



Hazardous and Mixed Waste Management Units at SNL/NM

Environmental Setting

AIR QUALITY & TERRESTRIAL MONITORING

- Ongoing
- Results presented in Annual Site Environmental Report

SURFACE WATER

- Most waste management activities occur indoors
- Waste management units not close to arroyos
- Drainage controlled to minimize contamination potential

GROUNDWATER

- Depth to groundwater
 - Approximately 500 feet in TA-1, TA-3, and TA-5
 - Varies at Manzano Storage Bunkers
- Monitoring results reported in Annual Groundwater Monitoring Report

GEOLOGIC FAULTS

- None of the geologic faults near SNL units have had displacement in Holocene time

Waste Storage Operations

CONTAINERS

- Appropriate for wastes and compatible with wastes
- In good condition
- Closed except when adding or removing waste
- Clearly labeled
- Inspected regularly
- Handled carefully
- Have secondary containment for containers of liquids
- If personnel discover a leaking or damaged container: contents transferred to another container in good condition and spills cleaned up

Waste Treatment Operations

CHEMICAL DEACTIVATION

- Neutralization, chemical oxidation, slow nonviolent treatment
- Detonation in “boom box” container designed to contain the detonation, capture fragments, and filter air emissions

THERMAL DEACTIVATION

- Decomposition by heating in special device

STABILIZATION AND SOLIDIFICATION

- Mix powdered or liquid wastes with a binder such as cement

AMALGAMATION

- Mix mercury with another metal to create an amalgam
- Treatment method specified in regulations for mixed wastes containing elemental mercury

MACROENCAPSULATION

- Encase waste in an inert jacket or coating
- Placing waste in a container of inert or non-corroding material and sealing the container
- Placing waste in a container with a liners made of inert or non-corroding materials and sealing the container

PHYSICAL TREATMENT

- Reducing size, removing coatings or fillers, dissolving coatings or fillers, releasing pressure

OPEN BURNING

- Treat silver acetylide silver nitrate (SASN) explosive that is forbidden for transport
- Only used to treat wastes contaminated with SASN
- Wastes generated during research and testing in adjacent Building 6715
- Wastes treated as soon as practical to minimize explosive hazards

Operations at Waste Management Units

SECURITY

- Prevent unknowing access through fences, locked doors and gates, warning signs

TRAINING

- Waste management personnel complete extensive initial and refresher training

WASTE CHARACTERIZATION

- Personnel provide information about waste properties and characteristics so wastes can be handled safely

INSPECTIONS

- Routine inspections of wastes and waste management units
- Equipment most likely to fail is inspected most frequently
- Timely action taken to correct defects, deterioration, damage, and other items needing repair or replacement

EMERGENCY PREPAREDNESS AND RESPONSE

- Spill control and cleanup supplies at each unit
- Fire protection and fire extinguishers at each unit
- Communications to warn other SNL personnel
- Communications and systems to summon assistance
- Emergency response arrangements with SNL resources, KAFB Fire and Emergency Services, hospitals, and City of Albuquerque



Hazardous and Mixed Waste Management Units at SNL/NM

Hazardous Waste Handling Unit

- Location: south of SNL TA-1
- Two buildings and two modular buildings inside fenced area
- Receive containers of waste from SNL operations
- Wastes stored, repackaged for shipment to off-site TSDFs



Buildings 958 and 959



Waste storage bays in Building 959

Radioactive and Mixed Waste Management Unit

- Location: southeast corner of SNL TA-3
- Four buildings and two modular buildings inside fenced area
- Receive containers of waste from SNL operations
- Some wastes treated
- Treated and untreated wastes stored, repackaged for shipment to off-site TSDFs



