Fact Sheet

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U.S. DEPARTMENT of ENERGY | Office of Legacy Management

Monticello, Utah | Disposal and Processing Sites

A CERCLA/RCRA SITE

This fact sheet provides information about the **Monticello site.** Long-term stewardship responsibilities for this site are managed by the **U.S. Department of Energy Office of Legacy Management** under the **Comprehensive Environmental Response, Compensation, and Liability Act and the Resource Conservation and Recovery 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 2020 census population of Monticello was about 1,918 permanent residents.

In 1942, the U.S. government, through the Defense Plant Corporation (DPC), funded the construction of a mill at a uranium and vanadium ore-buying station, built in 1940, adjacent to the city of Monticello. The Vanadium Corporation of America (VCA) operated the mill, created to produce vanadium and uranium for military purposes, for DPC 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 private entities continued to operate the mill until milling terminated in January 1960.

The mill processed about 900,000 tons of ore. Radiologically contaminated 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.
- 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 increased awareness of the adverse environmental impacts of radiologically contaminated materials prompted mill decommissioning and site stabilization between 1961 and 1965.

The primary activities included:

- Dismantling mill buildings and contents.
- Disposing of equipment and scrap.
- Burying contaminated materials on-site.

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Mill site before remediation.

- Grading and covering impounded tailings and other contaminated materials with soil.
- Revegetating the site.

Between 1974 and 1975, AEC demolished the mill's foundations, buried project debris in place, graded and revegetated the area, and put up a fence around the mill site to prevent public access to contaminated materials.

Remedial Action 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 newly established federal Surplus Facilities Management Program accepted the mill site for remedial action. This program established the Monticello Remedial Action Project (MRAP) to remediate contamination associated with operation of the Monticello mill.

In 1983, remedial efforts established new and separate projects, distinct from MRAP. The Monticello Vicinity Properties (MVP) project addressed tailings-contaminated privately and publicly owned properties in and surrounding the city of Monticello. The Monticello Mill Tailings Site (MMTS) project addressed the remaining MRAP properties (mill site and those adjacent to and downstream of the mill site).

Under authority of the U.S. Environmental Protection Agency (EPA), 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. EPA placed MVP and MMTS on the NPL in June 1986 and November 1989, respectively.

Monticello Vicinity Properties

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

Monticello Mill Tailings Site

MMTS remediation divided into two areas of action called operable units (OU). OU I covered cleanup of the former mill site property, including areas where MVP stored contaminated materials. OU II included cleanup of 34

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Mill site after remediation.

contaminated properties adjacent to and downstream of the mill site (peripheral properties). In September 1990, MMTS added a third operable unit, (OU III), which covered contaminated surface water and groundwater.

By August 1999, cleanup personnel transferred all contaminated materials from MVP and MMTS OU I and OU II, except contaminated materials allowed to remain on specific properties in accordance with applicable regulations (see "Supplemental Standards Properties" below), to an engineered disposal cell constructed on DOE property about 1 mile south of the former mill site (see "MVP and MMTS Waste Disposal" below).

OU I – Monticello Mill Site Tailings and Mill Site Property

OU I consisted of the 78-acre former mill site, tailings-contaminated areas on the mill site, and mill site areas where MVP stored contaminated materials. OU I cleanup activities also included constructing a permanent disposal cell and its leachate collection system. 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 and downstream of the mill site contaminated by windblown tailings and by contaminated soil and sediment deposited in and along Montezuma Creek. EPA deleted 22 peripheral properties that did not have contaminated surface water and groundwater from NPL in October 2003. Deletion of the remaining peripheral properties will happen only when contaminated surface water flowing through and contaminated groundwater beneath those properties meet OU III remediation goals.

In 2000, through the Federal Lands to Parks Program, DOE transferred ownership of about 380 acres of land, including the former mill site property and several peripheral properties, to the city of Monticello for permanent use as a public park and recreation.

OU III – Surface Water and Groundwater

OU III involves contaminated 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 impounded on the mill site. Mill tailings removal from 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

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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 groundwater from affected portions of the alluvial aquifer. The state engineer's office administered this control through the water appropriation (i.e., water right) 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. PRB is a subsurface installation that removes contaminants from the groundwater as it flows through the ZVI (iron filings). In 2005, DOE installed an aboveground treatment test facility and operated it through 2014, after which it was decommissioned. The system pumped groundwater from a well through two aboveground treatment vessels containing ZVI. DOE added this method of active groundwater remediation (pump and treat) to the OU III remedy in March 2009 through an Explanation of Significant Difference issued in January 2009.

DOE optimized active groundwater remediation in January 2015 to improve aquifer contaminant removal and speed up progress toward meeting established site-cleanup goals for groundwater and surface water. This optimization aggressively extracts contaminated groundwater from a focus area of the aquifer. Extracted water is pumped to the solar evaporation pond at the DOE disposal facility. As part of the groundwater-remediation optimization, DOE no longer uses PRB to remove contaminants from groundwater but instead as a containment structure to obstruct the movement of contaminated groundwater. This enables more productive extraction of contaminated groundwater for subsequent evaporative treatment. The groundwater-remedy optimization is thoroughly described in the Groundwater Remedy Improvement Plan at the Monticello, Utah, Site fact sheet (lmpublicsearch.lm.doe.gov/lmsites/3184-monticellogroundwaterremedy.pdf).

Supplemental Standards Properties

DOE selected the remedial action standards for radioactive materials specified in Title 40 Code of Federal Regulations, Part 192.12 (40 CFR 192.12) as relevant and appropriate standards for the cleanup of radioactive contamination located at the Monticello NPL sites. Regulations in 40 CFR 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. DOE applied supplemental standards (i.e., site-specific remediation standards that differ from the remediation standards specified at 40 CFR 192.12) where contaminated materials remain 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. DOE completed waste disposal in June 2000. The 90-acre repository provides long-term waste containment. A synthetic, multiple-layer liner system, at the base of the repository, isolates encapsulated wastes from the environment. 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 the Monticello NPL sites limit using land and groundwater from properties where contaminated soil or groundwater remains. Five categories of institutional controls apply to the Monticello NPL sites:

- Restrictive easements on city-owned property transferred from DOE.
- Radiological control at public road and utility excavations.
- Zoning restrictions on designated properties.
- Restrictive easements on privately owned property.
- Groundwater-use restrictions in a designated groundwater-restricted area.

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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 five years to ensure continued protection of human health and the environment. This requirement applies to the Monticello NPL sites because of contamination that remains in the disposal cell, on supplemental standards properties, on a property with a special zoning designation (because of elevated uranium in the soil), 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 sixth and most recent review, completed in July 2022, concluded that the remedies at the MVP and OUs I and II of the MMTS are currently protective of human health and the environment; however, additional actions are necessary to ensure long-term protectiveness. These additional actions are identified in the respective reports. The MMTS report concluded that a protectiveness determination cannot be made for OU III until the DOE Office of Legacy Management (LM) obtains further information regarding the potential risks posed by surface water contaminants. The MMTS report identified the necessary actions to obtain this information, which LM anticipates completing in 2023. At that time, EPA will make and complete a protectiveness determination for OU III in a Five-Year Report addendum.

Legacy Management Activities

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 semiannual 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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