# APPENDIX 5B
# CORRECTIVE ACTION MANAGEMENT UNIT
# POST CLOSURE CARE
# SANDIA NATIONAL LABORATORIES/NEW MEXICO

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CAA | central accumulation area |
| CAMU | Corrective Action Management Unit |
| CFR | Code of Federal Regulations |
| CSS | CWL and Sanitary Sewer Line |
| CWL | Chemical Waste Landfill |
| DOE | U.S. Department of Energy |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Restoration |
| GCL | Geosynthetic clay liner |
| HDPE | high-density polyethylene |
| LCRS | leachate collection and removal system |
| NMAC | New Mexico Administrative Code |
| NMED | New Mexico Environment Department |
| NNSA | National Nuclear Security Administration |
| NTESS | National Technology & Engineering Solutions of Sandia, LLC |
| PCB | polychlorinated biphenyl |
| PSL | Primary Subliner |
| PVC | polyvinyl chloride |
| RCRA | Resource Conservation and Recovery Act |
| SNL | Sandia National Laboratories |
| SNL/NM | Sandia National Laboratories/New Mexico |
| TA | Technical Area |
| TSCA | Toxic Substances Control Act |
| VCP | vitrified clay pipes |
| VOC | volatile organic compound |
| VSA | Vertical Sensor Array |
| VZMS | vadose zone monitoring system |
| WMA | waste management area |

# CORRECTIVE ACTION MANAGEMENT UNIT
# POST-CLOSURE CARE
# SANDIA NATIONAL LABORATORIES/NEW MEXICO

Sandia National Laboratories (SNL) 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 post-closure care plan identifies the post-closure activities that will be performed at the Corrective Action Management Unit (CAMU) in Technical Area (TA)-III at Sandia National Laboratories/New Mexico (SNL/NM). The CAMU is used for the containment of hazardous remediation waste that was generated during Environmental Restoration (ER) remediation activities, including closure of the Chemical Waste Landfill (CWL). The CAMU was designed and operated in compliance with the "Class III Permit Modification for the Management of Hazardous Remediation Wastes in the Corrective Action Management Unit, Technical Area III, Sandia National Laboratories/New Mexico Environmental Restoration Project," as modified (SNL/NM, September 1997, reprinted June 2002), and post-closure care has been conducted in accordance with the "Sandia National Laboratories/New Mexico Hazardous Waste Facility Operating Permit Number NM5890110518" (New Mexico Environment Department [NMED], 2015 and modifications), hereinafter referred to as the SNL/NM Permit. This plan is designed to meet the post-closure requirements of Title 20, Chapter 4, Part 1, Subpart V of the New Mexico Administrative Code (20.4.1.500 NMAC), incorporating the Resource Conservation and Recovery Act (RCRA) requirements in the Code of Federal Regulations, Title 40, Part 264, Section 264.552(e)(4)(iv) (40 CFR) §264.552[e][4][iv]).

## 5B.1.0 INTRODUCTION

The CAMU is located in the southeast corner of TA-III at SNL/NM as shown in Figure 5B-1. Figure 5B-2 presents topographic map of the CAMU. A barbed-wire fence surrounds the CAMU and the area is unpaved. The only significant vegetation within the fenced area is on the cover of the containment cell and no wetlands are present. Currently, the land use at TA-III is industrial, and the reasonably foreseeable land use in TA-III is industrial.

## 5B.2.0 DESCRIPTION

A site-wide description of SNL/NM is provided in Volume 3 of the Comprehensive Permit Renewal Request, titled "Sandia National Laboratories/New Mexico General Part B Permit Renewal Request," hereinafter referred to as the General Part B, and Appendix 3A of the General Part B.

## 5B.2.1 Location and General Description

The CAMU is a 3.75-acre area located in the southeast corner of TA-III at SNL/NM as shown in Figure 5B-1. Figure 5B-2 presents topographic map of the CAMU. 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 CAMU. The CAMU 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.

## 5B.2.2 Summary of Operations and Closure

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, stormwater retention ponds, and central accumulation area for the containment-cell leachate collection tanks and the decontamination-pad wash water storage tanks. The temporary treatment systems were removed after operations were complete. 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 clean closed. The containment cell was closed with waste remaining in place. The containment cell and its supporting infrastructure are subject to the post-closure requirements contained in the SNL/NM Permit (NMED, 2015 and modifications), 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).

## 5B.2.3 Description of the CAMU Containment Cell

The containment cell consists of an engineered liner and final cover systems that are designed to prevent 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 leachate collection and removal system (LCRS), and a vadose zone monitoring system (VZMS). Details of the containment cell, liner details, cover, and associated features are presented in Figures 5B-3, 5B-4, 5B-5, and 5B-6.

The containment cell contains approximately 31,800 cubic yards of remediation wastes that were generated as part of corrective action and closure activities at the chemical waste landfill (CWL), a hazardous waste landfill located adjacent to the containment cell. The cell also contains soils having low levels of tritium (up to 20,000 picocuries per liter soil moisture).

### 5B.2.3.1 Containment Cell Liner System

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

### 5B.2.3.2 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 (GCL)

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

### 5B.2.3.3 Leachate Collection and Removal System (LCRS)

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.

### 5B.2.3.4 Geomembrane Liner

A 60-mil high-density polyethylene geomembrane liner lies across the entire containment cell and below the LCRS and acts as the initial barrier to prevent 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.

### 5B.2.3.5 Geosynthetic Clay Liner (GCL)

A 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.

### 5B.2.3.6 Sidewall Liner Components

The sidewall liner components include the following in descending order:

1. Protective cover sheet

2. Geomembrane
3. GCL
4. Prepared subgrade

### 5B.2.3.7 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.

### 5B.2.3.8 Geomembrane

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

### 5B.2.3.9 GCL

The sidewall liner GCL is identical to the bottom liner GCL described in Section 5B.2.3.5.

### 5B.2.3.10 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.

### 5B.2.3.11 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 are applied to minimize erosion of the final cover; these include slope, surface-water run-off, 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 5B-5. Figure 5B-6 shows a cross-section view of the cover system; the cover components include the following in descending order:

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

### 5B.2.3.12 Topsoil and Native Soil Blend Layers

The topsoil and native soil blend layers provide 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.

### 5B.2.3.13 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.

### 5B.2.3.14 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 flexible HDPE membrane liner, which provides additional protection against moisture infiltration, 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.

### 5B.2.3.15 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 5B-7 and 5B-8, 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.

#### 5B.2.3.16 Primary Subliner (PSL) Monitoring Subsystem

The PSL monitoring subsystem is the primary monitoring subsystem of the VZMS and is designed to detect soil moisture increase directly beneath the engineered liner system. A soil moisture increase could indicate an engineered liner system leak. The PSL monitoring subsystem consists of five parallel-trending, sub-horizontal, vitrified clay pipes (VCPs) located 4 feet below the containment cell bottom liner, with horizontal spacing of 17 to 27 feet (Figures 5B-7 and 5B-8). Polyvinyl chloride (PVC) access tubes are connected to the ends of each VCP, enabling passage of a neutron moisture probe into the VCP for soil moisture monitoring. Figure 5B-8 presents a cross-sectional view of the PSL monitoring subsystem components.

#### 5B.2.3.17 Vertical Sensor Array (VSA) Monitoring Subsystem

The VSA monitoring subsystem is used to monitor soil moisture, soil temperature, and soil gas volatile organic compound (VOC) concentrations beneath the containment cell edges. It consists of 11 vertical boreholes located below the containment cell, including one beneath the LCRS sump (Figure 5B-8 and Figure 5B-9). 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 (TDR) soil-moisture content probe, a temperature sensor, and an active soil-gas sampler. The active soil-gas sampler is used to monitor VOCs that have migrated from the CWL residual soil vapor plume into the vadose zone beneath and around the containment cell. Instrumentation cabling and tubing is ducted to the surface outside of the containment cell liner perimeter. Figure 5B-9 presents a cross-sectional view of the VSA monitoring subsystem components.

#### 5B.2.3.18 Chemical Waste Landfill and Sanitary Sewer (CSS) Line Monitoring Subsystem

The CSS monitoring subsystem serves to detect leaks from the nearby sanitary sewer line and monitor VOCs that have migrated from the CWL residual soil vapor plume toward the containment cell. The CSS monitoring subsystem consists of six vertical, 20-foot-deep monitoring wells, spaced approximately 100 feet apart in a line parallel to the sanitary sewer line (Figure 5B-10). Each monitoring well has a 2-foot galvanized steel screen and a 2-inch diameter galvanized steel pipe, making it suitable for soil gas sampling and soil moisture measurements with a neutron moisture probe. Figure 5B-10 presents a cross-sectional view of the CSS monitoring subsystem components.

### 5B.2.4 Description of Stormwater Diversion Structure

During post-closure care, the function of stormwater diversion structures associated with the containment cell is to prevent stormwater run-on and run-off from eroding the final cover and to reduce the amount of water that potentially could infiltrate into the final cover. As shown in Figure 5B-5, the two stormwater diversion structures associated with the containment cell are the site diversion ditch and the containment cell perimeter drainage swale. Stormwater run-on is diverted away from the containment cell by the site diversion ditch where it is directed toward existing

surface-water drainage features. Stormwater run-off from the containment cell cover is directed to the perimeter drainage swale where it is discharged off-site via an outfall.

## 5B.2.5 CAMU Leachate Management

### 5B.2.5.1 CAMU Leachate Collection

Whenever leachate is being pumped, poured, or otherwise handled, Unit personnel meet all applicable preparedness and prevention requirements in Section 5B.4.7. Unit personnel will implement the Site-Wide Contingency Plan (Appendix 3E) in response to emergencies.

DOE/NNSA and NTESS clean up spills promptly in accordance and will notify the NMED. At least two verification samples will be collected and analyzed to ensure complete cleanup has been achieved. Additional verification samples may be required by the NMED depending on the magnitude of the spill.

The LCRS sump is inspected on a quarterly basis for the presence of leachate as specified in Table 5B-3. Leachate is pumped into 55-gallon drums or other suitable containers, characterized according to (Appendix 3B Waste Analysis Plan), and managed appropriately.

### 5B.2.5.2 CAMU Central Accumulation Area

Hazardous waste managed at the CAMU consists of 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. Environmental Protection Agency (EPA) Hazardous Waste Number for leachate is F039.

The CAMU incorporates a central accumulation area (CAA), for leachate and PPE waste accumulation, north of the containment cell. The CAA consists of a rectangular area covered with aggregate. Containers of hazardous waste managed within the CAMU CAA are managed in accordance with applicable regulations in 20.4.1.300 NMAC, incorporating 40 CFR §262.17.Leachate is 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 are staged with sufficient aisle space to allow the unobstructed movement of personnel and equipment to any portion of the CAA. No more than 100 containers of leachate will be accumulated in the area at any given time.

# 5B.3.0 UNIT INFORMATION

## 5B.3.1 Security Procedures and Equipment

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

### 5B.3.1.1 Security Fences

Figure 5B-11 shows the post-closure perimeter boundary for the 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.

### 5B.3.1.2 Warning Signs

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.

## 5B.3.2 Traffic Pattern, Volume, and Controls

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.

### 5B.3.2.1 Traffic Patterns

The primary traffic routes used to travel to the CAMU include Wyoming Boulevard, Hardin Boulevard, and Pennsylvania Avenue. Pennsylvania Avenue crosses Tijeras Arroyo over the via a bridge. A two-lane paved road to TA-III turns southwestward off Pennsylvania Avenue northeast of TA-III as shown on Figure 3A-4 in Appendix 3A of the General Part B.