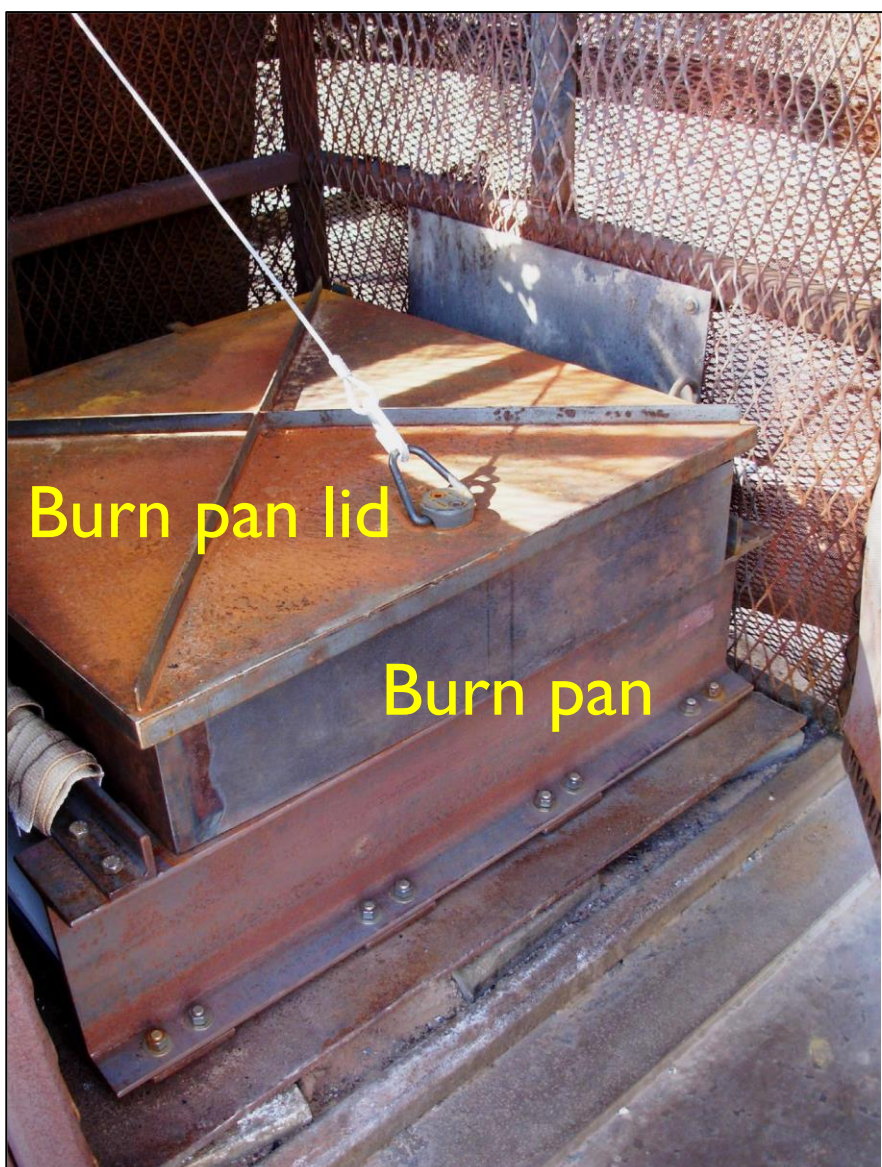
East side of Building 6920



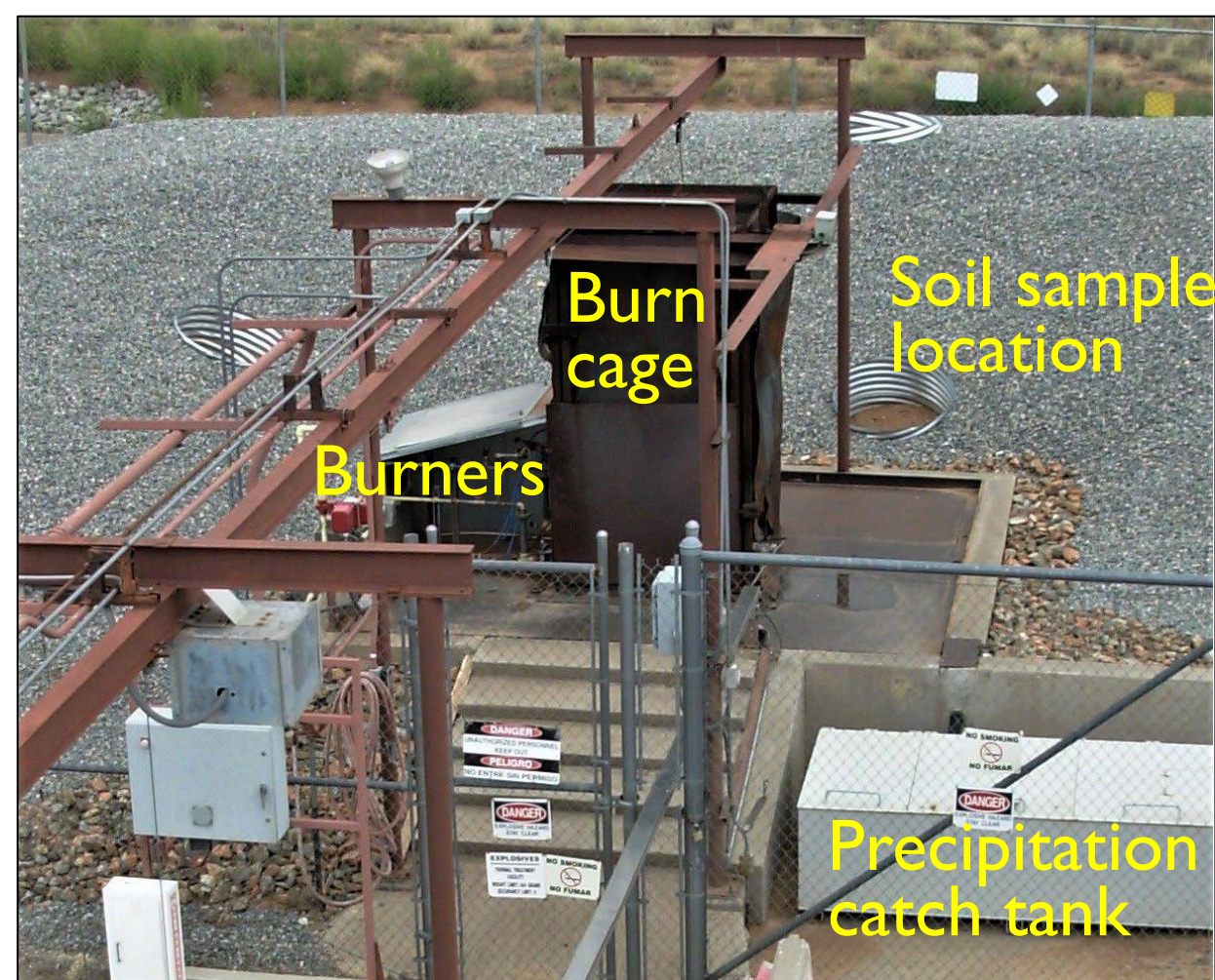
South bay in Building 6920

Thermal Treatment Unit

- Location: northern part of SNL TA-3
- Treats explosive waste that is forbidden for transport
- 23.5-gallon steel burn pan in fenced area south of Building 6715
- Operated remotely due to explosive hazard
- Steel lid fits over pan, closed except during treatment, maintenance, and loading/unloading
- Pan and lid surrounded by cage, concrete pad with steel liner, and 8-foot-high gravel-covered soil berm
- Noncombustible materials limit fire danger
- Precipitation filtered and collected in tank, tested before discharge
- Operations are protective of human health and the environment



