUIPMENT **Buildings 958, 959, 958B, and 958C**		
Building / storage area floor	Clean, no spills, cracks, or excessive wear	Weekly when and where wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Shelves (Building 959 only)	Clean, in good condition, no accumulated leaks or spills	Daily when and where wastes are handled. Weekly otherwise.

TABLE E-1 Inspection Schedule for the Hazardous Waste Handling Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Secondary containment	Free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Monitoring equipment	Instruments in good condition, operational, calibrated	Daily when and where wastes are handled. Monthly otherwise.
Waste transfer pump	Present, operational, and in good condition	Prior to use, Monthly otherwise.
Storm water retention pond	Good condition, adequate freeboard, outlet not obstructed, no evidence of release of hazardous or mixed waste	Weekly
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates and doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.6 INSPECTION PLAN FOR THE THERMAL TREATMENT UNIT

The Permittees shall perform inspections of the Thermal Treatment Unit (TTU) in accordance with the schedule and requirements in Table E-2.

TABLE E-2 Inspection Schedule for the Thermal Treatment Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT See Table D-6 in Permit Attachment D for additional information		
Eye wash and safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Spill control and cleanup items	Present, accessible, quantities per inventory, in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Public address system	Operational	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Prior to treatment. Monthly otherwise
OPERATING AND STRUCTURAL EQUIPMENT		
Waste transfer pump	Present, operational, and in good condition	Prior to use
Waste transfer tubes	Free of apparent leaks and in good condition	Prior to use
Burn pan	Present, free of apparent leaks, and in good condition	Prior to treatment. Monthly otherwise.
Burn pan lid	Operational and in good condition	Prior to treatment. Monthly otherwise.
Burn cage	Present and in good condition	Prior to treatment. Monthly otherwise.
Burn cage door	Operational and in good condition	Prior to treatment. Monthly otherwise.
Steel-lined concrete pad	No cracks and in good condition	Monthly
Filter element	Present, free of tears or holes, and in good condition	Monthly
Rain catch tank	Free of apparent leaks and in good condition	Monthly
Area condition	Free of combustible materials and weeds and in good condition	Prior to treatment. Monthly otherwise.
Red warning beacons	Present and operational	Prior to treatment. Monthly otherwise.

TABLE E-2 Inspection Schedule for the Thermal Treatment Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Water spigot and hose	Present, operational, and in good condition	Prior to treatment. Monthly otherwise.
Burner control warning bell	Operational	Prior to treatment. Monthly otherwise.
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly

E.7 INSPECTION PLAN FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

The Permittees shall perform inspections of the Radioactive and Mixed Waste Management Unit (RMWMU) in accordance with the schedule and requirements in Table E-3.

TABLE E-3 Inspection Schedule for the RMWMU		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-8 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, accessible, quantities per inventory, in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly

TABLE E-3 Inspection Schedule for the RMWMU		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly
OPERATING AND STRUCTURAL EQUIPMENT		
Building / storage area floor	Clean, no spills, cracks, or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Treatment area	Good condition, clean, uncluttered, no spills	Prior to treatment. Monthly otherwise.
Treatment equipment	Good condition (i.e., no releases or deterioration); or present if in storage	Daily when and where wastes are treated. Prior to use for consumables and items that have been stored. Monthly otherwise.
Monitoring equipment	Instruments in good condition, operational, calibrated	Daily when and where wastes are handled. Monthly otherwise.
Storm water retention pond	Good condition, adequate freeboard, outlet not obstructed, no evidence of release of hazardous or mixed waste	Weekly.
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates and doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly.
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly.
Labeling	Correct information, correct location, legible	Weekly.
Secondary Containment (liquid waste)	Adequate volume, free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise. .

TABLE E-3 Inspection Schedule for the RMWMU		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly.
Location	Correct aisle space, stable stacking	Weekly.

E.8 INSPECTION PLAN FOR THE AUXILIARY HOT CELL UNIT

The Permittees shall perform inspections of the Auxiliary Hot Cell Unit (AHCU) in accordance with the schedule and requirements in Table E-4. The items listed in Table E-4 shall be inspected in each AHCU waste management area.

In order to reduce the radiation exposure to levels as low as reasonably achievable (ALARA), the Permittees may conduct alternative inspections of the storage silos. When necessary to reduce radiation exposure for ALARA requirements, instead of inspecting the silos directly, the Permittees may visually inspect waste containers before they are placed in the silos and when they are removed from the silos. The visual inspection may be conducted from a safe distance or remotely via camera to maintain ALARA conditions for personnel.

TABLE E-4 Inspection Schedule for the Auxiliary Hot Cell Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-10 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational and in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, and in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly

TABLE E-4 Inspection Schedule for the Auxiliary Hot Cell Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
OPERATING AND STRUCTURAL EQUIPMENT		
Building / storage area floor, tops of silo covers	Clean, no spills, cracks, or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Treatment area	Good condition, clean, uncluttered, no spills	Prior to treatment. Monthly otherwise.
Treatment equipment	Good condition (i.e., no releases or deterioration)	Daily when and where wastes are treated. Prior to use for consumables. Monthly otherwise.
SECURITY DEVICES		
Warning signs	Present, legible, and in good condition	Monthly
Doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Secondary Containment (liquid waste)	Adequate volume, free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise.
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.9 INSPECTION PLAN FOR THE MANZANO STORAGE BUNKERS

The Permittees shall perform inspections of the Manzano Storage Bunkers (MSB) in accordance with the schedule and requirements in Table E-5.

TABLE E-5 Inspection Schedule for the Manzano Storage Bunkers		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-12 in Permit Attachment D for additional information**		
Portable eye wash	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, accessible, in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Smoke detector and external light	Present, appears to be in good condition	Monthly
Fire extinguisher	Present, charged, accessible, and in good condition	Monthly
OPERATING AND STRUCTURAL EQUIPMENT		
Bunker floor	Clean, no spills or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Bunker walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Bunker ceiling	Not leaking or spalling, and in good condition	Weekly when wastes are managed. Monthly otherwise.
Bunker lights	Operational and in good condition	Weekly when wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
SECURITY DEVICES		
Warning signs	Present, legible, and in good condition	Monthly
Doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Secondary	Adequate volume, free of liquids, good	Daily when and where wastes are

TABLE E-5 Inspection Schedule for the Manzano Storage Bunkers		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Containment (liquid waste)	condition (i.e., no cracks, excessive wear)	handled. Weekly otherwise.
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.10 INSPECTION PLAN FOR THE CORRECTIVE ACTION MANAGEMENT UNIT

E.10.1 Inspection, Maintenance, and Repair Activities and Frequencies

The CAMU shall be routinely inspected during the post-closure care period as discussed in the following sections. The CAMU systems associated with the containment cell that will require inspection and maintenance/repair during the post-closure care period include, but are not limited to: (1) the final cover; (2) surface-water diversion structures; (3) the LCRS; (4) the VZMS; and (5) the perimeter security fence, security signs, and gate locks. Inspection and maintenance of all of these systems shall be performed throughout the post-closure care period in accordance with the schedule in Table E-6. Inspections shall be performed on a regularly scheduled basis to ensure the integrity and proper functioning of the waste containment cell and final cover, surface water diversion structures, the LCRS, the VZMS, and the perimeter fence, security signs and gate locks. Maintenance activities are addressed in more detail in Permit Attachment H.

E.10.2 Final Cover System Inspection

The final cover shall be inspected on a quarterly basis. Cover inspections shall note, in writing, deep-rooted plants (with roots at least 8 ft deep at maturity), such as shrubs and trees, by identifying such species; whether there is any settlement of the cover surface in excess of 6 inches; whether animal intrusion burrows in excess of 4 inches in diameter or burrows of species able to burrow 6 ft or deeper are present; erosion of the cover soil in excess of 6 inches deep; contiguous areas with no vegetation in excess of 200 square feet; and any other conditions that may impact the cover's integrity and performance.

The final cover shall also undergo vegetation monitoring quarterly until the vegetative cover is successfully established according to the following criteria:

1. Total percent foliar coverage equals 20 percent (i.e., 20 percent of the land surface is covered with living plants versus 80 percent bare surface area);
2. Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and
3. No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet) are present.

If these criteria are met, it shall be concluded that the native community is successfully established on the cover. After the native community is successfully established, full biological inspections shall be conducted annually.

E.10.3 Storm-Water Diversion Structures Inspection

The storm-water diversion structures shall be inspected on a quarterly basis to verify structural integrity and to ensure adequate performance. Inspections shall note, in writing, whether there is any erosion of the channels or sidewalls in excess of 6 inches deep and whether there is any accumulation of silt greater than 6 inches deep or debris that blocks more than one-third of the channel width.

E.10.4 LCRS Inspection

As described in Section A.7.3.1 of Permit Attachment A, the LCRS shall be inspected on a quarterly basis for the presence of leachate using the LCRS pump. For inspection purposes, the LCRS pump shall be manually activated on at least a quarterly basis and on a schedule consistent with the inspection and maintenance schedule for the LCRS outlined in Table E-6 of this Permit Attachment. When the pump is manually activated, leachate will be removed from the sump until the LCRS pump experiences cavitation. At this point the pump will be deactivated and leachate removal will cease. When the pump is manually activated and no leachate is generated a video camera inspection shall be performed to determine whether the pump is experiencing cavitation due to an insufficient leachate level or whether the pump has malfunctioned. If the pump has malfunctioned, the cause of the malfunction shall be determined, and the pump replaced or repaired as necessary. The pump assembly may be removed and properly stored until needed.

E.10.5 VZMS Inspection

During quarterly monitoring events (see Table E-6 of this Permit Attachment), the VZMS components shall be inspected. The inspection shall note, in writing, the condition of the components including protective casings, access covers and doors, instrumentation access boxes, compression caps, locks, and electronic monitoring systems.

E.10.6 Security Fence Inspection

The fence, gates, and warning signs shall be inspected on a quarterly basis. The inspections shall document, in writing, the condition of the fence, including fence wires, posts, gates, gate locks, and warning signs, and note whether there is any excessive accumulations of wind-blown plants and debris that would obscure warning signs, block access to the CAMU containment cell, or would interfere with any waste management activities or with any of the VZMS components or monitoring of any kind.

Table E-6
CAMU Post-Closure Inspection and Maintenance/Repair Schedule

CAMU System to be Inspected	Inspection Parameters	Inspection Frequency	Maintenance/Repair Implementation	Maintenance/Repair Frequency
Final Cover System	Existence of invasive plants or plants with the potential for forming deep roots (at least 8 ft deep at maturity)	Quarterly	Physically remove or otherwise eliminate the invasive or deep-rooting plant	Within 60 days of identification or as soon as seasonal conditions are most favorable for eliminating the plants.
	Settlement of cover surface in excess of 6 inches		Repair cover system damage that exceeds prescribed limits, relocate animals if possible and repair burrows	Within 60 days of discovery of needed repairs[b]
	Animal intrusion burrows in excess of 4 inches in diameter or burrows that appear to be of species able to burrow 6 ft or greater)			
	Erosion of cover soil in excess of 6 inches deep			
	Contiguous areas of no vegetation >200 ft^2		Revegetate barren areas that exceed prescribed limits	Within 60 days of discovery of needed repairs or as soon as possible if seasonal conditions are not appropriate within 60 days
Final Cover System	Full biological inspection, including: Approximate percentage vegetative coverage (actively photosynthesizing) Approximate percentage native vegetation of the total vegetative cover Main plant species growing on the CAMU cover and the approximate percentage of the cover populated by each species.	Annually[a]	Remove plants, revegetate barren areas, relocate animals if possible and repair burrows, augment soil and/or reseed per biologist recommendations	Follow schedule above for each item.
Storm-Water Diversion Structures	Channel or side-wall erosion in excess of 6 inches deep	Quarterly	Repair erosion that exceeds prescribed limits	Within 60 days of discovery of needed repairs[b]
	Accumulations of silt in excess of 6 inches deep		Remove silt and debris accumulations that exceed prescribed limits	
	Debris that blocks more than 1/3 of channel width.			

Table E-6
CAMU Post-Closure Inspection and Maintenance/Repair Schedule

CAMU System to be Inspected	Inspection Parameters	Inspection Frequency	Maintenance/Repair Implementation	Maintenance/Repair Frequency
LCRS	Leachate in sump	Monthly / Quarterly[c]	Manually activate pump/inspect for leachate collection	Monthly/Quarterly
	Pump	Quarterly	Maintain/repair pump	Within 60 days of discovery of needed repairs[b]
	Plumbing		Maintain/repair plumbing	
VZMS	Protective casings Access covers and doors Instrumentation access boxes Compression caps	Quarterly	Maintain/repair protective casings, access covers and doors, instrumentation access boxes, and compression caps	Within 60 days of discovery of needed repairs[b]
	Locks		Clean/replace locks	
	Electronic monitoring systems		Maintain calibration and proper operating condition of electronic monitoring systems	
	Aboveground VZMS components		Ensure aboveground VZMS components are protected from weather	
	Monitoring equipment (pump, tubing, gauges, valves, etc.) in need of repair/maintenance			
Security Fence	Presence of wind-blown plants and debris	Quarterly	Remove wind-blown plants and debris	Within 60 days of discovery of needed repairs[b]
	Condition of fence wires, posts, gates, gate locks, and warning signs		Repair broken wire sections and posts Repair and oil gates Clean or replace locks Repair or replace warning signs	
Safety and Emergency Equipment See Table D-14 in Permit Attachment D for additional information	Spill control materials, including sorbent material, brooms and shovels are present, accessible, and in good condition	Monthly	Repair or replace	As soon as possible, but no later than 10 work days.
	Fire extinguisher is present, charged, accessible, and in good condition			
	Portable eyewash station is operational and in good condition			

a This inspection will be conducted quarterly until the vegetative cover is successfully established and annually thereafter.
b Maintenance/repairs shall be performed as necessary, based upon the results of inspections.
c The LCRS pump and plumbing shall be maintained/repaired based upon the results of quarterly inspections.
CAMU Corrective Action Management Unit.
ft2 Square foot (feet).
LCRS Leachate Collection and Removal System.
VZMS Vadose Zone Monitoring System

PERMIT ATTACHMENT F PERSONNEL TRAINING PLAN

F.1 INTRODUCTION

This Permit Attachment (F) describes training requirements for employees and any contractors who work at the Permitted Units, including the Corrective Action Management Unit (CAMU) (*See* 40 CFR § 264.16). The primary objective of the training is to prepare those personnel to safely manage hazardous and mixed waste. The degree of training varies with the job duties.

F.2 HAZARDOUS WASTE MANAGEMENT RESPONSIBILITIES

This program provides employees with training relevant to their positions. Personnel shall be given, at a minimum, a basic understanding of the Resource Conservation and Recovery Act (RCRA) regulatory requirements for waste management, emergency procedures, and operating procedures. Some employees shall receive additional classroom and on-the-job training designed for specific duties. In accordance with 40 CFR § 264.16(b) employees who have not received training or are unable to provide relevant and appropriate training documentation shall receive the required training within six months of assignment to hazardous and mixed waste management activities and prior to managing those wastes without supervision.

F.3 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES

Personnel who are directly involved in hazardous and mixed waste handling shall be informed of the potential hazards, procedures for safe handling of wastes, and emergency procedures. Individuals in supervisory or decision-making positions shall receive a comprehensive overview of all aspects of waste management relevant to the Permitted Unit. Personnel with specific or short-term assignments, such as visitors or temporary contractors not directly involved in waste management, may receive a site-specific safety briefing with emergency response information necessary for their duties as an alternative to the training specified in this Permit Attachment. The training program shall include a combination of classroom instruction, reviews of written documents, and on-the-job training exercises as appropriate for the position. Training course content and frequency shall be as shown in Table F-1 of this Permit Attachment. As regulatory compliance requirements change training courses shall be evaluated and modified, as necessary.

F.4 JOB TITLE/JOB DESCRIPTION AND TRAINING RECORDS

Job titles and descriptions of hazardous and mixed waste management personnel are provided in Tables F-4 through F-14 of this Permit Attachment. The job descriptions include requisite skills, education, and/or other qualifications as well as hazardous and mixed waste management job duties. The required training for each job title is listed in Tables F-1 and F-2 of this Permit Attachment. Additional required training for each job title for workers at the TTU are listed in Table F-3 of this Attachment.

In accordance with 40 CFR §264.16(d)(1) and (d)(2), a file of all Permitted Unit personnel, including their job titles and job descriptions shall be maintained at each Permitted Unit. For each job title, the file shall contain requisite qualifications, and training records.

In accordance with 40 CFR § 264.16(d) (4), training records shall be kept to document the type and amount of training received by employees at each Permitted Unit. Contents of these records shall include at a minimum, the following:

1. Job title for each position related to hazardous or mixed waste management;
2. The name of the employee assigned to each job title;
3. Written job description;
4. Written training requirements for each job title;
5. Records that document training received, such as attendance or signature lists, certificates, memoranda of training, or reports from computerized databases of training completion status.

Current-year training records shall be kept at the Unit to which employees are or were assigned and training records for previous years shall be maintained at the Facility Records Center. For MSB personnel, all training records to be maintained at the Unit shall be maintained at the RMWMU. For former employees, training records shall be maintained at the Facility Records Center for a minimum of three years from the date the employee last worked at a Permitted Unit.

F.5 TRAINING DIRECTOR

The Unit-specific Department Manager or designee shall function as the Training Director. The Manager shall maintain responsibility for ensuring that all Unit-specific required training is administered to all employees. The Training Director shall be knowledgeable about the hazardous waste management regulations, this Permit and specific hazardous or mixed waste management operations employed at the Permitted Unit. The Training Director shall ensure that the training required for individual employees is administered in accordance with the requirements of this Permit.

The Training Director may perform or delegate training to qualified trainers. Trainers shall be qualified on the basis of attainment of one or more of the following:

1. Certification in the subject matter addressed by the training;
2. Demonstration of knowledge and competence in the training subject; or,
3. Previous on-the-job or classroom training in the topics covered.

TABLE F-1
Training Content and Frequency

A. RCRA Regulation Training

Duration: Variable (1-4 hours)

Frequency: Initial/Periodic Refresher (at least annually)

Method: Classroom instruction, on-the-job training, document review.

Minimum content may include (as applicable to the specific Permitted Unit to which an employee is assigned):

1. Identification of hazardous waste
2. Treatment, storage, and disposal requirements
3. Generator and transporter requirements

B. RCRA Contingency Plan and Emergency Procedures

Duration: Variable (1-4 hours)

Frequency: Initial/Annual Refresher

Method: Classroom or online instruction, document review, classroom and hands-on exercises

Minimum content must include (as applicable to the specific Permitted Unit to which an employee is assigned):

1. Emergency notification procedures;
2. Response to emergencies
3. Evacuation route and procedures
4. Emergency equipment and personal protective equipment
5. Emergency Coordinator responsibilities
6. Post-emergency actions
7. Contingency Plan
8. Shutdown procedures (if any)

TABLE F-1 (Continued)

C. Technical Work Documents and Refresher

Duration: As appropriate

Frequency: Initial/Periodic Refresher

Method: Document review, on-the-job training

Minimum Content: This training is function-specific and may be divided into sections or modules. Each employee must participate in the sections that apply to his or her specific job function. Sections include, but are not limited to, the following as needed:

1. Waste Analysis Plan
2. Unit-specific safety practices
3. Unit-specific operational procedures (e.g., loading and unloading)
4. Unit security, entry, and control
5. Operation, maintenance, and inspection of equipment
6. Prevention of the ignition/reaction of ignitable/reactive wastes
7. Permit conditions
8. Emergency response
9. Unit tour

D. Hazardous Waste Operations and Emergency Response

Duration: Variable (24 hours or more with an 8-hour refresher)

Frequency: Initial/Refresher (at least annually)

Method: Classroom instruction, hands-on exercises

Minimum Content:

1. Hazardous and mixed waste management and regulations
2. Sources of information
3. Compatibility of hazardous and mixed wastes
4. Personnel protection
5. Principles of safety
6. Emergency procedures

TABLE F-2
Training for Each Job Title

Required Training (*See* Table F-1)	JOB TITLES										
	Training Director	**RCRA Project Leader**	**Emergency Coordinator**	**Chemist**	**Field Technician (Waste Handler)**	**Special Projects Staff**	**Inspector**	**Transpor-tation Manager**	**Unit Operations Support Staff**	**CAMU Leader/ Coordinator**	**CAMU Field Technician**
Resource Conservation and Recovery Act (RCRA) Regulations	X	X	X	X	X	X	X	X		X	X
Contingency Plan and Emergency Procedures	X	X	X	X	X	X	X	X	X	X	X
Technical Work Documents		X		X	X	X	X			X	X
Hazardous Waste Operations and Emergency Response (24- or 40-hour course)	X	X	X	X	X	X	X	X		X	X
Hazardous Waste Operations and Emergency Response (8-hour course)	X	X	X	X	X	X	X	X		X	X

TABLE F-3
Thermal Treatment Unit Personnel Training Content

A. **Explosives Personnel Safety Course**

Duration: Variable (at least 16 hours)

Frequency: Initial

Method: Classroom instruction

Minimum content may include:

1. Basic explosives definitions
2. Overview of explosives and explosive device categories and characteristics
3. Initiation stimuli and safety guidelines for avoiding accidental ignition
4. Standards for explosives operations, including compatibility, storage, and standard operating procedures

B. **Operating Procedures of the Thermal Treatment Unit**

Duration: Variable (1 to 4 hours)

Frequency: Annually

Method: Classroom instruction, on-the-job training, and/or document review

Minimum content may include:

1. Overview of written operating procedures
2. Overview of the Waste Analysis Plan
3. Safety practices
4. Security, site entry, and site control
5. Unit operations
6. Unit equipment and structures
7. Procedures to prevent the reaction of reactive waste
8. Permit requirements for the Thermal Treatment Unit

F.6 EMERGENCY TRAINING

Permitted Unit employees shall participate in Unit-specific emergency response training to assure effective response to emergencies. Emergency response training consists of classroom or online instruction, document reviews, and classroom or hands-on exercises. The content shall be reviewed at least annually and revised as necessary to incorporate changes in regulatory compliance requirements. Topics covered shall include at a minimum:

1. Emergency notification procedures;
2. Response to emergencies, including fires, explosions, and releases of hazardous and mixed wastes;
3. Procedures for using, inspecting, maintaining, and replacing emergency equipment and personal protective equipment;
4. Procedures for the shutdown of operations;
5. Procedures for evacuation (i.e., communications/alarms);
6. Responsibilities of the Emergency Coordinator;
7. Post-emergency reports and actions; and
8. Contingency Plan (See Permit Attachment D).

