APPENDIX 3J
AUXILIARY HOT CELL UNIT
HAZARDOUS AND MIXED WASTE MANAGEMENT UNITS
SANDIA NATIONAL LABORATORIES/NEW MEXICO

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ACRONYMS AND ABBREVIATIONS

AHCU	Auxiliary Hot Cell Unit
ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
CMU	concrete masonry unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ID	inner diameter
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NTESS	National Technology & Engineering Solutions of Sandia, LLC
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
AHCU	Auxiliary Hot Cell Unit
SAP	sampling and analysis plan
SNL/NM	Sandia National Laboratories/New Mexico
TA	Technical Area
TSDF	treatment, storage, and disposal facility
Unit	hazardous and mixed waste management unit
WMA	waste management area

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AUXILIARY HOT CELL UNIT
PART B PERMIT RENEWAL REQUEST
SANDIA NATIONAL LABORATORIES/NEW MEXICO

Sandia National Laboratories/New Mexico (SNL/NM) is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, (NTESS), a wholly owned subsidiary of Honeywell International Inc. for the owner, the U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA). This Sandia National Laboratories/New Mexico (SNL/NM) Auxiliary Hot Cell Unit (AHCU) Part B Permit Renewal Request is submitted to address the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subparts V and IX (20.4.1.500 and .900 NMAC), revised December 1, 2018 [12-01-18], requirements specific to hazardous and mixed waste container storage and treatment operations at the AHCU that require a permit. 20.4.1.500 and .900 NMAC adopt by reference, with limited exceptions, all of the Code of Federal Regulations, Title 40, Parts 264 and 270 (40 CFR §264 and §270).

This appendix contains hazardous and mixed waste management unit (Unit)-specific details that supplement the information provided in the following:

- Volume 2: the "Sandia National Laboratories/New Mexico General Part A Permit Renewal Request," hereinafter referred to as the General Part A, and

- Volume 3: the "Sandia National Laboratories/New Mexico General Part B Permit Renewal Request," hereinafter referred to as the General Part B.

The General Part A serves as a companion document to the General Part B and Unit-specific Part B appendices, including this AHCU Part B Permit Renewal Request. All of the hazardous and mixed wastes listed in the General Part A may be managed at the AHCU. As described in the General Part B, the phrase "hazardous and mixed waste" means a waste that meets the regulatory definition of either hazardous waste or mixed waste; the General Part B contains a list of definitions. Together, information provided in this appendix, in the General Part B, and in the appendices to the General Part B meet the applicable requirements for the AHCU that are specified in 20.4.1.500 NMAC/40 CFR 264 [12-01-18], and 20.4.1.900 NMAC/40 CFR 270 [12-01-18].

The AHCU occupies 7,500 square feet in Building 6597 in Technical Area (TA)-V. Operations include storage of hazardous and mixed wastes in containers, repackaging wastes, and treating the wastes as needed to render them more suitable for shipment to off-site treatment and/or disposal facilities. DOE/NNSA and NTESS currently operate the AHCU in accordance with the terms of "Sandia National Laboratories/New Mexico Hazardous Waste Facility Operating Permit Number NM5890110518" (New Mexico Environment Department [NMED], 2015 and modifications).

3J.1.0 GENERAL UNIT OPERATIONS

This section provides general descriptions of the AHCU waste management areas (WMAs) and specific waste management practices. The information in this section complements the information provided in Section 1.0 of the General Part B.

Specific information in this section regarding Unit operations includes containment systems; requirements for ignitable, reactive, and incompatible wastes; preparedness and prevention; hazards prevention; and container storage practices. Treatment practices are discussed in Section 3J.8.0 of this appendix.

The specific information provided and documents referenced in this section, together with the general information provided in Section 1.0 of the General Part B, address the applicable hazardous waste management facility requirements of 20.4.1.500 NMAC/40 CFR §264, Subparts I, AA, BB, and CC [12-01-18], and 20.4.1.900 NMAC/40 CFR §270.14 and §270.15 [12-01-18].

3J.1.1 Designated Waste Management Areas

The location of the AHCU at SNL/NM is shown on Figures 3J-1 and 3J-2. The location of the AHCU within TA-V is shown on Figure 3J-2. The AHCU includes four designated WMAs within the high bay of Building 6597: the hot cell; the work area near the hot cell (including the fume hood); the storage silos; and container storage (Figure 3J-3). The high bay of Building 6597 is a concrete and steel structure, with concrete masonry unit (CMU) walls and a concrete floor. The roof consists of steel joists covered with a metal deck, rigid insulation, and a single-ply roof membrane. The east side of the high bay is equipped with an overhead crane that can be used to move large items between the hot cell, the storage silos, and the work area. The floor of the work area is coated with an epoxy-based chemical resistant coating that forms a continuous protective barrier over the concrete floor. The floor of the container storage area is painted. The high bay area of Building 6597 is also equipped with a system of floor trenches covered with steel plates or grating. These trenches are not used to provide secondary containment for management of hazardous and mixed wastes.

At the AHCU, containers holding hazardous and mixed liquid wastes are either stored inside outer containers that provide secondary containment, or 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. They are designed to be resistant and impervious to corrosives and other liquids. The containers of liquids (up to and including 85-gallon overpack containers) will be stored on the grating. Any liquids released from the containers will drain through the grating into the tub. The pallets come in various sizes and capacities, they are designed for use with 55-gallon drums or other standard containers, and they meet the requirements of 20.4.1.900 NMAC/40 CFR §270.15[a] and [b] [12-01-18] and 20.4.1.500 NMAC/40 CFR §264.175(b)(1-3) [12-01-18].

Each pallet has sufficient capacity to hold the contents of the largest container of liquid stored on it. Containers are typically not stacked on each other on the pallets. Stacked containers are stored as described in Section 1.2.2.2 of the General Part B. Because the spill pallets are designed to

hold containers of liquids, the weight of the containers does not exceed the load-bearing capacity of the grating or the pallet.

The containers are stored indoors and are protected from precipitation by the building, and by the slope of the asphalt pavement and gravel-covered soil surface outside the building that directs stormwater away from the doorways, meeting the requirements of 20.4.1.500 NMAC/40 CFR §264.175(b)(4).

The hot cell and the fume hood in the work area are equipped with a negative pressure ventilation system. In addition, a flexible exhaust hose can be attached to the same system, allowing for localized negative pressure ventilation from the work area. The air flow from the ventilation system passes through a two-stage air filter train before being released to the environment through an exhaust stack. The filters effectively remove particulates entrained in the air flow.

The following sections provide descriptions of the location and capacity of each WMA. Treatment practices are summarized in Section 3J.1.4 and discussed in detail in Section 3J.8.0 of this appendix.

3J.1.1.1 Hot Cell

The hot cell is located in the high bay area of Building 6597. Waste management activities include repackaging hazardous and mixed wastes for shipment to off-site treatment, storage, and disposal facilities (TSDFs), and reducing waste volume by using tools to separate items with hazardous waste constituents from larger items. Outside overall dimensions of the hot cell are 16 feet, 8 inches on each side and 16 feet, 2 inches high. Inside space dimensions are 100 square feet with a height of 13 feet, 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 precast 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. The storage capacity of the hot cell is equivalent to 900 gallons of hazardous and mixed waste.

3J.1.1.2 Work Area

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 includes deactivation, stabilization, macroencapsulation, and physical treatment. Personnel also repackage wastes for shipment to off-site TSDFs. The work area (approximately 300 square feet) may be used for storage of up to 2,200 gallons of hazardous and mixed waste. The floor of the work area is covered with an epoxy-based coating.

From time to time, a temporary enclosure (a tent-like room) may be erected in the work area north of the hot cell and east of the permanent shield wall to accommodate large hazardous and mixed waste items and containers. If the hazardous and mixed waste item or container must be handled remotely, the temporary room will be built against the permanent shield wall to allow the use of

the manipulators at the shield wall. Each time an enclosure is erected, waste-specific considerations will determine details of the design; however, basic construction consists of polyvinyl chloride or metal framing, with clear or translucent plastic roof, walls, and openings. The enclosure will operate at a slight negative pressure.

A 6-foot-wide walk-in fume hood is located in the work area northeast of the 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 storage capacity for the overall work area.

3J.1.1.3 Storage Silos

Four 10-inch (inner diameter), 15-foot-deep floor silos and two 30-inch (inner diameter), 15-foot-deep floor silos are located in the work area north of the hot cell and east of the permanent shield wall (Figure 3J-3). These silos have removable locking-type shield plugs. The tops of the silos are raised slightly above the general floor level to reduce the possibility for the entry of water into the silo.

Two additional storage silos are located within the hot cell. Each silo is 10-inch (inner diameter). One silo is 15-foot deep and the other is 11-foot, 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 wastes that may be stored in the silos; secondary containment is provided by outer storage containers. The silos are typically used only for storage of hazardous and mixed wastes that exhibit high external radiation dose rates and therefore present hazards to personnel. The maximum waste storage capacity of the silos is 1,455 gallons.

3J.1.1.4 Container Storage (20.4.1.900 NMAC/40 CFR §270.15 and 20.4.1.500 NMAC/40 CFR, Subpart I)

Containers of hazardous and mixed waste are stored in the high bay, south and west of the hot cell, within an area of approximately 3,100 square feet. The footprint of the storage area varies, depending on the quantity and configuration of the wastes. The floor of the storage area is painted. The waste storage capacity is 3,520 gallons.

The high bay is equipped with a system of floor trenches covered with grating. These trenches are not used to provide secondary containment for management of hazardous and mixed wastes.

3J.1.2 Unit Operations

The AHCU WMAs are used to store any of the wastes bearing U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers listed in the General Part A (Volume 2). Many of the wastes may also be treated in the AHCU WMAs; specific treatment operations are discussed in Sections 3J-1.4 and 3J-8.0 of this appendix.

Information regarding operations requiring a permit at all hazardous and mixed Units at SNL/NM is included in Section 1.1 of the General Part B. Additional Unit-specific information is provided in the following sections.

3J.1.2.1 Operation of Containment Systems (20.4.1.500 NMAC/40 CFR §270.14[b][8][ii] and §270.15[a] and [b]; 20.4.1.500 NMAC/40 CFR §264.175[b][5])

Liquid wastes released from individual containers will accumulate in the spill pallets. Unit personnel will begin taking action to evaluate and remove accumulated liquids in the spill pallets upon discovery. Accumulated liquids are cleaned up as described in Section 1.1.1 of the General Part B.

Unit personnel do not store bulk liquids in the storage silos; any liquid wastes will be present in small containers within larger containers that provide secondary containment.

The floor trenches are not used for secondary containment, and Unit personnel do not anticipate that liquid hazardous and mixed wastes would enter the trenches. Hazardous and mixed waste liquids would only be released from containers of stored liquid wastes upon the (unlikely) failure of the spill pallets, and the largest single container would contain 122 gallons. The liquid would be contained in the trench and would be handled as described above upon discovery.

3J.1.2.2 Requirements for Ignitable, Reactive, and Incompatible Wastes (20.4.1.500 NMAC/40 CFR §264.17, 264.176, and §264.177; 20.4.1.900 NMAC/40 CFR §270.14[b][9] and §270.15[c] and [d])

Any of the ignitable or reactive wastes listed in the General Part A may be managed at the AHCU. Sources of ignition that may be present at the AHCU are those noted in Section 1.1.2.1 of the General Part B: welding activities, open flames, hot surfaces, frictional heat, radiant heat, sparks, and engines. Unit personnel employ the general precautions and practices described in Section 1.1.2 of the General Part B. Additional AHCU-specific features, potential ignition and reaction sources, precautions, and practices include:

- Ignitable and reactive wastes are segregated from other wastes within the storage area. The containers are labeled as described in Section 1.2.1 of the General Part B. Unit personnel typically place a portable sign near the wastes, use prominent labels, or use another method to assist in identifying them as ignitable and/or reactive.