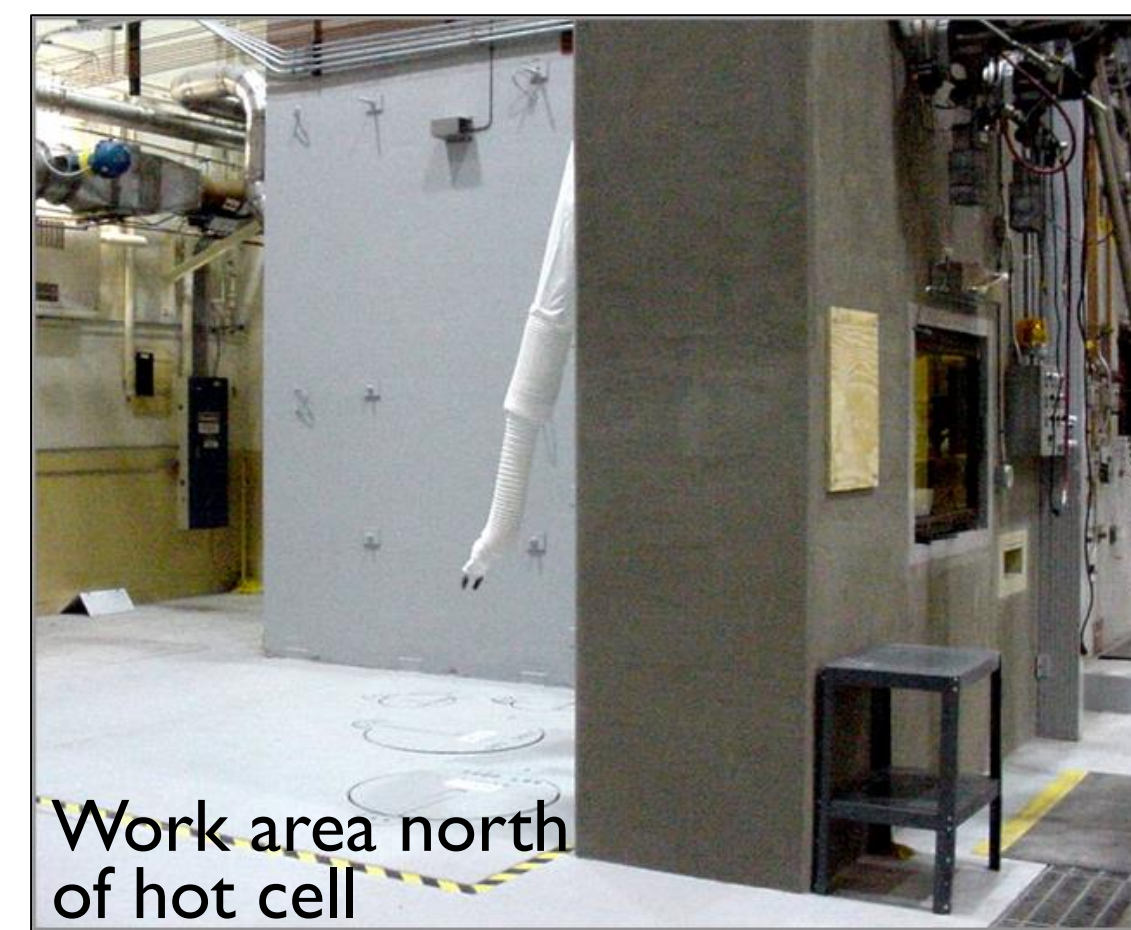
Burn pan lid
Burn pan



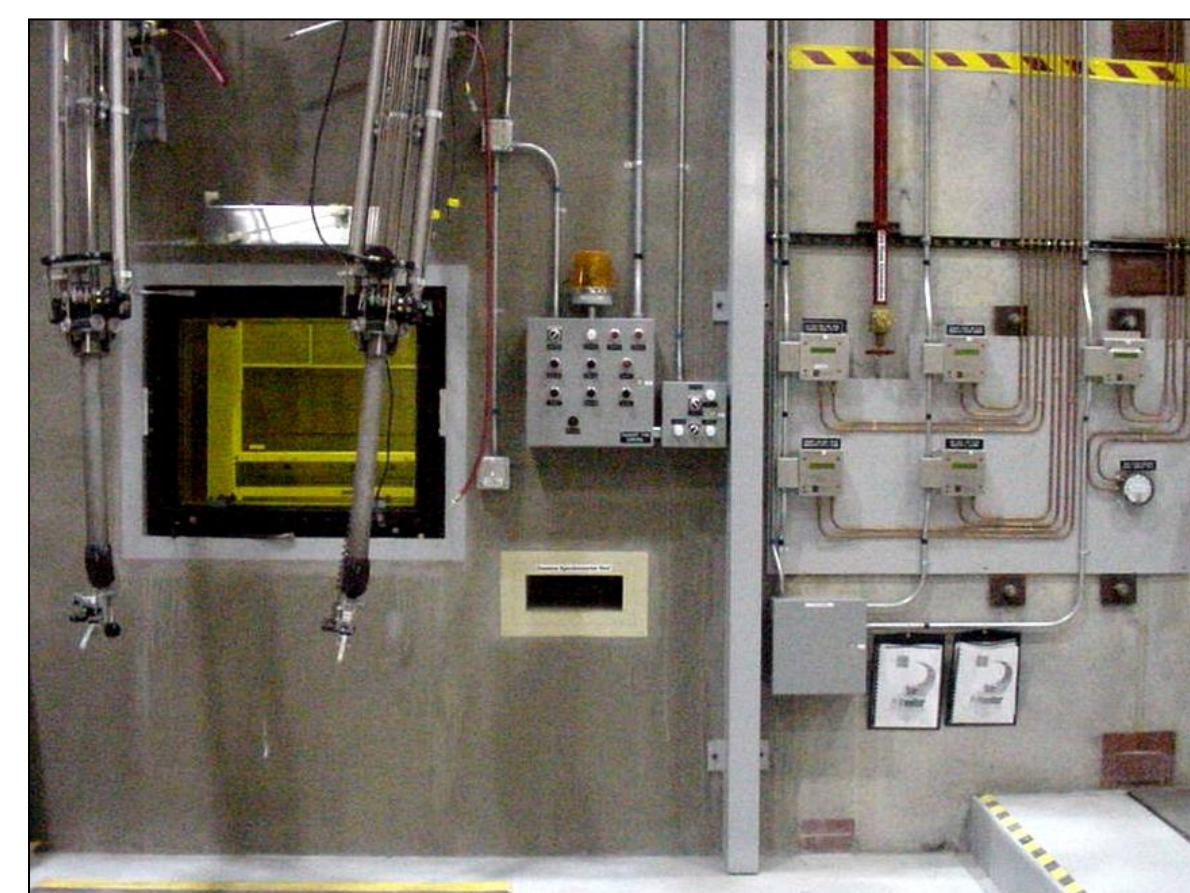
Burn cage
Burners
Soil sample location
Precipitation catch tank

Auxiliary Hot Cell Unit

- Location: SNL TA-5
- Hot cell, work area, storage silos, and container storage area in high bay of Building 6597