F.7 IMPLEMENTATION OF TRAINING PROGRAMS

The training program shall be implemented to assure that Unit personnel receive appropriate training in a timely manner.

Table F-4
Job Title, Description, and Qualifications:
RCRA Training Director

Job Title: Training Director

Job Description:

The Training Director shall ensure that all personnel meet the training requirements of this Permit. Examples of duties are:

- Identify and coordinate training required by RCRA regulations, this Permit, and Facility waste management worker-training requirements;
- Ensure maintenance of training records required by RCRA regulations and this Permit and demonstrate compliance with Facility waste management worker training requirements for all personnel; and
- Inform personnel when specific training is required.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for the Training Director are:

- Bachelor's degree from an accredited post-secondary institution; or,
- Three years experience with RCRA hazardous or mixed waste management regulations.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-5
Job Title, Description, and Qualifications:
RCRA Project Leader

Job Title: RCRA Project Leader

Job Description:

A RCRA Project Leader oversees, supervises, and coordinates collection, storage, and shipment of hazardous waste at a Permitted Unit. Examples of duties are:

- Ensure operation of the Permitted Unit in compliance with applicable RCRA regulations and this Permit;
- Identify and coordinate training required by RCRA regulations and this Permit;
- Determine training and reading requirements specific to positions, tasks or Unit activities;
- Coordinate activities related to management of hazardous or mixed waste at a Permitted Unit;
- Ensure maintenance of records required by RCRA regulations and this Permit, such as training records, inspection records, waste analysis records, and Contingency Plan;
- Ensure maintenance of additional records required for the Unit Operating Record;
- Prepare, review, and submit documents on waste management activities;
- Ensure compliance with RCRA regulations and this Permit for hazardous or mixed waste shipments; and
- Coordinate activities pertaining to hazardous or mixed waste audits.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for a RCRA Project Leader are:

- Bachelor's degree from an accredited post-secondary institution; or,
- Three years experience in managing hazardous or mixed waste.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-6
Job Title, Description, and Qualifications:
Emergency Coordinator

Job Title: Emergency Coordinator

Job Description:
An Emergency Coordinator evaluates, coordinates, and implements emergency actions in accordance with the Contingency Plan during an emergency (as defined in the Contingency Plan, Permit Attachment D). As defined in the Contingency Plan, Emergency Coordinator duties during and after an emergency include, but are not limited to:

- Identify the character, exact source, amount, and extent of released material or hazardous or mixed waste by observation, records reviews, or chemical analysis;
- Assess possible hazards to human health or the environment considering both direct and indirect effects;
- Take all reasonable measures necessary to ensure fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed waste at the Unit including stopping processes and operations, collecting and containing released waste, and removing or isolating containers;
- Monitor for leaks, pressure buildup, gas generation, and ruptures in valves, pipes, or other equipment if the Unit stops operations prior to restoration of normal operations;
- Provide for properly treating, storing, or disposing of recovered material, waste, contaminated soil or surface water, or any other media or material;
- Ensure that no waste that may be incompatible with the released waste is treated, stored, or disposed of until cleanup procedures are completed; and
- Ensure that all equipment listed in the Contingency Plan and site-specific contingency plan for any affected Unit is cleaned and fit for its intended use before resuming operations.

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for an Emerg**e**ncy Coordinator are:

- High school diploma or equivalent;
- Three years experience working with hazardous or mixed waste.

Training:
Initial and refresher training will be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-7
Job Title, Description, and Qualifications:
Chemist

Job Title: Chemist

Job Description:
A Chemist conducts supporting characterization of hazardous and mixed waste managed at the Facility. Examples of duties are:

- Evaluate data provided by the initial generator of a solid waste, and obtain additional information as needed for hazardous waste determination;
- Determine whether solid wastes are hazardous or mixed wastes as defined in 40 CFR Part 261;
- Assign appropriate hazardous waste codes to hazardous and mixed wastes;
- Identify treatment options and treatment standards for hazardous and mixed wastes to be treated on site;
- Evaluate data or information for treated wastes and treatment residues to characterize the residues, assign appropriate hazardous waste codes, and determine land disposal restrictions; and,
- Segregate hazardous and mixed waste.

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for a Chemist are:

- Bachelor's degree in chemistry or related field, and
- Two years experience working with hazardous or mixed waste.

Training:
Initial and refresher training will be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-8
Job Title, Description, and Qualifications:
Field Technician

Job Title: Field Technician (Waste Handler)

Job Description:
A Waste Handler conducts hazardous and mixed waste handling, segregating, and storing operations at a Permitted Unit. Examples of duties are:

- Transport and handle hazardous and mixed waste;
- Conduct daily inspections of Permitted Units where hazardous and mixed waste loading, unloading, or treatment operations occur;
- Perform basic maintenance and housekeeping activities;
- Segregate hazardous and mixed waste
- Sort, package, mark, label, store, treat, and segregate hazardous and mixed waste; and
- Compile information for the Facility or Unit Operating Record.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for a Waste Handler are:

- High school diploma or equivalent; or
- Two years experience in handling hazardous or mixed waste.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-9
Job Title, Description, and Qualifications:
Special Project Staff

Job Title: Special Projects Staff

Job Description:
A Special Projects Staff member performs duties associated with non-routine and special projects at a Permitted Unit. Examples of duties are:

1. Handle hazardous and mixed waste during a special project;

- Perform special project related maintenance and housekeeping activities;
- Operate hazardous and mixed waste treatment equipment associated with a special project;
- Store, label, and segregate hazardous and mixed waste associated with a special project;
- Identify and schedule special project activities involving hazardous waste or mixed waste;
- Monitor hazardous or mixed waste special project activities for safety and procedural compliance; and
- Compile special project information for the Facility or Unit Operating Record.

Required Skill, Education, or Other Qualifications:
At a minimum, the qualifications for a Special Projects Staff member are:

- High school diploma or equivalent; or
- Two years experience in handling hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-10
Job Title, Description, and Qualifications:
Inspector

Job Title: Inspector

Job Description: An Inspector conducts inspections of both hazardous or mixed waste and a Permitted Unit. Examples of duties are:

- Inspect at least daily areas subject to spills of hazardous or mixed waste when these areas are in use;
- Inspect at least weekly containers holding hazardous or mixed waste, container equipment, and secondary containment;
- Inspect at least monthly emergency equipment, security devices, and structural equipment at a Permitted Unit; and
- Record inspection date, time, name, observations, and repairs in an inspection log (in the form of an inspection checklist).

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for an Inspector are:

- High school diploma or equivalent; or
- Two years experience working with hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 in this Permit Attachment.

Table F-11
Job Title, Description, and Qualifications:
Transportation Manager

Job Title: Transportation Manager

Job Description:
A Transportation Manager coordinates the shipment of hazardous or mixed waste from a Permitted Unit. Examples of duties are:

- Prepare documentation and paperwork for off-site shipments of hazardous or mixed waste;
- Ensure proper packaging, labeling, marking, and placarding are in place for off-site shipments of hazardous and mixed waste; and
- Coordinate the loading of hazardous and mixed waste for off-site shipment.

Required Skill, Education, or Other Qualifications:
At a minimum, the qualifications for a Transportation Manager are:

- High school diploma or equivalent; or
- Two years experience coordinating shipments of hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 in this Permit Attachment.

Table F-12
Job Title, Description, and Qualifications:
Unit Operations Support Staff

Job Title: **Unit Operations Support Staff**

Job Description:
A Unit Operations Support Staff member has unescorted access to the Permitted Units but performs no activities that require contact with hazardous or mixed waste or waste containers. Unit Operations Support Staff include, but are not limited to:

- Administrative personnel;
- Information systems (database) personnel;
- Generator interface personnel, and
- Radiation support personnel. Note that the duties of radiation support personnel involve collecting radiological data; this requires contact with hazardous and mixed wastes and waste containers but is not consistent with the duties of a field technician in Table F-8.

Skill, Education, and Other Qualifications:
The Training Supervisor determines the requisite level of experience for each position.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-13
Job Title, Description, and Qualifications:
CAMU Project Leader/Operations Coordinator

Job Title: **Corrective Action Management Unit (CAMU) Project Leader/Operations Coordinator**

Job Description:
To provide ongoing oversight, supervision, and coordination at the CAMU during the post-closure care period for vadose zone monitoring and inspection and maintenance of the containment cell and Vadose Zone Monitoring System (VZMS) in compliance with this Permit. Examples of duties are:

- Coordinate and implement VZMS monitoring activities;
- Compile and archive VZMS monitoring data into the Operating Record;
- Produce annual monitoring results reports and other reports;
- Maintain/revise sampling and analysis plans for VZMS monitoring, as required;
- Coordinate and implement leachate removal and management activities;
- Ensure necessary inspections and required maintenance are properly conducted;
- Assure the maintenance of records, such as training records, inspection and maintenance records, and data reports, as specified in this Permit;
- Supervise the inventory, maintenance, and repair of all tools, supplies, equipment, and vehicles (i.e., ensure that they are in good working order) used for monitoring and maintenance operations; and
- Provide oversight of CAMU Field Technicians.

Required Education, Skill, and/or Experience:
- Bachelors' degree in chemistry, biology, physical science, engineering, environmental science; or
- Minimum of 5 years experience in waste management operations and/or environmental restoration; and
- Project management experience.

Training:
- Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-14
Job Title, Description, and Qualifications:
CAMU Field Technician

Job Title: Corrective Action Management Unit (CAMU) Field Technician

Job Description:
Perform post-closure monitoring, inspection, and maintenance activities as instructed by the CAMU Project Leader/Operations Coordinator. Examples of duties are:

- Perform VZMS monitoring activities;
- Perform inspection and maintenance activities; and
- Assist CAMU Project Leader/Operations Coordinator with leachate removal and management activities.

Required Education, Skill, and/or Experience:
The Training Supervisor determines the requisite level of experience for each position.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

PERMIT ATTACHMENT G CLOSURE PLANS

G.1 CLOSURE PLAN FOR THE HAZARDOUS WASTE HANDLING UNIT

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G.1.1 INTRODUCTION

This closure plan details the activities necessary to close the Hazardous Waste Handling Unit south of Technical Area I at Sandia National Laboratories, hereafter referred to as the HWHU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The HWHU is located south of TA-I, north of the entrance to TA-II, and occupies 1.35 acres enclosed within a fence on Facility property between the two Technical Areas. For purposes of closure the HWHU consists of four structures, an outdoor loading and driving surface, various equipment, a storm water catchment pond, and environmental media. Structures at the HWHU include the Hazardous Waste Packaging Building (Building 959), the Hazardous Waste Storage Building (Building 958), and two modular storage buildings (Buildings 958B and 958C). A covered storage pad, two office trailers, six storage sheds located near the eastern boundary of the HWHU, and associated equipment, furnishings, and tools that do not manage or contact hazardous or mixed wastes are not subject to the closure procedures and performance standards in this closure plan. A complete physical and operational description of the HWHU is in Permit Attachment A, Section A.2. The various HWHU components are shown generally on Figure G.1-1.

The HWHU is permitted to repackage and store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2, in containers. The storm water catchment pond is designed to receive storm water and snowmelt run-off from the HWHU. The operating capacity of the four buildings is specified at Permit Attachment J, Table J-1.

It is anticipated that the HWHU will be clean closed. The Permittees shall attain clean closure of the HWHU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the HWHU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.1.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the HWHU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all HWHU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the HWHU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the HWHU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the HWHU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the HWHU that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with HWHU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the HWHU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.1.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the HWHU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the HWHU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.1-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.1-1. Because of the length of the storm water catchment pond, the Permittees shall also collect two samples at the specified depths at each of three locations within the pond, the east and west ends and in the middle.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

The wet-wipe sampling locations to verify decontamination at Buildings 958, 959, and 958B/958C are identified in part on Figures G.1-2, G.1-3, and G.1-4 respectively.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.1-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.1-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Dioxin/Furan Congeners	8280, 8290	Place in dark and cool to 4°C	30 days
PCBs	8080/8082	Cool to 4°C	14 days
Herbicides	8150/8151	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.1.4 AMENDMENT TO THIS CLOSURE PLAN

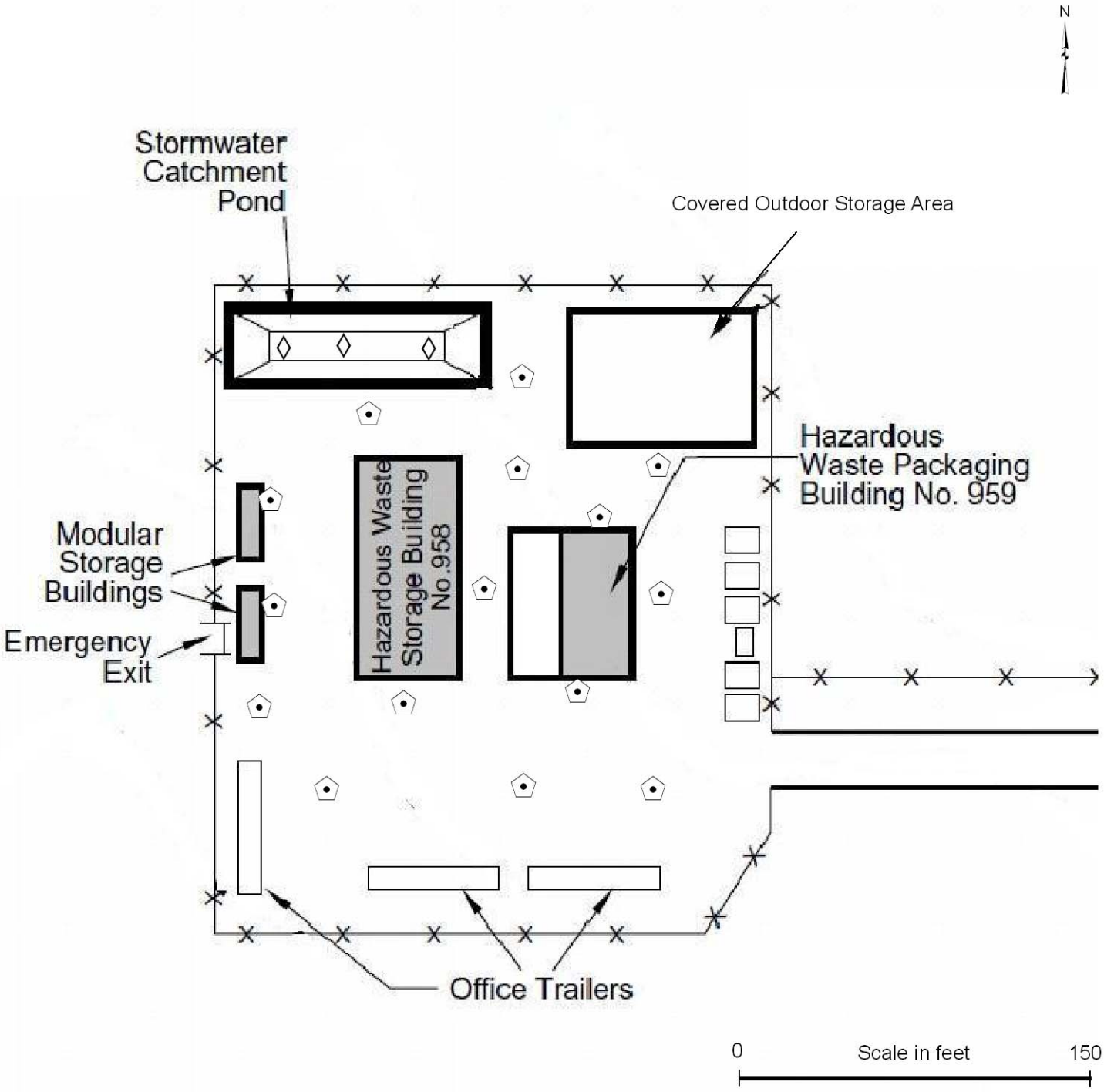
The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.1.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the HWHU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

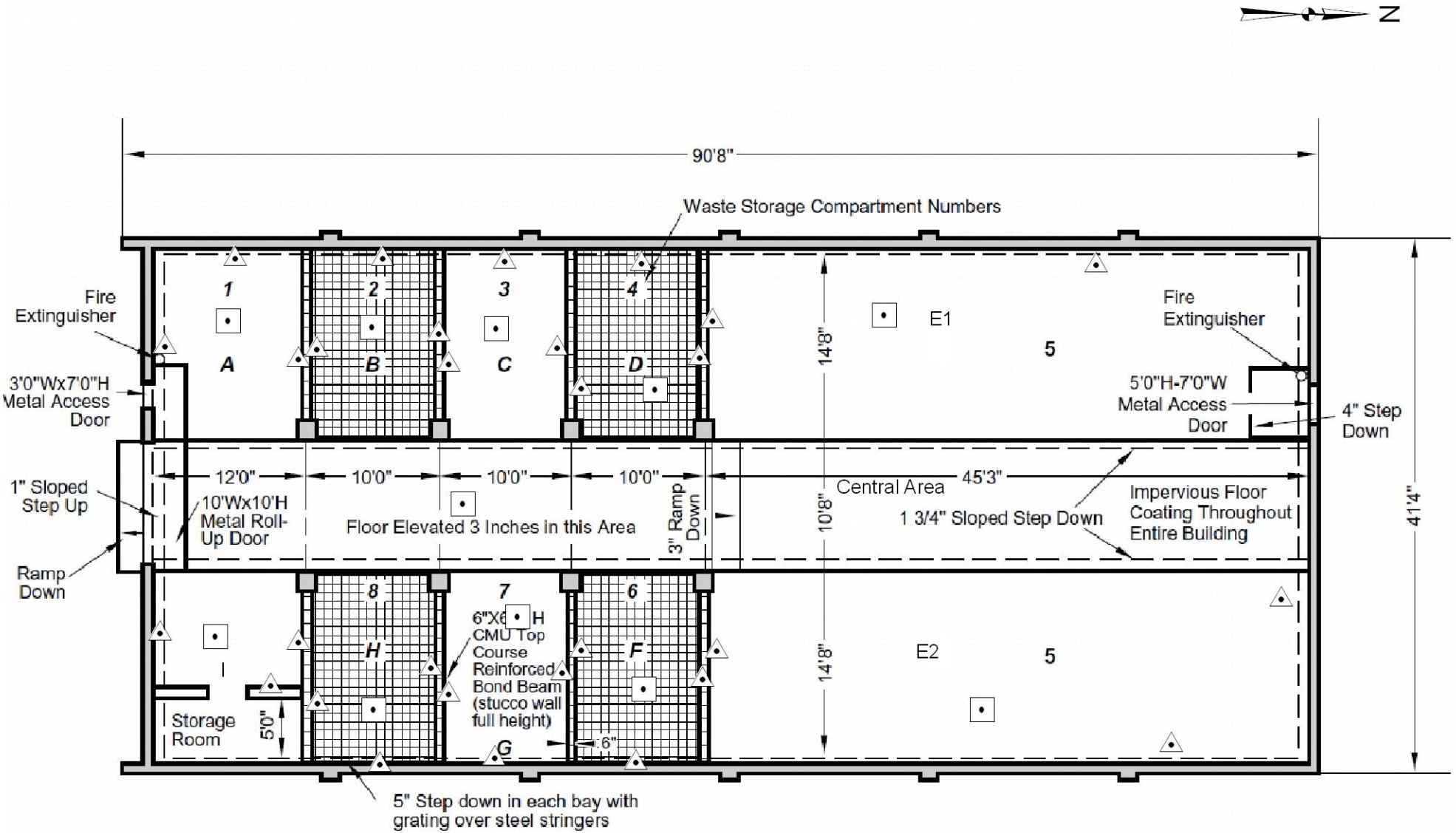
G.1.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the HWHU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.



Actual locations may vary from the figure.

Figure G.1-1
HWHU Outdoor Sampling Locations

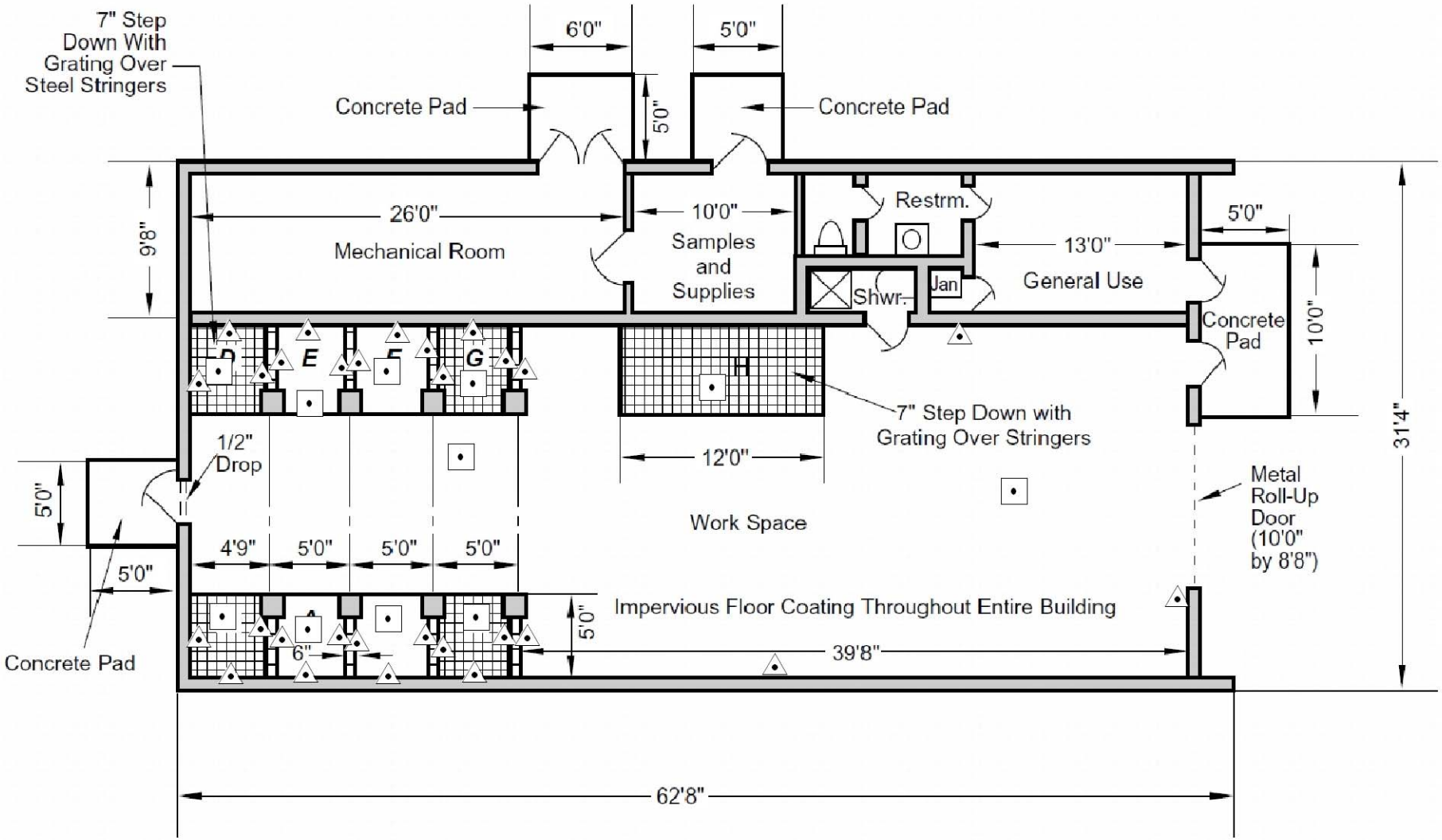


Actual locations may vary from the figure.