Within TA-III, traffic access to and from the CAMU is along 2-lane asphalt-paved roads shown on Figure 5B-12. Vehicles travel to the CAMU along on an asphalt-paved 2-lane drive to the gravel road (Figure 5B-11). Vehicles may be temporarily diverted onto gravel roads for short distances within TA-III when the asphalt-paved road is closed for construction or repair. The paved and gravel roads are maintained in good condition.

#### 5B.3.2.2 Traffic Volumes

Traffic volumes on Wyoming Boulevard and Hardin Boulevard are generally light to moderate. Traffic volumes on Pennsylvania Avenue are generally light. Traffic volumes within TA-III are light. Vehicle types are generally cars, light- and medium-duty trucks, and vans, approximately 10 to 30 vehicles per week travel to the CAMU.

#### 5B.3.2.3 Traffic Control Signals

Vehicles must stop at a gate prior to entering or leaving TA-III. Only authorized personnel are permitted into TA-III. Speed limit signs (i.e., "30 mph Unless Otherwise Posted") are located at several locations in TA-III.

There are no traffic control signals or signs within the CAMU fenced area. A speed limit sign (i.e., "Max. Speed 5 mph On Site") is posted on the gravel road to the CAMU (Figure 5B-12). Therefore, signals or signs are not necessary to control traffic outside the CAMU fenced area.

### 5B.3.3 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 CAMU 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. The CAMU is compliant with the seismic standards in 20.4.1.500 NMAC/40 CFR §264.18(a) [12-01-18] and 20.4.1.900 NMAC/40 CFR §270.14(b)(11)(ii) [12-01-18].

### 5B.3.4 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 CAMU is not located within the 100-year floodplain boundary, as described in Section 3A.4.3 in Appendix 3A of the General Part B. The CAMU 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].

### 5B.3.5Topographic 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 as 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 CAMU are shown on Figure 3A-2 in Appendix 3A of the General Part B and Figure 5B-2 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][iii] [12-01-18]).

- Surrounding land uses are shown on Figures 3A-2 and 3A-8 in Appendix 3A of the General Part B and Figure 5B-2 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][iv] [12-01-18]). The area surrounding the CAMU is occupied by test areas and 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 5B-2 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 CAMU) are shown on 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 CAMU (e.g., fences, gates) are shown on Figure 5B-12 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 CAMU are shown on Figure 3A-2 in Appendix 3A of the General Part B and Figure 5B-2 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][ix] [12-01-18]).

- The location of the WMA structures, loading and unloading areas, roads, and sanitary sewers associated with the CAMU are shown on Figures 5B-2 and 5B-11 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][x] [12-01-18]).

- Drainage control features (e.g., run-on/run-off, drainage barriers) are shown on Figure 5B-5 of this appendix (20.4.1.900 NMAC/40 CFR §270.14[b][19][x] and [xi] [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 CAMU. 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 CAMU, the extent of the SNL/NM facility, and the topographic relief in the area.

### 5B.3.6 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 Section 3 of Volume 4 (RCRA corrective action) and 5 (post-closure care units) of the Comprehensive Permit Renewal Request. Groundwater monitoring at the CAMU is not required because:

- The CAMU is not a regulated unit.

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

## 5B.4.0 POST-CLOSURE CARE PLAN

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 will continue for 30 years after that date, except that the 30-year post-closure care period may be shortened or extended.

Additional information on post-closure waste management practices to be conducted at the CAMU, and a description of the Unit is provided in Section 5B.2.0.

During the post-closure care period, the containment cell will continue to be monitored and maintained in a manner that will ensure protection of human health and the environment. The potential for exposure will be minimized by means of employing the following:

1. Engineered barriers will be maintained to prevent the migration of leachate into the surrounding environment;

2. Security measures will be maintained to restrict access to the area; and

3. Inspections, maintenance, and repairs will be performed as described in Section 5B.4.5 of this Post-Closure Care Plan.

### 5B.4.1 Amendment of Post-Closure Care Plan

At any time during the post-closure care period, DOE/NNSA and NTESS personnel will submit a written request to the NMED for a permit modification if changes to the post-closure plan are needed.

### 5B.4.2 Post-Closure Notices

Post-Closure notices are maintained in SNL/NM records (Section 5B.4.11), as described in Section 3.4.2 of Volume 5. The notices were already submitted for the CAMU and are not included in this Comprehensive Permit Renewal Request.

### 5B.4.3 Facility Points of Contact

The points of contact for the CAMU during the post-closure care period are listed in Section 3.3 of Volume 5.

### 5B.4.4 Monitoring the Vadose Zone

During the initial stages of the post-closure care period, the PSL, VSA, and CSS monitoring subsystems were monitored on a monthly and annual basis for one year. Monitoring will 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 is provided in Table 5B-1.

**Table 5B-1**
**VZMS 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 Moisture Probe |
| | | VSA | Soil Moisture Content Temperature | TDR probe Temperature Sensor |
| | | CSS | Moisture Content | Neutron Moisture Probe |
| | Annually[b] | VSA | Active Soil Gas | EPA Method TO-15 or equivalent, as revised and updated[c] |
| | | CSS | | |

Footnotes:
a Closure of the Unit was completed in October 2003.
b Active soil-gas sampling will be performed annually unless increased soil moisture is detected, in which case active soil-gas sampling will be performed on a quarterly basis.
c Method TO-15 or an equivalent method that includes the same analyte list, method detection limits equal to or lower than the TO-15 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.

CSS Chemical Waste Landfill (CWL) and Sanitary Sewer Line
PSL Primary Subliner
TDR Time domain reflectometer
VSA Vertical Sensor Array
VZMS Vadose Zone Monitoring System

Three sampling and analysis plans (SAPs) are provided in the following subsections:

- Section 5B.4.3.1 – PSL monitoring subsystem,
- Section 5B.4.3.2 – VSA monitoring subsystem, and
- Section 5B.4.3.3 – CSS monitoring subsystems.

The purpose of these SAPs is to document procedures for the collection and reporting of consistent, reliable, defensible, and comparable sampling results. In addition to the SAPs, SNL/NM personnel follow instructions in applicable field operating procedures (FOPs); these are summarized in Table 5B-2. The requirements of the SAPs in this appendix take precedence over any cited FOPs.

The current versions of the FOPs listed in Table 5B-2 have been provided to the NMED, and any updated versions of the procedures will be provided to the NMED within 60 days of their effective dates.

**Table 5B-2**
**Applicable Operating Procedures[a]**

| Number | 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 |

Footnote:
[a] Sandia National Laboratories/New Mexico-specific procedures that will be used as revised and updated.
FOP Field operating procedure

### 5B.4.4.1 SAP: PSL Monitoring Subsystem

#### *5B.4.4.1.1 Monitoring Method*

Soil moisture content of the soil directly beneath the engineered liner system is determined using a neutron moisture probe, such as a Model 503 Elite Hydroprobe manufactured by California Pacific Nuclear or equivalent. The neutron moisture probe is attached to a data cable and deployed to predetermined monitoring locations in each VCP using a cable-and-winch system. The neutron moisture probe is self-contained and includes an americium-241:beryllium radioactive source, and detector. The neutron source emits fast neutrons into the material surrounding the monitoring location. The fast neutrons interact with the moisture (specifically hydrogen) in the material. The neutron detector then counts the neutrons that are slowed (i.e., thermalized) by the interaction. The number of thermalized neutrons counted is proportional to the moisture content in the material; the higher the count, the higher the moisture content. The neutron count is converted to soil moisture content using a correlation formula. The calculated soil moisture content data is entered onto a computer spreadsheet for evaluation.

#### *5B.4.4.1.2 Neutron Moisture Probe QA/QC and Correlation*

The neutron soil moisture probe is operated in accordance with the operating manual and FOP 08-20. A standard count is taken prior to the monitoring event to ensure the highest measurement of accuracy. The standard count measures the proper function of the neutron moisture probe electronics.

The correlation of neutron counts to soil moisture content using the neutron soil moisture probe was initially performed in a vessel that duplicated as closely as possible the *in-situ* characteristics at the field measuring location. The neutron moisture probe was inserted into the access tube within the vessel, and neutron count measurements 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 correlation currently used for the instrument, which associates a neutron count to a known soil moisture content. The neutron moisture probe is calibrated according to manufacturer recommendations.

## 5B.4.4.2 SAP: VSA Monitoring Subsystem

### *5B.4.4.2.1 Soil Moisture and Soil Temperature Monitoring*

VSA soil moisture monitoring is performed using a time-domain reflectometer (TDR) system, such as a Campbell Scientific TDR100 or equivalent instrumentation. The TDR soil moisture probe is connected by a coaxial cable to a TDR signal generator, which sends a voltage signal to the probe. The voltage signal travels as follows:

$$\text{TDR} \rightarrow \text{probe} \rightarrow \text{surrounding material} \rightarrow \text{probe} \rightarrow \text{TDR}$$

The delay between the initial signal and the return pulse is proportional to the moisture content in the surrounding material; the longer the delay, the higher the moisture content. The TDR software uses a preprogrammed algorithm, the Topp Equation, to convert the voltage signal waveform to a volumetric soil moisture value. Because soil temperature can affect the TDR software-calculated soil moisture values, soil temperature is measured in conjunction with the soil moisture measurements. The soil temperature is measured with a digital thermometer, such as a Fluke Corporation Model 52 II digital thermometer or equivalent.

### *5B.4.4.2.2 Soil Gas Sampling*

The active soil-gas sampler is used to monitor VOCs that have migrated from the CWL residual soil vapor plume into the vadose zone beneath and around the containment cell. The VSA 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. A vacuum pump is used to draw soil gas through the sampling tubing and sampling screen until a minimum of three volumes are evacuated. The vacuum pump is then turned off and a valve on the sampling manifold assembly that directs the soil gas flow to a SUMMA canister, which is under vacuum, is opened, causing the soil gas sample to flow into the canister. Soil gas sampling is performed in accordance with FOP 08-22.

An analytical laboratory under contract to SNL/NM is used to provide the analytical services. Laboratory sample custody, data management, reporting, and sample disposal will be performed in accordance with established laboratory procedures. Analytical procedures will follow established laboratory standard operating procedures based upon the referenced EPA method. Active soil gas sampling will be performed for volatile organic compounds included in EPA Methods TO-15 or equivalent analytical method.

For each scheduled sampling event on Table 5B-2, field and laboratory quality assurance (QA) samples will include duplicate samples.

### *5B.4.4.2.3 Time-Domain Reflectometer and Data Acquisition Software and QA/QC*

Predetermined settings for the cable length, cable propagation velocity, probe length and offset, and waveform analysis criteria for each monitoring location are entered into the software to ensure

capture of the waveform signal to determine soil volumetric water content. Soil moisture and soil temperature monitoring will be performed in accordance with the associated operating manuals and FOP 08-21. The TDR signal generator and the digital thermometer are calibrated according to manufacturer recommendations.

### 5B.4.4.3 SAP: CSS Monitoring Subsystem

#### *5B.4.4.3.1 Soil Moisture Monitoring*

A neutron moisture probe is used to determine soil moisture in the CSS monitoring subsystem. It is attached to a data cable and deployed to predetermined monitoring points at each CSS location using a cable-and-winch system. Neutron counts are measured and converted to soil moisture content using a correlation formula. The correlation formula used for the CSS monitoring subsystem was developed using the same method described in Section 5B.4.3.1.2. The QA/QC requirements for the CSS monitoring subsystem are the same as those described in Section 5B.4.3.1.2. The neutron soil moisture probe is operated in accordance with the operating manual and FOP 08-20.