- Containers of wastes are labeled and segregated according to compatibility criteria in 20.4.1.500 NMAC/40 CFR §264 Appendix V. The liquids in containers that are stored together on a spill pallet must be compatible with each other, and each spill pallet provides an independent containment system. Likewise, only compatible solids are stored together. The pallets and containers of wastes are segregated into different rows and areas; each row or area containing only compatible wastes. Ignitable and reactive wastes are segregated from other wastes in this manner.

- Water-reactive wastes are not routinely stored in the Unit. If water-reactive wastes are present, they will be isolated from water contact as described in Section 1.1.2.1 of the General Part B, and their location will be identified using signs, labels, or some other method.

- Forklifts are not used for waste movement near treatment operations involving ignitable or reactive wastes to minimize potential sources of ignition while containers are or may be open.

- Wastes are mixed together on a very limited basis during the treatment and repackaging operations at the Unit. Ignitable and reactive wastes are treated or mixed on a case-by-case basis. Unit personnel plan each such operation carefully to identify the hazards and potential consequences. Personnel use waste characterization data and/or published chemical information (e.g., "NIOSH Pocket Guide to Chemical Hazards" [DHHS, 2007], or other chemical or engineering handbook) for each waste in the planning process. Personnel then conduct the operations according to the plan to control the hazards and prevent uncontrolled reactions. Treatment operations are described in Section 3J.8.0 of this appendix.

3J.1.2.3 Preparedness and Prevention (20.4.1.500 NMAC/40 CFR §264, Subpart C and 20.4.1.900 NMAC/40 CFR §270.14[b][8])

The following sections address required equipment, testing and maintenance of equipment, and access to communications or alarm systems at the AHCU.

3J.1.2.3.1 Required Equipment (20.4.1.500 NMAC/40 CFR §264.32)

Information about fire hydrants is provided in Section 1.1.3.1 of the General Part B. The fire hydrants closest to the AHCU are shown in Figure 3J-9.

The high bay of Building 6597 is equipped with an automatic fire suppression system; summarized below.

Information on other required equipment located at the AHCU is provided in Section 3J.6.0 and Table 3J-3 of this appendix.

Table 3J-1
Fire Suppression Systems, Auxiliary Hot Cell Unit

Building	Applicable NFPA Standard[a]	Sprinkler Design Occupancy Classification	System Type	Sprinkler Actuation[b]
6597	13	Storage	Automatic sprinkler, wet pipe	GB/FS

Footnotes:
[a] National Fire Protection Association (NFPA), 2021.
[b] Sprinklers are either glass bulb (GB) or fusible solder (FS) type, typically designed to open at temperatures of 155ºF or higher.

3J.1.2.3.2 Testing and Maintenance of Equipment (20.4.1.500 NMAC/40 CFR §264.33)

Information on equipment testing and maintenance at the AHCU is provided in Section 1.1.3.2 and in Appendix 3C of the General Part B and in Section 3J.4.0 of this appendix.

3J.1.2.3.3 Access to Communications or Alarm Systems (20.4.1.500 NMAC/40 CFR §264.34)

Information about the types and locations of communications or alarm systems at the AHCU is provided in Section 1.1.3.3 of the General Part B and in Section 3J.6.0 of this appendix.

3J.1.2.4 Hazards Prevention (20.4.1.900 NMAC/40 CFR §270.14[b][8])

The following sections address the procedures, equipment, and structures used at the AHCU to prevent hazards. Additional information applicable to the AHCU and all other Units at SNL/NM is included in Section 1.1.4 of the General Part B.

3J.1.2.4.1 Preventing Hazards in Unloading (20.4.1.900 NMAC/40 CFR §270.14[b][8][i])

AHCU personnel employ the practices described in Section 1.1.4.1 of the General Part B to prevent hazards in unloading. Unit personnel will typically perform loading and unloading activities just inside the rollup doors on the north and south sides of the WMA (Figure 3J-6). The floor is level and in good condition, and there is sufficient room for operating the vehicles and equipment.

Containers are handled in a manner to prevent shifting and falling. Drums and other containers of hazardous and mixed waste may be strapped together on a pallet before being loaded onto vehicles. Containers may be transported within the Unit by hand or with forklifts, drum dollies, or pallet jacks, depending on container size and weight.

3J.1.2.4.2 Preventing Run-off or Flooding (20.4.1.900 NMAC/40 CFR §270.14[b][8][ii])

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

The floor of the high bay in Building 6597 is slightly higher than the surrounding ground, serving to direct stormwater away from the building. The asphalt and concrete pavement around the AHCU slopes toward a storm drain and shallow drainage channels that direct stormwater toward the west.

3J.1.2.4.3 Preventing Contamination of Water Supplies (20.4.1.900 NMAC/40 CFR §270.14[b][8][iii])

Unit personnel do not anticipate that management of hazardous and mixed wastes at the AHCU will affect water supplies, as described in Section 1.1.4.3 of the General Part B.

3J.1.2.4.4 Mitigating Effects of Equipment Failure or Power Outages (20.4.1.900 NMAC/40 CFR §270.14[b][8][iv])

General measures that are available to Unit personnel are described in Section 1.1.4.4 of the General Part B.

The AHCU is equipped with a minimum of 90 minutes of general emergency lighting along the paths of egress. With respect to waste handling, backup power to the chain hoist will be required only during the short periods that the bridge crane is being used for an in-air transfer of hazardous and mixed waste. The bridge crane locks in place and is inoperable during a power outage. Portable generators can provide backup power to the chain hoist whenever the bridge crane is in use. The chain hoist, and tethers if necessary, will be used to lower any suspended packages to a safe configuration until power is restored unless leaving the package suspended is considered a safe configuration. No other AHCU systems require redundant power supplies.

3J.1.2.4.5 Preventing Undue Exposure (20.4.1.900 NMAC/40 CFR §270.14[b][8][v])

AHCU personnel employ the practices described in Section 1.1.4.5 of the General Part B to prevent undue exposure.

The enclosed work area and localized ventilation system in the fume hood and the local ventilation system in the work area provide additional protection for Unit personnel performing treatment operations. Anticipated emissions from treatment operations are discussed in Section 3J.8.2.

The AHCU has several features (e.g.. shielding and remote operation capabilities) that provide protection for personnel managing hazardous and mixed wastes that exhibit high external radiation dose rates. The silos will typically be used to store such wastes, providing additional protection for Unit personnel.

3J.1.2.4.6 Preventing Releases to the Atmosphere (20.4.1.900 NMAC/40 CFR §270.14[b][8][vi] and §270.27(a)(2); 20.4.1.500 NMAC/40 CFR §264.179 and Subparts AA, BB, and CC)

AHCU personnel employ the practices described in Section 1.1.4.6 of the General Part B to prevent releases to the atmosphere during storage.

Subpart AA

AHCU storage operations do not employ any of the processes subject to the requirements of 20.4.1.500 NMAC/40 CFR §264 Subpart AA.

Subpart BB

During storage activities, Unit personnel do not routinely manage hazardous and mixed wastes with organic concentrations ≥10 percent by weight in process equipment identified in 20.4.1.500 NMAC/40 CFR §264, Subpart BB [12-01-18]. Equipment used in such service at the AHCU will be used for less than 300 hours per calendar year and is therefore exempt from the requirements of 20.4.1.500 NMAC/40 CFR §264.1052 through 1060 [12-01-18] as noted in 20.4.1.500 NMAC/40 CFR §264.1050(f) [12-01-18]. Equipment use will be noted in the AHCU records.

Subpart CC

Unit personnel employ the practices described in Section 1.1.4.6 of the General Part B and maintain compliance with Container Level 1 standards (20.4.1.500 NMAC/40 CFR §264.1086[c]) for containers that are subject to the standards. Such containers may be stored in any of the WMAs at the Unit.

Section 3B.5.3 in Appendix 3B to the General Part B also describes procedures to maintain compliance with the air emissions requirements of 20.4.1.500 NMAC/40 CFR §264, Subparts BB and CC [12-01-18].

3J.1.3 Container Storage Practices (20.4.1.900 NMAC/40 CFR §270.15 and 20.4.1.500 NMAC/40 CFR §264 Subpart I)

Container storage practices applicable to the AHCU are presented in the following sections.

3J.1.3.1 Container Types and Labeling

AHCU personnel use the container types and labeling practices described in Section 1.2.1 of the General Part B.

3J.1.3.2 Container Handling (20.4.1.500 NMAC/40 CFR §264.173)

AHCU personnel employ the container handling practices described in Section 1.2.2 of the General Part B.

3J.1.3.2.1 Condition of Containers (20.4.1.500 NMAC/40 CFR §264.171)

The condition of containers at the AHCU is maintained as indicated in Section 1.2.2.1 of the General Part B.

3J.1.3.2.2 Aisle Space and Storage Configuration (20.4.1.500 NMAC/40 CFR §264.35)

AHCU personnel employ the aisle space and storage configuration described in Section 1.2.2.2 of the General Part B. Aisle width is typically 2.5 feet; this is adequate for unobstructed movement of Unit and emergency response personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of Unit operation in an emergency.

Drums and drum-shaped containers that are stacked may be stored on pallets and are stacked in a stable configuration. Box-shaped containers may be stacked without pallets. Containers of solids may also be stored directly on the floor. Containers of liquids are stored on spill pallets; when stacked, they are stacked in a stable configuration.

3J.1.3.2.3 Compatibility of Waste with Containers (20.4.1.500 NMAC/40 CFR §264.172)

AHCU personnel ensure waste compatibility with containers as indicated in Section 1.2.2.3 of the General Part B.

3J.1.3.2.4 Presence of Liquids in Containers (20.4.1.900 NMAC/40 CFR §270.15[b][1] and 20.4.1.500 NMAC/40 CFR §264.175[c])

AHCU personnel verify the absence of free liquids in containers as indicated in Section 1.2.2.4 of the General Part B before storing containers in areas that are not equipped with secondary containment.

3J.1.4 Treatment Operations

Hazardous and mixed wastes are treated at the AHCU by the following methods:

- *Chemical deactivation:* performed in the work area, including the fume hood .
- *Stabilization and solidification:* performed in the work area, including the fume hood .
- *Macroencapsulation:* performed in the work area, including the fume hood, and/or the hot cell .

- *Physical treatment:* performed in the work area, including the fume hood, and/or the hot cell .

The treatment practices are discussed in detail in Section 3J.8.0 of this appendix.

3J.2.0 UNIT DESCRIPTION AND INFORMATION

The information provided in this section is submitted to address the applicable requirements of 20.4.1.500 and .900 NMAC/40 CFR §264 270 [12-01-18]. The following subject areas are addressed in this section:

- Unit-specific security procedures and equipment (20.4.1.900 NMAC/40 CFR §270.14[b][4] and §270.14[b][19][viii] [12-01-18]; 20.4.1.500 NMAC/40 CFR §264.14 [12-01-18]);
- Unit-specific traffic patterns, volume, and controls (20.4.1.900 NMAC/40 CFR §270.14[b][10] [12-01-18]);
- Unit-specific location information for compliance with the seismic standard and floodplain requirements (20.4.1.900 NMAC/40 CFR §270.14[b][11] [12-01-18], and 20.4.1.500 NMAC/40 CFR §264.18[a] and [b] [12-01-18]);
- Unit-specific topographic map requirements (20.4.1.900 NMAC/40 CFR §270.14[b][19] [12-01-18]); and
- Unit-specific groundwater monitoring and protection information (20.4.1.900 NMAC/40 CFR §270.14[c] [12-01-18], and 20.4.1.500 NMAC/40 CFR §264.90[a] [12-01-18]).

An SNL/NM site-wide facility description addressing additional regulatory requirements is provided in Appendix 3A of the General Part B.

3J.2.1 Security Procedures and Equipment (20.4.1.900 NMAC/40 CFR §270.14[b][4]; 20.4.1.500 NMAC/40 CFR §264.14)

The following sections describe the security provisions provided at SNL/NM to prevent unknowing or unauthorized entry onto the active portions of the AHCU.