Figure G.1-2
HWHU Building 958 Sampling Locations

Legend

- floor (11)
- wall (29)

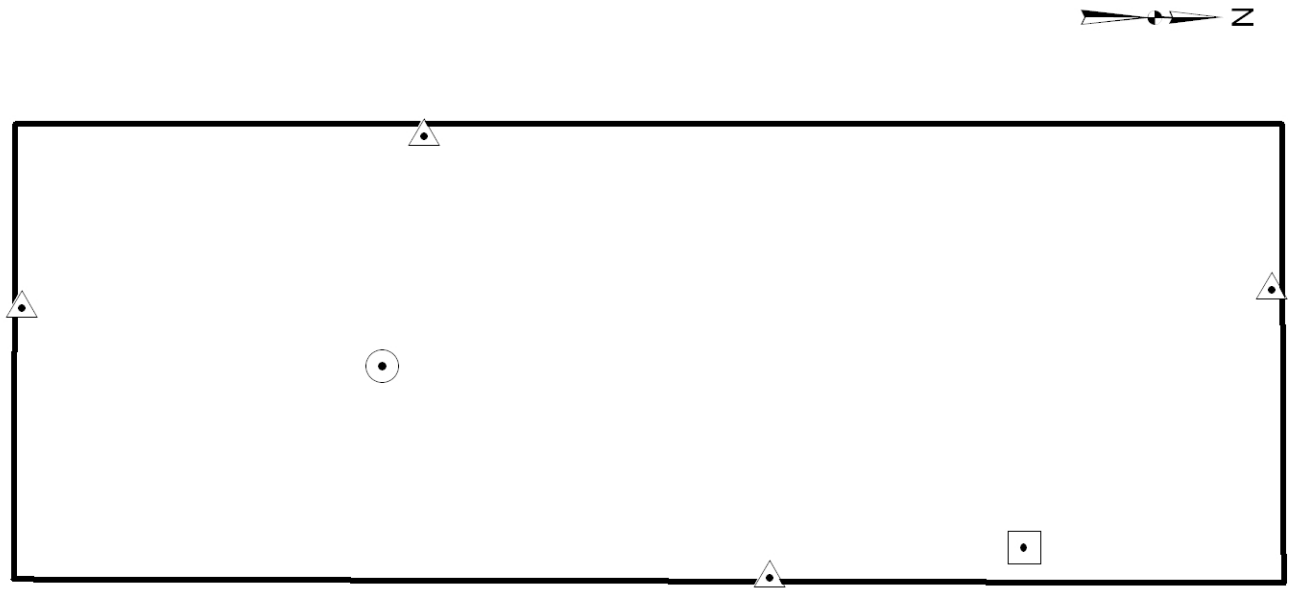


Actual locations may vary from the figure.

floor (11)

wall (29)

Figure G.1-3
HWHU Building 959 Sampling Locations



scale in feet

0 5

Actual locations may vary from the figure.

Note: Same sample plan for both modular buildings.

floor (1)

wall (4)

ceiling (1)

Figure G.1-4
HWHU Buildings 958B and 958C Sampling Locations

G.2 CLOSURE PLAN FOR THE THERMAL TREATMENT UNIT

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G.2.1 INTRODUCTION

This closure plan details the activities necessary to close the Thermal Treatment Unit at Technical Area III at Sandia National Laboratories, hereafter referred to as the TTU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.601 through 264.603, and Permit Part 6.

The TTU is a steel burn pan and cage located in a fenced area on a concrete pad south of Building 6715 and is surrounded by an earthen berm. The area potentially impacted by the TTU and therefore subject to closure extends outside the TTU caged area and includes ancillary piping and equipment, a loading area, and soils potentially impacted by particulate deposition and surface water run-off. A complete physical and operational description of the TTU is in Permit Attachment A, Section A.3. The various TTU components are shown generally on Figures G.2-1 and G.2-2.

The TTU treats reactive (*i.e.*, explosive) and ignitable hazardous wastes with the EPA waste codes listed in Permit Attachment B, Section B.1.

It is anticipated that the TTU will be clean closed. The Permittees shall attain clean closure of the TTU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the TTU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 7.0 of this Closure Plan.

G.2.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the TTU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all TTU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous waste from the TTU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the TTU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the TTU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the TTU that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with TTU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the TTU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.2.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the TTU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the appropriate quality assurance procedures to be utilized during closure.

The constituents of concern at the TTU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of constituents and groups of constituents is presented in Table G.2-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8 and Figures G.2-1 and G.2-2.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.2-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.2-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Total silver	6010/6020	None	6 months
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Dioxin/Furan Congeners	8280, 8290	Cool to 4°C	30 days
High Explosives	8330	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.2.4 AMENDMENT TO THIS CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.2.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the TTU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.2.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the TTU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

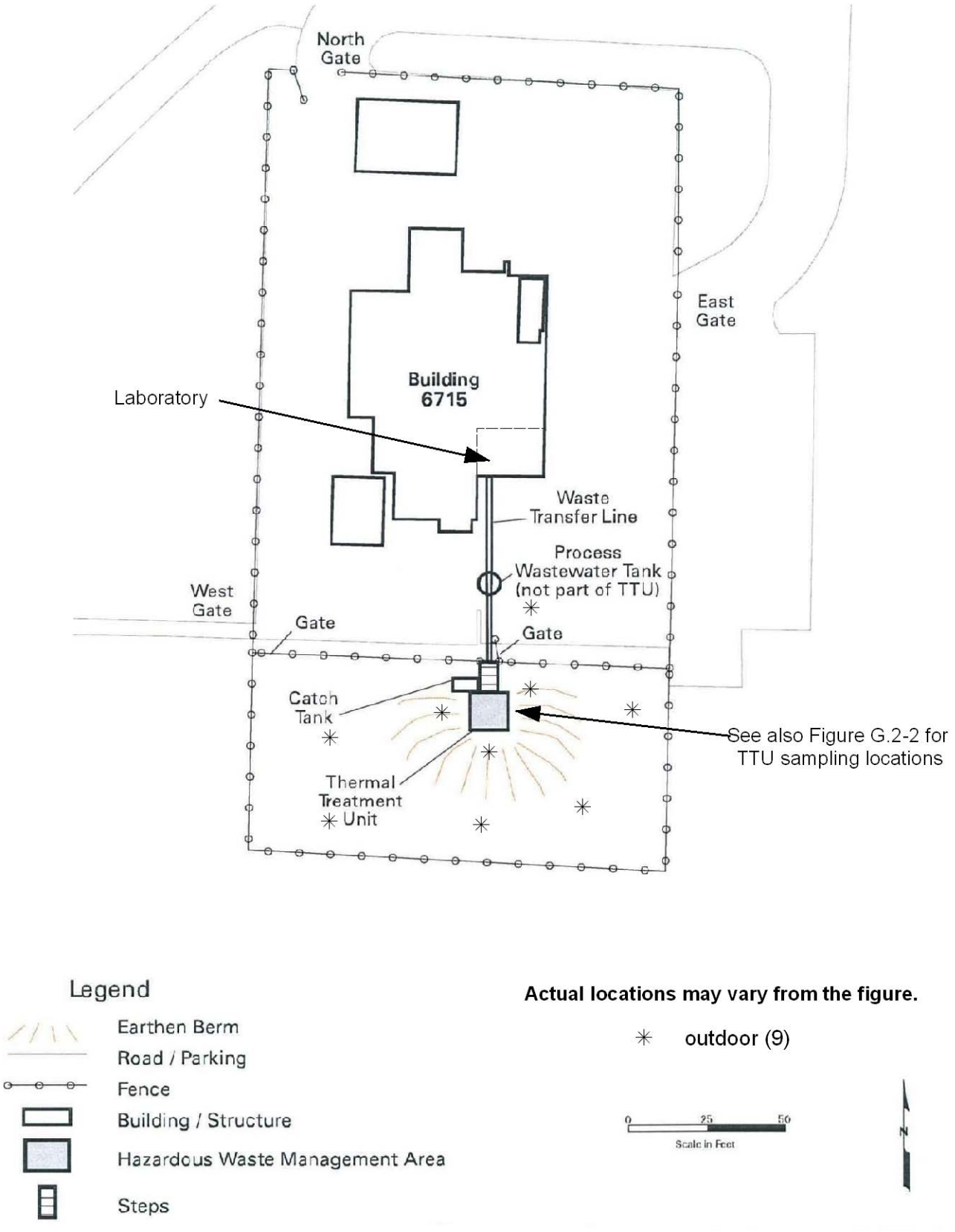
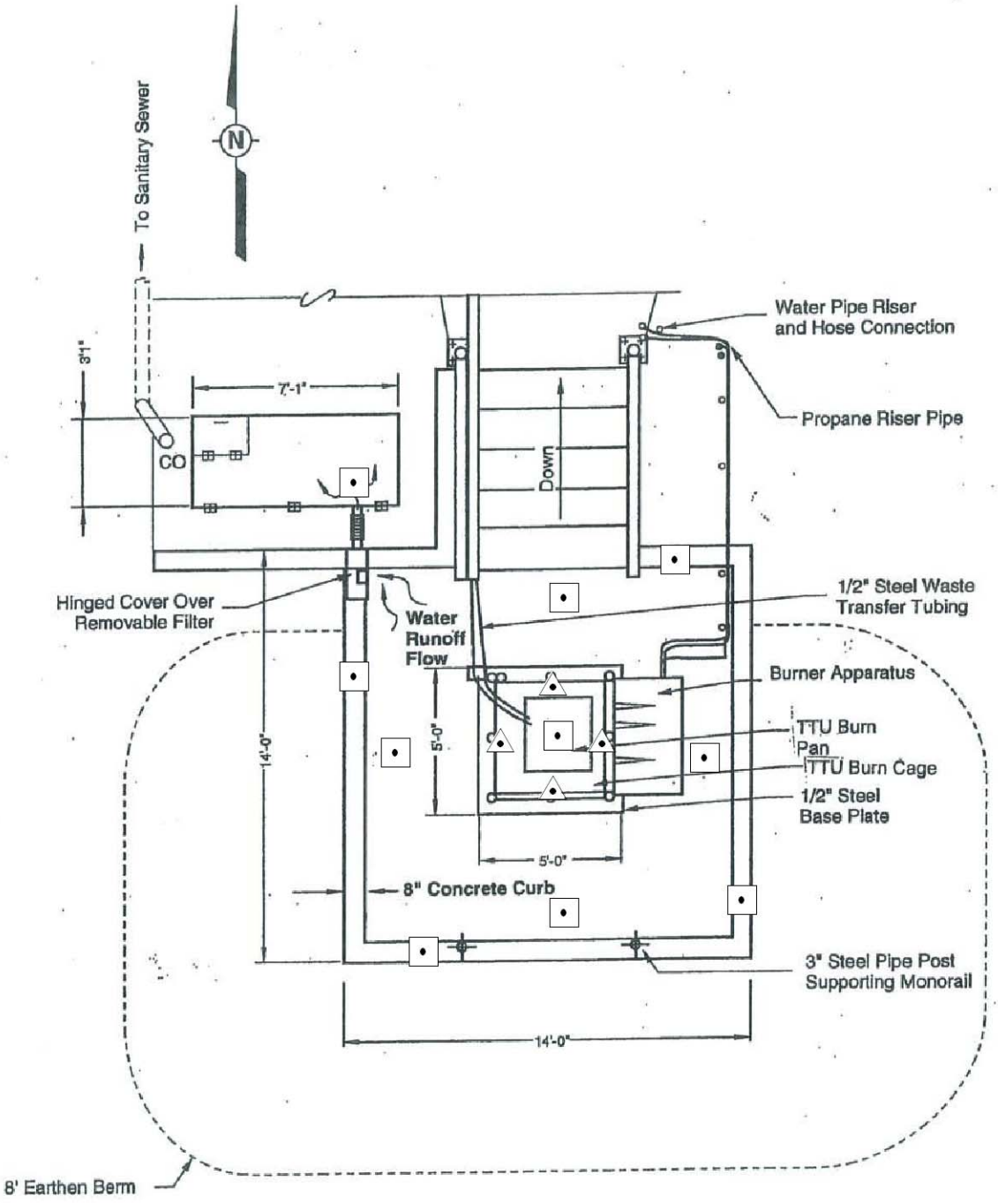


Figure G.2-1
TTU Soil Sampling Locations



Actual locations may vary from the figure.

- floor (10)
- wall (4)

Figure G.2-2
TTU Sampling Locations

G.3 CLOSURE PLAN FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

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G.3.1 INTRODUCTION

This closure plan details the activities necessary to close the Radioactive and Mixed Waste Management Unit at Technical Area III at Sandia National Laboratories, hereafter referred to as the RMWMU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The RMWMU is located in the southeastern portion of Technical Area (TA)-III and occupies approximately 3.1 acres enclosed within a fence. For purposes of closure the RMWMU consists of six structures, equipment, an outdoor storage pad and driving surface, a storm water retention pond, and environmental media. The waste management structures include Buildings 6920, 6921, 6925, and 6926, and two modular storage buildings, TP-150 and TP-153. The outdoor storage pad includes the paved areas within the fence to the north, east, and west of Building 6920 and to the south of Building 6921. Buildings 6920 and 6921 have associated fume hoods and negative-pressure ventilation systems whose exhaust passes through a HEPA filter before being released to the environment through an exhaust stack. The outdoor storage pad and driving surface drain to a storm water retention basin. Numerous rooms within Buildings 6920 and 6921 and associated equipment, furnishings, and tools that do not manage or contact hazardous or mixed wastes are not subject to the closure procedures and performance standards in this closure plan. A complete physical and operational description of the RMWMU is in Permit Attachment A, Section A.4. The various RMWMU components are shown generally on Figure G.3-1.

The RMWMU is permitted to store and treat hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2. The RMWMU is permitted to treat hazardous and mixed wastes with the set of EPA waste codes indicated in Permit Attachment B, Section B.3. The total square footage and permitted operating capacity of the buildings, the modular storage buildings, and the outdoor storage pad are specified at Permit Attachment J, Table J-1.

It is anticipated that the RMWMU will be clean closed. The Permittees shall attain clean closure of the RMWMU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the RMWMU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.3.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the RMWMU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all RMWMU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the RMWMU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the RMWMU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the RMWMU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the RMWMU that were required to be decontaminated .

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with RMWMU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the RMWMU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

SAMPLING and analysis plan

This sampling and analysis plan identifies: 1) the constituents of concern at the RMWMU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the RMWMU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.3-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.3-1. Because of the length of the storm water retention pond at the RMWMU, the Permittees

shall collect two samples at the specified depths at each of three locations within the pond, the north and south ends and in the middle.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7. The wet-wipe sampling locations to verify decontamination at Buildings 6920, 6921, 6925 and 6926, and modular storage units TP-150 and TP-153 are identified in part on Figures G.3-2, G.3-3, G.3-4, and G-3-5 respectively.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.3-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.3-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
High Explosives	8330	Cool to 4°C	14 days
PCBs	8080/8081	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.3.3 AMENDMENT TO This CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.3.4 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the RMWMU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.3.5 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the RMWHU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