#### *5B.4.4.3.2 Soil Gas Sampling*

The CSS monitoring subsystem is sampled to monitor for VOCs that have migrated from the CWL residual soil vapor plume toward the containment cell. A vacuum pump is connected to the sample port and cap that seals the monitoring well casing. The vacuum pump is used to draw the soil gas through the well casing and sampling screen until a minimum of three well casing volumes are evacuated. The sampling manifold and method described in Section 5B.4.3.2 is used to collect the sample. Soil gas sampling is performed in accordance with FOP 08-22.

Laboratory analytical services, and field and laboratory QA are performed as described in Section 5B.4.3.2.

### 5B.4.4.4 Assessing the Monitoring Results

As part of each monitoring event, soil moisture content from the VZMS is evaluated to determine if there has been leakage from the containment cell and, if so, the character and magnitude of the leak. Soil gas is monitored to determine the influence of the CWL residual soil vapor plume into the vadose zone beneath and around the containment cell.

#### *5B.4.4.4.1 Soil Moisture*

In the case of a soil moisture increase greater than 4 percent above baseline (expressed as gravimetric percent moisture content at CSS and PSL locations or expressed as volumetric percent moisture content at VSA locations) at any monitoring location(s), DOE/NNSA and NTESS will confirm the result by performing additional monitoring within 30 days at the locations exceeding the trigger level. If a second analysis confirms that the trigger level has been exceeded, DOE/NNSA and NTESS will notify the NMED in writing within 15 after receipt of the second analysis confirming that the trigger level has been exceeded during the particular monitoring

event. Within 180 days, DOE/NNSA and NTESS will evaluate the soil moisture data to determine the likely location and source of the moisture and report the results in writing to the NMED. If the likely source is the sanitary sewer line, DOE/NNSA and NTESS will continue monitoring and will take action if necessary to locate, reduce, and/or eliminate the source of the moisture.

If the likely source is the containment cell, DOE/NNSA and NTESS will take further action as required by NMED.

#### *5B.4.4.4.2 Soil Gas*

If a soil-gas sample result exceeds a trigger level of 20 parts per million by volume (ppmv) total VOCs, DOE/NNSA and NTESS will confirm the result by collecting additional samples within 30 days. If a second analysis confirms that the trigger level has been exceeded, DOE/NNSA and NTESS will notify the NMED in writing within 15 days after receipt of the second analysis confirming that the trigger level has been exceeded during the particular sampling event. DOE/NNSA and NTESS will take further action as required by NMED.

### 5B.4.5 Inspection, Maintenance, Repair Activities, and Frequencies

The CAMU will 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 system,
2. Stormwater diversion structures,
3. The LCRS,
4. The VZMS, and
5. The perimeter security fence and signage.

Inspection and maintenance of these systems will be performed throughout the post-closure care period in accordance with the schedule and criteria in Table 5B-3. Inspection records are maintained as described in Post-Closure Care Section 3.4.2 (Volume 5).

Example inspection forms are provided in Attachment 5B-B. A response indicating the condition of each item subject to inspection requirements will 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, Unit personnel take corrective action in a timely manner upon discovery to ensure that the problem does not lead to an environmental or human health hazard. As appropriate, actions may 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 will be completed as soon as practical to preclude further damage.

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

Inspection and maintenance are discussed in the following subsections.

### 5B.4.5.1 Final Cover System

#### *5B.4.5.1.1 Inspections and Frequencies*

The final cover will be inspected on a quarterly basis. Cover inspections will document, in writing:

- the presence of deep-rooted plants (with roots at least 8 feet 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 feet 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 will also undergo an annual biological inspection of the vegetation that will include:

- Checking that 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);
- Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and
- No contiguous bare spots greater than 200 square feet (approximately 14 feet by 14 feet) are present.

#### *5B.4.5.1.2 Maintenance and Repair Activities*

Water will be prevented from ponding on the surface of the CAMU cover in any area in excess of 100 square feet. DOE/NNSA and NTESS will 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 will be killed within 60 days or as soon as seasonal conditions are favorable for eliminating them.

Cover damage that exceeds the limits described in Section 5B.4.5.1.1 will be repaired within 60 days to a condition that meets or exceeds the original design. Repair specifications will include, but not be necessarily limited to, the following.

Animal intrusion burrows, settlement areas, and areas of erosion will be backfilled and compacted using non-contaminated soil with properties similar to the soil used to construct the final cover. The soil will meet the original construction specifications for the CAMU final cover. DOE/NNSA and NTESS will make reasonable attempts to relocate animals prior to backfilling their burrows.

Areas with no vegetation in excess of 200 square feet will 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 will be completed as soon as possible when appropriate conditions occur. Where necessary, the topsoil layer and gravel mulch surface will be repaired to provide a suitable seedbed. The repair will be done using materials meeting the original specifications of the CAMU final cover.

### 5B.4.5.2 Stormwater Diversion Structures

#### *5B.4.5.2.1 Inspections and Frequencies*

The stormwater diversion structures will be inspected on a quarterly basis to verify structural integrity and to ensure adequate performance. Inspections will document, 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.

#### *5B.4.5.2.2 Maintenance and Repair Activities*

Based upon the results of the stormwater diversion structure inspections, erosion or damage that exceeds the limits described in Section 5B.4.5.2.1 and Table 5B-3 will 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 will be removed within 60 days.

### 5B.4.5.3 LCRS

#### *5B.4.5.3.1 Inspections and Frequencies*

Leachate collects in the LCRS at a consistent and slowly declining rate. The LCRS will be inspected on a quarterly basis for the presence of leachate using the LCRS pump. Inspections will document, in writing, any findings. For inspection purposes, the LCRS pump will 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 5B-3. 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 leachate is expected but none is pumped, a video camera inspection may be performed if needed 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 will be determined, and the pump replaced or repaired as necessary. The pump assembly may be removed and properly stored until needed.

#### *5B.4.5.3.2 Maintenance and Repair Activities*

The LCRS pump and plumbing will be maintained/repaired as necessary to maintain them in good condition based upon the results of quarterly inspections. Maintenance/repairs will be done within 60 days of discovery that the maintenance/repairs are needed.

### 5B.4.5.4 VZMS

#### *5B.4.5.4.1 Inspections and Frequencies*

During quarterly monitoring events (see Table 5B-3), the VZMS components will be inspected. The inspection will document, in writing, the condition of the components including protective casings, access covers and doors, instrumentation access boxes, compression caps, locks, and electronic monitoring systems.

#### *5B.4.5.4.2 Maintenance and Repair Activities*

The VZMS components will be maintained/repaired within 60 days, as needed, to maintain them in good condition, based upon inspection results. Activities will include, as applicable, maintaining protective casings, access covers/doors, and instrumentation access boxes, ensuring the PSL and CSS 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 will also include ensuring that all aboveground VZMS components are protected from the weather.

### 5B.4.5.5 Security Fencing and Signage

#### *5B.4.5.5.1 Inspections and Frequencies*

The fence, gates, and warning signs will be inspected on a quarterly basis. The inspections will 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 containment cell, or would interfere with any waste management activities or with any of the VZMS components or monitoring of any kind.

#### *5B.4.5.5.2 Maintenance and Repair Activities*

The fence, gates, and warning signs will be maintained/repaired within 60 days, as needed, to maintain them in good condition, as indicated by quarterly inspections. Activities will include 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.

## Table 5B-3
## Post-Closure Inspection and Maintenance/Repair Schedule, Corrective Action Management Unit

| System to be Inspected | Inspection | | Maintenance/Repair | |
|---|---|---|---|---|
| | Frequency | Parameter | Implementation | Frequency |
| Final Cover System | Quarterly | Existence of invasive plants or plants with the potential for forming deep roots (at least 8 feet deep at maturity) | 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 feet or greater) | | |
| | | Erosion of cover soil in excess of 6 inches deep | | |
| | | Contiguous areas of no vegetation >200 square feet | 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 | Annually[a] | Full biological inspection, including:<br>Approximate percentage vegetative coverage (actively photosynthesizing)<br>Approximate percentage native vegetation of the total vegetative cover<br>Main plant species growing on the CAMU cover and the approximate percentage of the cover populated by each species. | 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. |
| Stormwater Diversion Structure | Quarterly | Channel or side-wall erosion in excess of 6 inches deep | 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. | | |

Footnotes at end of table.

## Table 5B-3 (Concluded)
## Post-Closure Inspection and Maintenance/Repair Schedule, CAMU

| System to be Inspected | Inspection | | Maintenance/Repair | |
|---|---|---|---|---|
| | Frequency | Parameter | Implementation | Frequency |
| LCRS | Quarterly | Leachate in sump | Manually activate pump/inspect for leachate collection | Quarterly |
| | Quarterly | Pump | Maintain/repair pump | Within 60 days of discovery of needed repairs[b] |
| | | Plumbing | Maintain/repair plumbing | |
| VZMS | Quarterly | Protective casings<br>Access covers and doors<br>Instrumentation access boxes<br>Compression caps | 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 | Quarterly | Presence of wind-blown plants and debris | 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<br>Repair and oil gates<br>Clean or replace locks<br>Repair or replace warning signs | |
| Safety and Emergency Equipment<br>See Table 5B-4. | Monthly | Spill control materials, including sorbent material, brooms and shovels are present, accessible, and in good condition | Repair or replace | As soon as possible, in accordance with Section 5B.3.5. |
| | | Fire extinguisher is present, charged, accessible, and in good condition | | |
| | | Portable eyewash station is operational and in good condition | | |

Footnotes:
[a] This inspection will be performed quarterly until the vegetative cover is successfully established and annually thereafter.
[b] Maintenance/repairs will be performed as necessary, based upon the results of inspections.
[c] The LCRS pump and plumbing will be maintained/repaired based upon the results of quarterly inspections.
CAMU Corrective Action Management Unit
$ft^2$ square foot (feet)
LCRS leachate collection and removal system
VZMS vadose zone monitoring system

## 5B.4.6 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." This section describes training requirements for employees and any contractors who work at the CAMU. 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.

### 5B.4.6.1 Training Program

The DOE/NNSA and NTESS 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/NNSA, NTESS, and any subcontractors who have responsibility for the day-to-day management of hazardous and mixed waste at the CAMU.

CAMU personnel receive training in accordance with the "Site-Wide Personnel Training Plan" provided as Appendix 3D of the General Part B.

### 5B.4.6.2 Job Descriptions

Job titles, descriptions, and qualifications for CAMU positions are provided in Attachment 5B-C. The job descriptions include job duties and education, skills, or experience requirements. All CAMU personnel receive all the training listed in Table 3D-2 in Appendix 3D (Volume 3).

### 5B.4.6.3 Training Records

Current-year training records for current CAMU personnel are maintained at the CAMU. Historical training records for current CAMU personnel are maintained in SNL/NM records. Training records for current CAMU personnel are kept until post-closure care is complete. Training records for former Unit personnel are kept in SNL/NM records for a minimum of three years from the date last worked at the CAMU.

## 5B.4.7 Preparedness and Prevention

### 5B.4.7.1 Required Equipment

The equipment required by 20.4.1.500 NMAC, incorporating 40 CFR §264.32 is maintained at the CAMU, as well as the additional equipment described in the CAMU Contingency Plan (Section 5B.4.8), Table 5B-4.