3J.2.1.1 Barriers and Means to Control Entry (20.4.1.500 NMAC/40 CFR §264.14[b][2][i] and [ii])

The doors to Building 6597 are kept closed and locked. As noted in Appendix 3A of the General Part B, SNL/NM security personnel periodically monitor the TA-V gate during non-operational hours.

Unit personnel have identification badges. Visitors and other personnel are escorted while in the high bay. These procedures limit access to the AHCU WMAs in accordance with 20.4.1.500 NMAC/40 CFR §264.14(b)(2) [12-01-18].

The AHCU is located in TA-V (Figures 3J-1 and 3J-2). TA-V is enclosed by an 8-foot-high chain-link fence. Regular entries into and exits from TA-V are through Building 6577, or through the adjoining vehicle gate. TA-V access control procedures assure that only properly identified and authorized persons, vehicles, and property are allowed entrance to and exit from TA-V.

3J.2.1.2 Warning Signs (20.4.1.500 NMAC/40 CFR §264.14[c])

Building 6597 high bay personnel doors and the entrance to the AHCU are posted with “Danger: Unauthorized Personnel Keep Out” (or functionally equivalent) signs. The signs contain the warning in English and Spanish are legible from a distance of 25 feet and can be seen from any approach to the part of Building 6597 that houses the AHCU.

3J.2.2 Traffic Pattern, Volume, and Controls (20.4.1.900 NMAC/40 CFR §270.14[b][10])

General traffic pattern information, traffic volumes, and traffic control signals for the SNL/NM facility are provided in Appendix 3A of the General Part B.

3J.2.2.1 Traffic Patterns

The primary traffic routes used to transport hazardous and mixed wastes to the AHCU include Wyoming Boulevard, Hardin Boulevard, and Pennsylvania Street. Pennsylvania Street crosses Tijeras Arroyo via a bridge. A two-lane paved road to TA-V turns southwestward off Pennsylvania Street at a point northeast of TA-III.

Waste transport vehicles travel along a 2-lane asphalt-paved drive to enter TA-V from the two-lane paved road as shown on Figures A-4 and A-6 in Appendix 3A of the General Part B. Vehicles must stop at a gate prior to entering or leaving TA-V. Within TA-V, waste is transported on asphalt- or concrete-paved surfaces (Figure 3J-4).

3J.2.2.2 Traffic Volumes

Traffic volumes on Wyoming Boulevard and Hardin Boulevard are generally light to moderate. Traffic volumes on Pennsylvania Street are generally light. Vehicle types are generally cars, light- and medium-duty trucks, and vans. Flatbed trucks or trailers also use primary traffic routes to transport waste containers.

Fewer than 5 vehicles typically travel to the AHCU per week. These include flatbed trucks and trailers carrying supplies and containers of hazardous and mixed waste to and from the AHCU.

3J.2.2.3 Traffic Control Signals

Within TA-V, there are no traffic control signals or signs. Vehicles must stop at the vehicle gate prior to entering or leaving TA-V. Vehicle presence within TA-V is limited to waste transport and other work vehicles. Therefore, signals or signs are not necessary to control traffic within TA-V.

3J.2.3 Unit Location Information (20.4.1.900 NMAC/40 CFR §270.14[b][11])

3J.2.3.1 Seismic Standard (20.4.1.900 NMAC/40 CFR §270.14[b][11][i and ii]; 20.4.1.500 NMAC/40 CFR §264.18[a])

The WMAs at the AHCU are not located within 3,000 feet of any faults with Holocene displacements (Section 3A.4.2 in Appendix 3A of the General Part B).

3J.2.3.2 Floodplain Standard (20.4.1.900 NMAC/40 CFR §270.14[b][11][iii]; 20.4.1.500 NMAC/40 CFR §264.18[b])

The WMAs at the AHCU are not located within the 100-year floodplain boundary (Section 3A.4.3 in Appendix 3A of the General Part B). The AHCU is compliant with the floodplain standards in 20.4.1.500 NMAC/40 CFR §264.18(b) [12-01-18] and 20.4.1.900 NMAC/40 CFR §270.14(b)(11)(iii) [12-01-18].

3J.2.4 Topographic Maps (20.4.1.900 NMAC/40 CFR §270.14[b][19])

Topographic maps and figures are provided herein or referenced to meet the requirements of 20.4.1.900 NMAC/40 CFR §270.14(b)(19) [12-01-18]. Due to the large amount of information, it is not provided on a single map. The maps clearly show the map scale, the date of preparation, and a north arrow (20.4.1.900 NMAC/40 CFR §270.14[b][19][i] and [vi] [12-01-18]). The maps and figures used to fulfill these regulatory requirements include the following:

- An SNL/NM-wide 100-year floodplain map is provided on Figure 3A-2 in Appendix 3A of the General Part B (20.4.1.900 NMAC/40 CFR §270.14[b][19][ii] [12-01-18]).

- Surface waters, including intermittent streams, near the AHCU are shown on Figure 3A-2 in Appendix 3A of the General Part B and Figure 3J-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][iii] [12-01-18]).

- Surrounding land uses are shown on Figure 3A-2 and 3A-8 in Appendix 3A of the General Part B and Figure 3J-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][iv] [12-01-18]). The area surrounding the AHCU is occupied by other SNL/NM-controlled operations (industrial land use).

- Wind roses for SNL/NM are shown on Figure 3A-2 in Appendix 3A of the General Part B and Figure 3J-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][v] [12-01-18]).

- Legal boundaries of SNL/NM (including the AHCU) is provided as Figure 3A-2 in Appendix 3A of the General Part B (20.4.1.900 NMAC/40 CFR §270.14[b][19][vii] [12-01-18]).

- Access control features at the AHCU (e.g., fences, gates) are shown on Figures 3J-5 and 3J-6 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][viii] [12-01-18]).

- Supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near the AHCU are shown on Figure 3A-2 in Appendix 3A of the General Part B and Figure 3J-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][ix] [12-01-18]).

- The location of the AHCU and associated WMA structures, loading and unloading areas, roads, and sanitary sewers at the AHCU are shown on Figures 3J-5 and 3J-6 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][x] [12-01-18]).

- Drainage control features, such as run-on/run-off, drainage barriers, are shown on Figure 3J-7 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][x] and [xi] [12-01-18].

- Locations of the AHCU and AHCU WMAs are shown on Figures 3J-3 and 3J-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][xii] [12-01-18]).

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at SNL/NM and in the vicinity of the AHCU. As provided for in 20.4.1.900 NMAC/40 CFR §270.14(b)(19) [12-01-18], the maps are included at these scales and contour intervals due to the size of the AHCU, the extent of the SNL/NM facility, and the topographic relief in the area.

3J.2.5 Groundwater Monitoring (20.4.1.900 NMAC/40 CFR §270.14[c]; 20.4.1.500 NMAC/40 CFR §264.90[a])

Groundwater monitoring information is discussed in Section 12 of Volume 3 and the Unit-specific appendices of Volume 4 (RCRA corrective action) and Volume 5 (post-closure care units) of the DOE/NNSA and NTESS Comprehensive Permit Renewal Request. Groundwater monitoring at the AHCU is not required because:

- The AHCU is not a regulated unit as defined in 20.4.1.500 NMAC/ 40 CFR §264.90(a)(2) [12-01-18].

- There have been no releases of hazardous and mixed waste to groundwater in the past, nor is the AHCU likely to affect groundwater quality during normal operations or during unusual events.

3J.3.0 WASTE ANALYSIS PLAN

In accordance with 20.4.1.900 NMAC/ 40 CFR §270.14[b][2] and 20.4.1.500 NMAC/40 CFR §264.13, “General Waste Analysis” [12-01-18], waste analysis requirements applicable to all Units, including the AHCU, are addressed in Appendix 3B of the General Part B.

3J.4.0 INSPECTION PLAN

20.4.1.500 NMAC/40 CFR §264.15 and §264.33 [12-01-18] and 20.4.1.900 NMAC/40 CFR §270.14(b)(5) [12-01-18] require that WMAs and associated systems be inspected on a regular basis and in accordance with procedures to assure their integrity, maintenance, and safe operation.

Unit personnel perform periodic inspections to identify malfunctions, signs of deterioration, operator errors, and discharges or spills that may be causing or may lead to a release of hazardous or mixed waste or hazardous waste constituents to the environment or may pose a threat to human health. The inspections are performed on a regular schedule based on the likelihood of equipment or system failure and associated consequences. The inspections include safety and emergency equipment, security devices, and operating and structural equipment related to management of hazardous and mixed wastes to ensure that human health and the environment will be protected.

The general SNL/NM inspection plan and schedule that meets these requirements are described in the "Site-Wide Inspection Plan," provided as Appendix 3C of the General Part B. AHCU personnel conduct inspections in accordance with the site-wide plan.

Specific items and areas that are inspected are listed in Table 3J-2, with the inspection criteria and frequency. The items listed in the table are inspected in each AHCU WMA.

Automatic fire suppression systems are included in Table 3J-2. Unit personnel check to see that the systems are present. SNL/NM personnel also test the systems based on the requirements of National Fire Protection Association 25 "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems" (NFPA, 2022) as described in Section 1.1.3.2 of the General Part B.

Performing inspections of all areas at the AHCU where hazardous and mixed wastes are handled may expose Unit personnel to unnecessary radiation if the wastes exhibit high external radiation doses. To maintain the radiation exposure to levels as low as reasonably achievable (ALARA), Unit personnel will conduct alternative inspections of the storage silos when such wastes are present. Instead of directly inspecting the silos or wastes while wastes are stored in the silos, Unit personnel will visually inspect the empty silos and the hazardous and mixed waste containers or packages before the wastes are placed in the silos and will inspect the containers when they are removed from the silos. If Unit personnel do not observe any indications of deterioration in the empty silos, or damage to or release from the hazardous and mixed waste items as they are removed from the silos, the lack of visible evidence of release will be considered sufficient to determine that there have not been releases of hazardous and mixed wastes.

The visual inspections of all areas at the AHCU may be conducted via camera from a remote area if needed to maintain ALARA conditions for the Unit personnel.

The results of inspections by Unit personnel (including any corrective actions required and taken) are recorded on forms identical or similar to the ones presented in Appendix 3C. The inspection plan (Appendix 3C and this section) and inspection records for the current calendar year are maintained in Building 6597 or in the TA-V electronic facility documentation system. Inspection records for previous calendar years are maintained in department offices of AHCU personnel or SNL/NM records.

Table 3J-2
Inspection Criteria and Frequency, Auxiliary Hot Cell Unit

Inspected Item	Inspection Criteria	Inspection Frequency
SAFETY AND EMERGENCY EQUIPMENT **See Table 3J-3 "Emergency Equipment and Locations" in this appendix for additional information**		
Eye wash / safety shower	Operational and in good condition	Monthly
Spill control and cleanup items	Present, quantities per inventory, and in good condition	Monthly
Personal protective equipment	Present, quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present	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		
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.
Storage silos	Liner in good condition, no cracks or visible deterioration	Prior to waste storage.
Storage silo covers	Top surface in good condition, no cracks or excessive wear	Prior to waste storage. Monthly otherwise.

Footnotes at end of table.

Table 3J-2 (Concluded)
Inspection Criteria and Frequency, Auxiliary Hot Cell Unit

Inspected Item	Inspection Criteria	Inspection Frequency
OPERATING AND STRUCTURAL EQUIPMENT (Concluded)		
Loading and unloading areas	Good condition, safe working surface, free of 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 consumable items. Monthly otherwise.
SECURITY DEVICES		
Warning signs	Present 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)	Check individual containers as they are handled. Weekly otherwise. [a]
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Check individual containers as they are handled. Weekly otherwise. [a]
Labeling	Correct information, correct location, legible	Check individual containers as they are handled. Weekly otherwise. [a]
Secondary Containment (e.g., spill pallets for liquid waste)	Adequate volume, free of liquids, good condition (i.e., no cracks, excessive wear)	Check individual containers as they are handled. Weekly otherwise. [a]
Storage Conditions	Waste compatible with container, container located with compatible wastes	Check individual containers as they are handled. Weekly otherwise. [a]
Location	Correct aisle space, stable stacking	Check individual containers as they are handled. Weekly otherwise.
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Check individual containers as they are handled. Weekly otherwise. [a]

Footnote:
[a] Containers will be inspected prior to placement into and immediately following removal from a storage silo.