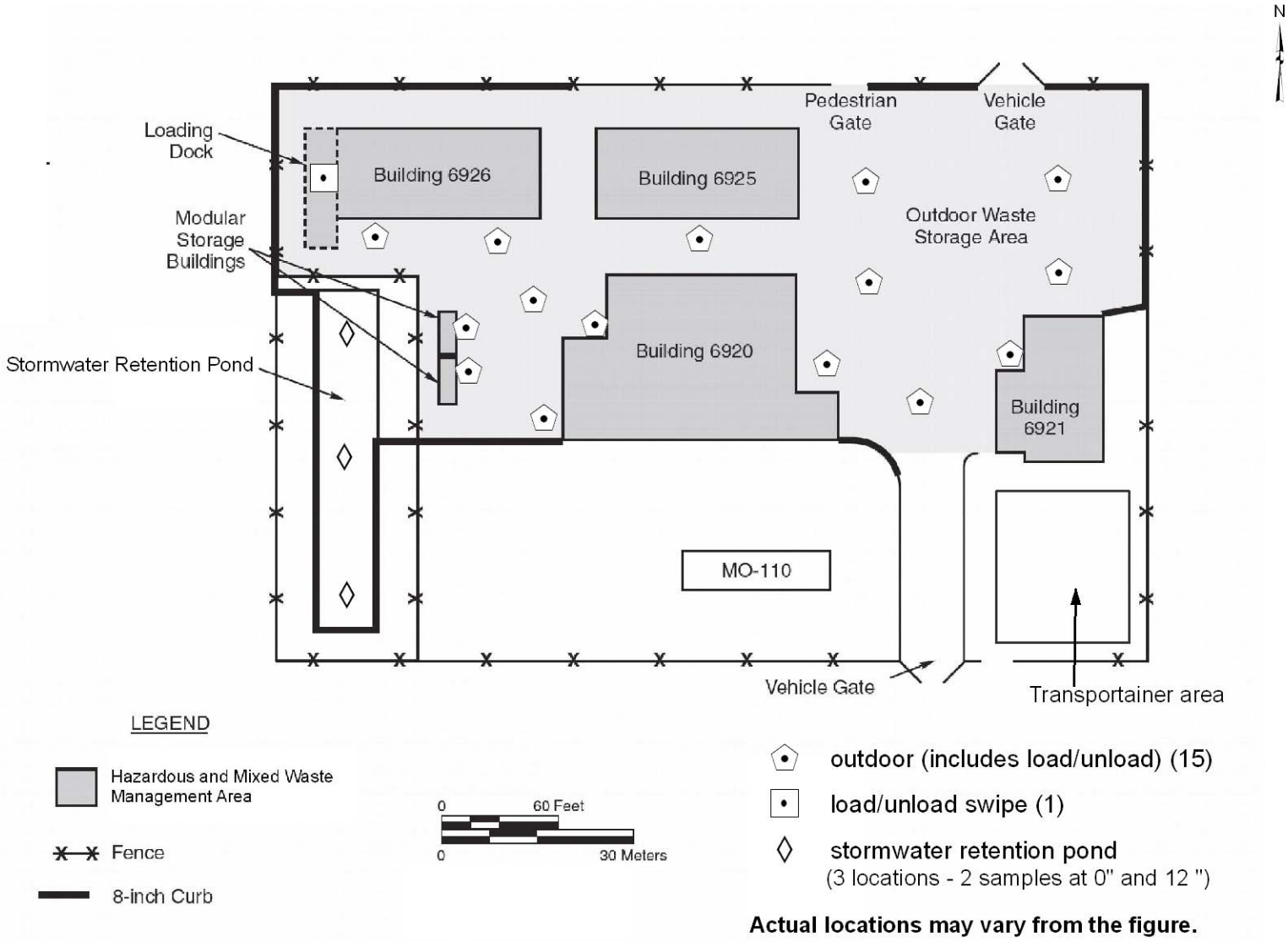


Figure G.3-1
RMWMU Sampling Locations

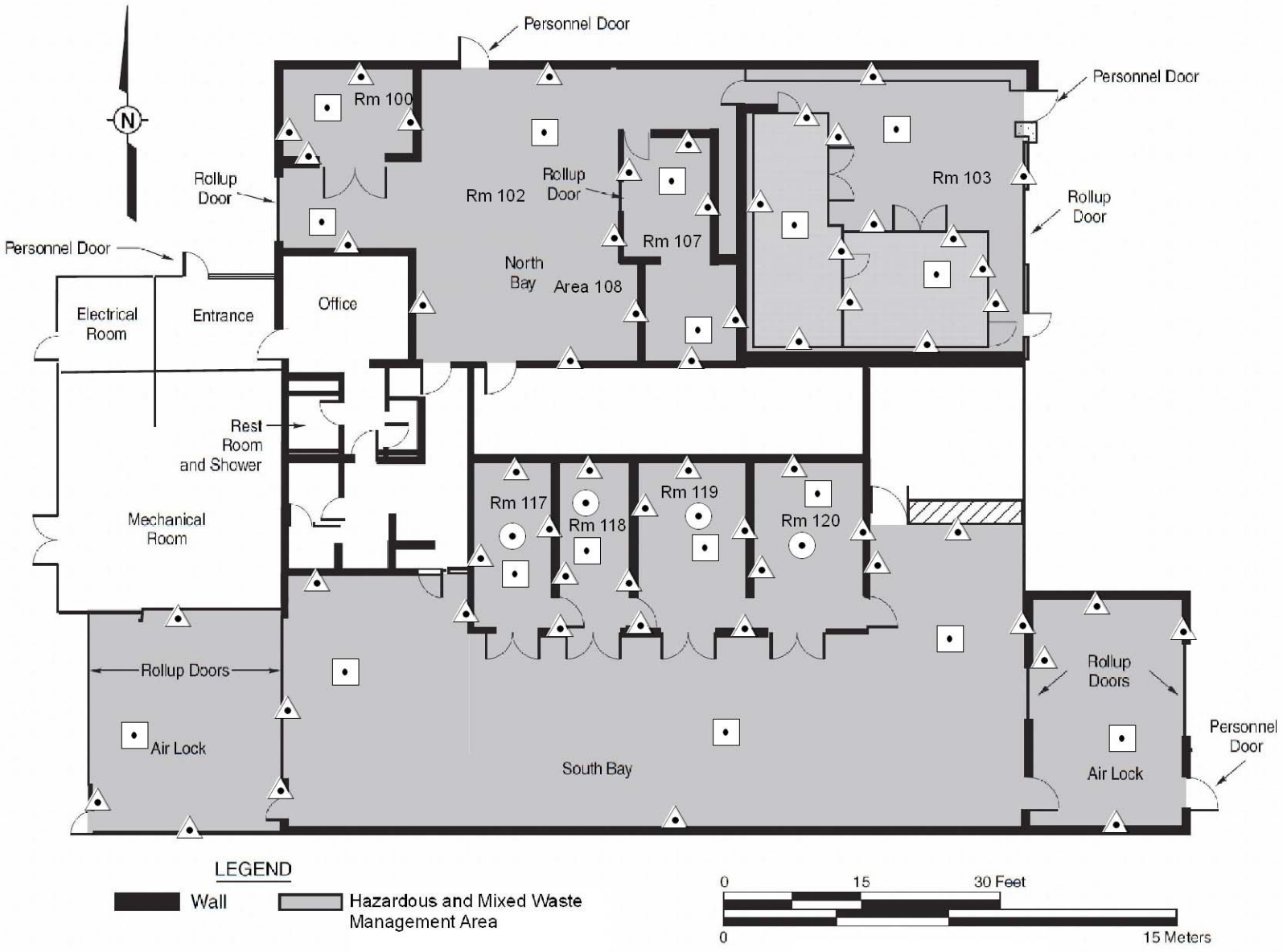


Figure G.3-2
RMWMU Building 6920 Sampling Locations

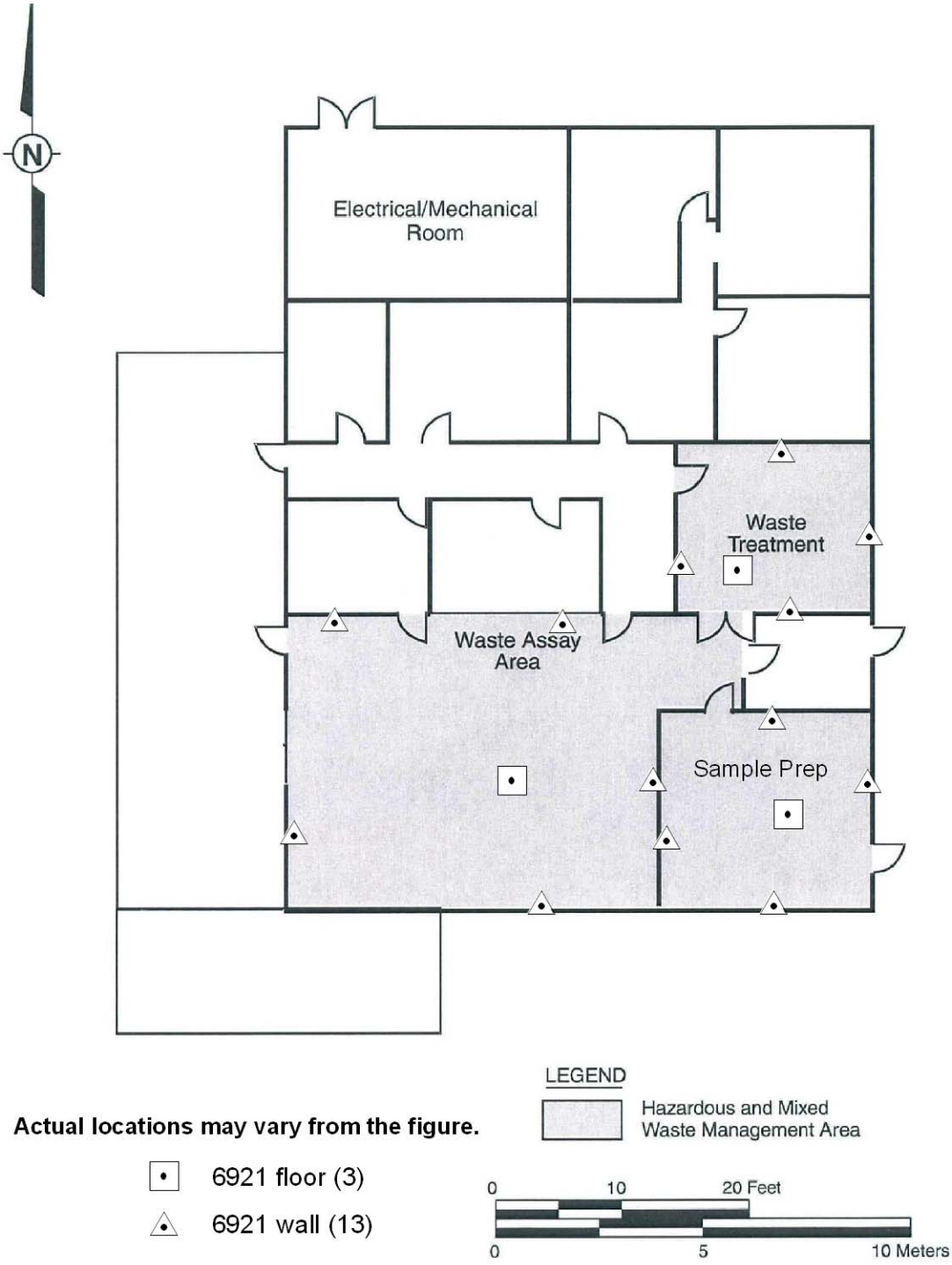
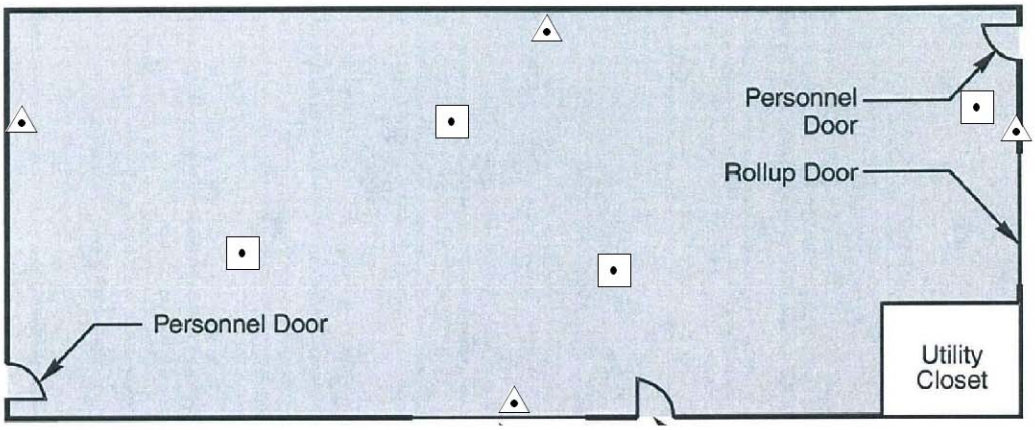
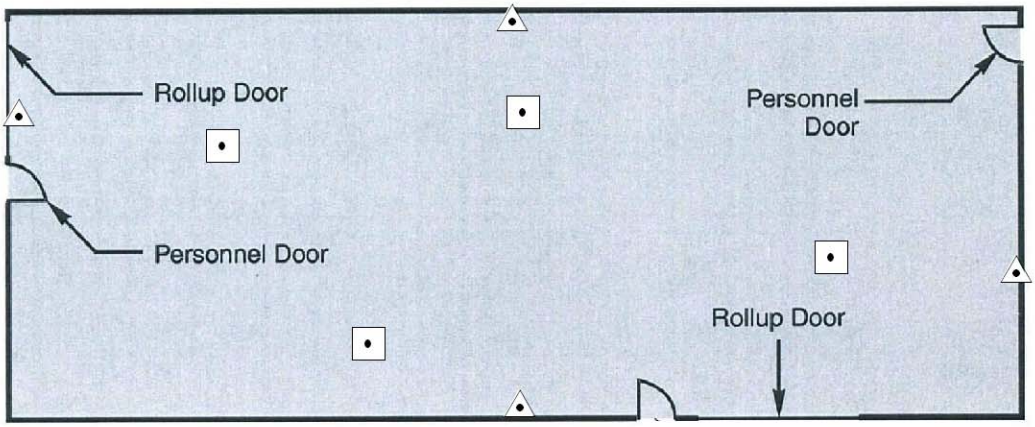


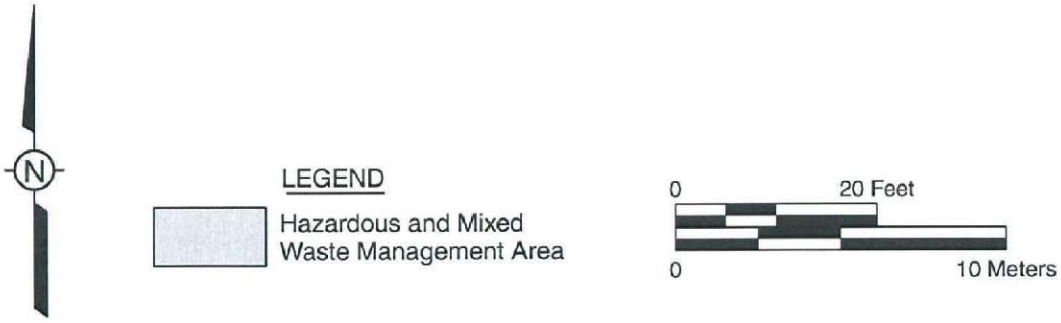
Figure G.3-3
RMWMU Building 6921 Sampling Locations



Building 6925



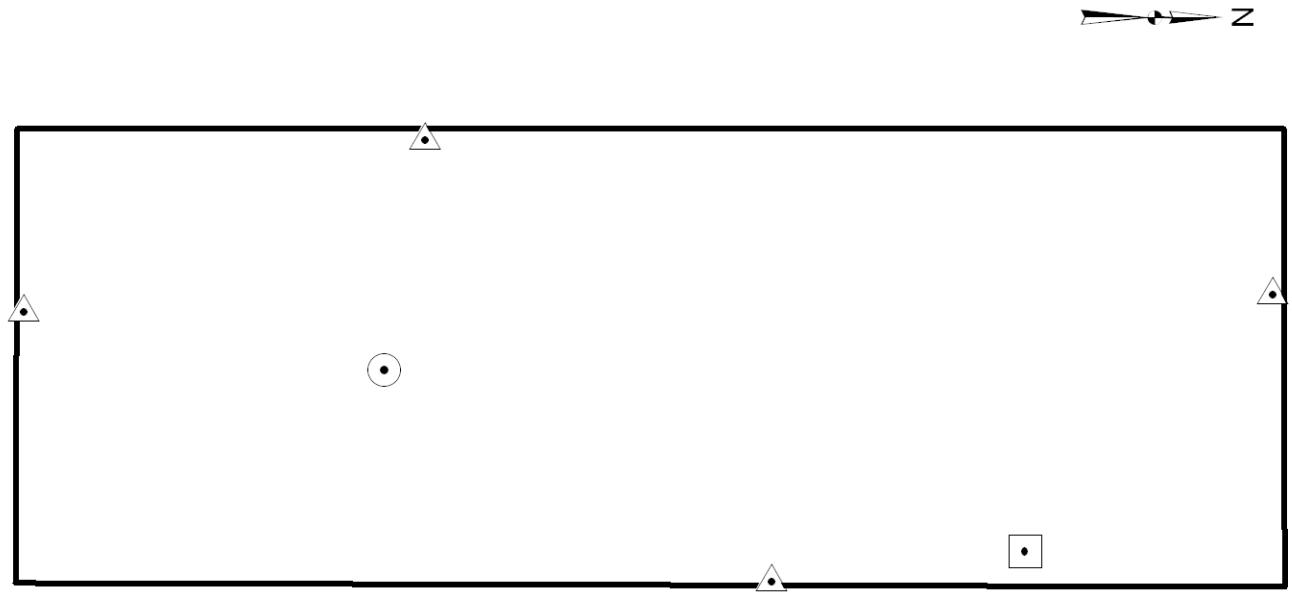
Building 6926



Actual locations may vary from the figure.

- floor (4 each)
- wall (4 each)

Figure G.3-4
RMWMU Buildings 6925 and 6926 Sampling Locations



Note: Same sample plan for both modular buildings.

Figure G.3-5
RMWMU Modular Storage Units - TP-150 and TP-153 Sampling Locations

G.4 CLOSURE PLAN FOR THE AUXILIARY HOT CELL UNIT

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G.4.1 INTRODUCTION

This closure plan details the activities necessary to close the Auxiliary Hot Cell Unit at Technical Area V at Sandia National Laboratories, hereafter referred to as the AHCU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The AHCU is located in the high bay of Building 6597 and is comprised of four waste management areas: 1) the auxiliary hot cell, 2) the work area near the hot cell including a fume hood, 3) the storage silos, and 4) the container storage area. The unloading/loading area is indoors. A complete physical and operational description of the AHCU is in Permit Attachment A, Section A.5. The various AHCU components are shown generally on Figure G.4-1.

The AHCU is permitted to treat and store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.1. The AHCU is permitted to treat hazardous and mixed wastes with the set of EPA waste codes listed in Permit Attachment B, Section B.3. The square footage and operating capacity of the AHCU are identified in Permit Attachment J, Table J-1.

It is anticipated that the AHCU will be clean closed. The Permittees shall attain clean closure of the AHCU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the AHCU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 7.0 of this Closure Plan.

G.4.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the AHCU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all AHCU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the AHCU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the AHCU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the AHCU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the AHCU, that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with AHCU as needed to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the AHCU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8, are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.4.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the AHCU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the AHCU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.4-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.4-1. The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

Table G.4-1.
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.4-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

G.4.4 AMENDMENT TO THIS CLOSURE PLAN

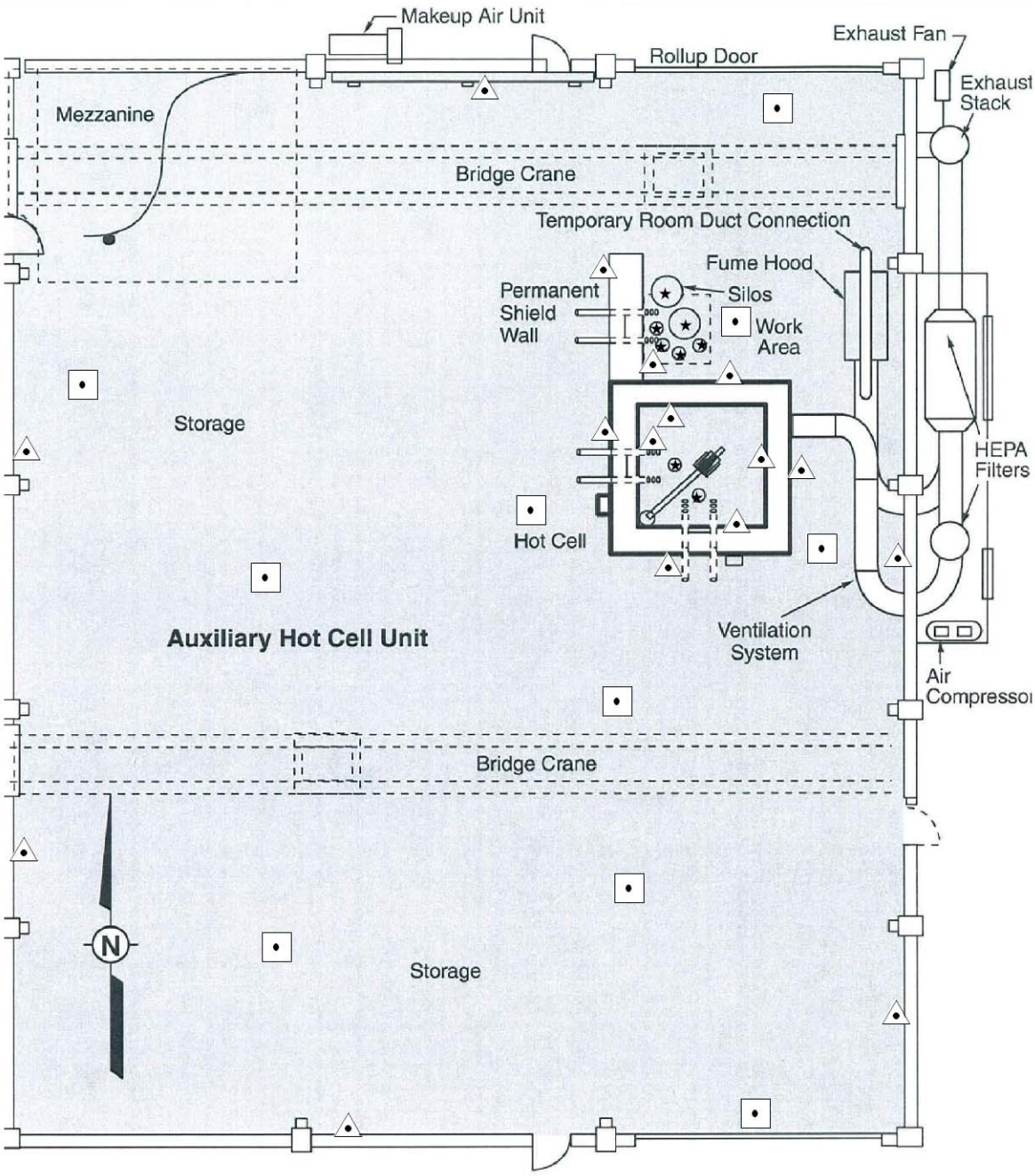
The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.4.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the AHCU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.4.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the AHCU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.



LEGEND

Hazardous and Mixed Waste Management Area

0 7.5 15

SCALE IN FEET

AHCU floor (10)

AHCU wall (16)

★ AHCU silo (8) Note: Each silo requires 1 sample.

Actual locations may vary from the figure.

Figure G.4-1
AHCU Sampling Locations

G.5 CLOSURE PLAN FOR THE MANZANO STORAGE BUNKERS

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G.5.1 INTRODUCTION

This closure plan details the activities necessary to close the Manzano Storage Bunkers. The Manzano Storage Bunkers are hereafter referred to as the MSBs. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The MSBs are located within the fenced Manzano Base approximately 1 mile east of the exit road leading to the entrances to Technical Areas (TAs)-III and V and at the end of Pennsylvania Avenue. The location of the MSBs within the Sandia National Laboratories is shown on Figures 2 and 25 in Permit Attachment L (*Figures*).

There are five bunkers collectively referred to as the MSBs. Each of the five bunkers is considered an individual hazardous waste management unit. The five bunkers include Bunkers 37034, 37045, 37055, 37057, and 37118. There are three types of bunkers: Type B (37034); Type C (37118); and Type D (37045, 37055, and 37057). Each of these bunkers is constructed of concrete (walls, roof, and floor), is covered by earthen materials, and the walls and roof of each bunker are rounded. Type B and D bunkers consist of an access tunnel leading to a main chamber that is used for storage of hazardous and mixed wastes. Type C bunkers do not have an access tunnel and consist entirely of a main chamber used for storage of hazardous and mixed wastes. The waste loading/unloading area for each MSB is immediately outside the outer door. A complete physical and operational description of the MSBs is in Permit Attachment A, Section A.6. Type B, C, and D bunker configurations and dimensions are shown generally on Figures G.5-1, G.5-2, and G.5-3 respectively.

Because this Permit Attachment G.5 addresses five hazardous waste management units, and because the units may close at different times or in concert, the requirements of this closure plan may be fulfilled at separate times for individual units or at the same time and with the same documents for all or multiple units.

The MSBs are permitted to store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2, in containers. The operating capacities and total square footage of the individual bunkers are identified at Permit Attachment J, Table J-1.

It is anticipated that the MSBs will be clean closed. The Permittees shall attain clean closure of the MSBs by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the MSBs will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.5.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at a given MSB.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all closure activities at the MSB.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the MSB no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the MSB and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the MSB.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the MSB that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with the MSB to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the MSB contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1 or the environment as specified in Permit Section 6.3.8, are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.5.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the MSB, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the MSB shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.5-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Samples shall be collected at the waste loading and unloading area (*i.e.*, area outside the door to the bunker).