### 5B.4.7.2 Testing and Maintenance of Equipment

The equipment described in Table 5B-4 of the CAMU Contingency Plan (Section 5B.4.8), is tested and maintained as necessary, to assure its proper operation in time of emergency in accordance with 20.4.1.500 NMAC, incorporating 40 CFR §264.33.

### 5B.4.7.3 Access to Communications or Alarm System

Personnel at the CAMU will have access to a communications or alarm system as described in the CAMU Contingency Plan (Section 5B.4.8) and 20.4.1.500 NMAC, incorporating 40 CFR §264.34.

### 5B.4.7.4 Preventing Hazards in Unloading

CAMU personnel will typically load containers of leachate and PPE waste into vehicles next to the CAA. The ground is level and there is sufficient room for operating the vehicles and equipment.

Containers are handled in a manner to prevent shifting and falling. Containers may be strapped together on a pallet before being loaded onto vehicles.

### 5B.4.7.5 Preventing Run-off or Flooding

There are no active hazardous or mixed waste management areas at the CAMU that would require run-off prevention. The stormwater diversion features described in Section 5B.2.5 will be maintained to prevent flooding.

### 5B.4.7.6 Preventing Contamination of Water Supplies

The current conditions of the CAMU final cover (Section 5B.2.4) and stormwater drainage features (Section 5B.2.5) are protective of human health and the environment under industrial land use and protective of local water supplies, including the regional groundwater aquifer beneath the CAMU. The monitoring program described in Section 5B.4.3 will provide continued protection of the regional groundwater aquifer.

### 5B.4.7.7 Mitigating Effects of Equipment Failure and Power Outages

The current conditions of the CAMU are not subject to adverse effects from equipment failure or power outages.

### 5B.4.7.8 Preventing Undue Exposure

The current conditions of the CAMU final cover (Section 5B.2.4) and stormwater drainage features (Section 5B.2.5) are protective of human health and the environment under industrial land use

and are protective of human health and the environment under industrial land use and prevent undue exposure of site workers and the public. The land use restrictions described in Section 5B.1.0 will be maintained.

#### 5B.4.7.9 Preventing Releases to the Atmosphere

The current conditions of the CAMU final cover and stormwater drainage features (Section 5B.2.5) are protective of human health and the environment. Releases to the atmosphere are not anticipated. Land use restrictions will be maintained to provide continued protection.

### 5B.4.8 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 DOE/NNSA and NTESS "Site-Wide Contingency Plan" is included as Appendix 3E of the General Part B.

Figure 5B-13 presents the evacuation routes for the CAMU. Figures 5B-14 and 5B-15 present emergency response and access information for the CAMU. Table 5B-4 lists the emergency equipment typically available at the CAMU. Table 5B-5 lists the emergency coordinators for the CAMU.

Current copies of the site-wide contingency plan (Appendix 3E of the General Part B) and this supplemental information are maintained at the CAMU and at the SNL/NM Emergency Operations Center.

**Table 5B-4**
**Emergency Equipment and Locations, Corrective Action Management Unit**

| Category | Description | Location |
|---|---|---|
| Spill Control Equipment | Spill control materials, such as sorbent material, booms and shovels | Leachate Storage Area Shed |
| Fire Extinguisher | Portable, Multi-Class | One near the Leachate Storage Area and Containment Cell, and one in Corrective Action Management Unit (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 (Figures 5B-14 and 5B-15) |

**Table 5B-5**
**Emergency Coordinator List, Corrective Action Management Unit**

| CAMU Emergency Coordinator [a] | | Phone Numbers | | | Office Address [b] |
|---|---|---|---|---|---|
| **Title** | **Name** | **Office** | **Cell** | **Home** | |
| Primary | Robert Ziock | 505-845-0485 | 505-238-3668 | 505-255-4714 | Sandia National Laboratories P.O. Box 5800 Albuquerque, NM |
| First Alternate | Alexis Ortiz | 505-845-8126 | 505-584-1824 | 505-584-1824 | |
| Second Alternate | Caitlin LaChance | 505-845-9919 | 505-220-0075 | 505-328-4710 | |

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

## 5B.4.9 Financial Assurance and Liability Requirements

Under 20.4.1.500 NMAC, incorporating 40 CFR §264.140(c), and Public Law 108-199, federal facilities, including SNL, are exempt from financial assurance requirements.

## 5B.4.10 Completion and Certification of Post-Closure Care

Within 60 days of the end of the post-closure care period for the CAMU, DOE/NNSA and NTESS will submit a written certification that post-closure care for the CAMU was performed in accordance with the specifications of this Appendix 5B. The certification will be submitted as described in Section 3.4.3 of Volume 5 Post-Closure Care.

In addition, DOE/NNSA and NTESS will prepare a final post-closure care report summarizing pertinent information regarding post-closure monitoring, maintenance, and repair activities and any variances from this Post-Closure Care Plan (Appendix 5B) and the reasons for the variances. The post-closure care report will be provided with the certification to the NMED within 60 days of the end of the post-closure period. Transmittal of the report will include a request from DOE/NNSA and NTESS for the NMED to approve termination of post-closure care for the CAMU.

## 5B.4.11 Records Management

DOE/NNSA and NTESS will maintain documentation of closure of all hazardous waste management units (40 CFR §264.119[b] and 40 CFR §270.32[b][2]).
DOE/NNSA and NTESS will maintain post-closure care records as described in Section 3.4.2 of the Post-Closure Care Plan (Volume 5).

## 5B.5.0 REFERENCES

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NMED, see New Mexico Environment Department.

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## 5B.6.0 FIGURES

Figures begin on the next page.

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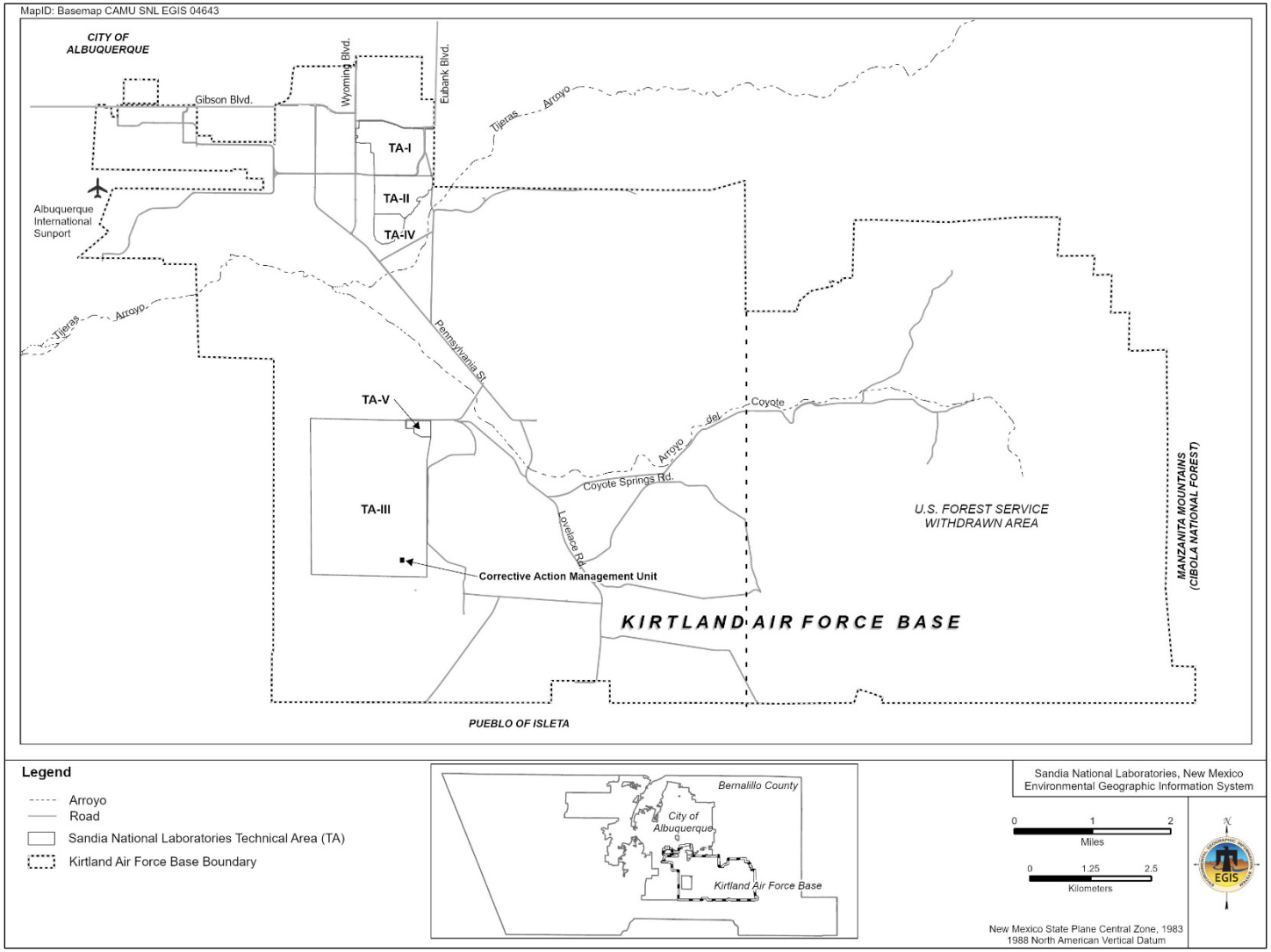


**Figure 5B-1**
**Location of Corrective Action Management Unit**

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## *Figure 5B-2*
## *Topographic Map Corrective Action Management Unit*