3J.5.0 PERSONNEL TRAINING

Training requirements for Unit personnel are specified in 20.4.1.900 NMAC/40 CFR §270.14[b][12], and 20.4.1.500 NMAC/40 CFR §264.16, [12-01-18] "Personnel Training."

3J.5.1 Training Program

The SNL/NM training program is designed and implemented to prepare personnel to operate and maintain safely those areas used for managing hazardous and mixed waste. The training program applies to all employees of the DOE, Sandia, and any subcontractors who have responsibility for the day-to-day management of hazardous and mixed waste at the AHCU.

AHCU personnel receive training in accordance with the "Site-Wide Personnel Training Plan" provided as Appendix 3D of the General Part B. Only the following job descriptions identified in Appendix 3D, Table 3D-2 are applicable at the AHCU: Training Director, Project Leader, Emergency Coordinator, Chemist, Field Technician, Special Projects Staff, Inspector, and Unit Operations Support Staff.

3J.5.2 Training Records

Current-year training records for AHCU personnel are maintained at the AHCU. All other training records for AHCU personnel are maintained in the department offices of AHCU personnel or as described in Section 3D.6.0 in Appendix D of the General Part B.

3J.6.0 CONTINGENCY PLAN AND EMERGENCY RESPONSE

Emergency response requirements for permitted units are specified in 20.4.1.500 NMAC/40 CFR §264, Subpart D [12-01-18], "Contingency Plan and Emergency Procedures," and in 20.4.1.900 NMAC/40 CFR §270.14(b)(7) [12-01-18]. The "Site-Wide Contingency Plan" is included as Appendix 3E of the General Part B. Supplemental AHCU-specific information is included in this section, in Figures 3J-8, 3J-9, and 3J-10, and in Tables 3J-3 and 3J-4 of this appendix. Current copies of the site-wide contingency plan and this supplemental information are maintained in department offices of AHCU personnel and at the SNL/NM Emergency Operations Center.

3J.6.1 Waste Management Areas

The AHCU is located in the northeast (high bay) part of Building 6597 in TA-V and is used to repackage, store, and treat hazardous and mixed wastes. Building 6597 is a CMU building; the high bay area of the building has a roof height of 35 feet. The AHCU includes four WMAs:

- The hot cell is constructed of precast concrete with a stainless-steel lining. A permanent shield wall extends north of the cell. The cell is used for repackaging and treatment.

- The work area is located in the corner of the high bay north and east of the hot cell and the permanent shield wall. Waste management activities in the work area include storage and treatment and may require the use of a temporary enclosure. A 6-foot-wide walk-in fume hood in the work area can be used for storage and treatment.

- Eight floor silos (six in the work area and two in the cell) can be used for storage.

- Containers of hazardous and mixed waste may also be stored in the high bay, typically south and west of the hot cell.

Hazardous and mixed wastes bearing the EPA Hazardous Waste Numbers listed in the General Part A may be stored and/or treated at the AHCU WMAs. Wastes are segregated according to compatibility groups.

During an emergency, Unit personnel will evacuate the unit as described in Section 3E.5.2 of the site-wide contingency plan. During an emergency, Sandia security officers provide unimpeded access to the AHCU for authorized personnel as directed by the IC.

Figure 3J-8 presents the evacuation routes for the AHCU. Figures 3J-9 and 3J-10 present emergency response and access information for the AHCU. Table 3J-3 lists the emergency equipment typically available at the AHCU. Table 3J-4 lists the emergency coordinators for the AHCU.

Table 3J-3
Emergency Equipment and Locations, Auxiliary Hot Cell Unit

Category	Description/Capabilities	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
	PPE (protective suits, goggles and/or safety glasses)	Near north entrance to Building 6597 high bay
Internal Communication and Alarm System	Voice communication	
	Fire alarm pull boxes (pulling handle sends signal to KFES, 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 boxes (pulling handle sends signal to KAFB Fire and Emergency Services, does not actuate the system)	One near each exit door in Building 6597 high bay

Footnotes at end of table.

Table 3J-3 (Concluded)
Emergency Equipment and Locations, Auxiliary Hot Cell Unit

Category	Description/Capabilities	Location
Building 6597		
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 3J-9

Footnotes:
KFES Kirtland Air Force Base Fire and Emergency Services
PPE personal protective equipment

Table 3J-4
Emergency Coordinator List, Auxiliary Hot Cell Unit

AHCU Emergency Coordinator [a]		Phone Numbers			Office
Title	**Name**	**Office**	**Cell**	**Home**	**Address [b]**
Primary	Keven MacRunnels	505-844-8068		505-263-5913	Sandia National Laboratories P.O. Box 5800 Albuquerque, NM
First Alternate	Bryan Green	505-284-3161	505-280-5118	505-280-5118	
Second Alternate	Michael Torneby	505-845-3254	505-238-9948	505-850-2731	

Footnotes:
[a] One or more of these personnel are routinely available during operating hours (8:00 am to 4:30 pm Monday - Friday).
[b] The office address for each Emergency Coordinator is the same.

3J.7.0 CLOSURE PLAN

Applicable closure requirements are specified in 20.4.1.900 NMAC/40 CFR §270.14(b)(13), and 20.4.1.500 NMAC/40 CFR §264, Subparts G and I, [12-01-18]. General closure information applicable to all Units at SNL/NM and general sampling and analytical procedures to be used during closure activities are presented in the "Site-Wide Closure Plan" in Appendix 3F of the General Part B. The site-wide plan in Appendix 3F includes a description of the SNL/NM facility, waste descriptions, closure performance standards, general closure methods, a sampling and analysis plan (SAP), a general closure schedule, procedures for amendment of the plan, closure certification and letter, survey plat, and post-closure requirements. Unit-specific information for closure of the AHCU is included in this section.

3J.7.1 Unit Description

The AHCU is used to repackage, store, and treat hazardous and mixed wastes. The AHCU is located in the northeast (high bay) part of Building 6597 (Figure 3J-11) in TA-V at SNL/NM. Building 6597 is a CMU building. The AHCU includes four designated WMAs within the high bay of Building 6597: the hot cell; the work area near the hot cell (including the fume hood); the storage silos; and a container storage area:

- The hot cell is constructed of precast concrete and is lined with stainless steel. A permanent shield wall extends north of the cell. The cell is used for repackaging and treatment.

- The work area is located in the corner of the high bay north and east of the hot cell and the permanent shield wall. Waste management activities in the work area include storage and treatment. The floor of the work area is coated with an epoxy-based coating. The work area includes a 6-foot-wide walk-in fume hood, which is also used for storage and treatment of waste in containers. The fume hood is equipped with a negative-pressure ventilation system. A flexible exhaust hose can be attached to this system, allowing localized negative-pressure ventilation from the work area. Air flow from the ventilation system passes through a two-stage filter train before being released to the environment through an exhaust stack. The filter train effectively removes particulates entrained in the air flow.

- Eight floor silos (six in the work area and two in the hot cell) can be used for storage. Each silo is constructed of concrete and lined with a removable welded stainless-steel sleeve.

- Containers of hazardous and mixed waste may also be stored in the southern half of the high bay. The footprint of the storage area will vary, depending on the quantity and configuration of waste containers (e.g., containers may also be stored in the northwest portion of the high bay). The floor of the storage area is painted. The high bay area of building 6597 is also equipped with a system of floor trenches covered with steel plates or grating. These trenches are not used to provide secondary containment for management of hazardous and mixed wastes.

3J.7.2 Estimate of Maximum Waste in Storage (20.4.1.500 NMAC/40 CFR §264.112[b][3])

The maximum volume of hazardous and mixed waste in storage at any time at the AHCU is estimated at 8,075 gallons of liquids and/or solids. This is the maximum volume of hazardous and mixed waste that could be removed from the WMAs before closure activities begin. The maximum total waste volume is broken down as follows:

- Building 6597 hot cell: 900 gallons
- Building 6597 work area: 2,200 gallons
- Building 6597 container storage area: 3,520 gallons
- Building 6597 storage silos: 1,455 gallons

3J.7.3 Closure Conditions

In addition to the general assumptions listed in Section 3F.5 in the Site-Wide Closure Plan, closure activities specified in this plan assume the following conditions were met during the operational life of the AHCU:

- Waste handling and treatment activities that involved opening containers of hazardous and mixed waste were confined to the interiors of the AHCU WMAs. If contamination occurred, it would have been confined to those areas.

- Treatment activities were conducted in a controlled manner, minimizing the potential for releases of hazardous and mixed wastes or hazardous waste constituents.

- If hazardous and mixed wastes or hazardous waste constituents were inadvertently released into the local exhaust systems during treatment activities, they would only be present in the system up to the first filter.

- Enclosed WMAs (e.g., hot cell and floor silos) are considered independently of other WMAs when evaluating the potential presence of hazardous and mixed wastes or hazardous waste constituents.

- Steel plates covering floor trenches were moved only as needed for maintenance. hazardous and mixed wastes or hazardous waste constituents are not present in any section of floor trench that has been covered with steel plates unless there has been a release of hazardous and mixed wastes into that section of trench.

- Covers to each silo have been opened only as needed for storage operations. Hazardous and mixed wastes or hazardous waste constituents are not present in each silo unless there has been a release of hazardous and mixed wastes into that silo.

- The container storage area occupied the entire south half of the high bay, and containers were not stored in the northwest corner of the high bay.

- Hazardous and mixed wastes or hazardous waste constituents could not be present except in areas in the high bay where wastes were managed.

- The interior floor in the high bay was maintained to retain its integrity by following established maintenance and inspection procedures, and some soil will be present on the floor due to normal traffic and operations.

3J.7.4 Closure Process and Schedule

This closure will be conducted to support attainment of the closure performance standards outlined in Section 3F.4 of the Site-Wide Closure Plan.

3J.7.4.1 Closure Process

The closure process and general activities described in Sections 3F.5 through 3F.9 of the Site-Wide Closure Plan will be applied to closure of the WMAs at the AHCU. With respect to the individual WMAs, Unit personnel will use the following approach:

- The records review and structural assessment described in Section 3.F.5.6 will be conducted prior to initiating closure.

- The floor and walls of the hot cell will be visually examined for evidence of deterioration and releases. The surfaces will be decontaminated using a strippable coating designed to adhere to and allow removal of particles that have been deposited on such surfaces

- Equipment within the work area will be evaluated to determine whether it is more effective to remove it or decontaminate it. Items that are most likely to be removed include local exhaust systems (up to the first filter), filters, and portable equipment. Items that are most likely to be decontaminated include the interior of the fume hood. The floor of the work area will be decontaminated by sweeping and washing, as described in Section 3F.5 of the site-wide plan.

- The liners of the silos will be visually examined for evidence of deterioration and releases. The silos are isolated from the rest of the WMAs at the AHCU. Waste management activities in the silos do not include opening, repackaging, or otherwise handling hazardous and mixed waste in a manner that could cause releases of waste or hazardous waste constituents. Therefore, the silos are not contaminated unless there is visual evidence or documentation indicating a release or conditions that could have led to a release of hazardous and mixed wastes or hazardous waste constituents.

- The container storage area will be decontaminated by sweeping and washing, as described in Section 3F.7 of the site-wide plan.

3J.7.4.2 Closure Schedule

Section 3F.5 of the Site-Wide Closure Plan provides a timeline for closure activities applicable to all permitted Units at the SNL/NM facility. Currently, there is not an estimated date of closure for the AHCU. When closure is planned, a Unit-specific closure schedule will be prepared and submitted to NMED prior to initiation of closure activities at the AHCU.

3J.7.5 Closure Activities

Sections 3F.6 through 3F.8 of the Site-Wide Closure Plan presents general constituents of concern, decontamination and removal procedures, and sampling and analysis to verify the success of closure activities.