Table G.5-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
High Explosives	8330	Cool to 4°C	14 days
PCBs	8080/8081	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7. The sampling locations to demonstrate decontamination verification are identified in part on Figures G.5-1, G.5-2, and G.5-3.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.5-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

G.5.4 AMENDMENT TO THIS CLOSURE PLAN

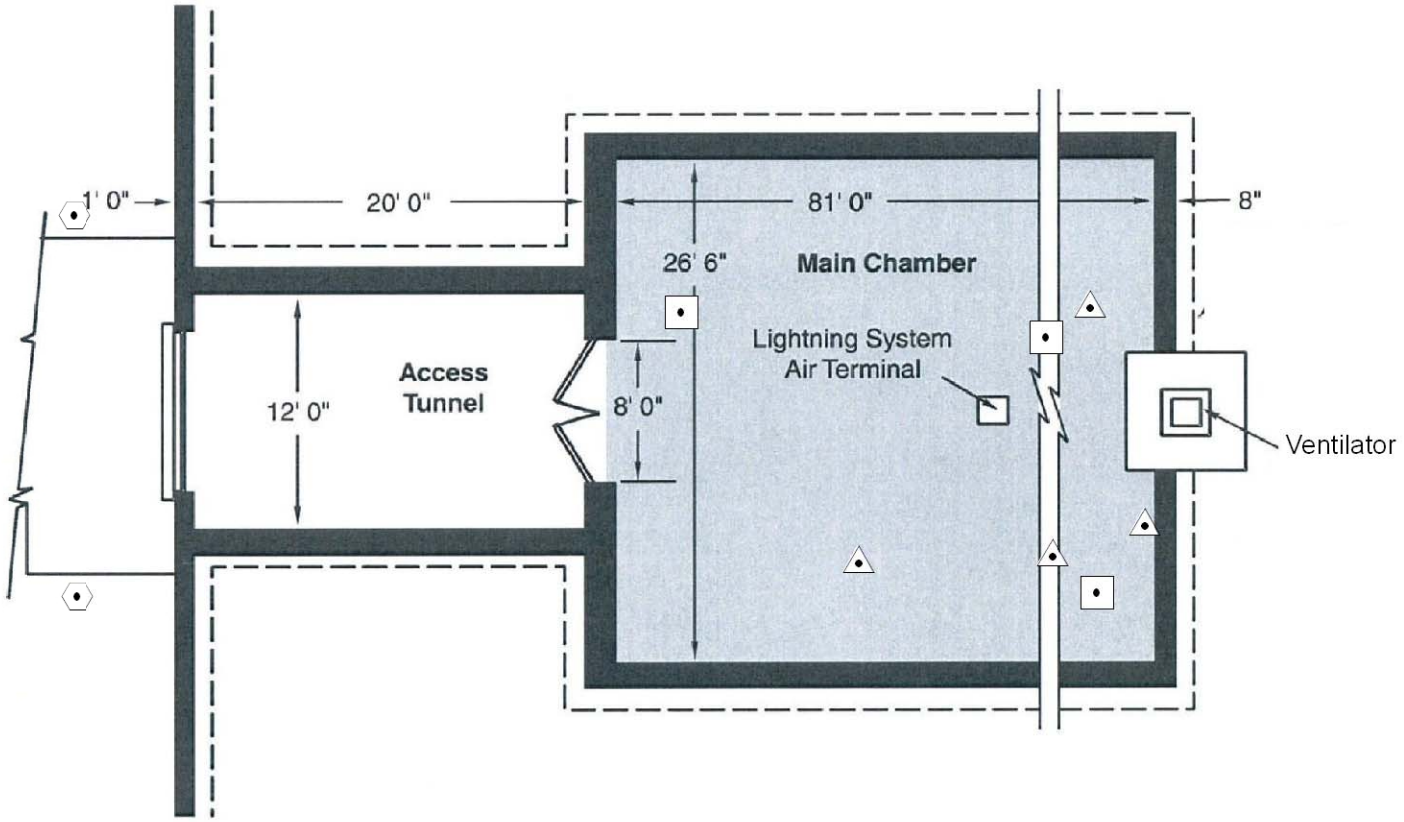
The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.5.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of each MSB is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.5.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the MSB, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.



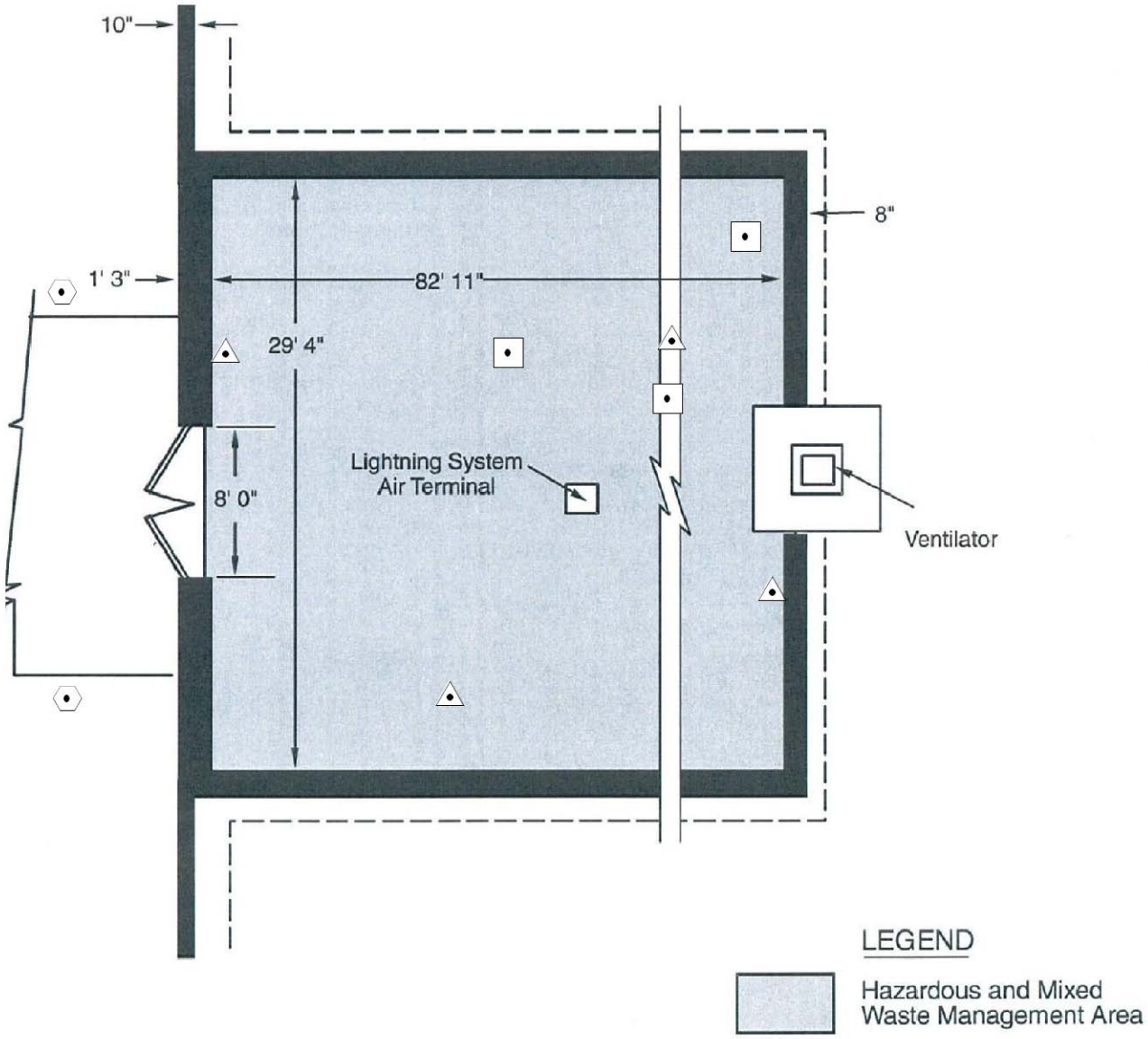
LEGEND

Hazardous and Mixed Waste Management Area

Actual locations may vary from the figure.

- floor (3)
- wall/ceiling (4)
- load/unload/soil (2)

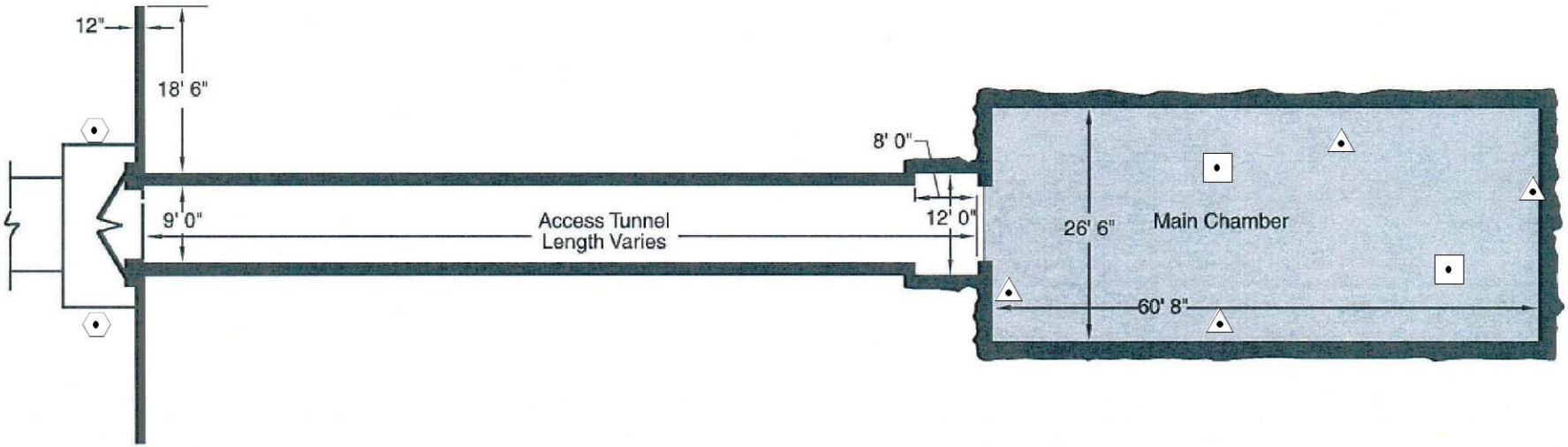
Figure G.5-1
Manzano Bunker 37034 (Type B Bunker Configuration) Sampling Locations



Actual locations may vary from the figure.

- floor (3)
- wall/ceiling (4)
- load/unload/soil (2)

Figure G.5-2
Manzano Bunker 37118 (Type C Bunker Configuration) Sampling Locations



LEGEND

Hazardous and Mixed Waste Management Area

Actual locations may vary from the figure.

- floor (2)
- wall/ceiling (4)
- load/unload/soil (2)

Figure G.5-3
Manzano Bunkers 37045, 37055, and 37057 (Type D Bunker Configuration) Sampling Locations

PERMIT ATTACHMENT H POST-CLOSURE CARE PLAN FOR THE CORRECTIVE ACTION MANAGEMENT UNIT

H.1 INTRODUCTION

This post-closure care plan addresses the post-closure activities that shall be performed at the Corrective Action Management Unit (CAMU) by the Permittees. The CAMU is used for the containment of hazardous and toxic wastes that were generated during remediation activities at the Chemical Waste Landfill (CWL), which is located 100 yards southeast of the CAMU. The CWL is regulated by a stand-alone Post-Closure Care Permit.

This post-closure plan incorporates the requirements of 40 CFR § 264.117 through § 264.120 and § 264.552(e)(6). Post-closure care of the CAMU began on October 15, 2003, and shall continue for 30 years after that date, except that the 30-year post-closure care period may be shortened or extended, as specified in Part 7 of this Permit.

Additional information on post-closure waste management practices to be conducted at the CAMU, and a description of the Unit is provided in Permit Attachment A (*Facility Description*).

During the post-closure care period, the CAMU containment cell shall be monitored and maintained in a manner that shall ensure protection of human health and the environment. The potential for exposure shall be minimized by means of employing the following:

1. Engineered barriers shall be maintained to minimize the migration of leachate into the surrounding environment;
2. Security measures shall be maintained to restrict access to the area; and
3. Inspections, maintenance, and repairs shall be performed as needed and in accordance with Permit Attachment E and this Permit Attachment.

H.2 STORM-WATER DIVERSION STRUCTURES

During post-closure care, the function of storm-water diversion structures associated with the containment cell is to prevent storm-water run-on and runoff from eroding the final cover and to reduce the amount of water that potentially could infiltrate into the final cover. As shown in Figure 36 of Permit Attachment L (*Figures*), the two storm-water diversion structures associated with the containment cell are the site diversion ditch and the containment cell perimeter drainage swale. Storm-water run-on is diverted away from the containment cell by the site diversion ditch where it is directed toward existing surface-water drainage features. Storm-water runoff from the containment cell cover is directed to the perimeter drainage swale where it is discharged off-site via an outfall.

H.3 SECURITY

Figure 32 of Permit Attachment L (*Figures*) shows the post-closure perimeter boundary for the CAMU containment cell area. A contiguous four-strand, barbed-wire fence with two main gates delineates this boundary. The gates are locked when authorized personnel are not present at the CAMU; only authorized personnel control access. Warning signs stating, "*Danger—*

Unauthorized Personnel Keep Out" are posted on all sides of the CAMU fence at 100-foot intervals, at the main gate, and at the emergency exit. The warning signs are legible from a distance of at least 25 feet, visible from any approach to the CAMU, and are posted in both Spanish and English.

H.4 MAINTENANCE AND REPAIRS

Maintenance and repairs shall be conducted as required in this Permit Attachment and in accordance with Permit Attachment E, Section E.3 and Table E-6.

H.4.1 Final Cover System

Water shall be prevented from ponding on the surface of the CAMU cover in any area in excess of 100 square feet. The Permittees shall prevent the establishment of deep-rooted plants, such as shrubs and trees by identifying such species during quarterly inspections and eliminating them before they become established. The plants shall be killed within 60 days or as soon as seasonal conditions are favorable for eliminating them.

Cover damage that exceeds the limits described under "Inspection" shall be repaired within 60 days to a condition that meets or exceeds the original design. Repair specifications shall include, but not be necessarily limited to, the following.

Animal intrusion burrows, settlement areas, and areas of erosion shall be backfilled and compacted using non-contaminated soil with properties similar to the soil used to construct the final cover. The soil shall meet the original construction specifications for the CAMU final cover. The Permittees shall make reasonable attempts to relocate animals prior to backfilling their burrows.

Areas with no vegetation in excess of 200 square feet shall be reseeded in accordance with the original construction specifications for the CAMU final cover. If seasonal conditions (e.g. temperature) are not appropriate for establishing vegetation within 60 days, repairs shall be completed as soon as possible when appropriate conditions occur. Where necessary, the topsoil layer and gravel mulch surface shall be repaired to provide a suitable seedbed. The repair shall be done using materials meeting the original specifications of the CAMU final cover.

H.4.2 Storm-Water Diversion Structures

Based upon the results of the storm-water diversion structure inspections, erosion or damage that exceeds the limits described under the preceding paragraph shall be repaired within 60 days to a condition that meets or exceeds the original design. Silt and debris accumulations that exceed the above specified limits shall be removed within 60 days.

H.4.3 LCRS

The LCRS pump and plumbing shall be maintained/repaired as necessary to maintain them in good condition based upon the results of quarterly inspections. Maintenance/repairs shall be done within 60 days of discovery that the maintenance/repairs are needed.

H.4.4 VZMS

The VZMS components shall be maintained/repaired within 60 days, as needed, to maintain them in good condition -- based upon inspection results. Activities shall include, but not be limited to, maintaining protective casings, access covers/doors, and instrumentation access boxes, ensuring the PSL and CSS compression caps are in good repair, cleaning or replacing locks as necessary, and maintaining calibration and proper operating condition of all electronic monitoring systems. Maintenance/repair activities shall also include ensuring that all aboveground VZMS components are protected from the weather.

H.4.5 Security Fencing and Signage

The fence, gates, and warning signs shall be maintained/repaired within 60 days, as needed, to maintain them in good condition -- as indicated by quarterly inspections. Activities shall include, but are not limited to, the following as needed: removing excessive accumulations of wind-blown plants and debris, repairing broken wire sections and posts, repairing and oiling gates, cleaning or replacing locks, and repairing or replacing warning signs.

H.5 VADOSE ZONE MONITORING SYSTEM LEAK DETECTION MONITORING FREQUENCY AND ASSESSMENT

Sampling and analysis plans (SAPs) for the PSL, VSA, and CSS monitoring subsystems are included in Sections H.6, H.7 and H.8 of this Permit Attachment, respectively, and related Sandia National Laboratories/NM (SNL/NM) Field Operating Procedures (FOPs) are summarized in Table H-2. The purpose of these SAPs is to document procedures for the collection and reporting of consistent, reliable, defensible, and comparable sampling results. Other instructions are provided in SNL/NM FOPs; however, the requirements of the SAPs in this Permit Attachment shall take precedence over any cited FOPs. The most current versions of these FOPs shall be consulted for the purpose of conducting vadose zone monitoring.

The Permittees shall provide to the New Mexico Environment Department (the Department) within 60 days of the effective date of this Permit in hard copy and electronic format the current versions of the FOPs cited in this Permit Attachment. The Permittees shall provide the Department with any updated versions of the FOPs within 30 days of their acceptance by the Permittees. If any requirement or procedure is found by the Department to be unacceptable for reasons including, but not limited to, the requirement or procedure will or could prevent the acquisition of representative and reliable sampling results, the requirement or procedure shall be replaced by the Permittees with a different requirement or procedure that is acceptable to the Department.

TABLE H-1 Vadose Zone Monitoring System Post-Closure Monitoring Frequency, Parameters, and Methods				
Time Frame	**Monitoring Frequency**	**Monitoring System**	**Monitoring/Sampling Parameter**	**Monitoring Method**
Years 2–30 after closure[a]	Quarterly	PSL	Moisture Content	Neutron Probe
		VSA	Soil Moisture Content Temperature	TDR probe Temperature Sensor
		CSS	Moisture Content	Neutron Probe
	Annually[b]	VSA	Active Soil Gas	EPA Method TO-14 or equivalent, as revised and updated[c]
		CSS		

TDR Time domain reflectometer
a Closure of the Unit was completed in October 2003.
b Active soil-gas sampling shall be conducted annually unless increased soil moisture is detected, in which case active soil-gas sampling shall be conducted on a quarterly basis.
c Method TO-14 or an equivalent method such as TO-15 that includes the same analyte list, method detection limits equal to or lower than the TO-14 limits, and provides the same or higher level of data quality. Methods from *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition* (EPA/625/R-96/010b), 1999, as revised and updated.

Table H-2 Applicable SNL Operating Procedures[a]	
Procedure Number	**Procedure Title**
FOP 08-20	Soil Moisture Determination Utilizing Neutron Logging
FOP 08-21	Soil Moisture Monitoring Using Time Domain Reflectometry
FOP 08-22	Soil Vapor Sampling

[a] Sandia National Lab's Procedures (procedures will be used as revised and updated)

H.5.1 Frequency

During the initial stages of the post-closure care period, the primary subliner (PSL), vertical sensor array (VSA), and chemical waste landfill and sanitary sewer line monitoring subsystems (CSS) of the vadose zone monitoring system (VZMS) were monitored on a quarterly and annual

basis for one year. Monitoring shall continue on a quarterly and annual basis for the remainder of the monitoring period unless corrective action is required because of a release of hazardous waste or constituents. A summary of the VZMS post-closure monitoring frequency, parameters, and methods are presented in Table H-1 of this Permit Attachment.

H.5.2 Assessment

As part of each monitoring event, soil moisture content and soil gas results obtained from the VZMS shall be evaluated to determine if there has been leakage or a release of soil gas from the containment cell and, if so, the character and magnitude of the leak or release.

H.5.2.1 Soil Moisture

In the case of a soil moisture increase greater than 4 percent (expressed as gravimetric percent moisture content) at any monitoring location(s), the Permittees shall immediately confirm the result by collecting and analyzing additional samples. If a second analysis confirms that the trigger level has been exceeded, the Permittees must notify the Department in writing within seven days after receipt of the second analysis confirming that the trigger level has been exceeded during the particular sampling event. Within 180 days, the Permittees shall evaluate the soil moisture data to determine the likely location and source of the moisture and report the results in writing to the Department. If the likely source is the sanitary sewer line, the Permittees shall continue monitoring and shall take action if necessary to locate, reduce, and/or eliminate the source of the moisture.

If the likely source is the containment cell, the Permittees shall initiate corrective action as specified below.

H.5.2.2 Soil Gas

If a soil-gas sample result exceeds a trigger level of 20 parts per million by volume (ppmv) total volatile organic compounds (VOCs), the Permittees shall immediately confirm the result by collecting and analyzing additional samples. If a second analysis confirms that the trigger level has been exceeded, the Permittees must notify the Department in writing within seven days after receipt of the second analysis confirming that the trigger level has been exceeded during the particular sampling event.

H.5.2.3 Corrective Action

The Permittees shall submit, within 180 days of confirmation that the trigger level for soil gas has been exceeded, an evaluation of soil gas data in the vicinity of the CAMU, including data for the CWL. The evaluation shall include a determination of the source of the soil gas, and an evaluation of whether the increased soil gas will cause groundwater contamination of any hazardous constituent to exceed the clean up levels specified in Permit Part 8. After the Department has reviewed and approved the evaluation, and the source is determined to be the CAMU, the Permittees shall submit, within 180 days, an application for a permit modification to establish a corrective action program for the CAMU. The application must include at a minimum, a detailed description of the corrective action that will be taken by the Permittees to reduce the concentrations of soil gas to levels that will not exceed the trigger level of 20 ppmv

total VOCs, and the action that will be taken to reduce the concentrations of soil gas to levels that will not cause groundwater contamination of any hazardous constituent to exceed the clean up levels specified in Permit Part 8. The application shall also include a plan for a soil-gas monitoring program that will demonstrate the effectiveness of the corrective action.

For soil moisture, if the Permittees have determined that the likely source of increased moisture is the containment cell, the Permittees shall submit within 180 days an application for a permit modification to establish a corrective action program for the CAMU. The application must include at a minimum, a detailed description of the corrective action that will be taken by the Permittees to stop the release.

All applications for corrective action shall contain a schedule for implementation of the corrective action, and shall describe any necessary characterization and clean up of the vadose zone and groundwater that must be accomplished to protect human health and environment in accordance with the requirements of Permit Section H.1 and Permit Part 8.

H.6 SAMPLING AND ANALYSIS PLAN FOR THE CAMU PRIMARY SUBLINER MONITORING SYSTEM

The Primary Subliner (PSL) is one of three vadose zone monitoring systems associated with the Corrective Action Management Unit (CAMU) containment cell. Monitoring using the PSL Monitoring Subsystem shall be conducted to verify containment cell integrity and performance. This Sampling and Analysis Plan (SAP) describes the monitoring and sampling strategy for the PSL that shall be used during post-closure care.

The PSL is the primary monitoring system for the containment cell. It consists of five parallel-trending, horizontal, vitrified clay pipes (VCPs) located 5 feet below the containment cell bottom liner, with horizontal spacing of 17 to 27 feet. A polyvinyl chloride access tube is connected to the ends of each VCP to facilitate the deployment of a neutron probe for moisture monitoring. The access tubes open on the north and south sides of the containment cell. A neutron probe is manually moved through the VCP during monitoring events.

Monitoring requirements for the post-closure care period are specified in Table H-1 of this Permit Attachment.

H.6.1 Monitoring Methods

Moisture monitoring in the PSL subsystem involves measuring soil moisture content through each VCP using a neutron probe. The moisture sensor will be a California Pacific Nuclear (CPN) 503DR Hydroprobe Moisture Depth Gauge, or equivalent. The CPN 503DR probe uses a 50.0-millicurie americium-241:beryllium neutron source for moisture content measurement. With the custom-made cable-and-winch system available at the Facility, the CPN 503DR probe can be configured to move through each VCP while communicating with the control box on the surface.