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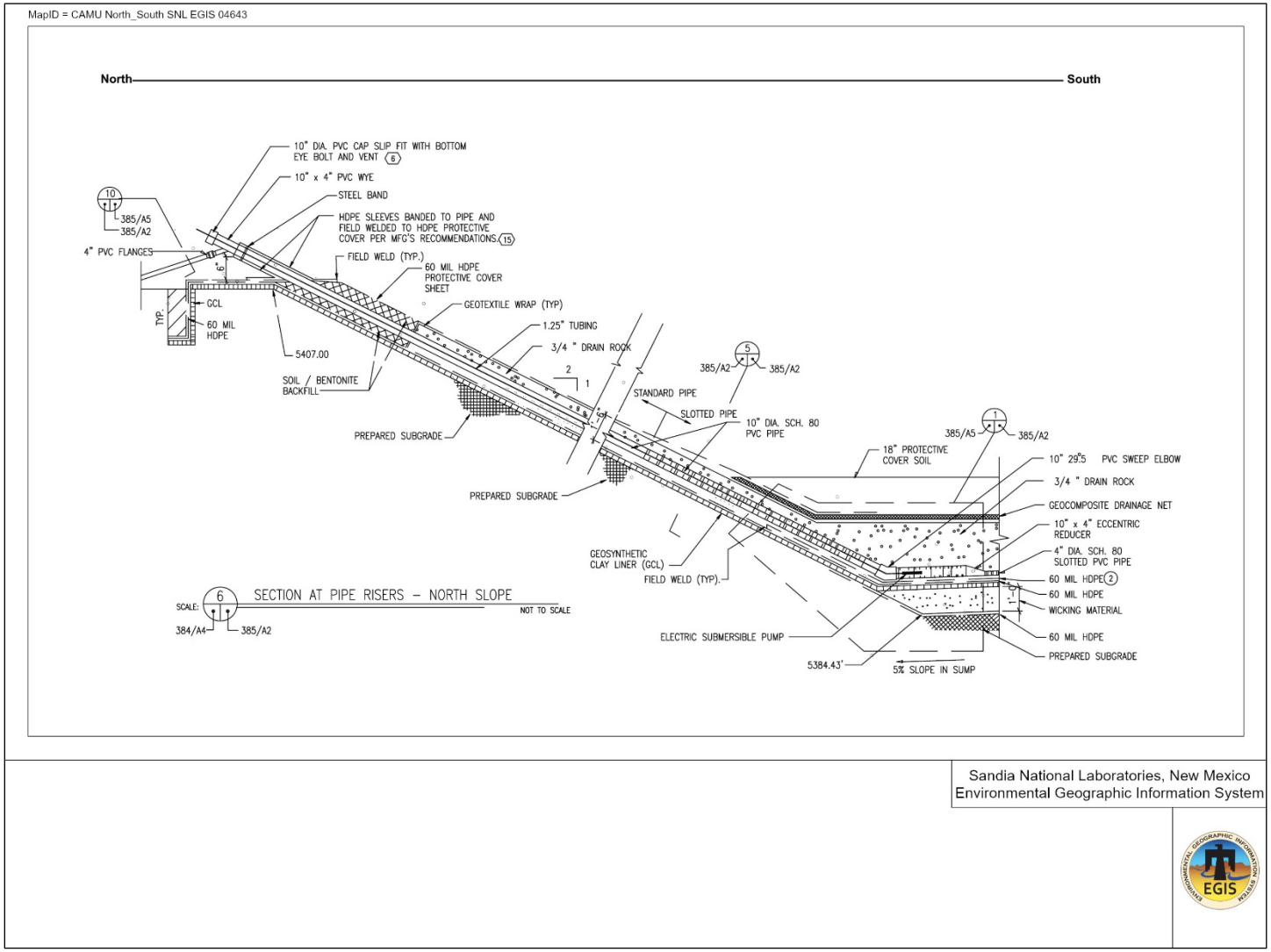


**Figure 5B-3**
**North-South Cross-Section of Leachate Collection and Removal System Sump C, Corrective Action Management Unit**

