



Monticello, Utah, Disposal and Processing Sites CERCLA/RCRA sites

This fact sheet provides information about the **Monticello disposal and processing sites**. Long-term stewardship responsibilities for this are managed by the **U.S. Department of Energy Office of Legacy Management** under the **Comprehensive Environmental Response, Compensation, and Liability Act**.

Site Information and History

The Monticello, Utah, Disposal and Processing Sites are located in and near the city of Monticello, which is in the southeastern corner of the state, about 250 miles southeast of Salt Lake City, Utah. The 2010 census population of Monticello was approximately 2,000.

In 1942, the U.S. government, through the Defense Plant Corporation (DPC), provided funding for a mill to be constructed at a uranium and vanadium ore-buying station that was built in 1940. The mill, created to produce vanadium and uranium for military purposes, was operated for DPC by the Vanadium Corporation of America (VCA) from 1942 into early 1944. VCA reopened the mill from 1945 to 1946 under lease from DPC. The U.S. Atomic Energy Commission (AEC), predecessor of the U.S. Department of Energy (DOE), obtained the mill in 1948, but it continued to be operated by private entities until ore milling was terminated in January 1960.

Approximately 900,000 tons of ore were processed at the mill. Mill tailings—predominantly sandy residue that contains low levels of radionuclides and metals that remain after ore is processed—were impounded at four locations adjacent to the nearby Montezuma Creek. Properties in Monticello and near the mill site were contaminated by windblown tailings, tailings carried by water in Montezuma Creek, and tailings that were used for construction-related purposes such as:

- Fill for open lands
- Backfill around water, sewer, and electrical lines

- Base for driveways, sidewalks, and concrete slabs
- Backfill against basement foundations
- Sand mix in concrete, plaster, and mortar

Termination of ore milling and increasing awareness of its environmental effects prompted mill decommissioning and site stabilization between 1961 and 1965.

The primary activities were:

- Dismantling mill buildings and contents
- Disposing of equipment and scrap
- Burying contaminated materials onsite
- Grading and covering impounded tailings and other contaminated materials with soil
- Revegetating the site

Mill foundations were demolished in 1974 and 1975. Debris from the project was buried in place and the area was graded and revegetated. A fence was put up around the mill site to prevent public access to contaminated materials.

Remedial Action and Regulatory Setting

AEC began radiological surveying throughout the city of Monticello in 1971 to identify the nature and extent of mill-related, radiological contamination. In 1980, the mill site was accepted into the newly established federal Surplus Facilities Management Program for remedial action. The Monticello Remedial Action Project (MRAP) was established under this program to remediate contamination associated with operation of the Monticello mill.



Mill Site Before Remediation.

In 1983, remedial activities for tailings-contaminated, private and publicly owned properties in and surrounding the city of Monticello—known as vicinity properties—were separated from MRAP upon establishment of the Monticello Vicinity Properties (MVP) project. Remaining MRAP properties (mill site and those adjacent to, and downstream of, the mill site) were designated as the Monticello Mill Tailings Site (MMTS) project.

Under authority of the U.S. Environmental Protection Agency, MVP and MMTS qualified for placement on the National Priorities List (NPL) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) and the Superfund Amendments and Reauthorization Act. MVP and MMTS were placed on the NPL in June 1986 and November 1989, respectively.

Monticello Vicinity Properties

Because tailings were used around the city for construction purposes, contaminated areas including sidewalks, patios, sheds, and other property improvement locations were demolished. Approximately 150,000 cubic yards of materials contaminated with mill tailings, ore, and related byproduct materials were excavated from affected properties and moved to the mill site for temporary storage, until they could be placed in a permanent repository. Areas cleaned up under MVP (424 properties) were backfilled, graded, and reconstructed. The project was finished in June 1999 and the MVP site was removed from the NPL on February 28, 2000.

Monticello Mill Tailings Site

Remediation of the MMTS was divided into two areas of action known as operable units (OU). OU I covered the former mill site property, including areas where MVP cleanup materials were stored. OU II included cleanup of 34 properties adjacent to, and downstream of, the mill site (peripheral properties).

A third operable unit (OU III), covering surface water and groundwater, was added in September 1990.

By August 1999, all contaminated materials from MVP and MMTS OU I and OU II were transferred to an engineered disposal cell constructed on DOE property approximately 1 mile south of the former mill site.

OU I – Monticello Mill Site Tailings and Mill Site Property

OU I consisted of the 78-acre former mill site, tailings containment areas on the mill site, and areas on the mill site that were used to store MVP material. Construction of a permanent disposal cell and its leachate collection system were included in OU I activities. The OU I cleanup remedy included relocating contaminated materials from the mill site to the disposal cell, revegetation of the site after tailings were removed, realigning Montezuma Creek to its natural channel, and re-establishing wetland areas.

OU II – Peripheral Properties

OU II consisted of 33 private properties and one former DOE property adjacent to (peripheral to) and downstream of the mill site that had been contaminated by windblown tailings and by soil and sediment deposited in and along Montezuma Creek. Twenty-two peripheral properties that had not been affected by contaminated surface water and groundwater were removed from the NPL in October 2003. Removal of the remaining peripheral properties from the NPL will happen only when surface water flowing through, and groundwater beneath, those properties meet OU III remediation goals.

In 2000, DOE transferred ownership of approximately 380 acres of land, including the former mill site property and several peripheral properties, to the City of Monticello through



Mill Site After Remediation.

the Federal Lands to Parks Program, for permanent use as a public park and recreation.