- Receive containers of waste from SNL operations
- Some wastes treated
- Treated and untreated wastes stored, repackaged for shipment to off-site TSDFs



Work area north of hot cell



Operator controls for work area (left) and hot cell (right)



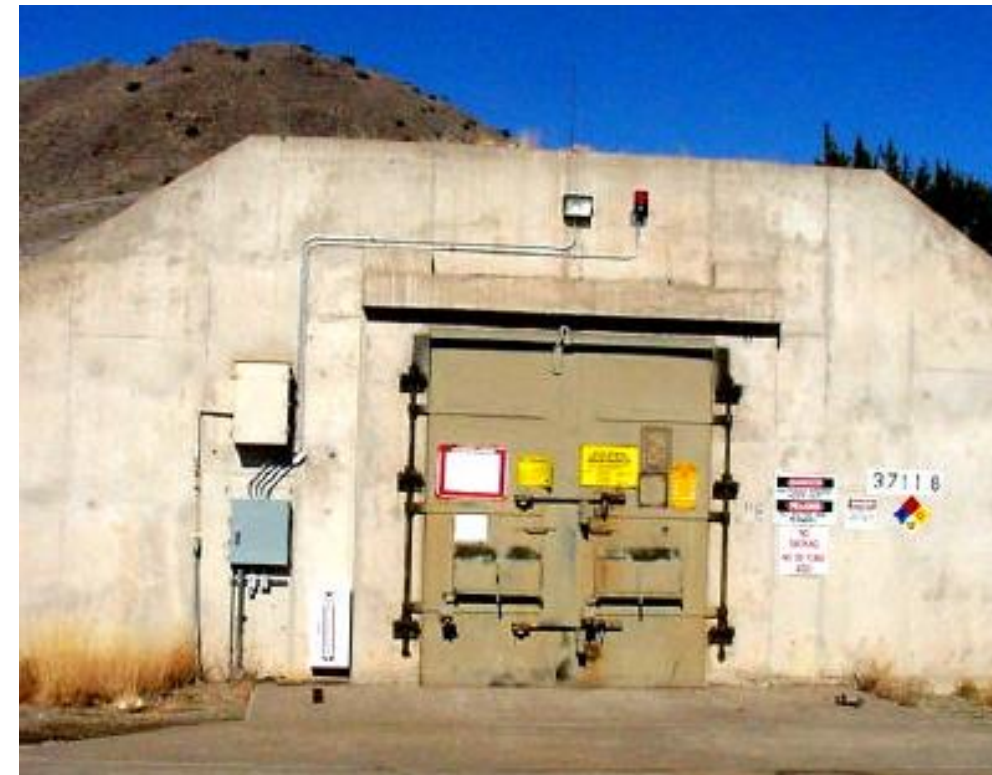
Hazardous and Mixed Waste Management Units at SNL/NM