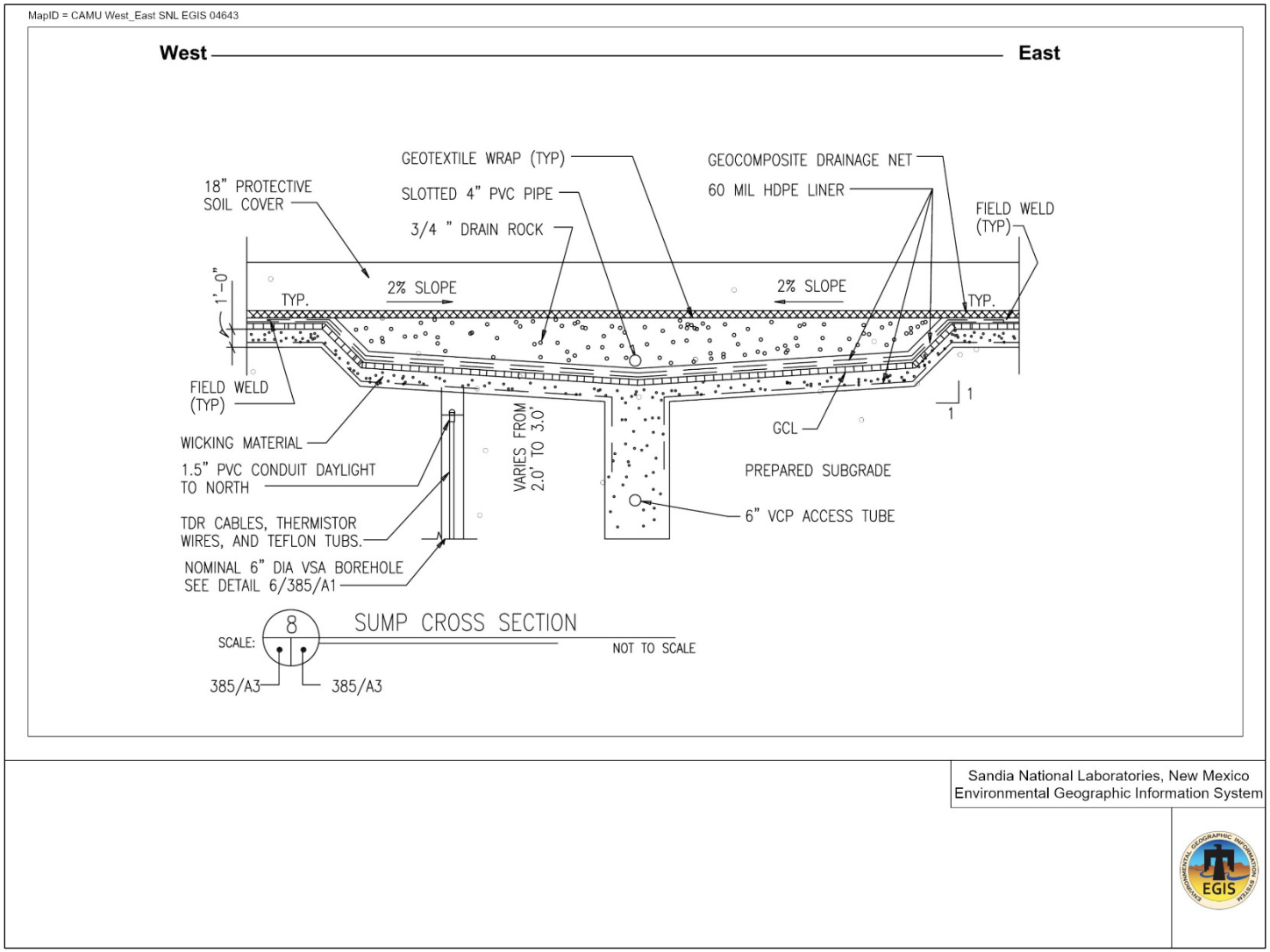


**Figure 5B-4**
**East-West Cross-Section of Containment Cell, Corrective Action Management Unit**

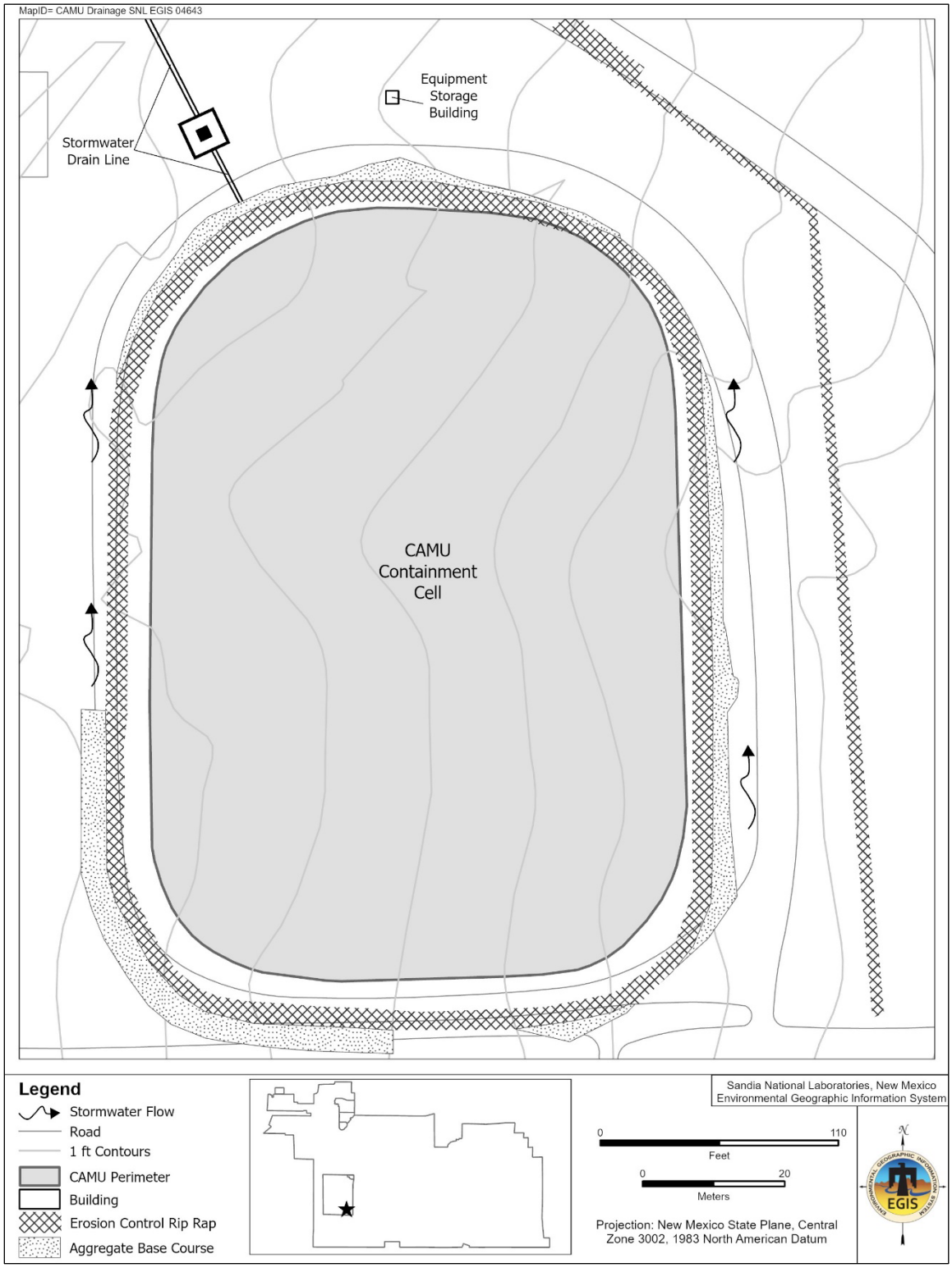


**Figure 5B-5**
**Drainage Control Features, Corrective Action Management Unit**

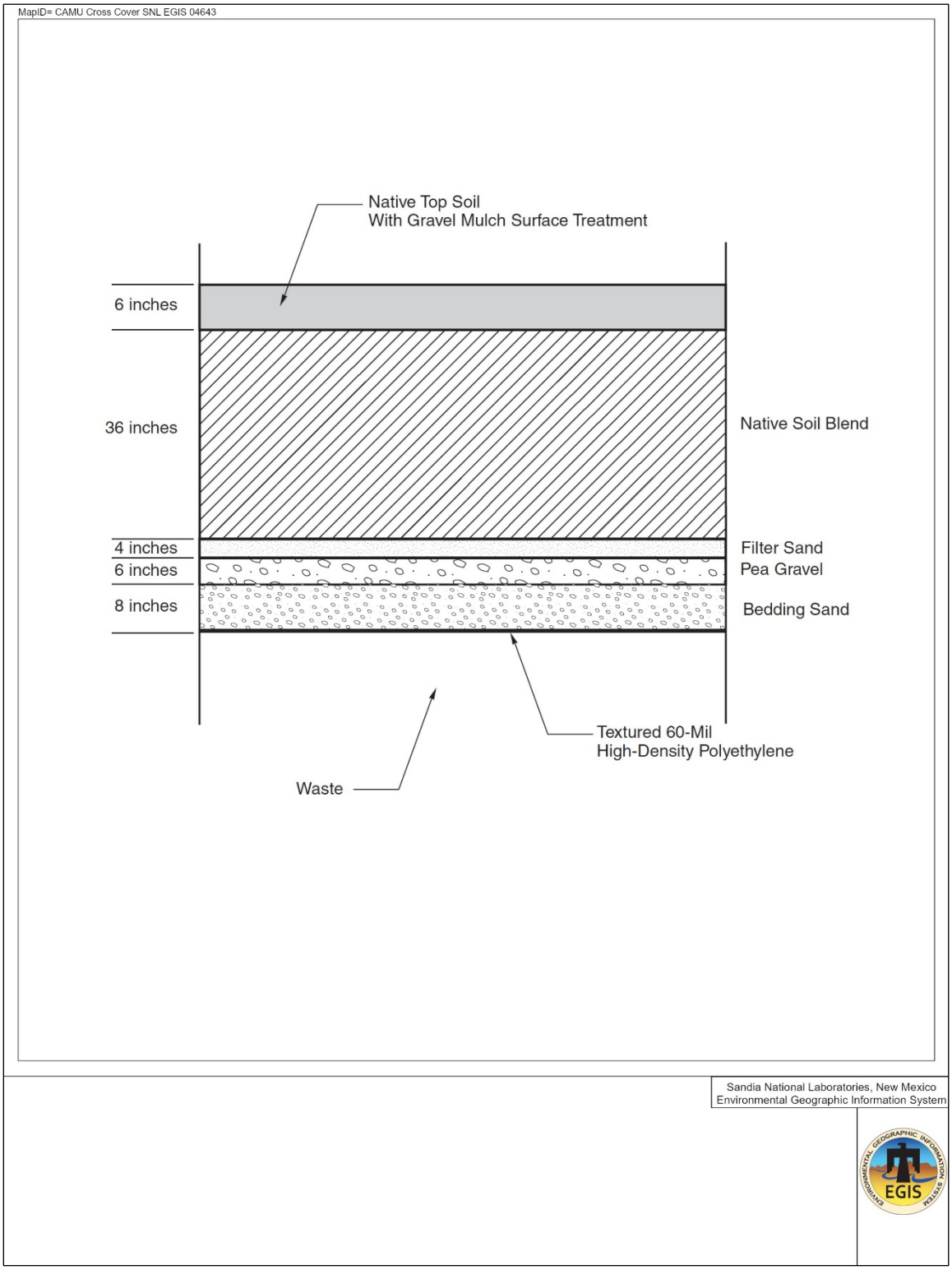


**Figure 5B-6**
**Schematic Cross-Section of Containment Cell Cover System, Corrective Action Management Unit**

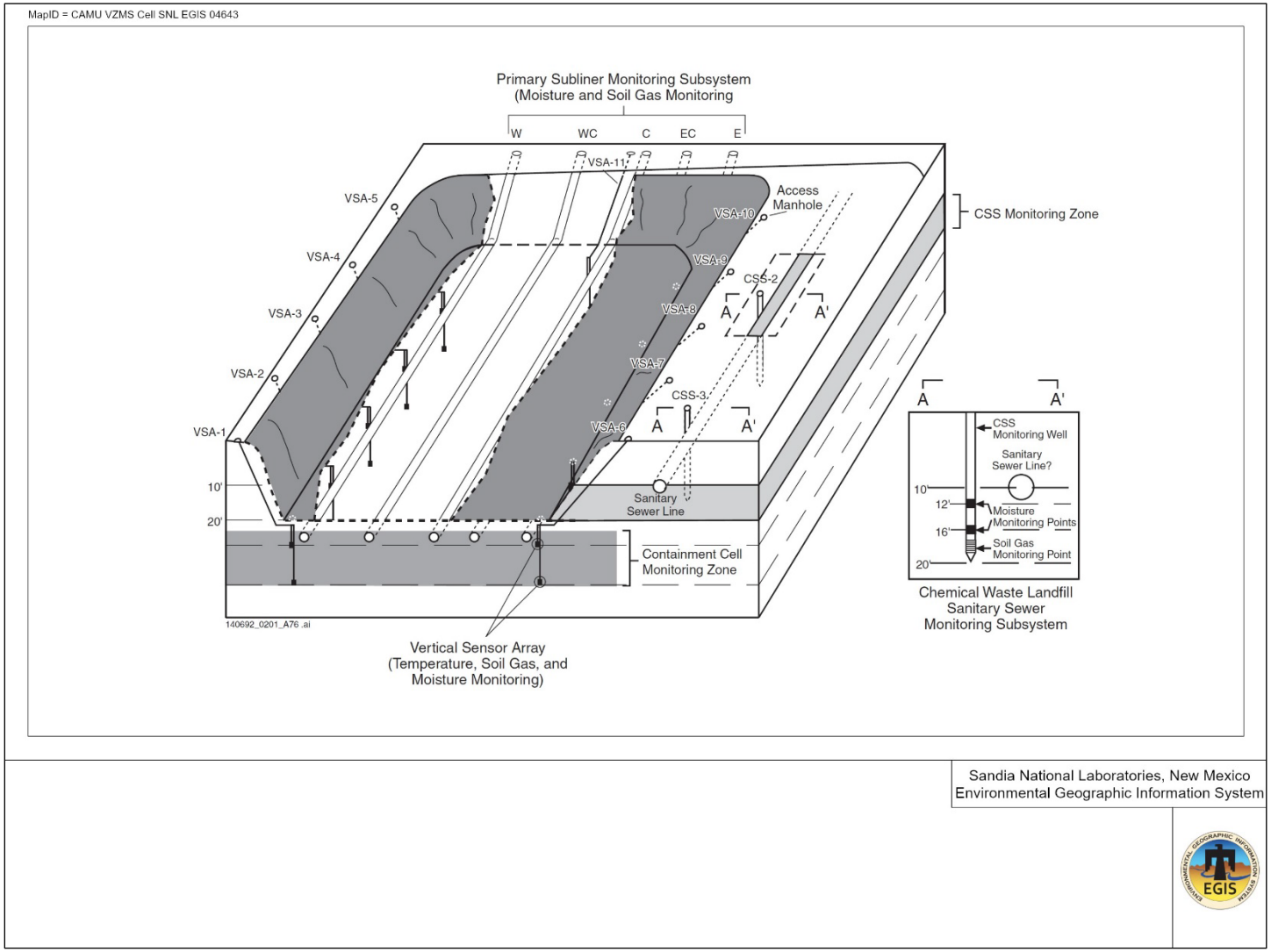


**Figure 5B-7**
**Block Diagram of Containment Cell and Vadose Zone Monitoring System, Corrective Action Management Unit**

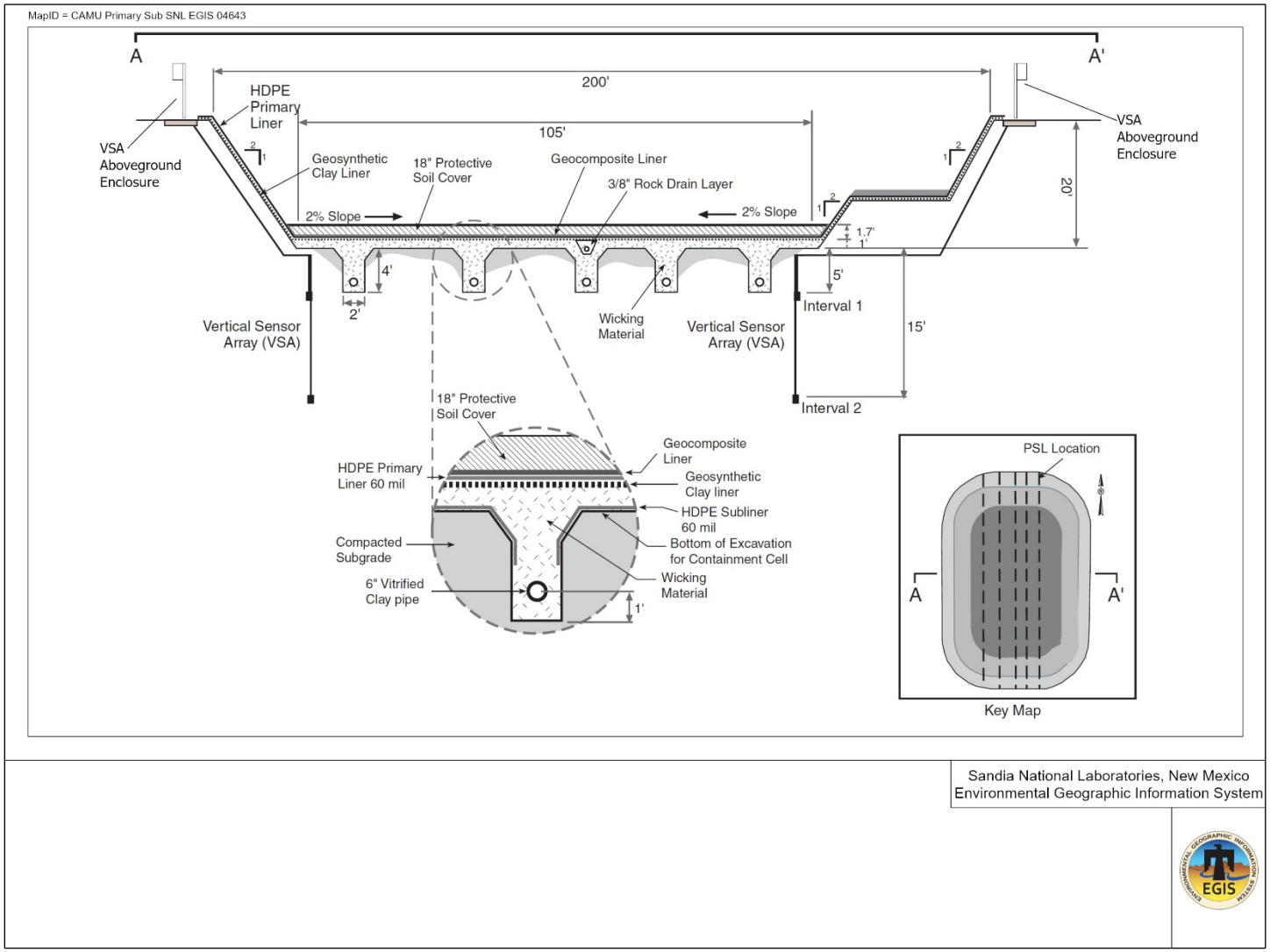


**Figure 5B-8**
**Cross-Section View of Containment Cell and Primary Subliner Monitoring System, Corrective Action Management Unit**