Details specific to the AHCU are presented in the following list:

- Removal and decontamination will be as described in Section 3F.7 of the site-wide closure plan, amended as described above to address unique aspects of the AHCU WMAs.

- All the constituents listed in Table 3F-3 of the site-wide closure plan (Appendix 3F) will be included, due to the variety of wastes managed at the AHCU;

- Sample locations, frequency, collection, documentation, and quality assurance/quality control will be as described in Section 3F.8;

- All wastes generated during closure will be managed in accordance with applicable requirements.

Closure activities will be documented in a report as described in Section 3F.5.7 of the Site-Wide Closure Plan.

3J.8.0 TREATMENT PLAN

Treatment operations for hazardous and mixed wastes treated at the AHCU are described in this section.

The following treatment technologies may be used to treat hazardous and mixed wastes at the AHCU:

- Chemical deactivation,
- Stabilization and solidification,
- Macroencapsulation, and
- Physical treatment.

Unit personnel may use each technology to treat any of the wastes in the General Part A that include the particular technology in the process description. The waste management areas at the AHCU that are used for the treatment of hazardous and mixed wastes are the hot cell, and the work area (including the fume hood), as described below. Because treatment at the AHCU (except some physical treatment) will be conducted in containers, it is not subject to the miscellaneous unit and environmental performance standards in 20.4.1.500 NMAC/40 CFR §264, Subpart X [12-01-18]. Treatment effectiveness for each waste stream is discussed in Section 3J.8.3.

3J.8.1 Treatment Operations

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

- To meet land disposal restrictions;
- To make the waste safer for storage or treatment; and/or
- To meet TSDF requirements.

All of the treatment at the AHCU is batch treatment performed on single packages or containers of waste. For chemical deactivation and stabilization/solidification, each package is typically one 55-gallon drum or less, or a single item that may be larger than a drum. Macroencapsulation may be performed on large batches of waste in containers of various sizes. Each type of treatment is performed on batches of 500 pounds of waste or less, with the exception of macroencapsulation and physical treatment, which may occasionally involve very large, heavy items. Liquid wastes are treated in batches of 55 gallons or less.

Waste treatment may generate secondary waste streams (treatment residues). Hazardous and mixed treatment residues may undergo additional on-site treatment and/or be sent to an appropriate off-site TSDF.

The waste treatment processes described in this section are effective in addressing hazardous characteristics in hazardous and mixed wastes, including the following:

- Solid items exhibiting the hazardous waste characteristics of ignitability or reactivity may be chemically deactivated to eliminate the characteristic(s).

- Liquid waste exhibiting the hazardous waste characteristics of ignitability, corrosivity, and/or reactivity may be chemically deactivated to remove the characteristic(s).

- Liquid wastes and particulates containing hazardous waste toxicity characteristic metals (excluding elemental mercury and high mercury subcategories) may be stabilized and/or solidified to reduce or eliminate the leaching potential of the hazardous waste constituents.

- Debris and wastes containing hazardous waste toxicity characteristic metals (excluding elemental and high mercury subcategories defined in 20.4.1.800 NMAC/40 CFR §268), may be macroencapsulated to reduce or eliminate the leaching potential of the hazardous waste constituent(s).

- Solid items with hazardous constituents may be physically separated from larger items, and the size of individual pieces may be reduced.

Treated wastes and waste residues resulting from treatment of hazardous and mixed wastes may or may not require further management as hazardous wastes, as discussed in Appendix 3B, Section 3B.2.5. Each waste treatment technology or process listed above is described in the following sections.

3J.8.1.1 Chemical Deactivation

Unit personnel perform chemical deactivation in containers in the work area (including the fume hood) at the AHCU. The 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. Deactivation can be accomplished by several technologies (e.g., neutralization or chemical oxidation). However, the

intent of this section is to identify and describe specific methods or treatment trains which may be used at the AHCU to deactivate ignitable wastes defined in 20.4.1.200 NMAC/40 CFR §261.21(a)(2) and (4) [12-01-18], corrosive and reactive wastes defined in 20.4.1.200 NMAC/40 CFR §261.23 [12-01-18]. Deactivation may or may not result in a final waste form, depending on the process, and may be used as the first in a series of treatment steps.

Deactivation processes for reactive wastes are conducted under carefully controlled conditions.

- Deactivation of reactive wastes is typically conducted in small batches such that process control can be easily maintained and chemical reactions take p[lace in a slow, nonviolent manner. Hydrides, deuterides, and tritides are deactivated by slow addition to an ice water bath, as needed. 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 is added as needed 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 are 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 may 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.

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 adjustment to facilitate subsequent treatment; such pretreatment 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 inside 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 may be treated in small batches under laboratory conditions (similar to the deactivation of reactive wastes) such that process control can be easily maintained.

3J.8.1.2 Stabilization and Solidification

Unit personnel perform stabilization in containers in the work area, (including the fume hood) at the AHCU. Stabilization is a process of binding hazardous waste 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 suitable for stabilization and/or solidification include liquids, 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 and placed in a container, the mass is allowed to cure and/or set. Smaller batches may be mixed by hand and allowed to cure in smaller containers (e.g., 5-gallon pails, and tubs and trays of various sizes).

Development of appropriate formulas is waste specific. Stabilization agents for toxic metals may include Portland cement, pozzolans, thermoplastics, organic polymers, and clays. However, other waste forms may require proprietary reagents that are available for specific applications. Additional reagents may be added to reduce contaminant leachability, reduce cure and/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 waste constituents. Waste characterization data are used to determine whether the 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 contaminants present. Pretreatment may be required to assure compatibility between the waste and the binding agent (e.g., neutralization of liquid wastes to an acceptable pH range of 5.0 to 11.0). Once the proper binding agent(s) 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. The stabilization process is performed by combining the predetermined quantities of binding agent(s) with the waste and thoroughly mixing, if appropriate. The resulting mixture is staged to allow an appropriate cure time.

3J.8.1.3 Macroencapsulation

Unit personnel perform macroencapsulation in containers in the work area (including the fume hood) and/or the hot cell at the AHCU. Macroencapsulation is generally applicable to debris, whereas stabilization/solidification (Section 3J.8.1.2) is generally applicable to liquids, sludges, and particulate-type wastes. Macroencapsulation is the process of 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 waste constituents by surrounding the waste material with a leach-resistant coating.

Unit personnel perform macroencapsulation using one of the following processes:

- Encasing the waste in concrete, typically within a larger container that serves as a mold for the concrete.

- Coating the waste with polymer agents within a mold. Polymers typically 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 carefully maintained to assure that adequate coating occurs.

- Placing the waste, along with inert void-filling materials as needed, inside a commercially available container made of inert or noncorroding materials such as polyethylene or stainless steel and sealing the container to encapsulate the waste. This method is not used to treat D008 radioactive lead solids.

- Placing the waste in a container that may consist of an outer shell with a liner of inert or noncorroding material such as polyethylene or stainless steel. Outer containers and liners may be rigid (e.g., a steel box with a polyethylene liner) or flexible (e.g., a MacroBag® or similar container). After the wastes and inert void-filler materials, as applicable, 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. Unit personnel use containers of various shapes and sizes, depending on the volume and dimensions of waste items to be macroencapsulated.

3J.8.1.4 Physical Treatment

Unit personnel perform physical treatment (volume reduction through separation) in the work area (including the fume hood) and/or the hot cell at the AHCU. The treatment includes:

- Reducing waste volume by using commercially available tools (e.g., hammers, screwdrivers, wrenches, pliers, saws, drills, cutters, etc.) to separate items with hazardous waste constituents from larger items or from each other, including removal of coating and filler materials. In some cases, the hazardous and mixed waste item may undergo further physical treatment or treatment in containers.

- Reducing the size of waste items by using tools (e.g., mallets, cutters, etc.) to crush or cut items into smaller pieces. The pieces may undergo further treatment in containers.

3J.8.2 Preventing Releases to the Atmosphere

Most of the hazardous and mixed wastes treated at the AHCU are inorganic and are not expected to generate emissions during treatment. Unit personnel perform chemical reactions that could

generate emissions (deactivation and stabilization/solidification) in a controlled manner as described above to further minimizes potential air emissions. Treatment operations that may generate air emissions of gases, vapors, or particulates will be conducted in a controlled manner within the fume hood if possible. Air flow from the fume hood passes through a two-stage filter train before being released to the environment through an exhaust stack. The filters effectively remove particulates entrained in the air flow.

The filters do not remove organic constituents entrained in the air flow. AHCU personnel employ the practices described in Section 3J.8.2 of the General Part B to prevent releases of organic constituents to the atmosphere during treatment (20.4.1.900 NMAC/40 CFR §270.14[b][8][vi] and §270.27(a)(2); 20.4.1.500 NMAC/40 CFR §264.179 and Subparts AA, BB, and CC).

3J.8.2.1 Subpart AA

The AHCU treatment operations do not employ processes subject to the requirements of 20.4.1.500 NMAC/40 CFR §264, Subpart AA.

3J.8.2.2 Subpart BB

During treatment, Unit personnel do not routinely manage hazardous and mixed wastes with organic concentrations ≥10 percent by weight in process equipment identified in 20.4.1.500 NMAC/40 CFR §264, Subpart BB [12-01-18]. Equipment used in such service at the AHCU will be used for less than 300 hours per calendar year and is therefore exempt from the requirements of 20.4.1.500 NMAC/40 CFR §264.1052 through 1060 [12-01-18] as noted in 20.4.1.500 NMAC/40 CFR §264.1050(f) [12-01-18]. Equipment use will be noted in the AHCU records.

3J.8.2.3 Subpart CC

Unit personnel follow the practices described in Section 3J.8.2 of the General Part B. Unit personnel do not perform any treatment subject to Container Level 3 standards (20.4.1.500 NMAC/40 CFR §264.1086[c]).

Section 3B.5.3 in Appendix 3B to the General Part B also describes procedures to maintain compliance with the air emissions requirements of 20.4.1.500 NMAC/40 CFR §264, Subparts BB and CC [12-01-18].

3J.8.3 Treatment Effectiveness (20.4.1.900 NMAC/40 CFR §270.23[d])

As required in 20.4.1.900 NMAC/40 CFR §270.23(d) [12-01-18], Unit personnel evaluate treatment effectiveness by appropriate methods for each batch of waste treated at the AHCU. In many cases (e.g., stabilization/solidification), Unit personnel 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 treatment is effective for the samples may be used to demonstrate

effectiveness for the rest of the waste. Characterization of the treated waste is described in Appendix 3B (Section 3B.2.5.2) of the General Part B.

3J.8.3.1 Chemical Deactivation

Unit personnel check treatment effectiveness using one or more of the following methods (depending on the goal of the treatment performed):

- Visual check for completeness of chemical reaction for solid items that were treated to remove the characteristic of reactivity (e.g., color change or structural change).
- Visual check or ignitability test for liquids that were treated to remove the characteristic of ignitability.
- Check whether treated waste is an oxidizer as defined in 49 CFR §173.151.
- Visual check for liquids that were treated to remove the characteristic of reactivity.
- Fingerprint chemical check for the presence of sulfides and cyanides if their presence caused the waste to be reactive.
- Fingerprint check for pH of liquids that were treated to remove the characteristic of corrosivity.
- Knowledge of process to determine whether chemical reaction(s) were completed, with consideration of stoichiometry, temperature, or time as applicable.

3J.8.3.2 Stabilization and Solidification

Unit personnel check treatment effectiveness using one or more of the following methods (depending on the goal of the treatment performed):

- Visual check for the presence of free liquids.
- Paint filter test to determine whether free liquids are present if the treated waste is amorphous and may contain some liquids.
- Analysis of one or more 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 20.4.1.800 NMAC/40 CFR §268.40, the analysis will include underlying hazardous constituents as described in Appendix 3B.

3J.8.3.3 Macroencapsulation

Unit personnel check effectiveness using one or more of the following methods, as appropriate:

- Visually checking each macroencapsulated item to verify that it is completely encased in the inert resin or concrete.
- For inert or noncorroding containers and containers with inert or noncorroding liners, visually checking the seal of the liner and/or container.
- For containers with inert liners, observing that the sealing equipment operated correctly.