Manzano Storage Bunkers

- Location: Manzano Base
- Five concrete bunkers inside fenced area
- Receive containers of waste from SNL operations
- Wastes stored, repackaged for shipment to off-site TSDFs



Front of Bunker 37057



Front of Bunker 37118

Solid Waste Management Units and Areas of Concern

- Location: SNL and Kirtland Air Force Base
- Include former testing and disposal areas
- Total SWMUs and AOCs: 317
- Corrective action is complete: 311 of 317
- No controls or restrictions needed: 286 of 311 completed sites
- Long-term controls are needed at 25 of 311 completed sites to verify continued protection of human health and the environment

Chemical Waste Landfill

- Location: southeast corner of SNL TA-3
- Former hazardous and mixed waste landfill
- Landfill contents were excavated during closure, residual subsurface contamination is present
- Chromium and trichloroethene from the landfill migrated to groundwater
- Ongoing post-closure care includes groundwater and soil vapor monitoring



Groundwater monitoring well north side of landfill

Long-Term Monitoring and Maintenance of Controls

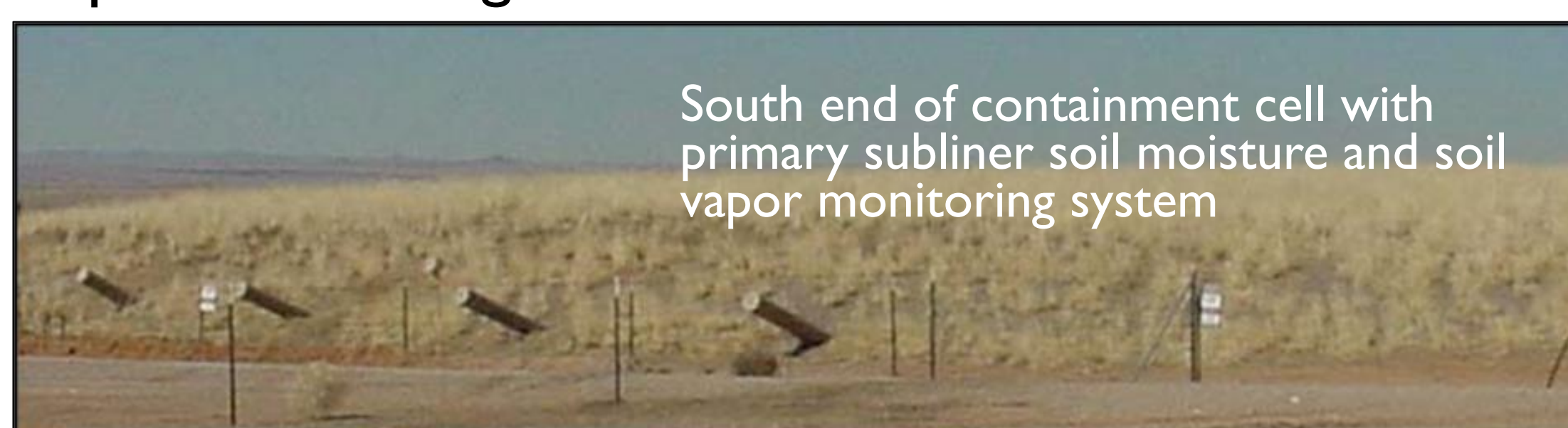
- Long-term controls are needed at 25 of 311 completed sites to verify continued protection of human health and the environment