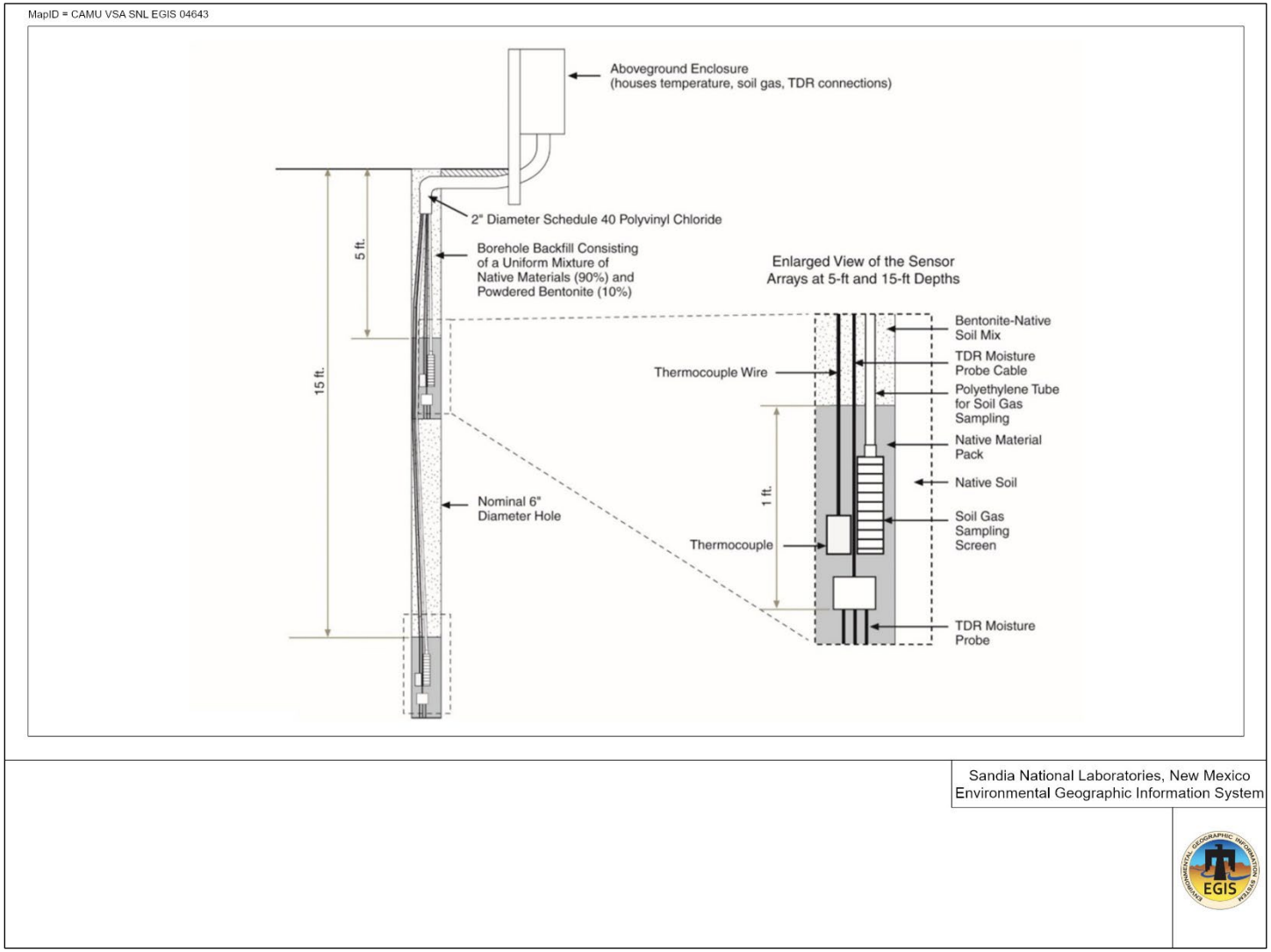


**Figure 5B-9**
**Configuration of Vertical Sensor Array Monitoring Subsystem, Corrective Action Management Unit**

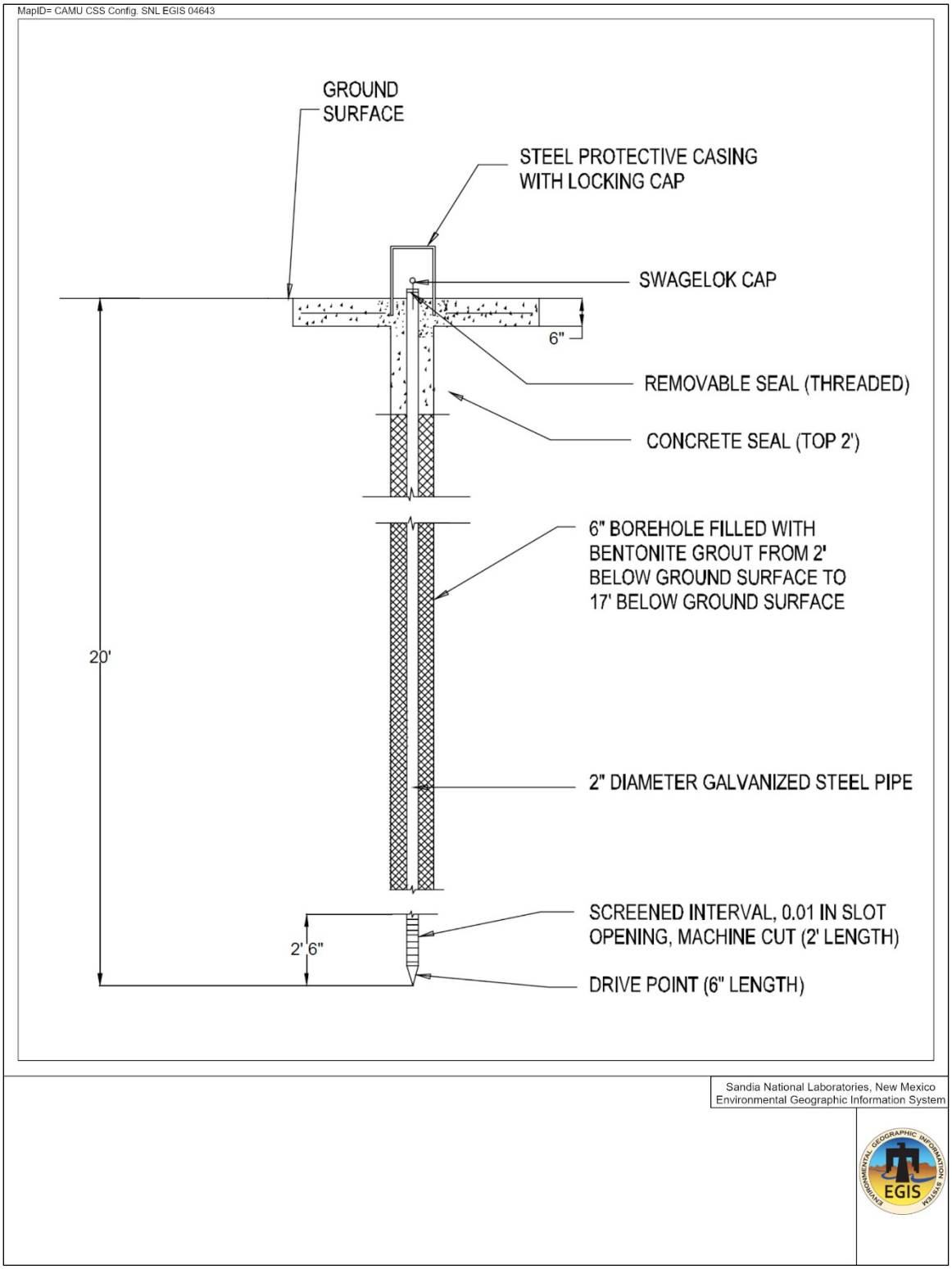


**Figure 5B-10**
**Cross-Section Configuration of Chemical Waste Landfill and Sanitary Sewer Monitoring Subsystem, Corrective Action Management Unit**