Following neutron logging, the calculated moisture content data shall be entered onto a computer spreadsheet for evaluation. Moisture monitoring shall be conducted in accordance with FOP 08-20 (most current version).

H.6.2 CPN 503DR Hydroprobe Moisture Depth Gauge QA/QC and Correlation

The CPN 503DR Hydroprobe Moisture Depth Gauge is used to measure absorption of emitted neutrons and is a geophysical technique to measure soil moisture content. The assumption is made that the hydrogen in soil moisture is the dominant absorber of the emitted neutrons.

The CPN 503DR probe shall be operated in accordance with FOP 08-20. The standard count measures the proper function of the gauge electronics and also compensates for the source decay. This measurement shall be performed daily when the probe is used, as described in the FOP.

The correlation of neutron counts to soil moisture content using the CPN 503DR neutron probe was initially performed in a vessel that duplicated as closely as possible the *in situ* characteristics at the field measuring location. The probe was inserted into the access tube within the vessel, and count readings were taken for a known soil moisture content in the repacked native soil. The resulting neutron count/soil moisture content relationship was used to develop the initial correlation currently used for the instrument, which associates a neutron count to a known soil moisture content. To insure the accuracy of the moisture measurement using the correlation formula the neutron probe must be recalibrated to account for source decay and drift of the electronic counting system. During calibration the probe response is restored to the same condition as existed when the correlation formula was determined. The probe shall be returned to the manufacturer annually for calibration.

H.7 SAMPLING AND ANALYSIS PLAN FOR THE CAMU VERTICAL SENSOR ARRAY MONITORING SYSTEM

The Vertical Sensor Array (VSA) monitoring subsystem provides both lateral and vertical gradient information on *in situ* soil moisture, soil temperature and soil gas. Sampling and analysis via the VSA monitoring system shall be conducted to verify the integrity and performance of the CAMU containment cell. This Sampling and Analysis Plan (SAP) describes the monitoring and sampling strategy that shall be used for the VSA during post-closure care.

The VSA monitoring subsystem consists of 11 vertical boreholes located below the containment cell. Each borehole contains sampling points at 5 and 15 feet below the containment cell liner. The sampling points contain the following three components: a time-domain reflectometry (TDR) soil-moisture probe, a temperature sensor, and an active soil-gas sampler. Instrumentation cabling and tubing is ducted to the surface outside of the containment cell liner perimeter. The cabling and tubing connection ends for each VSA borehole are located within individual weatherproof, aboveground enclosures positioned around the perimeter of the containment cell.

H.7.1 Monitoring and Sampling Strategy

Monitoring requirements for the VSA are also outlined in Table H-1 of this Permit Attachment.

TDR moisture monitoring and temperature monitoring will be conducted in accordance with FOP 08-21.

H.7.2 Sampling Methods and Analytical Procedures

The soil gas-sampling package consists of a 2-inch-diameter and 6-inch-long, end-capped and slotted polyvinyl chloride screen at the sampling location, connected to the ground surface by 1/4-inch-inside-diameter Teflon™ tubing. Except as required herein, soil gas sampling shall be conducted in accordance with FOP 08-22.

Laboratory sample custody, data management, reporting, and sample disposal shall be performed in accordance with established laboratory procedures. Analytical procedures shall follow established laboratory standard operating procedures based upon the referenced EPA method. Active soil gas sampling shall be conducted for volatile organic compounds included in EPA Methods TO-14 or equivalent analytical method.

Except as required herein, Table H-2 of this Permit Attachment lists the field procedures that will be used in support of this SAP. These procedures provide instructions for conducting VSA monitoring and sampling operations. For each scheduled sampling event on Table H-2, field and laboratory quality assurance (QA) samples shall include duplicate samples and trip and field blanks in accordance with the procedure and the TO-14 or equivalent analytical method.

H.7.3 Time-Domain Reflectometer and Data Acquisition Software and QA/QC

The TDR100 Time-Domain Reflectometer and PC-TDR software will be operated in accordance with the FOP 08-21 and the Campbell Scientific, Inc. TDR100 Instruction Manual (Campbell Scientific, Inc., April 2002).

The reflectometer will be operated and tested according to the operator's manual as discussed in FOP 08-21. Predetermined settings for the cable length, waveform, and probe for each monitoring location are entered into the PC-TDR software to ensure capture of the waveform signal to determine soil volumetric water content.

H.8 SAMPLING AND ANALYSIS PLAN FOR THE CHEMICAL WASTE LANDFILL AND SANITARY SEWER LINE MONITORING SYSTEM AT THE CAMU

The Chemical Waste Landfill (CWL) and Sanitary Sewer Line (CSS) monitoring subsystem is designed to allow detection and identification of leakage from the sanitary sewer line, as well as volatile organic compounds (VOCs) that could potentially migrate from the CWL towards the CAMU containment cell. This SAP describes the monitoring and sampling strategy that shall be used for the CSS monitoring system during post-closure care.

The CSS monitoring subsystem is located east of the containment cell and consists of six vertical, 20-foot-deep boreholes, spaced approximately 100 feet apart in a line parallel to the north-south oriented sanitary sewer line. Each borehole is equipped with galvanized steel casing suitable for deployment of a neutron probe for soil moisture monitoring and a sampling port used to collect soil gas samples.

H.8.1 Monitoring and Sampling Strategy

Monitoring shall also be conducted as specified in Table H-1 of this Permit Attachment. The CSS monitoring system shall be used to perform the following activities:

1. Detect liquid releases from the sanitary sewer line, thereby providing information to eliminate false positive detections at the other vadose zone monitoring systems. Potential releases from the sanitary sewer line would be of an aqueous nature and could contain nitrates and perhaps phosphates and sulfates. VOCs originating from the sanitary sewer line are not anticipated; and
2. Detect VOC vapors migrating northwest through the vadose zone toward the containment cell from residual contamination at the CWL.

A neutron probe shall be used at the CSS monitoring locations to measure soil moisture. During a monitoring event, the probe is manually lowered to the selected monitoring point inside the galvanized steel casing. Moisture monitoring within the CSS shall be conducted following FOP 08-20.

H.8.2 Sampling Methods and Analytical Procedures

The CSS monitoring points shall also be used for soil gas sampling to detect and identify VOC vapors that may potentially migrate toward the containment cell from residual contamination at the CWL. Except as required herein, soil gas sampling shall be conducted in accordance with FOP 08-22.

An analytical laboratory under contract to the Permittees for the Facility shall be used to provide the analytical services. Laboratory sample custody, data management, reporting, and sample disposal shall be performed in accordance with established laboratory procedures. Active soil gas sampling shall be conducted for VOCs included in EPA Methods TO-14 or equivalent analytical method.

Except as required herein, Table H-2 of this Permit Attachment lists the field procedures that shall be used in support of this SAP. These procedures provide instructions for CSS monitoring and sampling operations. For each scheduled sampling event prescribed by Table H-1 of this Permit Attachment, field and laboratory quality assurance (QA) samples shall include duplicate samples.

The Permittees shall perform the QA/QC checks and correlations for the CPN 503DR Hydroprobe Moisture Depth Gauge as set forth in Section H.6.2 of this Permit Attachment, and shall operate the probe in accordance with FOP 08-20.

H.9 ANNUAL REPORT

The Permittees shall submit to the Department a certified annual report describing the post-closure care conducted at the CAMU for the previous year. The annual report shall be submitted no later than March 31 of every year that post-closure care takes place. The report shall summarize the results of required inspection and maintenance/repair activities indicating whether repairs were effective and met the applicable CAMU construction or Permit maintenance

specifications. The report shall also summarize sampling results, leachate generation, and any problems, leaks, or releases that either endangered or presented significant potential to endanger human health or the environment and what was done to mitigate such problems, leaks, or releases.

H.10 CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

Within 60 days of the end of the post-closure care period for the CAMU, the Permittees shall submit to the Department, by registered mail, a written certification that post-closure care for the CAMU was performed in accordance with the specifications of this Permit including this Permit Attachment. Responsible officials of the Permittees, as well as an independent registered professional engineer, shall sign the certification. Documentation supporting the independent registered professional engineer's certification of completion of post-closure care shall be furnished by the Permittees to the Department upon request In addition, the Permittees shall prepare a final post-closure care report summarizing pertinent information regarding post-closure monitoring, maintenance, and repair activities and any variances from this Permit Attachment and the reasons for the variances. The post-closure care report shall be provided with the certification to the Department within 60 days of the end of the post-closure period. Transmittal of the report shall include a request from the Permittees for the Department to approve termination of post-closure care for the CAMU. However, submittal of the latter request does not obligate the Department to terminate post-closure care, and the Department instead, may extend the period of post-closure care if necessary to protect human health and the environment pursuant to 40 CFR § 264.117(a)(2)(ii).

PERMIT ATTACHMENT I COMPLIANCE SCHEDULES

Reserved

PERMIT ATTACHMENT J HAZARDOUS AND MIXED WASTE MANAGEMENT UNITS

J.1 ACTIVE PORTION OF THE FACILITY

The active portion of the facility comprises those units permitted to treat and store hazardous and mixed waste. These units are listed in Table J-1.1.

The following information describes process codes and associated process descriptions:

- S01-storage in containers (Table J-1.1)
- T04-treatment in containers (Table J-1.2)
- X01-treatment by open burning (Table J-1.2)
- T04-physical treatment (Table J-1.2)

Table J-1.1. Units Permitted for Storage in Containers (Process Code S01)

Unit Identifier	Storage Capacity	General Information	Type of Unit
TA-I: Hazardous Waste Handling Unit Building 958	59,950 gal	Includes hazardous and mixed waste packaging and storage Total square footage : 3520	Indoor
TA-I: Hazardous Waste Handling Unit Building 959	7,590 gal	Includes hazardous and mixed waste packaging and storage Total square footage: 1800	Indoor
TA-I: Hazardous Waste Handling Unit, Modular Storage Building 958B	5,000 gal	Includes the storage of ignitable and reactive wastes (e.g., lithium batteries) and flammable solids Total square footage: 176	Indoor
TA-I: Hazardous Waste Handling Unit, Modular Storage Building 958C	5,000 gal	Includes the storage of ignitable and reactive wastes (e.g., lithium batteries) and flammable solids Total square footage: 176	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6920	13,420 gal	Includes storage, treatment (see Table J-1.2), and repackaging of hazardous and mixed wastes Total square footage: 5800	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - in Building 6921	7,810 gal	Includes treatment (See Table J-1.2), , repackaging and storage of hazardous and mixed wastes Total square footage: 1450	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6925	83,160 gal	Includes treatment (See Table J-1.2), repackaging and storage of hazardous and mixed wastes Total square footage: 4000	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6926	83,160 gal	Includes storage of hazardous and mixed wastes Total square footage: 4000	Indoor

Table J-1.1. Units Permitted for Storage in Containers (Process Code S01)			
Unit Identifier	**Storage Capacity**	**General Information**	**Type of Unit**
TA-III: Radioactive And Mixed Waste Management Unit - Modular Storage Building TP150	1,100 gal	Includes storage of reactive and ignitable hazardous and mixed wastes Total square footage: 207	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Modular Storage Building TP153	1,100 gal	Includes storage of reactive and ignitable hazardous and mixed wastes Total square footage: 207	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Asphalt Storage Area located North, East, and West of Building 6920	19,800 gal	Includes the storage of hazardous and mixed wastes. Total square footage: 48500	Outdoor
TA-V: Auxiliary Hot Cell Unit	6,620 gal	Includes storage, treatment (See Table J-1.2), and repackaging of hazardous and mixed wastes in Building 6597 Total square footage: 3500	Indoor
TA-V: Auxiliary Hot Cell Unit	1,455 gal	Includes storage of mixed waste in Storage Silos located in Building 6597 Total square footage: 13	Indoor
Manzano Base: Bunker 37034	25,080 gal	Includes storage of hazardous and mixed waste Total square footage: 2146	Indoor
Manzano Base: Bunker 37045	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37055	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37057	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37118	35,200 gal	Includes storage of hazardous and mixed waste Total square footage: 2433	Indoor

Table J-1.2. Units Permitted for Treatment (Process Codes T04 and X01)				
Unit Identifier	**Process Codes**	**Operating Capacity**	**General Information**	**Type of Unit**
TA-III: Radioactive And Mixed Waste Management Unit – All treatment in Buildings 6920 and 6921 Macroencapsulation also in Building 6925	T04	65 gal/day 3,000 gal/yr 80 lb/day 150 lb/yr 550 gal/day 6,000 gal/yr 16 lb/day 100 lb/yr 13,800 gal/day 138,000 gal/yr 5,000 lb/day 50,000 lb/yr	Chemical deactivation Thermal deactivation Stabilization and solidification Amalgamation Macroencapsulation Physical treatment See Table J-1.1 for storage	Indoor
TA-III: Thermal Treatment Unit	X01	20.8 gal in pan 9,500 lb/yr	Open burning	Outdoor
TA-V: Auxiliary Hot Cell Unit	T04	55 gal/day 2,000 gal/yr 550 gal/day 2,000 gal/yr 55 gal/day 6,000 gal/yr 5,000 lb/day 50,000 lb/yr	Chemical deactivation Stabilization and solidification Macroencapsulation Physical treatment See Table J-1.1 for storage	Indoor

Units subject to post-closure care under this Permit are listed in Table J-2. The Chemical Waste Landfill is regulated under a stand-alone Post-Closure Care Permit.

Table J-2. Permitted Units Undergoing Post-Closure Care (Process Code S99)

Unit Identifier	Regulatory Status	Operating Capacity	General Information
TA-III: Corrective Action Management Unit	Post-Closure Permitted Unit	31,800 cubic yards	Post-Closure care of CAMU containment cell where remediation wastes remain in place

The closed units that are listed in Table J-3 do not require post-closure care and are not considered units subject to the requirements of this Permit. Therefore, Table J-3 is for informational purposes only.

Table J-3. Closed Units Not Requiring Post-Closure Care

Unit Identifier	Process Codes	Regulatory Status	Operating Capacity	General Information
TA-V: High Bay Waste Storage Unit, Building 6596	S01	Clean Closed	100,320 gallons	Container storage unit underwent RCRA Clean Closure in June of 2006
Manzano Base: Bunker 37063	S01	Clean Closed	25,080 gallons	Container storage unit was never used for hazardous or mixed waste storage. Therefore, the application to permit it was withdrawn and the Unit was closed in October of 2006
Manzano Base: Bunker 37078	S01	Clean Closed	35,200 gallons	Container storage unit was never used for hazardous or mixed waste storage. Therefore, the application to permit it was withdrawn and the Unit was closed in October of 2006

PERMIT ATTACHMENT K SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Table K-1 provides the list of solid waste management units (SWMUs) and areas of concern (AOCs) at the Facility for which corrective action is required under the Consent Order; whereas, Table K-2 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is required under this Permit. Table K-3 provides the list of SWMUs, AOCs, and hazardous waste management units for which corrective action is complete with controls. Table K-4 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete without controls and that do not require monitoring. Attachment J, Table J-1 (*Active Portion of the Facility*) includes a list of hazardous waste management units at the Facility and the status (*e.g.*, permitted operating, closed) of each unit.

TABLE K-1
Solid Waste Management Units and Areas of Concern Requiring Corrective Action Under the Consent Order

SWMU/AOC #	Name or Description	Comments
OU-1289	***Mixed Waste Landfill***	
76	Mixed Waste Landfill (TA-III)	
OU 1295	***Septic Tanks and Drainfields***	
49	Bldg. 9820 Drains (Lurance Canyon)	Pending CAC status
101	Bldg. 9926/9926A Septic System and Seepage Pit (Coyote Test Field)	Pending CAC status
116	Bldg. 9990 Septic System (Coyote Test Field)	Pending CAC status
138	Bldg. 6630 Septic System (TA-III)	Pending CAC status
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Pending CAC status
147	Bldg. 9925 Septic Systems (Coyote Test Field)	Pending CAC status
149	Bldg. 9930 Septic System (Coyote Test Field)	
150	Bldgs. 9939/ 9939A Septic System and Drainfield (Coyote Test Field)	Pending CAC status
154	Bldg. 9960 Septic System and Seepage Pits (Coyote Test Field)	
161	Bldg. 6636 Septic System (TA-III)	Pending CAC status
OU-1306	***TAs-III & V***	
83	Long Sled Track	
84	Gun Facilities	
105	Mercury Spill (Bldg. 6536)	Pending CAC status
196	Bldg. 6597 Cistern (TA-V)	Pending CAC status
240	Short Sled Track	
OU-1307	***Liquid Waste Disposal System***	
4	LWDS Surface Impoundments	Pending CAC status
5	LWDS Drainfield (TA-V)	Pending CAC status
52	LWDS Holding Tank	Pending CAC status
OU-1309	***Tijeras Arroyo***	
46	Old Acid Waste Line Outfall	Pending CAC status

TABLE K-1 Solid Waste Management Units and Areas of Concern Requiring Corrective Action Under the Consent Order		
SWMU/AOC #	**Name or Description**	**Comments**
OU-1332	***Foothills Test Area***	
8	Open Dump (Coyote Canyon Blast Area)	
28-2	Mine Shafts	Pending CAC status
58	Coyote Canyon Blast Area	
OU-1334	***Central Coyote Test Area***	
68	Old Burn Site	
OU-1335	***Southwest Test Area***	
91	Lead Firing Site (Thunder Range)	Pending CAC status
	Miscellaneous Sites	
	Tijeras Area Ground-Water (TAG) Investigation	
	TA-V Area Ground-Water Investigation	
	Burn Site Area Ground-Water Investigation	
1090	Bldg. 6721 Septic System (TA-III)	Pending CAC status
1094	Live Fire Range East Septic System (Lurance Canyon)	Pending CAC status
1095	Bldg. 9938 Seepage Pit (Coyote Test Field)	Pending CAC status
1101	Bldg. 885 Septic System (TA-I)	Pending CAC status
1114	Bldg. 9978 Drywell (Coyote Test Field)	Pending CAC status
1116	Bldg. 9981A Seepage Pit (Solar Tower Complex)	Pending CAC status
1117	Bldg. 9982 Drywell (Solar Tower Complex)	Pending CAC status
LTES-1	Cable Debris Site	Pending CAC status

TABLE K-2 Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units Requiring Corrective Action Under this Permit		
SWMU/AOC #	**Name or Description**	**Comments**
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved

TABLE K-3 Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete with Controls		
SWMU/AOC#	**Name or Description**	**Date of CAC Approval**
OU 1295	***Septic Tanks and Drainfields***	
137	Bldg. 6540/6542 Septic System (TA-III)	02/08
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Pending CAC status
OU 1302	***TA-I***	
96	Storm System Drain	06/06
98	Bldg. 863 (TCA, Photochemical Releases: Silver Catch Boxes)	11/05
187	Septic Tank Piping for POTW	06/06
190	Steam Plant Tank Farm	06/06
226	Old Acid Waste Line	06/06
OU 1303	***TA-II***	
1	Radioactive Waste Landfill	02/08
2	Classified Waste Landfill (TA-II)	06/06
3	Chemical Disposal Pit	02/08
135	Bldg. 906 Drain System (TA-II)	06/06
OU 1306	***TAs-3&5***	
105	Mercury Spill (Bldg. 6536)	Pending CAC status
196	Bldg. 6597 Cistern (TA-V)	Pending CAC status
OU 1307	***Liquid Waste Disposal System***	
4	LWDS Surface Impoundments	Pending CAC status
OU 1309	***Tijeras Arroyo***	
45	Liquid Discharge (behind TA-IV)	02/08
46	Old Acid Waste Line Outfall	Pending CAC status
96	Storm Drain System Outfall (for TA-II)	06/06
229	Storm Drain System Outfall (for TA-II)	06/06
OU 1332	***Foothills Test Area***	
87	Bldg. 9990 Firing Site	06/06
OU 1335	***Southwest Test Area***	
91	Lead Firing Site (Thunder Range)	Pending CAC status
	Miscellaneous Sites	
1029	Bldg. 6584 North Septic System (TA-III)	06/06
1081	Bldg. 6650 Septic System (TA-III)	02/08
1090	Bldg. 6721 Septic System (TA-III)	Pending CAC status

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
OU 1295	***Septic Tanks and Drainfields***		
49	Bldg. 9820 Drains (Lurance Canyon)	Pending	Pending CAC status
101	Bldg. 9926/9926A Septic System and Seepage Pit (Coyote Test Field)	Pending	Pending CAC status
116	Bldg. 9990 Septic System (Coyote Test Field)	Pending	Pending CAC status
138	Bldg. 6630 Septic System (TA-III)	Pending	Pending CAC status
139	Bldg. 9964 Septic System	12/95	
141	Bldg. 9967 Septic System	11/01	
142	Bldg. 9970 Septic System	09/00	
143	Bldg. 9972 Septic System	09/00	
144	Bldg. 9980 Septic System	09/00	
145	Bldgs. 9981/9982 Septic System	09/00	
146	Bldg. 9920 Drain System (Coyote Test Field)	02/08	
147	Bldg. 9925 Septic Systems (Coyote Test Field)	Pending	Pending CAC status
148	Bldg. 9927 Septic System (Coyote Test Field)	02/08	
150	Bldgs. 9939/ 9939A Septic System and Drainfield (Coyote Test Field)	Pending	Pending CAC status
151	Bldg. 9940 Septic System	11/01	
152	Bldg. 9950 Septic System (Coyote Test Field)	02/08	
153	Bldg. 9956 Septic Systems (Coyote Test Field)	02/08	
160	Bldg. 9832 Septic System	11/01	
161	Bldg. 6636 Septic System (TA-III)	Pending	Pending CAC status
OU 1300			
211	Bldg. 840, Former UST 840-1 (TA-I)	09/00	
OU 1302	***TA-I***		
25	Burial Site (South of TA-I)	12/95	
30	PCB Spill (Reclamation Yard)	04/05	
32	Steam Plant Oil Spill	12/95	
33	Motor Pool Oil Spill	04/05	
41	Bldg. 838 Mercury Spill	12/95	
42	Acid Spill, Bldg. 879 Water Treatment Facility	09/00	
73	Hazardous Waste Repackaging and Storage (Bldg. 895)	12/95	
104	PCB Spill	12/95	
186	TCE Dumping south of Bldg. 859	09/00	
192	TA-I Waste Oil Tank	07/00	
276	Former Bldg. 829X Silver Recovery Sump (TA-I)	02/08	
OU 1303	**TA-II**		