CONTROLS

- Controls include both administrative and physical controls
- Controls are site-specific and are consistent with risks from site conditions and contaminants of concern
- Controls are layered for effectiveness and reliability
- Administrative controls include maintaining information
- Physical controls include restricting access and land use, physical barriers and signs, inspections, maintenance, and monitoring systems

Corrective Action Management Unit

- Location: southeast corner of SNL TA-3
- Containment cell holding treated soils from the Chemical Waste Landfill
- Cell volume: 31,800 cubic yards
- Bottom and sidewall liner system
- Leachate collection and removal system
- Ongoing post-closure care includes soil moisture and soil vapor monitoring



South end of containment cell with primary subliner soil moisture and soil vapor monitoring system

HAZARDOUS AND MIXED WASTES SANDIA NATIONAL LABORATORIES

Activities Generating Hazardous and Mixed Waste

- Research and development, testing, manufacturing and production
- Maintenance, decommissioning, demolition, waste management

Types of Waste

- Chemicals, process wastes such as solvents and chemical mixtures, solid items (such as protective gloves and wipes) contaminated with chemicals
- Debris, paint and other maintenance wastes, other items

Ongoing General Waste Management Process

- SNL personnel generate wastes at numerous SNL locations (including locations in metropolitan Albuquerque) and accumulate the wastes in containers at all the locations
- Containers are collected and taken to SNL hazardous and mixed waste management units
- **Wastes are stored, some are treated, at 9 units (see table)**
- Wastes and treatment residues are packaged and sent to off-site permitted treatment, storage, and disposal facilities (TSDFs)
- **Post-closure care at two on-site closed hazardous and mixed waste management units (see table)**

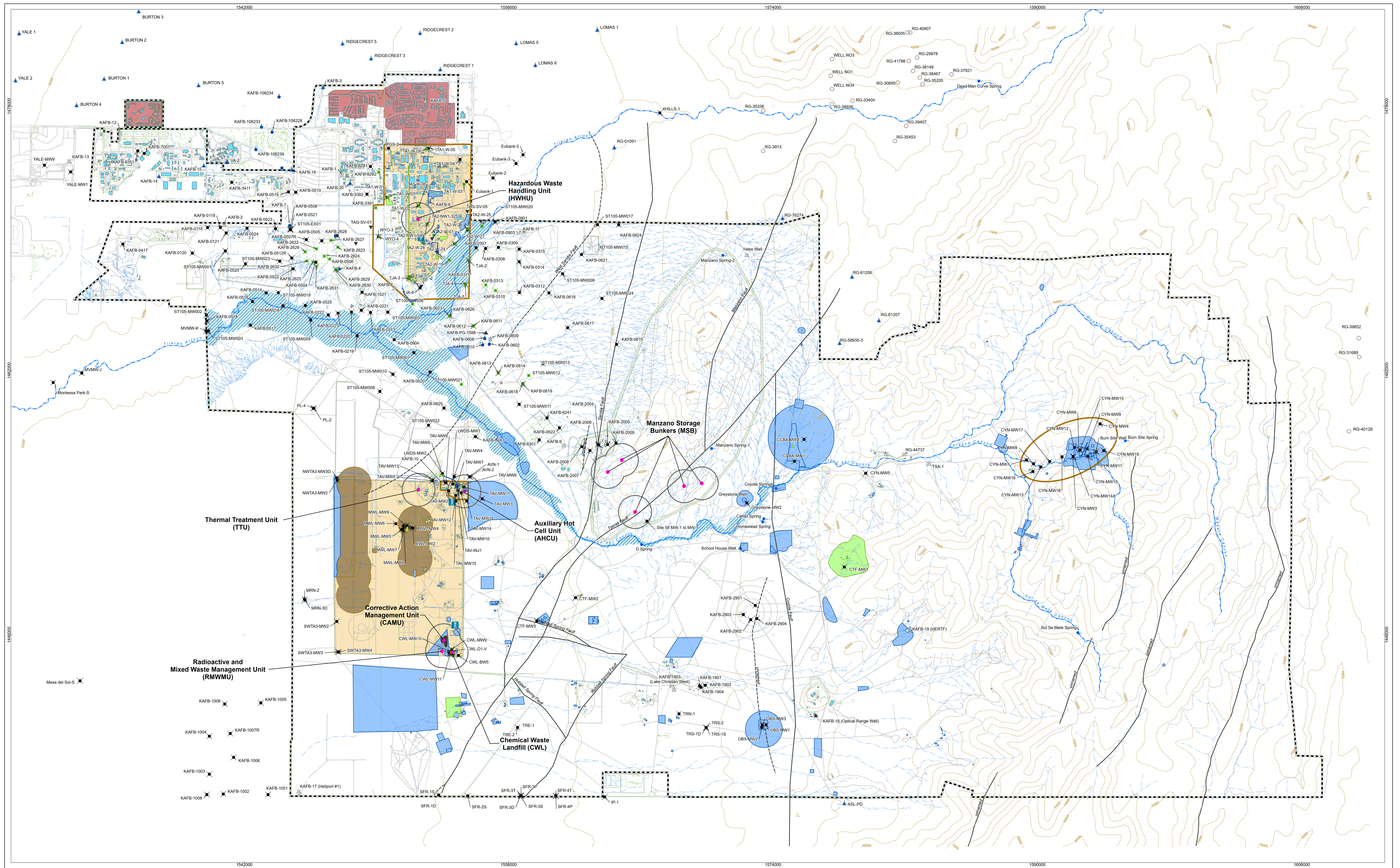
Environmental Corrective Action at Sandia National Laboratories

