

Environmental Restoration Project



ER Site No. CAMU: Corrective Action Management Unit

ADS: 1345

Operable Unit: CAMU

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Site History

Regulatory

The Corrective Action Management Unit (CAMU) is designed and permitted to store, treat, and permanently contain Environmental Restoration (ER) Project hazardous wastes. The CAMU is located near the southeastern corner of Technical Area III, on ER Site 107. The regulations governing CAMUs were established to encourage reduction of risks at contaminated waste sites through better control of contaminant sources without the significant expense associated with offsite disposal. Public participation and stakeholder involvement were instrumental in the implementation of a CAMU at Sandia National Laboratories (SNL). This is the first CAMU for Department of Energy (DOE).

After significant public involvement in the CAMU decision process, SNL applied for a modification to their existing permit for managing hazardous waste. The modification was granted by the Environmental Protection Agency (EPA) in September 1997. Authorization to perform soil washing and/or soil stabilization in the CAMU was granted by the EPA in November 1997. Authorization to operate a low temperature thermal desorption (LTTD) unit, originally granted by the New Mexico Environment Department (NMED) in April 1998, was reissued in September 2002. The CAMU is only permitted to store, treat, and provide long-term management for ER-derived wastes. Wastes produced from SNL's on-going mission-related activities are not allowed in the CAMU. Approval for the safe containment of TSCA-regulated soil was granted by EPA in June 2002.

Installation and Operations

The 19 acre CAMU site includes the following facilities:

- a Bulk Waste Staging Area (BWSA) designed to manage contaminated soils prior to treatment operations,
- a containerized waste staging area (CWSA) for storage of large "roll-off" containers and other containers suitable for outdoor storage,
- four (4) "Sprung" structures of approximately 5000 square feet each for storage of containerized wastes, contaminated soils and/or materials and supplies,
- a large treatment area with associated utility connections for operation of soil stabilization (ST) and LTTD treatment equipment,
- a containment cell with a capacity of approximately 37,000 cubic yards of soil (compacted volume) for permanent on-site containment of ER wastes that meet regulatory and permit criteria. The cell design includes a monitoring system for leak detection, and a leachate collection and removal system.
- decontamination facilities for personnel and equipment, and
- storm water management ponds for run-off control.

A brief review of the construction and operational history of the CAMU is provided below.

The initial phase of construction of the CAMU was finished in April 1998. Included in this phase was installation of the concrete foundation pads for four Sprung Structures, erection of two Sprung Structures, and construction of the Bulk Waste Staging Area (BWSA) and CWSA. Documents required for initiating CAMU waste operations, such as an operational plan and health and safety plan, were completed in December 1998, and then revised in 2002 prior to initiation of treatment operations.

In January 1999, the first waste was accepted into the CAMU. By March 1999, construction of the waste treatment pads, two additional Sprung Structures, the containment cell, and the vadose zone monitoring system (VZMS) were completed and ended Phase II of the CAMU construction. An aerial view of the facility in the spring of 1999 is shown in [Photograph 1](#).

Partial utilization of the VZMS began in December 1998. Full operation of all three monitoring subsystems comprising the VZMS was initiated in June 1999. The VZMS is used to monitor soil moisture content, volatile organic compound soil gas composition, and subsurface temperature underlying and adjacent to the containment cell as shown in [Diagram 1](#).

Constituents of Concern

Some of the waste managed at the CAMU contains regulated chemical constituents that have potential toxicological and physical hazards. The main types of chemical contamination present in the soils that have been treated at the CAMU are:

- Volatile Organic Compounds (VOCs) - 1,1,1-Trichloroethane and Acetone

- Semivolatile Organic Compounds (SVOCs) - Aniline, Bis(2-ethylhexyl)phalate, and O-toluidine
- Heavy Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, and Selenium
- Polychlorinated Biphenyls (PCBs)

These organic compounds and metals can cause acute and chronic health effects. A few chemicals have been identified as known or suspected human carcinogens. Following treatment to lower contaminant concentrations, soils were placed in the CAMU containment cell.

Current Hazards

Activities at the CAMU are now being directed toward placement of the remaining soil containing regulated constituents into the containment cell, decontamination of treatment equipment, capping of the containment cell, and decontamination and closure of the facility. With the completion of treatment operations in January 2003, exposure hazards to workers, especially inhalation hazards from staged soil piles that were waiting to be treated, have been eliminated. No requirements for the use of respiratory protection are currently anticipated for placement of the remaining soil in the containment cell or installation of the cell cover. Respiratory protection will be required for some decontamination operations performed during closure of the site. The CAMU work environment will continue to be monitored and risks mitigated during these remaining activities.