3J.8.3.4 Physical Treatment

Unit personnel check treatment effectiveness using one of more of the following methods (depending on the goal of the treatment performed):

- Visual check that item(s) with hazardous waste constituents has(ve) been completely separated from other item(s).
- Visual check that pieces are the desired size.

3J.9.0 REFERENCES

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3J.10.0 FIGURES

Figures begin on the next page.

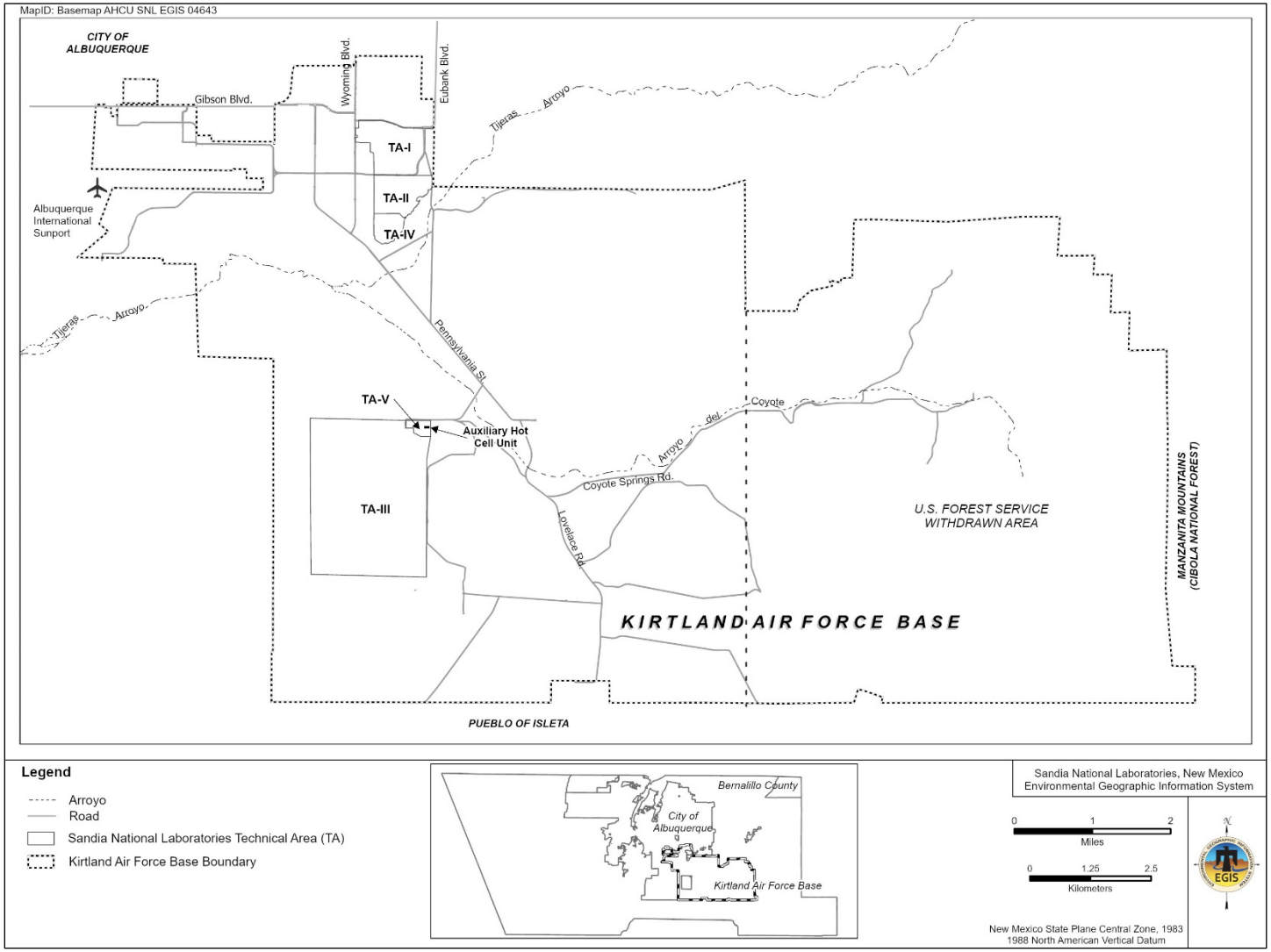

Figure 3J-1
Location Map, Auxiliary Hot Cell Unit at Sandia National Laboratories/New Mexico