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
43	Radioactive Material Storage Yard (TA-2)	09/00	
44	Decontamination Site and Uranium Calibration Pits (UCPs)	07/00	
48	Bldg. 904 Septic System and HE Drain System (TA-II)	06/06	
113	Area II Firing Sites	11/01	
114	Explosive Burn Pit	04/05	
136	Bldg. 907 Septic System and HE Drain System (TA-II)	06/06	
159	Bldg. 935 Septic System and Drywell (TA-II)	06/06	
165	Bldg. 901 Septic System (TA-II)	06/06	
166	Bldg. 919 Septic System (TA-II)	06/06	
167	Bldg. 940 Septic System and Seepage Pit (TA-II)	06/06	
OU 1306	***TAs-3&5***		
18	Concrete Pad	04/05	
26	Burial Site (Western Part of TA-3)	04/05	
31	Electrical Transformer Oil Spill	11/01	
34	Centrifuge Oil Spill	11/01	
35	Vibration Facility Oil Spill (TA-3)	04/05	
36	HERMES Oil Spill	11/01	
37	PROTO Oil Spill	11/01	
51	Bldg. 6924 Pad, Tank, and Pit	11/01	
78	Gas Cylinder Disposal Pit	02/08	
100	Bldg. 6620 Drain/Sump	11/01	
102	Radioactive Disposal Area	11/01	
107	Explosive Test Area (South-East TA-3)	04/05	Also site of CAMU
111	Bldg. 6715 Sump/Drain	11/01	
188	Bldg. 6597 Above Ground Containment Spill Tank	12/95	
241	Storage Yard	04/05	
275	Seepage Pits, TA-V	07/00	
OU 1307	***Liquid Waste Disposal System***		
5	LWDS Drainfield (TA-V)	Pending	Pending CAC status
52	LWDS Holding Tank	Pending	Pending CAC status
OU 1309	***Tijeras Arroyo***		
7	Gas Cylinder Disposal (Arroyo del Coyote)	09/00	Transferred to KAFB in 2000, listed on KAFB Permit
16	Open Dumps (Arroyo del Coyote)	09/00	
23	Disposal Trenches (near Tijeras Arroyo)	07/00	
40	Oil Spill (6000 Igloo Area)	11/97	
50	Old Centrifuge Site (Tijeras Arroyo)	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
77	Oil Surface Impoundment	07/00	
227	Bunker 904 Outfall	06/06	
228A	Centrifuge Dump Site	09/00	
228B	Centrifuge Dump Site	11/01	
230	Storm Drain System Outfall (for TA-4)	04/05	
231	Storm Drain System Outfall (for TA-4)	04/05	
232	Storm Drain System Outfall	04/05	
233	Storm Drain System Outfall	07/12	
234	Storm Drain System Outfall	07/12	
235	Storm Drain System Outfall	09/00	
OU 1332	***Foothills Test Area***		
15	Trash Pits (Frustration Site)	12/97	
19	TRUPAK Boneyard Storage Area (NW End of Old Aerial Cable)	07/00	
27	Animal Disposal Pit (Coyote Springs)	07/00	
28-1	Mine Shafts	12/97	
28-2	Mine Shafts	Pending	Pending CAC status
28-3	Mine Shafts	12/97	
28-4	Mine Shafts	12/97	
28-5	Mine Shafts	12/97	
28-6	Mine Shafts	12/97	
28-7	Mine Shafts	12/97	
28-8	Mine Shafts	12/97	
28-9	Mine Shafts	12/97	
28-10	Mine Shafts	11/01	
66	Boxcar Site	04/05	
67	Frustration Site	11/01	
82	Old Aerial Cable Site	11/01	
277	New Firing Site East of Optical Range	11/01	
OU 1333	***Canyons Test Area***		
10	Burial Mounds (Bunker Area North of Pendulum Site)	07/00	
12A	Open Arroyo Channel	09/00	
12B	Buried Debris in Graded Area	07/00	
13	LCBS Oil Surface Impoundment (Lurance Canyon Burn Site)	07/00	
59	Pendulum Site	07/00	
60	Bunker Area	11/01	
63-A	Balloon Test Area: Plutonium Dispersal Study Program (PDSP) Site	09/00	
63-B	Balloon/Helicopter Site	07/00	
64	Gun Site (Madera Canyon)	09/00	
65-A	Lurance Canyon Explosive Test Site: Small Debris Mound	09/00	
65-B	Lurance Canyon Explosive Test Site: Primary Detonation Area	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
65-C	Lurance Canyon Explosive Test Site: Secondary Detonation Area	09/00	
65-D	Lurance Canyon Explosive Test Site: Near Field Dispersion Area	09/00	
65-E	Far Field Dispersion Area	07/00	
72	Operation Beaver Site	07/00	
81-A	Catcher Box/Sled Track	11/01	
81-B	Impact Pad	11/01	
81-C	New Aerial Cable Site: Former Burial Location	09/00	
81-D	Northern Cable Area	11/01	
81-E	Gun Impact Area	11/01	
81-F	Scrap Yard	11/01	
92	Pressure Vessel Test Site (Coyote Canyon Blast Area)	12/97	
93	Madera Canyon Rocket Launcher Pads A, B & C	07/00	
94-A	Aboveground Tanks, Lurance Canyon Burn Site	07/00	
94-B	Debris/Soil Mound Area	04/05	
94-C	Bomb Burner Area and Discharge Line	11/01	
94-D	Lurance Canyon Burn Site: Bomb Burner Discharge Pit	09/00	
94-E	Lurance Canyon Burn Site: Small Surface Impoundment	09/00	
94-F	LAARC Discharge Pit	04/05	
94-G	Scrap Yard, Lurance Canyon Burn Site	11/01	
94-H	Fuel Spill at Open Pool Test Area, Lurance Canyon Burn Site	04/05	
225	AEC Storage Facility/Kirtland AFB	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
OU 1334	***Central Coyote Test Area***		
9	Burial/Open Dump (Schoolhouse Mesa)	04/05	
11	Explosive Burial Mounds	09/00	
20	School House Mesa Burn Site	12/95	
21	Metal Scrap (Coyote Springs)	09/00	
22	Storage/Burn (West of DEER)	07/00	
47	Unmanned Seismic Observatory	12/95	
57-A	Workman Site-Firing Site	09/00	
57-B	Workman Site-Target Area	09/00	
61-A	Blast Area	07/00	
61-B	Cratering Area	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
61-C	Schoolhouse Mesa Test Site -- Schoolhouse Bldg.	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
62	Greystone Manor Site (Coyote Springs)	12/95	
69	Old Borrow Pit	12/95	
70	Explosives Test Pit (Water Towers)	09/00	
71	Moonlight Shot Area	07/00	
88-A	Firing Site: Ranch House	12/95	
88-B	Firing Site: Instrumentation Pole	09/00	
OU 1335	***Southwest Test Area***		
6	Gas Cylinder Disposal Pit (Bldg. 9966)	11/01	
6-A	Gas Cylinder Disposal Pit	11/01	
14	Burial Site (Bldg. 9920)	07/00	
17	Scrap Yards/Open Dump (Thunder Range)	07/00	
39	Oil Spill - Solar Facility	11/97	
38	Oil Spills (Bldg. 9920)	07/00	
53	Bldg. 9923 Storage Igloo	11/97	
54	Pickax Site (Thunder Range)	07/00	
55	Red Towers Site (Thunder Range)	09/00	
56	Old Thunderwells (Thunder Range)	07/00	
85	Burial Site (Bldg. 9920)	07/00	
86	Firing Site (Bldg. 9927)	11/01	
89	Shock Tube Site (Thunder Range)	07/00	
90	Beryllium Firing Site (Thunder Range)	09/00	
103	Scrap Yard (Bldg. 9939)	07/00	
108	Firing Site (Bldg. 9940)	07/00	
109	Firing Site (Bldg. 9950)	07/00	
112	Explosive Contaminated Sump (Bldg. 9956)	09/00	
115	Firing Site (Bldg. 9930)	09/00	
117	Trenches (Bldg. 9939)	11/01	
191	EQUUS Red	11/01	
193	Sabotage Test Area	07/00	
194	General Purpose Heat Source Test Area	11/97	
Misc. Sites			
	Building 828, TA-1	04/05	
	TNT Site	04/05	
195	Experimental Test Pit	11/05	
1001	Bldg. 898 Septic System (TA-I)	11/05	
1002	Bldg. 8895/MO 100 Septic System (TA-I)		No Investigation Needed, Active System
1003	Former Bldg. 915/922 Septic System (TA-II)	11/05	
1004	Bldg. 6969 Septic System (Robotic Vehicle Range)	02/08	
1005	Bldg. 6020 Septic System (6000 Igloo Area)		No Investigation Needed, Active System

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1006	Bldg. 6741 Septic System (TA-III)	06/06	
1007	Bldg. 6530 Septic System (TA-III)	06/06	
1008	Bldg. 6750 Septic System (TA-III)	11/05	
1009	Bldg. 6620 Internal Sump (TA-III)	11/05	
1010	Bldg. 6530 Septic System (TA-III)	06/06	
1013	Bldg. T-52 and Former Bldg. 6500 South Septic System (TA-V)		Does Not Exist
1014	Former T-12, T-42, and T-43 Septic System (TA-V)	11/05	
1015	Bldg. 6530 Septic System (TA-III)	06/06	
1016	Bldg. 914 Seepage Pit (TA-II)		No Investigation Needed
1017	Bldg. 897X Septic System (TA-I)		Does Not Exist
1020	MO-146, MO-235, and T-40 Septic System (TA-III)	06/06	
1021	Bldg. 859 Drywell (TA-I)		No Investigation Needed
1022	Bldg. 6505A Seepage Pit (TA-III)		No Investigation Needed
1023	Bldg. 6505 Southwest Seepage Pit (TA-III)		No Investigation Needed
1024	MO 242-245 Septic System (TA-III)	06/06	
1025	Bldg. 6501 East Septic System (TA-III)	11/05	
1026	Bldg. 6501 West Septic System (TA-III)	11/05	
1027	Bldg. 6530 Septic System (TA-III)	11/05	
1028	Bldg. 6560 Septic System (TA-III)	06/06	
1030	Bldg. 6587 Septic System (TA-III)	11/05	
1031	Former Bldgs. 6589 and 6600 Septic System (TA-III)	02/08	
1032	Bldg. 6610 Septic System (TA-III)	11/05	
1033	Bldg. 6631 Septic System (TA-III)	11/05	
1034	Bldg. 6710 Septic System (TA-III)	02/08	
1035	Bldg. 6715 Septic System (TA-III)	02/08	
1036	Bldg. 6922 Septic System (TA-III)	02/08	
1037	MO 14, MO 15 Septic System (TA-I)		No Investigation Needed, Active System
1038	MO 154 Drywell (TA-I)		No Investigation Needed
1039	MO 155 Drywell (TA-I)		No Investigation Needed
1040	MO 156 Drywell (TA-I)		No Investigation Needed
1041	T-28 Drywell (TA-I)		No Investigation Needed
1042	T-29 Drywell (TA-I)		No Investigation Needed
1043	T-30 Drywells (TA-I)		No Investigation Needed
1044	T-31 Drywell (TA-I)		No Investigation Needed
1045	T-32-2 Drywell (TA-I)		No Investigation Needed
1046	T-44 Drywell (TA-I)		No Investigation Needed
1047	T-45 Drywell (TA-I)		No Investigation Needed
1048	T-46 Drywell (TA-I)		No Investigation Needed
1049	T-47 Drywells (TA-I)		No Investigation Needed

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1050	T-48 Drywells (TA-I)		No Investigation Needed
1051	Bldg. 803 Outfall (TA-1)		No Investigation Needed
1052	Bldg. 803 Seepage Pit (TA-I)	02/08	
1053	Bldg. 823 Outfall (TA-I)		No Investigation Needed
1054	Bldg. 823 Drywells (TA-I)		No Investigation Needed
1055	Bldg. 829 Drywell (TA-I)		No Investigation Needed
1056	Bldg. 838 Drywell (TA-I)		No Investigation Needed
1057	Bldg. 839 Drywell (TA-I)		No Investigation Needed
1058	Bldg. 847 Drywell (TA-I)		No Investigation Needed
1059	Bldg. 850 Drywell (TA-I)		No Investigation Needed
1060	Bldg. 857A Drywell (TA-I)		No Investigation Needed
1061	Bldg. 867 Drywells (TA-I)		No Investigation Needed
1062	Bldg. 869 Drywell (TA-I)		No Investigation Needed
1063	Bldg. 882 Drywell (TA-I)		No Investigation Needed
1064	Bldg. 890 Drywells (TA-I)		No Investigation Needed
1065	Bldg. 893 Drywells (TA-I)		No Investigation Needed
1066	Bldg. 894 Drywells (TA-I)		No Investigation Needed
1067	Bldg. 959 Drywell (TA-I)		No Investigation Needed
1068	Bldg. 904E Drywell (TA-II)		No Investigation Needed
1069	Bldgs. 913/913A Septic System (TA-II)		Does Not Exist?
1070	Bldg. 962 Drywells (TA-IV)		No Investigation Needed
1071	Bldg. 986 Drywell (TA-IV)		No Investigation Needed
1072	Bldg. T-52 and Former Bldg. 6500 Septic System (TA-V)	11/05	
1073	Bldg. 6580 Seepage Pit (TA-V)	11/05	
1074	Bldgs. 6581/6582 MO 32/57 Septic System (TA-V)		No Investigation Needed
1075	Bldg. 6582 Septic System (TA-V)		Does Not Exist
1076	Bldg. 6585 Septic System (TA-V)		Does Not Exist
1077	Bldg. 6920 Septic System (TA-III)	11/05	
1078	Bldg. 6640 Septic System (TA-III)	02/08	
1079	Bldg. 6643 Septic System (TA-III)	02/08	
1080	Bldg. 6644 Septic System (TA-III)	02/08	
1082	Bldg. 6620 Septic System (TA-III)	11/05	
1083	Bldg. 6570 Septic System (TA-III)	06/06	
1084	Bldg. 6505 Septic System (TA-III)	02/08	
1085	Bldg. 6520 Septic System (TA-III)		Does Not Exist
1086	Bldg. 6526 Septic System (TA-III)	06/06	
1087	Bldg. 6743 Seepage Pit (TA-III)	02/08	
1088	Bldg. 6736 Septic System (TA-III)		Does Not Exist
1089	Bldg. 6734 Seepage Pit (TA-III)	11/05	
1091	Bldg. 6720 Septic System (TA-III)	11/05	
1092	MO 228-230 Septic System (TA-III)	02/08	
1093	Bldg. 6584 West Septic System (TA-III)	11/05	
1094	Live Fire Range East Septic System (Lurance Canyon)	Pending	Pending CAC status

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1095	Bldg. 9938 Seepage Pit (Coyote Test Field)	Pending	Pending CAC status
1096	Bldg. 6583 Septic System (TA-III)	11/05	
1097	SFER/127/128/130 Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed
1098	TA-V Plenum Rooms Drywell (TA-V)	02/08	
1099	Bldg. 634 Outfall (TA-I)		No Investigation Needed
1100	Bldg. 814 Outfall (TA-I)		No Investigation Needed
1101	Bldg. 885 Septic System (TA-I)	Pending	Pending CAC status
1102	Former Bldg. 889 Septic System (TA-I)	02/08	
1103	Bldg. 6030 Septic System (6000 Igloo Area)		No Investigation Needed, Active System
1104	Bldg. 6595 Seepage Pit (TA-V)	02/08	
1105	Bldg. 6596 Drywell (TA-V)	11/05	
1106	Bldg. 6505 Interior Sump (TA-III)		No Investigation Needed
1107	Bldg. 6526 Drywell (TA-III)		No Investigation Needed
1108	Bldg. 6531 Seepage Pits (TA-III)	06/06	
1109	Bldg. 6530 Seepage Pit (TA-III)		No Investigation Needed
1110	Bldg. 6536 Drain System (TA-III)	06/06	
1111	Bldg. 6720 Seepage Pit (TA-III)	11/05	Site referred to as Bldg. 6720 Drywell (TA-III) in Consent Order
1112	Bldg. 6590 Reactor Sump Drywell (TA-V)	11/05	
1113	Building 6597 Drywell (TA-V)	02/08	
1114	Bldg. 9978 Drywell (Coyote Test Field)	Pending	Pending CAC status
1115	Former Offices Septic System (Solar Tower Complex)	07/12	
1116	Bldg. 9981A Seepage Pit (Solar Tower Complex)	Pending	Pending CAC status
1117	Bldg. 9982 Drywell (Solar Tower Complex)	Pending	Pending CAC status
1118	Bldg. 9966 Drywell (Thunder Range)		No Investigation Needed
1119	Live Fire Range West Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed, Active System
1120	Bldg. 6595 Seepage Pit (TA-V)	02/08	
LTES-1	Cable Debris Site	Pending	Pending CAC status

PERMIT ATTACHMENT L FIGURES

(for Attachment G and Attachment M figures, see Attachment G and M)

PERMIT ATTACHMENT M LONG-TERM MONITORING AND MAINTENANCE PLAN FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN GRANTED CORRECTIVE ACTION COMPLETE WITH CONTROLS

M.1 INTRODUCTION

This Long Term Monitoring and Maintenance Plan (LTMMP) addresses measures that the Permittees shall perform to provide protection of human health and the environment from constituents of concern present at various Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at Sandia National Laboratories/New Mexico (SNL/NM). These SWMUs/AOCs are listed in Permit Attachment K, Table K-3, *Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for Which Corrective Action is Complete with Controls,* and Table 1 of this Permit Attachment.

The SWMUs/AOCs subject to this LTMMP are located within the fenced boundaries of Kirtland Air Force Base (KAFB).

Measures under this LTMMP include surveillance of site conditions and maintenance of institutional controls. The controls are consistent with the risks presented by the site conditions and constituents of concern at each SWMU/AOC. The controls are implemented in an integrated and layered approach to enhance their effectiveness and reliability, and to provide continued protection in the event that one or more controls become temporarily impaired. Administrative and physical controls at the SWMUs/AOCs subject to this LTMMP include:

- Information management,
- Restrictions on future use,
- Awareness,
- Limited access restrictions as described in this LTMMP, and
- Physical features at some SWMUs/AOCs.

Maintenance of control measures, including routine surveillance, is conducted as necessary to prevent deterioration or failure of controls.

The administrative and physical controls are described in Section 2. The scope and frequency of surveillance and maintenance measures are described in Section 3, and periodic reports of SWMU/AOC status are summarized in Section 4 of this LTMMP. Information about the individual SWMUs/AOCs, controls, and maintenance measures is summarized in Table 1. Except for SWMUs 96 and 187, the SWMU/AOC locations are shown in Figures 1 through 7 of this Permit Attachment. The locations of SWMUs 96 and 187 could not be shown on Figures 1-7 due to their large spatial distribution. Instead, the locations for SWMUs 96 and 187 may be found on maps contained in the Investigation Report for each of these SWMUs.

M.2 INSTITUTIONAL CONTROLS

M.2.1 Administrative Controls

The following information about each SWMU/AOC listed in Table M-1 is maintained at SNL/NM: the SWMU/AOC location, characteristics, constituents of concern, corrective action, current conditions, and restrictions on future use.

The SWMUs/AOCs listed in Table M-1 are not approved for residential land use. Plans for future activities by the Permittees within one-half mile of each SWMU/AOC shall be evaluated to identify aspects that are not consistent with land use requirements for that SWMU/AOC.

M.2.2 Physical Controls

Physical controls that shall be implemented for each SWMU/AOC are listed in Table 1. Each of the SWMUs/AOCs listed in Table M-1 is located within the fenced boundaries of KAFB. Public access to KAFB is restricted. Additional physical controls at these SWMUs/AOCs consist of one or more of the following:

- Land use restrictions (primarily industrial),
- Warning and information signs posted at each SWMU/AOC where feasible,
- Fences that restrict access to some or all of each SWMU/AOC, and
- Physical features such as subsurface location (e.g., sewer lines).

Where signs are posted at the SWMUs/AOCs, the signs shall include the following information:

- SWMU/AOC number;
- Site-specific instructions; and
- Contact information for further direction.

The specific controls and maintenance measures for each SWMU/AOC are listed in Table M-1.

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1295 Septic Tanks and Drainfields							
137	Bldg. 6540/6542 Septic System (TA-III)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each at selected corners of the SWMU	Annual		3
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each at selected corners of the SWMU	Annual		5
OU 1302 TA-I							
96	Storm System Drain	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground storm drains throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown
98	Building 863 (TCA, Photochemical Releases: Silver Catch Boxes)	Maintained and tracked	Industrial	Not feasible	Annual	SWMU consists of subsurface area located under a building. No signs, postings, or inspections are feasible due to SWMU features.	1
187	Septic Tank Piping for POTW	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground sewer lines throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown
190	Steam Plant Tank Farm	Maintained and tracked	Industrial[a]	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		1
226	Old Acid Waste Line	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground drain line throughout TA-I, II, and IV. No signs, postings, or inspections are feasible due to SWMU features.	1 and 2

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1303 TA-II							
1	Radioactive Waste Landfill	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each in selected corners of the SWMU	Annual		2
2	Classified Waste Landfill (TA-II)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		2
3	Chemical Disposal Pit	Maintained and tracked	Industrial	Included with SWMU 1	Annual	Located adjacent to SWMU 1.	2
135	Building 906 Drain System	Maintained and tracked	Industrial	1 sign	Annual		2
OU 1306 TA III and V							
105	Mercury Spill (Bldg. 6536)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3
196	Bldg. 6597 Cistern (TA-V)	Maintained and tracked	Industrial	1 sign in the middle of the SWMU	Annual		3
OU 1307 Liquid Waste Disposal System							
4	LWDS Surface Impoundments	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1309 Tijeras Arroyo							
45	Liquid Discharge (Behind TA-IV)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in approximately each corner of the SWMU outside of the TA-IV fence	Annual	Western half of the SWMU is located within the TA-IV fenced boundary	2
46	Old Acid Waste Line Outfall	Maintained and tracked	Industrial	4 signs along the TA-IV fence line and 7 signs posted along the south and west perimeter of the SWMU	Annual		2
229	Storm Drain System Outfall (for TA-II)	Maintained and tracked	Industrial	1 sign at the top of the outfall	Annual		2
OU 1332 Foothills Test Area							
87	Building 9990 Firing Site	Maintained and tracked	Industrial[a]	4 signs, one at the access road and three on the perimeter of the SWMU	Annual		6
OU 1335 Southwest Test Area							
91	Lead Firing Site (Thunder Range)	Maintained and tracked	Industrial[a]	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		4
Miscellaneous Sites							
1029	Building 6584 North Septic System (TA-III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
1081	Building 6650 Septic System (TA-III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3
1090	Bldg. 6721 Septic System (TA-III)	Maintained and tracked	Industrial	1 sign, approximately in the middle of the SWMU	Annual		3

[a] The Permittees have separate documentation with KAFB to maintain institutional controls at this location, however, this documentation does not prohibit KAFB uses of the land.