- Completed corrective action at 311 of the 317 solid waste management units (SWMUs) and areas of concern (AOCs) at SNL
- Ongoing corrective action at three groundwater AOCs
- Future corrective action at three SWMUs that are active test facilities
- **Long-term monitoring and maintenance at the 25 completed SWMUs and AOCs with controls**

HAZARDOUS AND MIXED WASTE MANAGEMENT UNITS TO BE INCLUDED REQUEST FOR RENEWAL OF HAZARDOUS WASTE OPERATING PERMITS SANDIA NATIONAL LABORATORIES

UNIT	TYPE OF WASTE MANAGED		WASTE MANAGEMENT ACTIVITY					
	HAZARDOUS WASTE	MIXED WASTE	STORAGE	TREATMENT	CONTAINMENT	DISPOSAL	POST-CLOSURE CARE	LONG-TERM MONITORING AND MAINTENANCE
Hazardous Waste Handling Unit	X	X	X					
Thermal Treatment Unit	X			<ul style="list-style-type: none"> • Open burning 				
Radioactive and Mixed Waste Management Unit	X	X	X	<ul style="list-style-type: none"> • Chemical deactivation • Thermal deactivation • Stabilization and solidification • Macroencapsulation • Amalgamation • Physical treatment 				
Auxiliary Hot Cell Unit	X	X	X	<ul style="list-style-type: none"> • Chemical deactivation • Stabilization and solidification • Macroencapsulation • Physical treatment 				
Manzano Storage Bunkers: 5 separate bunkers	X	X	X					
Chemical Waste Landfill	X					X *	X	
Corrective Action Management Unit	X				X		X	
Solid Waste Management Units and Areas of Concern with Controls: 25 units	X	X						X

- Used for disposal 1961-1981.



- Legend**
- Monitoring well, Regional Aquifer
 - Monitoring Well, Perched Groundwater System
 - Soil Vapor Monitoring Well
 - Soil Vapor Monitoring Well, Plugged and Abandoned
 - Bioventing Well
 - Production Well, potable
 - Production Well, non-potable
 - Production Well, plugged and abandoned
 - Injection Well
 - Extraction Well
 - Extraction Well, plugged and abandoned
 - Offsite Well
 - Spring, current or historical flow
 - RCRA Permitted Waste Management Unit
 - Meteorological Tower
 - Fault, exposed and concealed
 - Fault, fully concealed
 - Fence
 - Road
 - Index Contour (200 foot)
 - Arroyo
 - Surface Drainage
 - 100 Year Flood Plain
 - SNL/NM Technical Areas
 - RCRA Permitted Waste Management Unit 1000-ft Buffer
 - Building
 - Requiring Corrective Action Under the Consent Order
 - Corrective Action is Complete with Controls
 - Corrective Action is Complete without Controls
 - Groundwater Areas Of Concern
 - KAFB Boundary