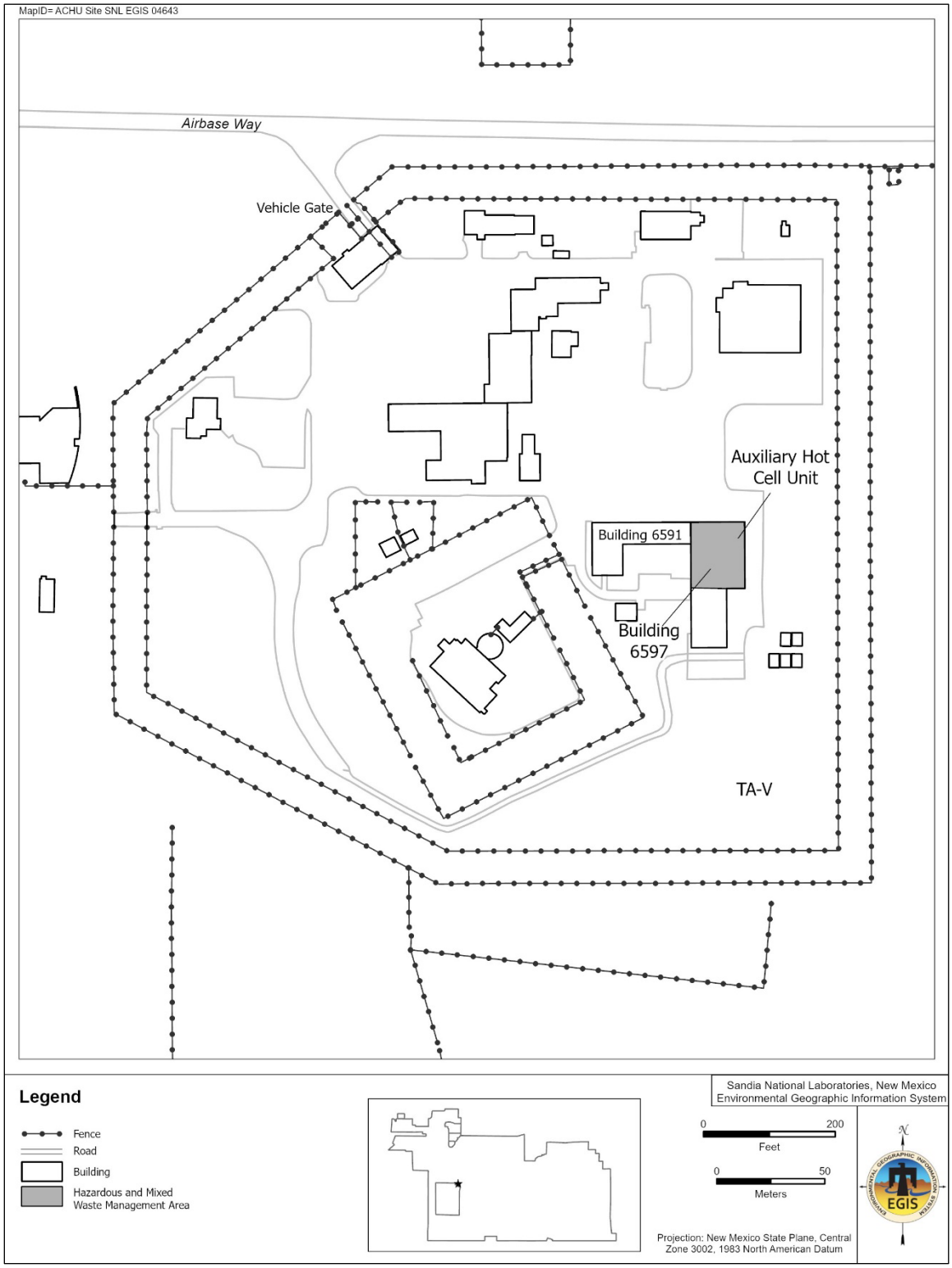

Figure 3J-2
Location of Auxiliary Hot Cell Unit in Technical Area V

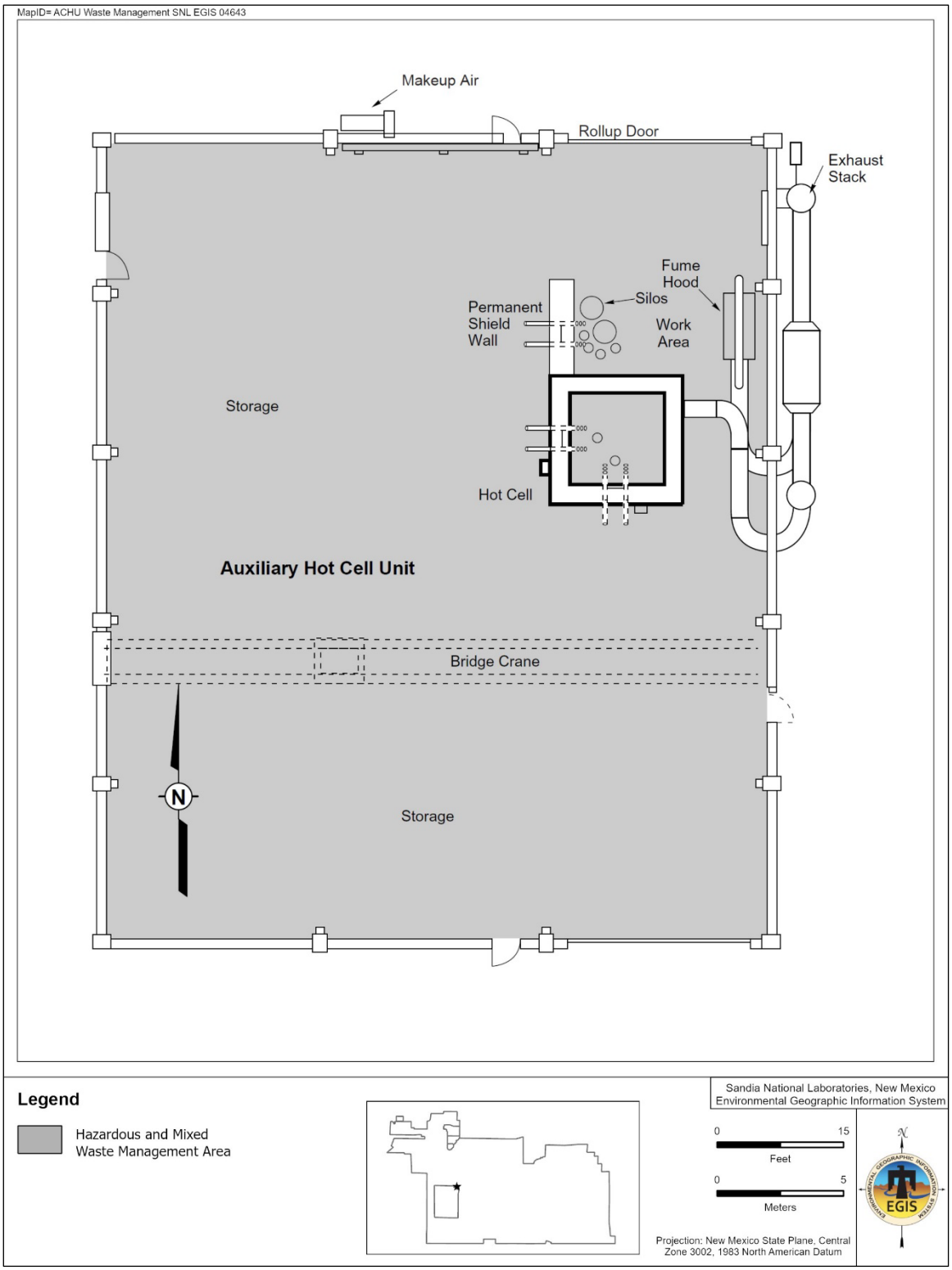

Figure 3J-3
Hazardous and Mixed Waste Management Areas, Auxiliary Hot Cell Unit

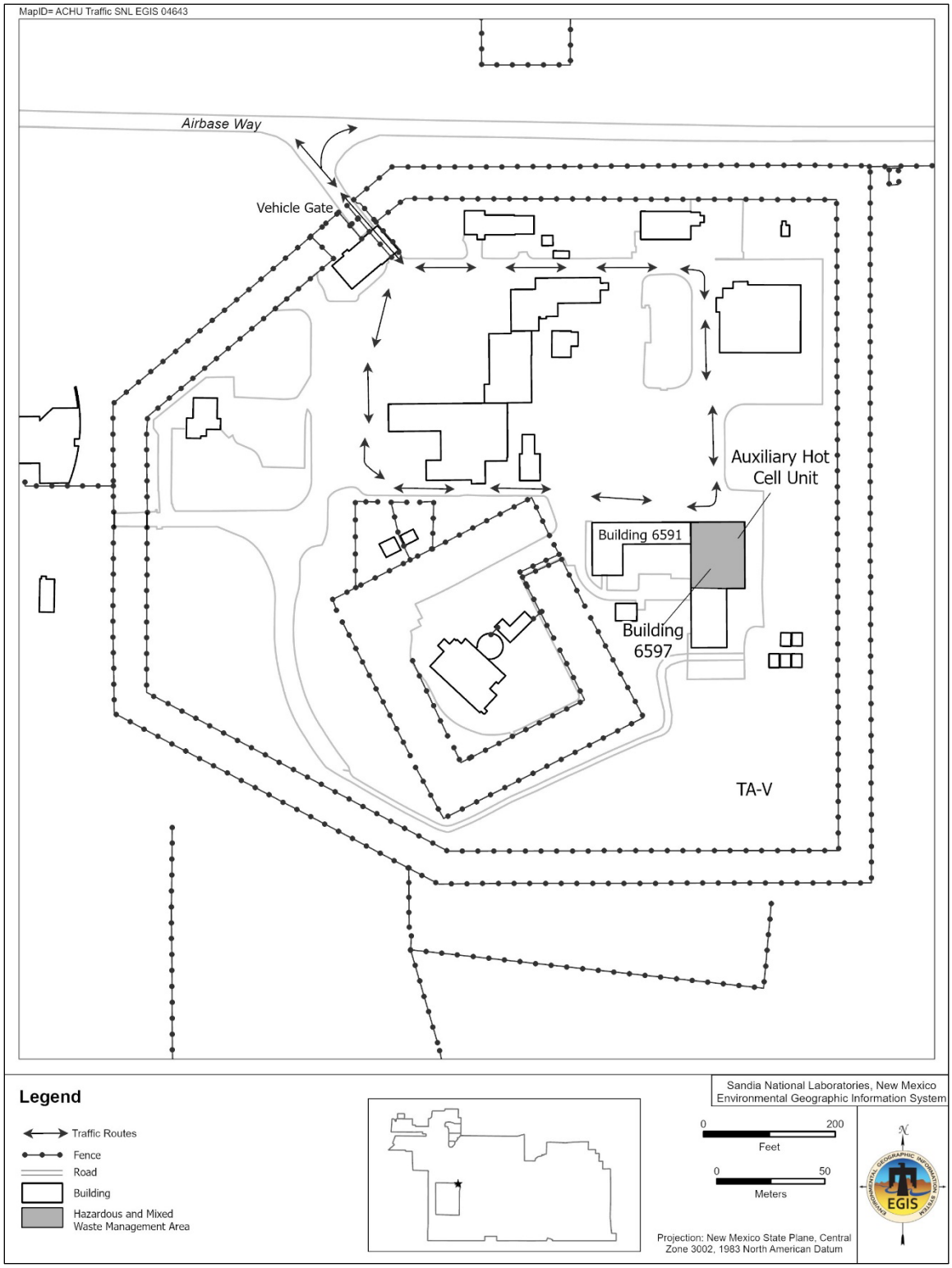

Figure 3J-4
Traffic Routes and Controls, Auxiliary Hot Cell Unit

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Figure 3J-5
Topographic Map, Auxiliary Hot Cell Unit

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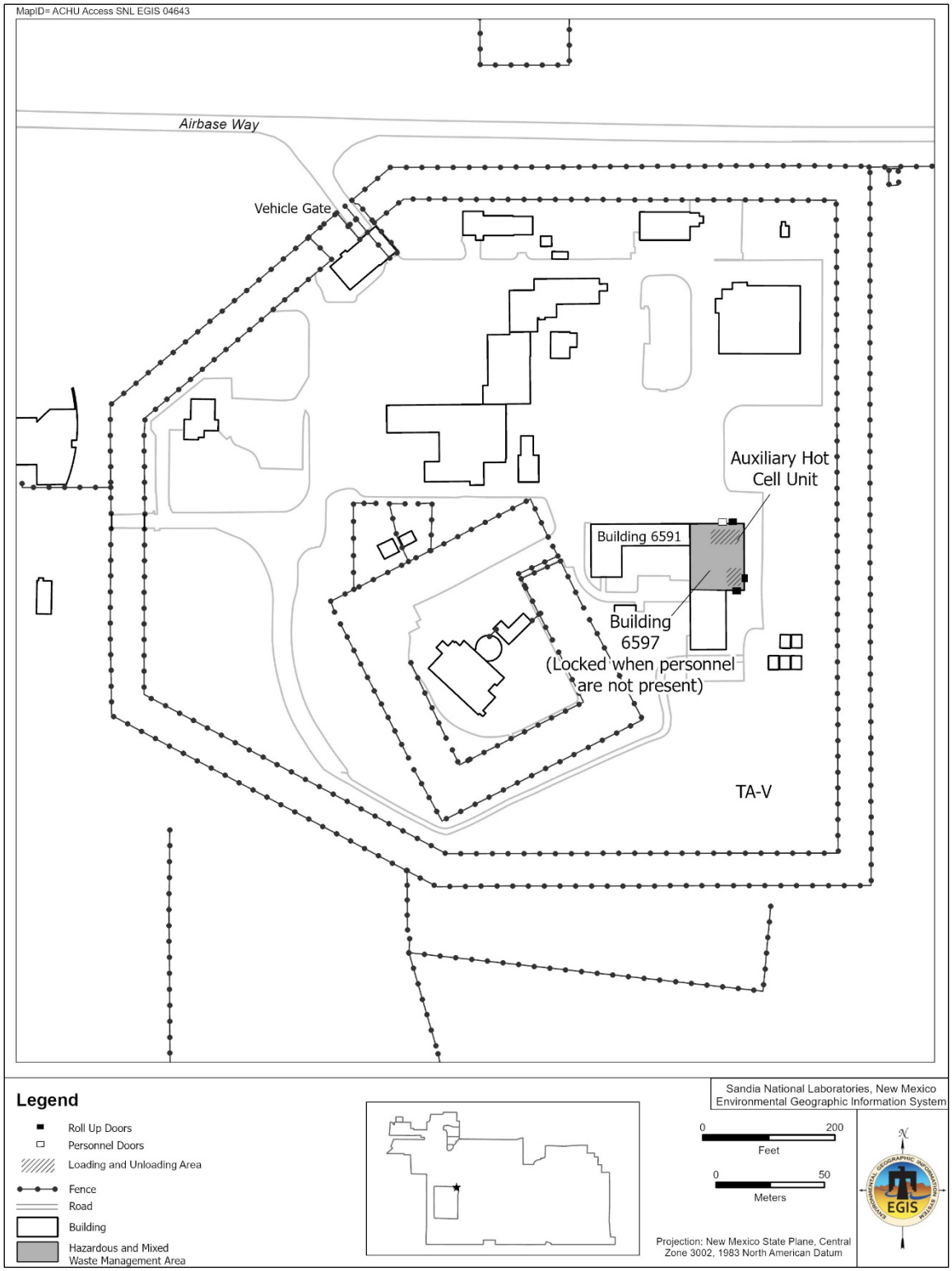