OU III – Surface Water and Groundwater

OU III involves surface water and groundwater that flows within and beneath the valley of Montezuma Creek. A plume of contaminated groundwater in the shallow alluvial aquifer exists beneath a portion of the former mill site and extends approximately 1 mile to the east (downstream). The plume, primarily contaminated by uranium, has a negative effect on surface-water quality. The primary source of groundwater contamination was tailings that were impounded on the mill site. Mill tailings removal under OU I significantly reduced contaminant levels in surface water and groundwater.

Favorable site conditions prompted selection of monitored natural attenuation with institutional controls as the OU III remedy in May 2004. The remedy allows contamination to dissipate through natural processes in the aquifer without the need for engineered controls. An institutional control, implemented in May 1999, banned domestic use of water from affected portions of the alluvial aquifer. This control is administered by the state engineer's office through the water-well permitting process.

DOE installed a permeable reactive barrier (PRB)—using zero-valent iron (ZVI) as the treatment medium—at the Monticello site in 1999 as a test case for groundwater remediation. The PRB is a subsurface installation that removes contaminants from the groundwater as it flows through the ZVI (iron filings). An aboveground treatment test facility was installed in 2005. The system pumps groundwater from a well through two aboveground vessels containing ZVI. This method of active groundwater remediation (pump-and-treat) was added to the OU III remedy in March 2009 through an Explanation of Significant Difference issued in January 2009.

Active groundwater remediation was optimized in January 2015 to improve aquifer-contaminant removal. This optimization aggressively extracts groundwater from a focus area of the aquifer. Extracted water is pumped to the solar evaporation pond at the DOE disposal facility. The optimized system speeds up progress toward meeting established site cleanup goals for groundwater and surface water. The groundwater remedy optimization is thoroughly described in the Groundwater Remedy Improvement Plan at the Monticello, Utah, Site fact sheet (www.lm.doe.gov/Monticello/Groundwater_Remediation_Improvement_Plan.pdf).

Supplemental Standards Properties

Regulations in Title 40 *Code of Federal Regulations* (CFR), Part 192.21, allow contaminated material to be left in place in cases where attempts to reach cleanup standards greatly increase the risk of human injury, could cause excessive harm to the environment, or the cost of cleanup is unreasonably high compared to the long-term benefits to human health and the environment. Supplemental standards (i.e., site-specific remediation standards) have been applied at 11 privately owned and city-owned properties in Monticello, in city streets and utilities rights-of-way, and in Utah Department of Transportation Highways 191 and 491 rights-of-way within the city. DOE is responsible for ensuring that the chance for exposure to contaminated material on supplemental standards properties is minimal and that long-term management of the material is appropriate.

MVP and MMTS Waste Disposal

Waste gathered through MVP and MMTS remedial actions is encapsulated in an engineered disposal cell (or waste repository), constructed under OU I, on DOE property approximately 1 mile south of the former mill site. Disposal of waste was completed in June 2000. The approximately 90-acre repository was constructed for long-term waste containment. Encapsulated wastes are isolated from the

environment by a synthetic, multiple-layer liner system at the base of the repository. A ground-surface cover system is made with a layer of compacted soil, an overlying synthetic liner, and a vegetated soil cap designed to use native plants to limit water percolation. The cover system also serves to prevent radon from escaping from the contained tailings. The base liner system collects water that remained in the waste when it was encapsulated. The small amount of liquid waste that drains from the waste material is transferred to an adjacent engineered solar evaporation pond.

Institutional Controls

Institutional controls at Monticello NPL sites limit using land and groundwater from properties with contaminated soil that was left in place according to supplemental standards, or from properties situated above contaminated groundwater. Five categories of institutional controls apply to Monticello NPL sites:

1. Restrictive easements on city-owned property transferred from DOE
2. Radiological control at public road and utility excavations
3. Zoning restrictions
4. Restrictive easements on privately owned property
5. A groundwater-restricted area

CERCLA Five-Year Reviews

Section 121(c) of CERCLA requires that remedial actions resulting in hazardous substances, pollutants, or contaminants remaining at a site—above levels that allow for unlimited use and unrestricted exposure—be reviewed every 5 years to ensure protection of human health and the environment. This requirement applies to the Monticello site because of above-level contamination that remains in the disposal cell, on supplemental standards properties, and in surface water and groundwater. Therefore, CERCLA Five-Year Reviews are required by statute for MVP and MMTS. The cycle of these Five-Year Reviews began in 1997. The fifth and most recent reviews, completed in June 2017, concluded that MVP and MMTS remedies remain protective of human health and the environment.

Legacy Management Activities

The DOE Office of Legacy Management (LM) manages MVP and MMTS in accordance with the site-specific Long-Term Surveillance and Maintenance Plan. Under this plan, LM:

- Manages the waste repository to ensure that encapsulated waste remains isolated from the environment
- Performs radiological surveillance and control of contamination left on supplemental standards properties

- Conducts surveillance to ensure that land- and water-use controls continue to be relevant and effective
- Monitors and maintains the pump-and-treat groundwater remedy optimization system
- Conducts semi-annual monitoring of water wells and surface water locations associated with OU III

In addition to routine (daily, monthly, and quarterly) surveillance activities, LM documents the integrity of MVP and MMTS remedies in annual site inspection reports and CERCLA Five-Year Reviews.



CONTACT INFORMATION

**IN CASE OF AN EMERGENCY AT THE SITE,
CONTACT 911**

**LM TOLL-FREE EMERGENCY HOTLINE:
(877) 695-5322**

Site-specific documents related to the **Monticello, Utah, Disposal and Processing Sites** are available on the LM website at www.energy.gov/lm/monticello-utah-disposal-and-processing-sites

For more information about LM activities at the **Monticello, Utah, Disposal and Processing Sites** contact:

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