M.3 MAINTENANCE OF INSTITUTIONAL CONTROLS

M.3.1 Maintenance of Administrative Controls

Records and information for each SWMU/AOC listed in Table M-1 are maintained in written or electronic form at SNL. The records are kept current and are updated when new information becomes available or is generated. The records include the following:

- Site location and characteristics;
- Site history and corrective action;
- Land use permits or agreements with KAFB;
- Documentation of current site conditions, including information from annual inspections;
- Type of controls
- Maintenance records
- Planning information, including restrictions on future activities at the site; and
- Copies of reports previously submitted to the Department.

M.3.2 Maintenance of Physical Controls

The Permittees shall periodically inspect and maintain the physical controls at the SWMUs/AOCs. Documented annual inspections include reviews of the following, as applicable:

- Condition of the site;
- Evidence of erosion, seepage, or subsidence;
- Evidence of newly-occurring or newly-visible contamination;
- Condition and location of signs;
- Evidence of activities that are not consistent with restrictions in place; and
- Evidence of residential activities adjacent to the given SWMU/AOC that would necessitate additional awareness measures and access restrictions for the site.

Inspection results are evaluated for necessary maintenance, including repair, replacement, or installation. Maintenance will occur on the following schedule (Table M-2) unless weather or other site-specific conditions require a delay.

Table M-2 Maintenance Schedule	
Maintenance Issue	**Response Schedule**
Erosion, seepage, or subsidence	Evaluate severity and if necessary develop mitigation plan within 120 days Complete in a timely manner
Newly-occurring or newly-discovered contamination	See Permit Part 8
Signs	Begin to address within 30 days Complete in a timely manner
Activities that are inconsistent with site restrictions	Begin to address within 30 days Complete in a timely manner
Awareness measures to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 30 days Implement measures in a timely manner
Access restrictions to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 60 days Implement measures in a timely manner

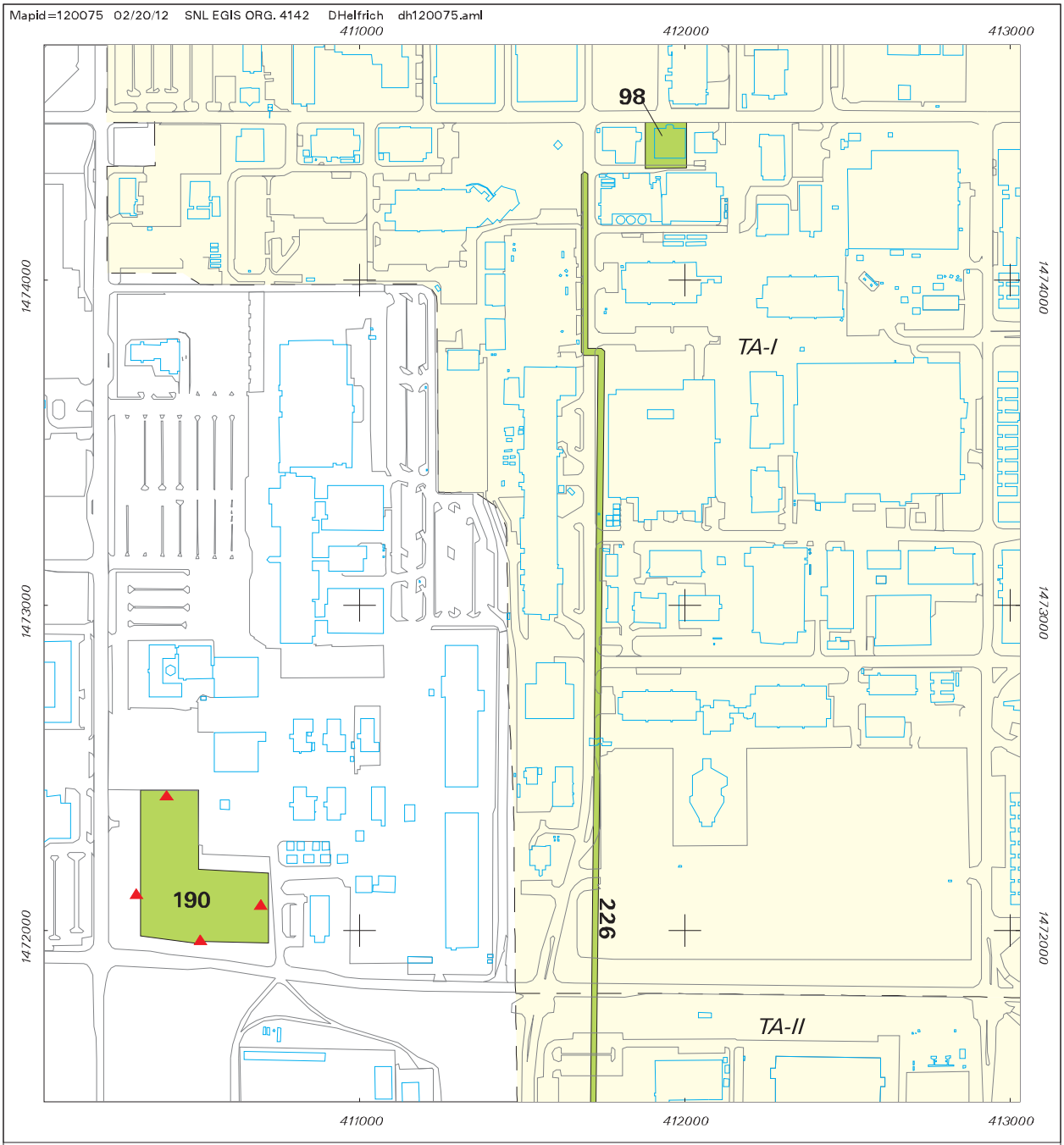
The Permittees shall perform follow-up inspections to verify completion of corrective actions. Follow-up inspections shall occur within 180 days after the actions are completed and may be combined with annual inspections.

M.4 LTMMP REPORTING REQUIREMENTS

An annual SWMU/AOC LTMMP report shall be prepared to document the following:

- Annual inspection results;
- Maintenance and repair activities required;
- Status of maintenance and repair activities; and
- Other conditions or events at the site that affect the performance of the controls.

The report shall include all SWMUs/AOCs listed in the Permit Table M-1. The annual report for each calendar year shall be submitted to the Department by March 31 of the following year.



Kirtland Air Force Base

Legend

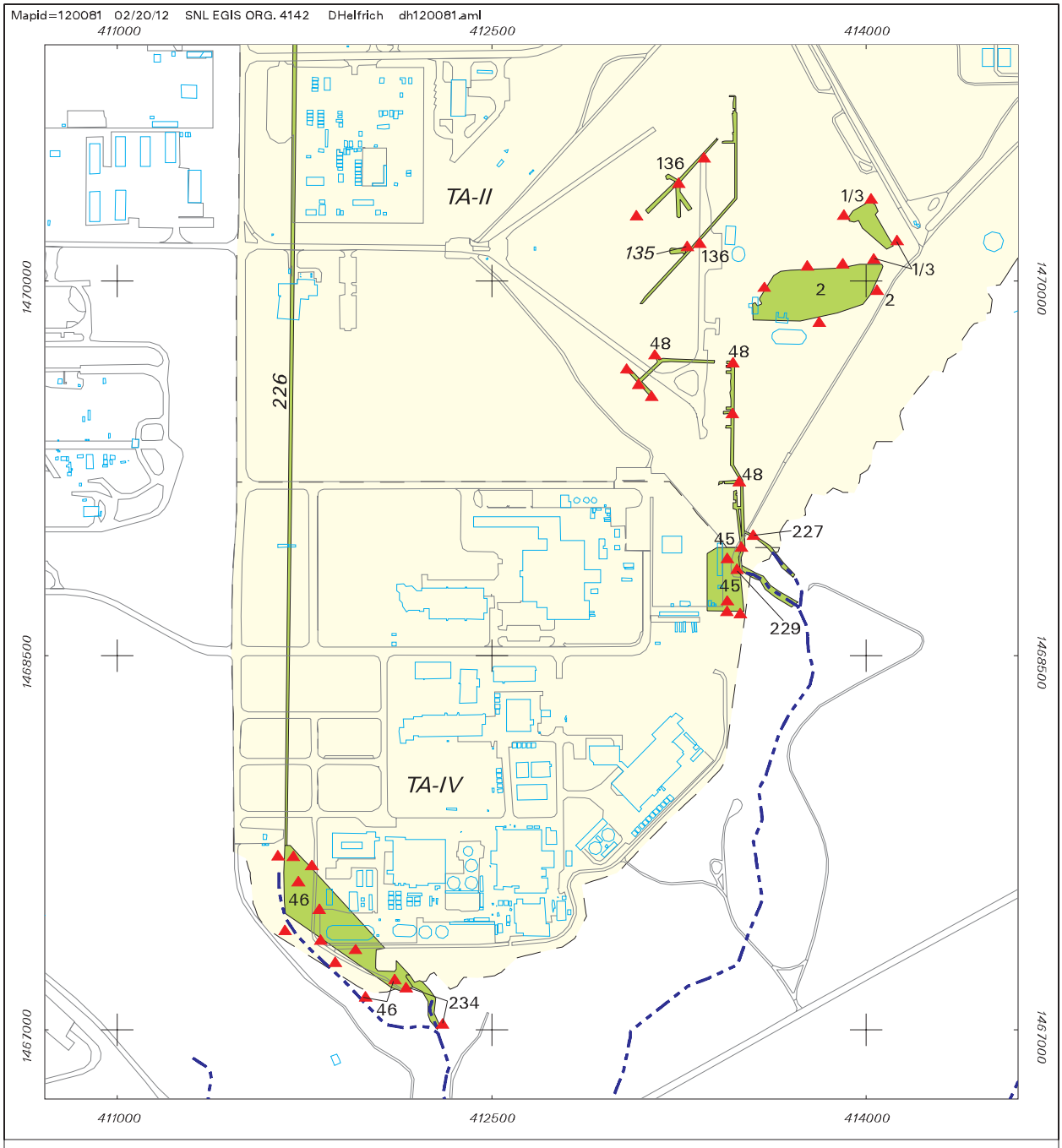
- Sign Location
- Road
- Building / Structure
- SWMU with Controls
- SNL Tech Area I

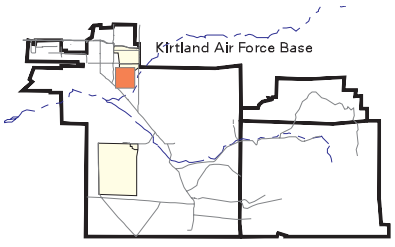
Figure 1
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Area I

0 250 500
Scale in Feet

0 60 120
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System





Legend

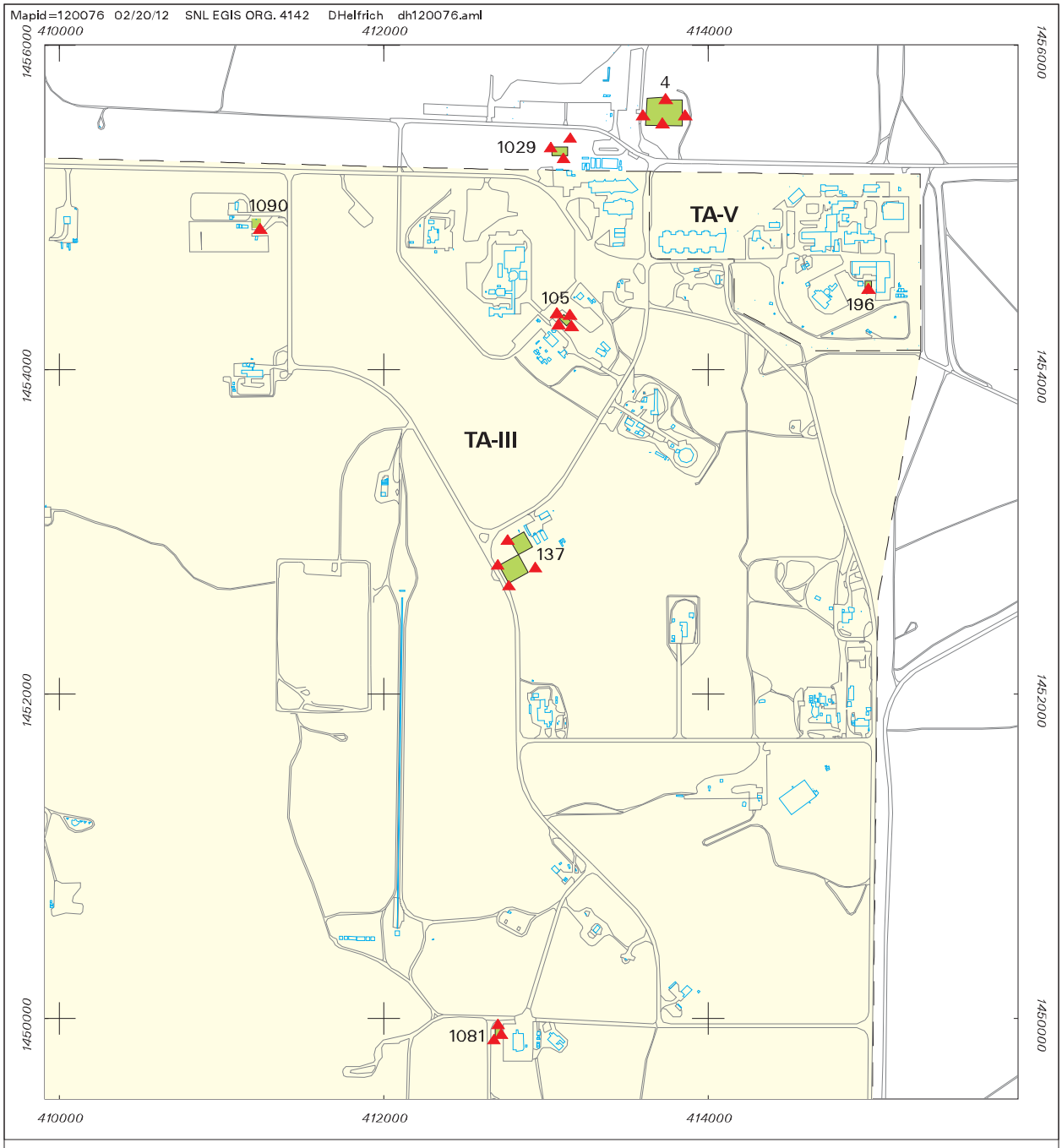
- Sign Location
- Road
- Surface Drainage
- Building / Structure
- SWMU with Controls
- SNL Tech Area II & IV

Figure 2
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Areas II and IV

0 325 650
Scale in Feet

0 78 156
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



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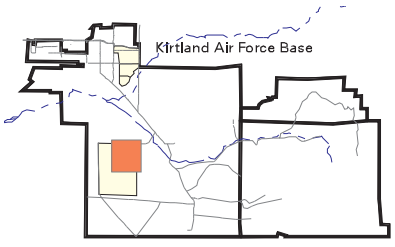


Sign Location

Road

Building / Structure

SWMU with Controls

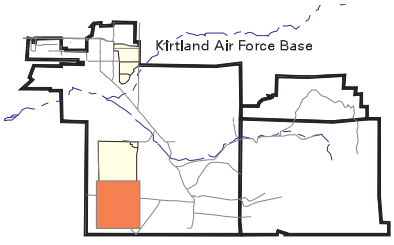
SNL Tech Area III

Figure 3
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Areas III and V

0 500 1000
Scale in Feet

0 120 240
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

- Sign Location
- Road
- Fence
- Building / Structure
- SWMU with Controls
- SNL Tech Area III

Figure 4
Solid Waste Management Units 54, 91, and 279 - Corrective Action Complete with Controls

0 750 1500
Scale in Feet

0 180 360
Scale in Meters

Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Legend

- Sign Location
- Unpaved Road
- Fence
- Building / Structure
- SWMU with Controls

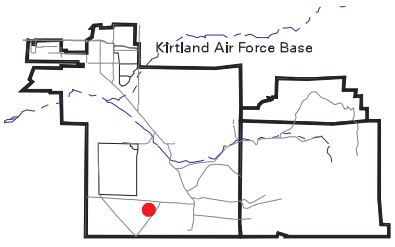


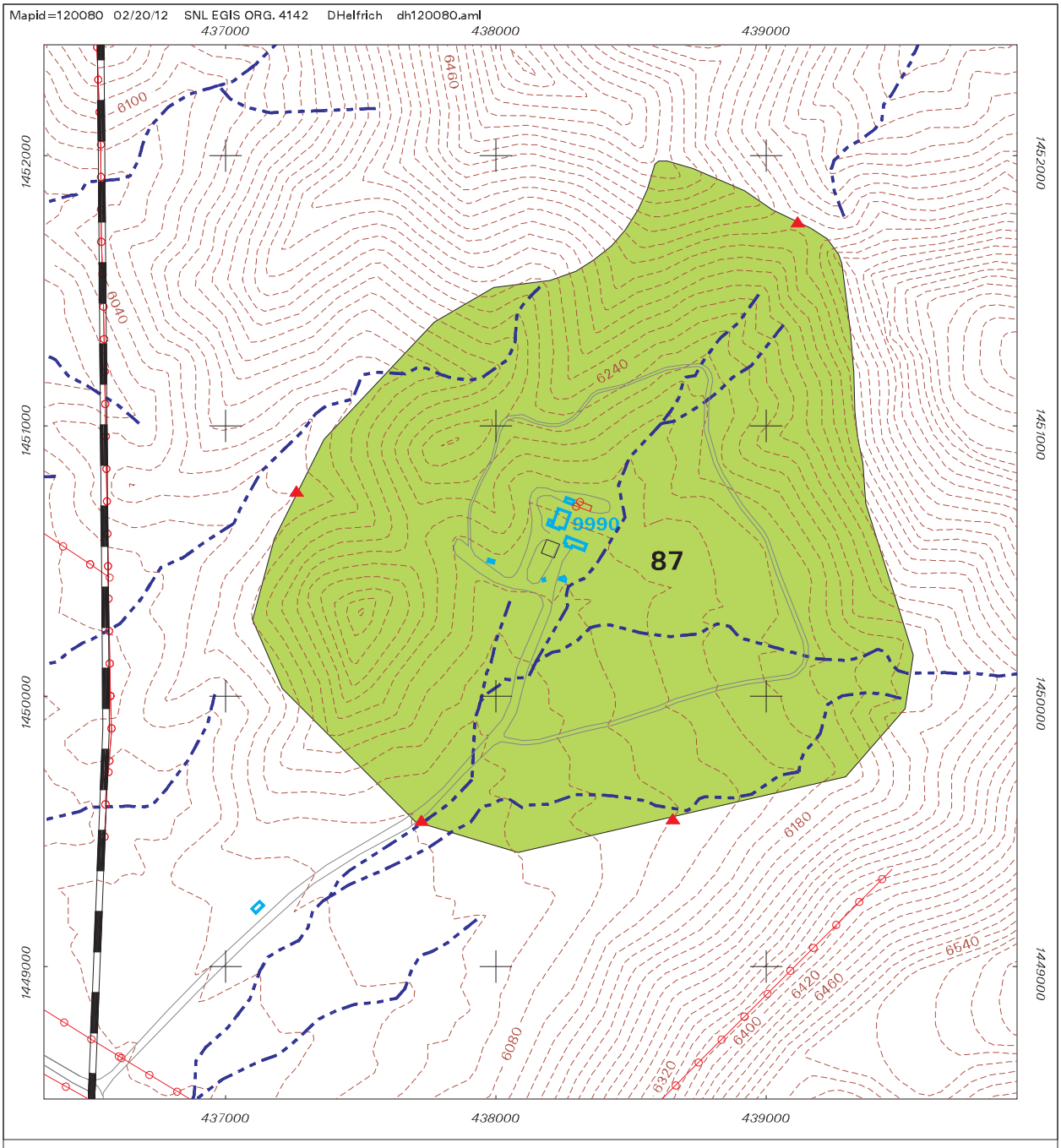
Figure 5
Solid Waste Management Unit 140 - Corrective Action Complete with Controls

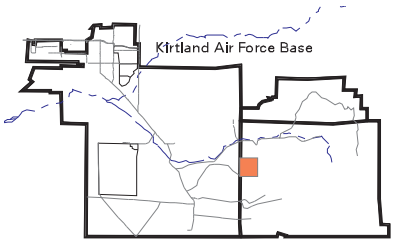
0 25 50
Scale in Feet

0 6 12
Scale in Meters

Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Sandia National Laboratories, New Mexico
Environmental Geographic Information System





Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Legend

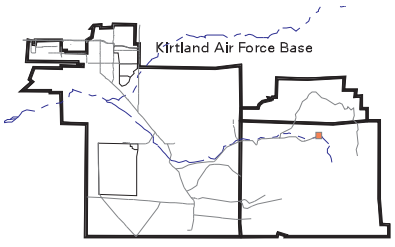
- Sign Location
- Unpaved Road
- 20-ft Contour
- KAFB Boundary
- Building / Structure
- Surface Drainage
- Fence
- SWMU with Controls

Figure 6
Solid Waste Manangement Unit 87 - Corrective Action Complete with Controls

0 300 600
Scale in Feet

0 72 144
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

- Sign Location
- Unpaved Road
- 10-ft Contour
- Building / Structure
- Surface Drainage
- SWMU with Controls

Figure 7
Solid Waste Management Untits 94-B, 94-F, and 94-H - Corrective Action Complete with Controls

0 100 200
Scale in Feet

0 24 48
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System