Figure 3J-6
Access Control Features, Auxiliary Hot Cell Unit

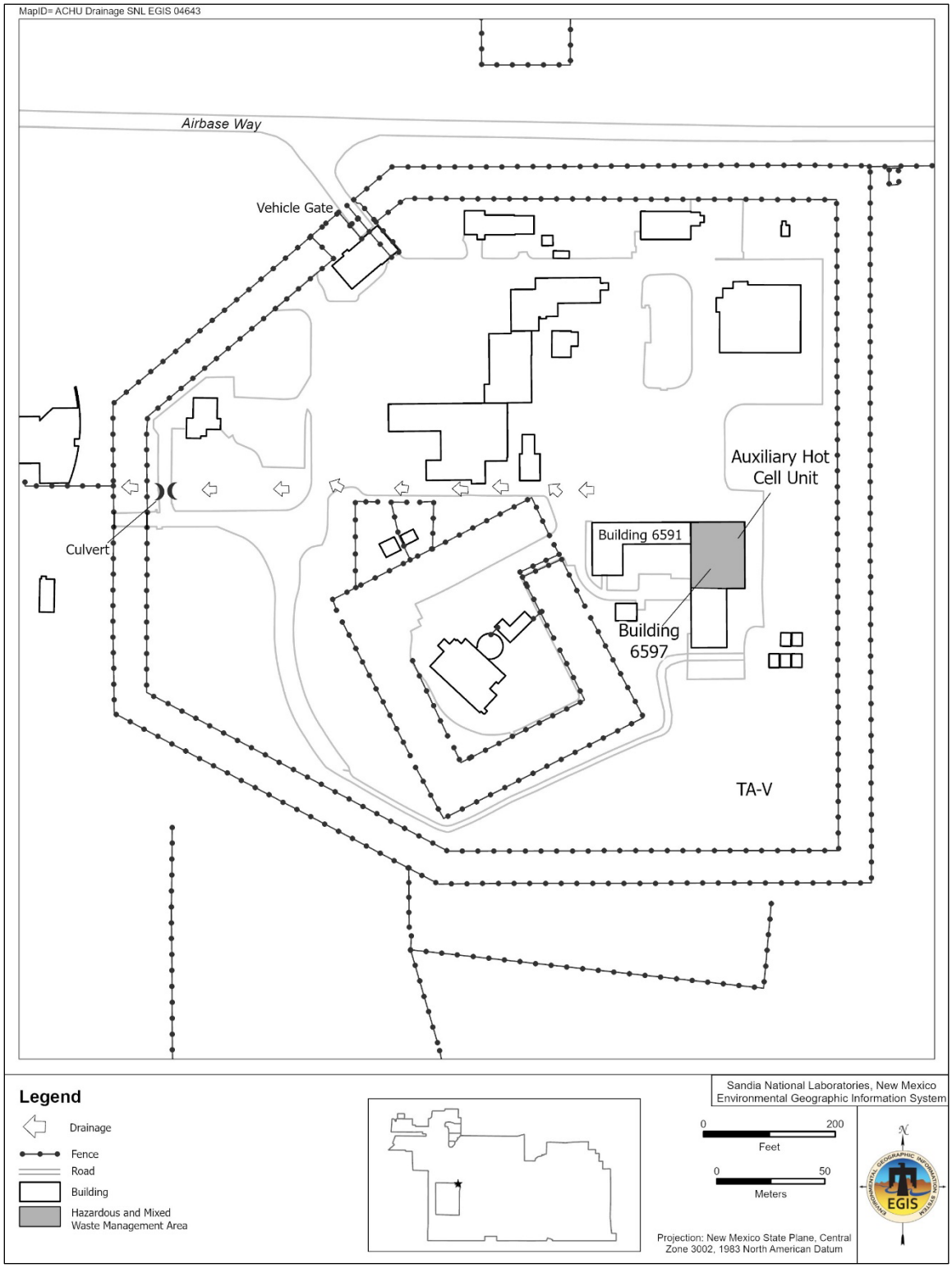

Figure 3J-7
Drainage Control Features, Auxiliary Hot Cell Unit

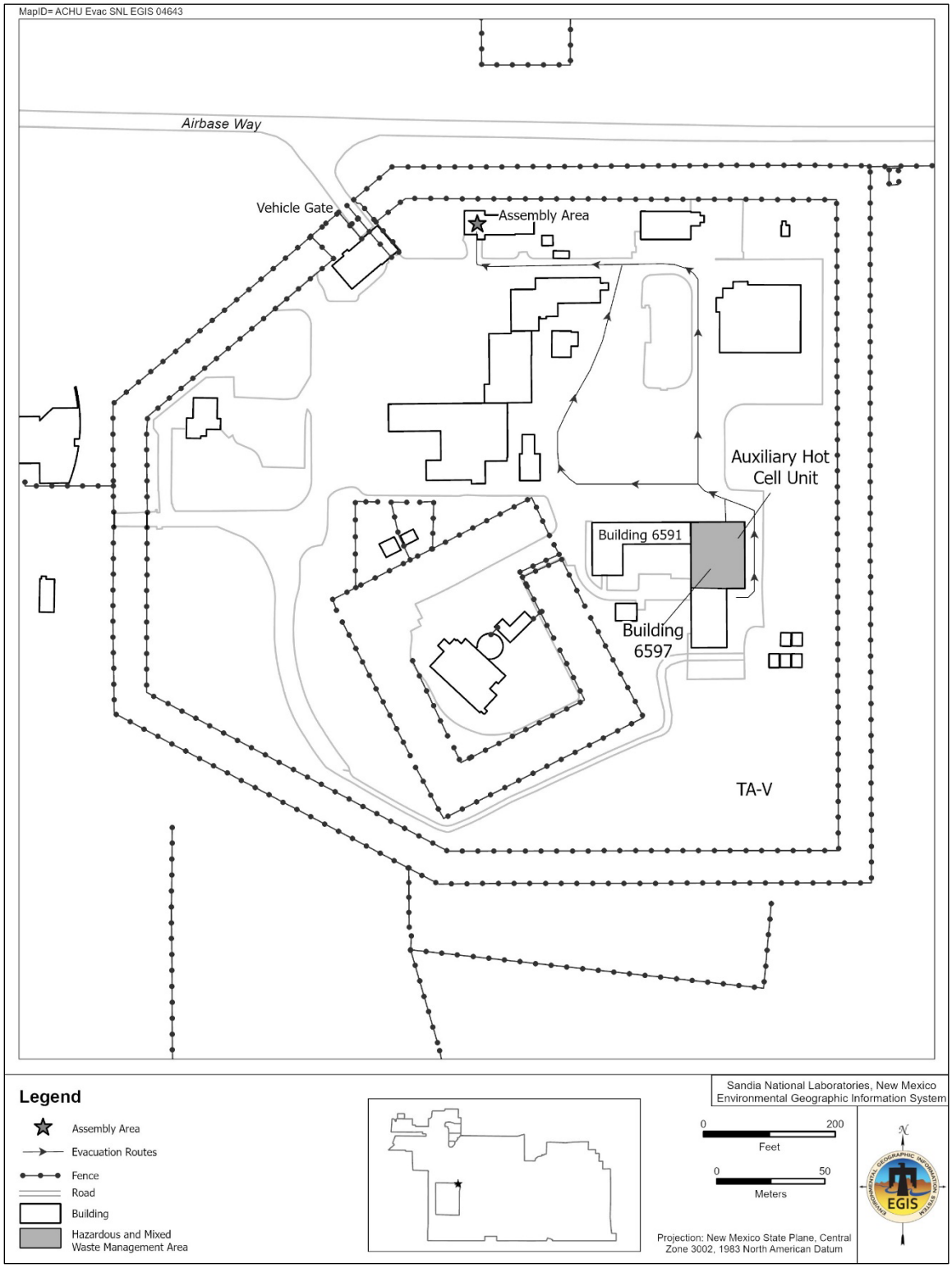

Figure 3J-8
Evacuation Routes, Auxiliary Hot Cell Unit

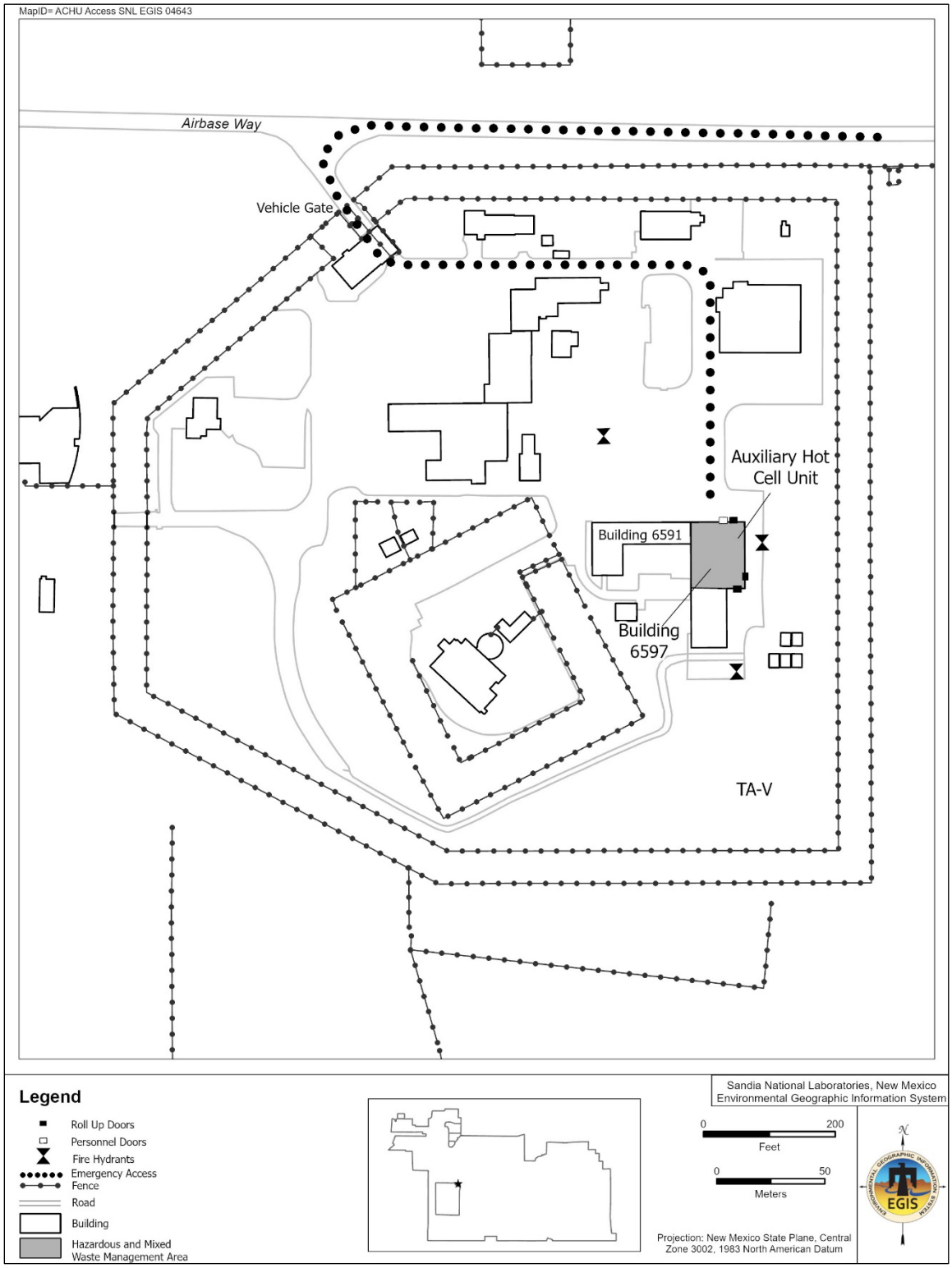

Figure 3J-9
Emergency Response and Access Information, Auxiliary Hot Cell Unit

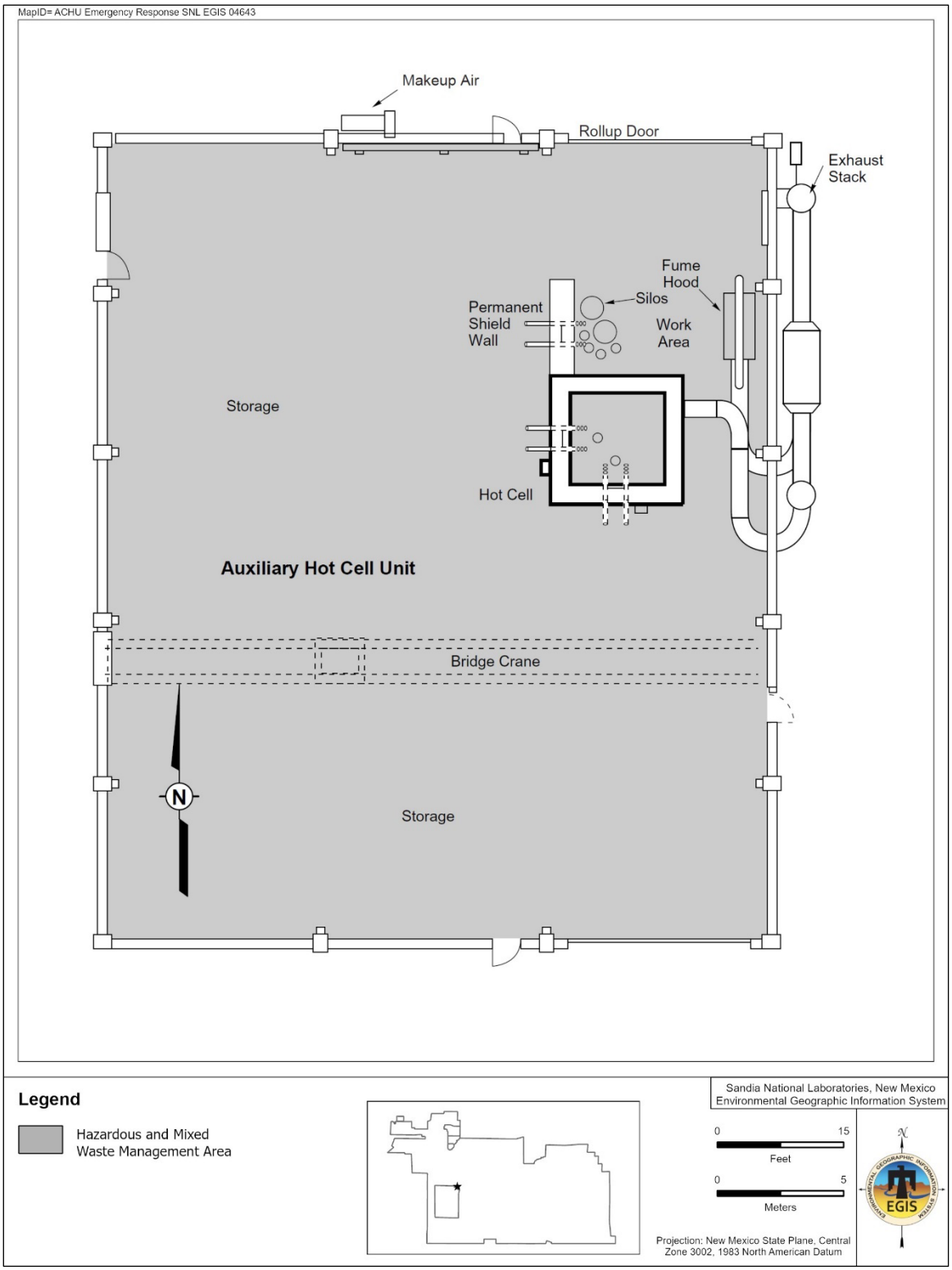

Figure 3J-10
Detailed Emergency Response and Access Information, Auxiliary Hot Cell Unit

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