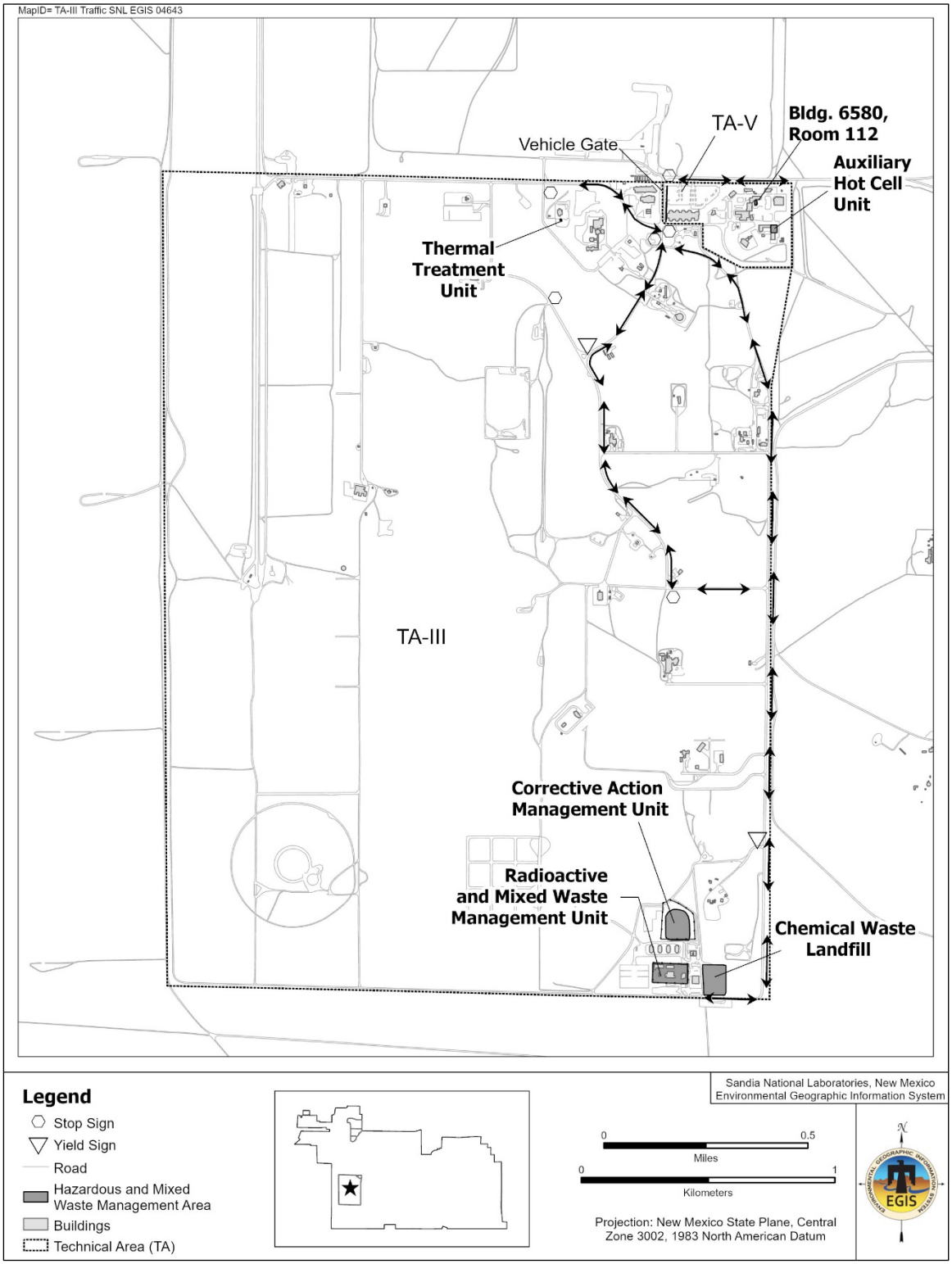


**Figure 5B-11**
**Traffic Route and Controls, Corrective Action Management Unit**

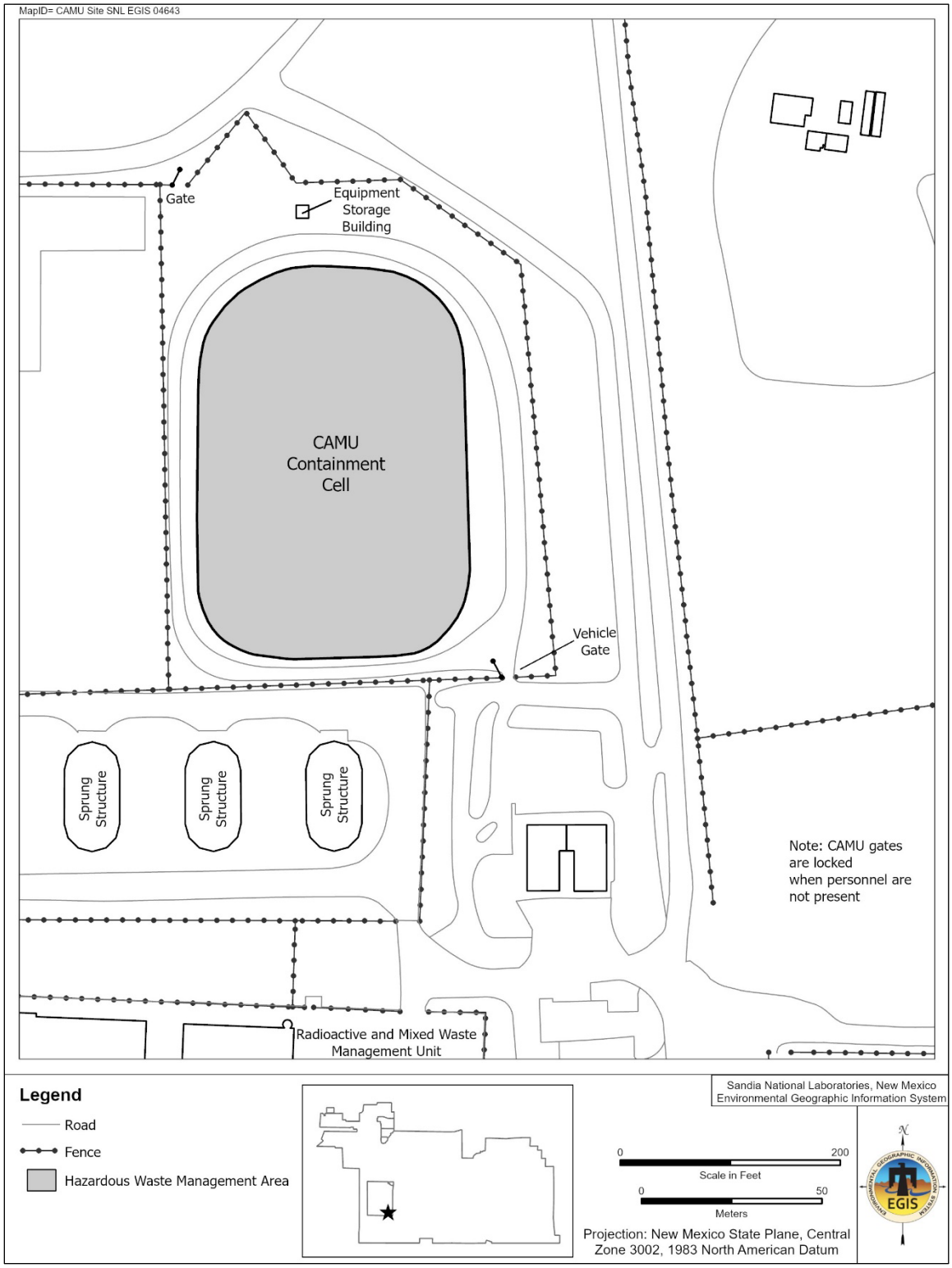


**Figure 5B-12**
**Access Control Features, Corrective Action Management Unit**

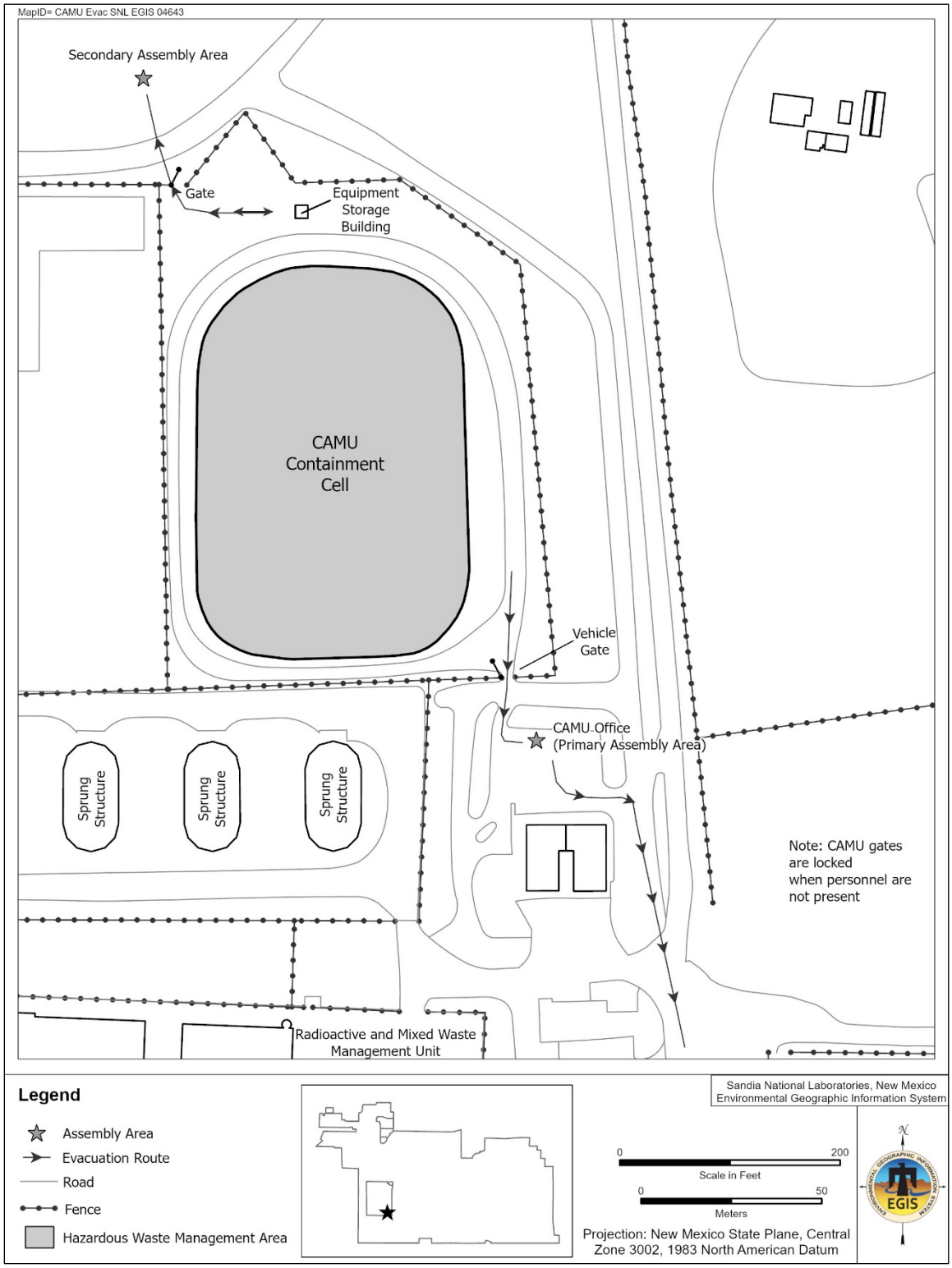


**Figure 5B-13**
**Evacuation Routes Corrective Action Management Unit**

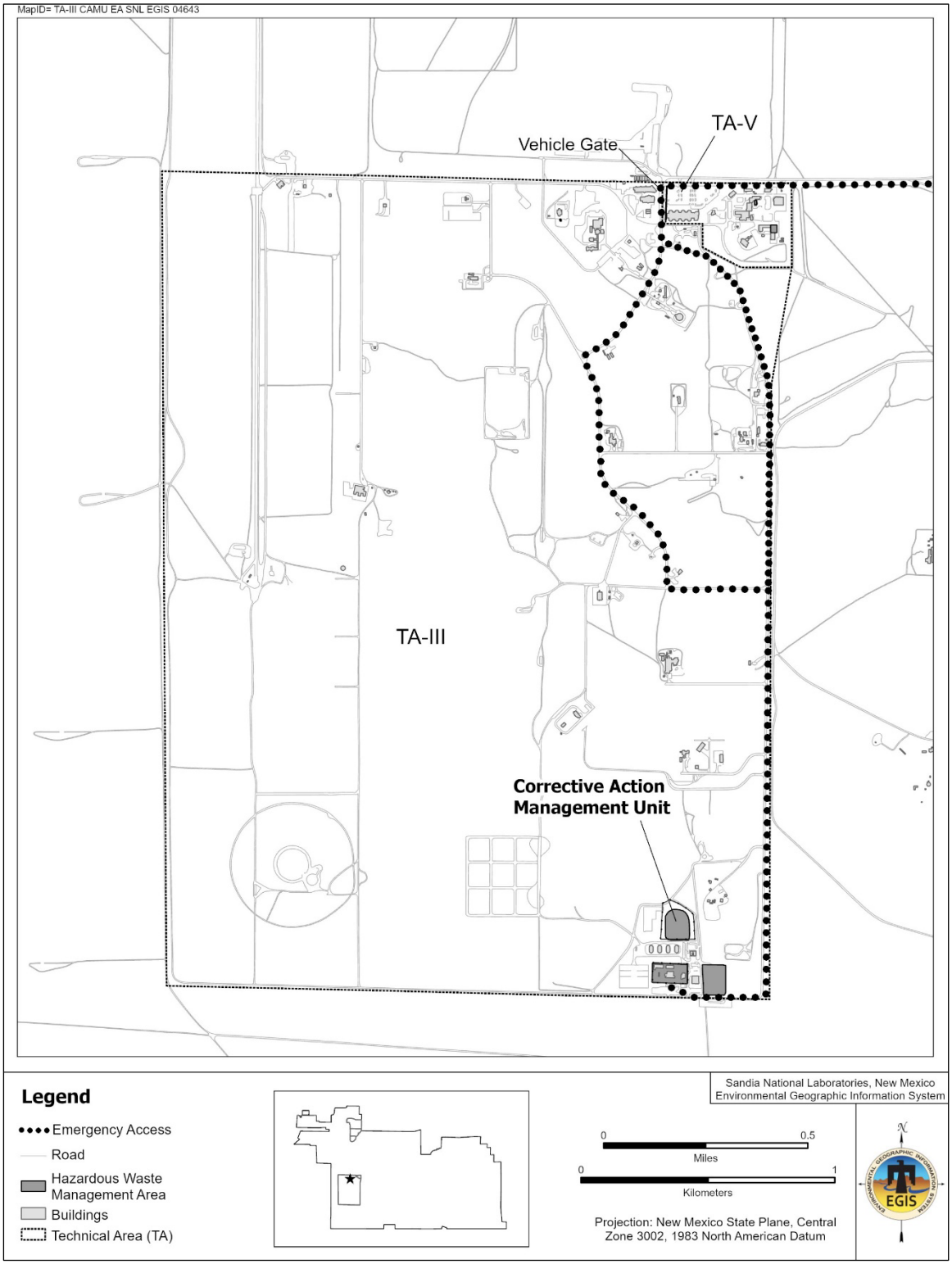


**Figure 5B-14**
**Emergency Response and Access Information, Corrective Action Management Unit**