No materials containing biological hazards, explosives, or radioactive materials with the exception of tritium, are present in soils that have been placed in the containment cell at the CAMU. The CAMU is not a SNL-regulated radiological work permit (RWP) site or radioactive material management area (RMMA). No radionuclides above what is considered background are permitted within the CAMU except tritium. Soil moisture that contains tritium below a concentration of 20,000 picocuries per liter (pCi/L) has been accepted at the CAMU. This tritium concentration is above what is considered background (i.e., 420 pCi/L), but this referenced level is a EPA drinking water standard and therefore the concentrations present in the soil at the CAMU do not pose any significant radiological health risks.

Occupational safety at the CAMU is managed using the HAZWOPER Standard (10 CFR 1910.120) in which all operations are governed under a comprehensive Health And Safety Plan (HASP). Hazards associated with specific activities conducted at the CAMU are controlled through the use of Task Hazard Analyses (THAs), contained in the HASP. All site workers have extensive training specific to hazardous waste operations and the site itself.

Current Status of Work

Treatment

Waste treatment operations began in August 2002. Placement of the first soil into the CAMU

containment cell occurred in September 2002. LTTD treatment was completed in December 2002 and soil stabilization was finished in early January 2003.

Organic-contaminated soils were treated using an on-site LTTD unit ([See Photograph 2](#)). The LTTD used heat to volatilize the organic compounds from the soil and then destroyed the gases that were generated with a catalytic oxidation process (this process is similar to the catalytic oxidation that occurs in today's cars). Effluent gases were then cooled and wet scrubbed to neutralize acid concentration prior to discharge. Approximately 8,940 cubic yards of soil contaminated with VOCs were treated by LTTD.

The treatment method for metals-contaminated soils consisted of soil stabilization in a cement matrix ([See Photograph 3](#)). Soils with metal concentrations requiring treatment, that also contained PCBs at concentrations regulated under TSCA, were also sent through the soil stabilization unit. Approximately 25,592 cubic yards of soil were processed using stabilization. Some of the soil at the CAMU required treatment by both LTTD and soil stabilization, while other soil required no treatment.

As of late January 2003, placement of soil into the containment cell is nearly complete (See Photographs [4](#) and [5](#)).

Vadose Zone Monitoring System

Annual VZMS monitoring results reports have been completed and submitted to the New Mexico Environment Department and EPA Region 6 in September 2000, September 2001, and September 2002. Baseline monitoring requirements, which consist of collection of a minimum of 12 continuous months of moisture, soil gas, and temperature data, were met in December 2000. A VZMS Baseline Monitoring Results Report was submitted to NMED and EPA in October 2001. Variances in monitored parameters outside the range established during baseline monitoring will serve as a potential indication that the containment cell liner has been compromised and leakage below the cell may be occurring.

Future Work Planned

After placement of soils into the containment cell has been completed, construction of the containment cell cover, decontamination of the facility, and other site closure operations will be initiated. Covering the contents of the containment cell will entail the construction of an engineered cap. Closure activities for the CAMU are planned to be completed in the fall of 2003. Leak detection monitoring of the soil environment immediately below the containment cell will continue following closure of the CAMU.

Waste Volume Estimated/Generated

Prior to the commencement of treatment operations, waste acceptance in association with the Chemical Waste Landfill (CWL) Voluntary Corrective Measure (ER Site 74) resulted in temporary storage in the BWSA of 35,372 cubic yards of soil. An additional 3,770 cubic yards of soil, consisting of no-treat soil, soil requiring metals stabilization and soil with concentrations of PCBs regulated under TSCA , were being managed in the Sprung Structures ([See Table 1](#)). An additional 9,005 cubic yards of soil, designated as no treatment or requiring soil stabilization, was being temporarily staged at the CWL prior to being moved to the CAMU. These volumes were reduced when the soil was placed in the containment cell by using heavy equipment to compact the material. The CAMU is permitted to accept up to one million cubic feet of SNL/NM ER Project hazardous waste. No liquid waste will be placed within the containment cell.

All of the soil managed within the CAMU was derived from excavation of the CWL. Prior to any soil being taken into the CAMU, laboratory waste analysis reports were evaluated to verify that CAMU waste acceptance criteria had been met. Records of all waste that has been accepted into the CAMU are maintained at the facility in compliance with permit and regulatory conditions. Storm water, decontamination water, and other site operations generated waste is carefully managed and analyzed to assure it is properly disposed.