Maybell, Colorado, Disposal Site

Long-Term Surveillance and Maintenance Program

U.S. Department of Energy
Grand Junction Office

FACT SHEET

The Grand Junction Office has provided cost-effective and efficient stewardship for more than 10 years

Overview

Uranium ore was processed at the Maybell, Colorado, site between 1957 and 1964. These operations created process-related wastes and tailings, a sandlike waste product containing radioactive materials and other contaminants. The U.S. Department of Energy (DOE) encapsulated the tailings in an engineered disposal cell in 1998.

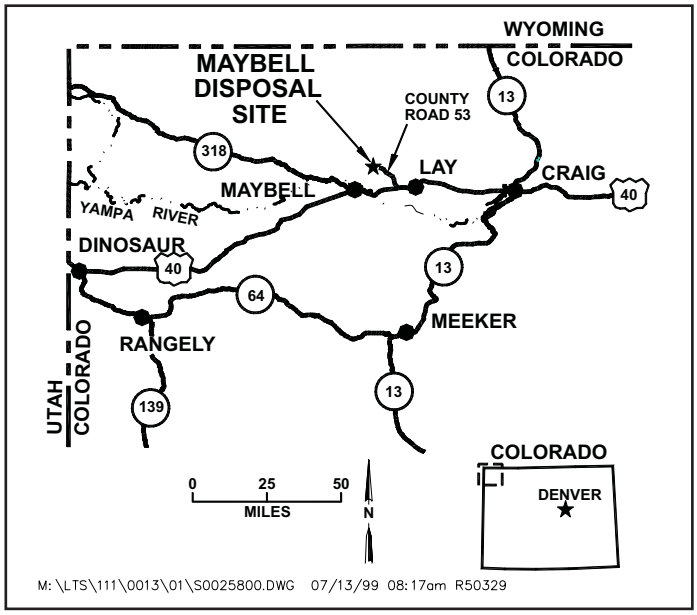
The U.S. Nuclear Regulatory Commission included the Maybell Disposal Cell under a DOE general license in 1999. DOE is responsible, under the general license, for the long-term custody, monitoring, and maintenance of the site. The DOE Long-Term Surveillance and Maintenance (LTSM) Program at the Grand Junction (Colorado) Office is responsible for the long-term safety and integrity of the disposal site.

In 1988, DOE established the LTSM Program to provide stewardship of disposal cells that contain low-level radioactive material after completion of environmental restoration activities. The mission of the LTSM Program is to ensure that the disposal cells continue to prevent release of contaminated materials to the environment. These materials will remain potentially hazardous for thousands of years. As long as the disposal cells function as designed, risks to human health and the environment are negligible.

The LTSM Program maintains the safety and integrity of the disposal cell through periodic monitoring, inspections, and maintenance; serves as a point of contact for stakeholders; and maintains an information repository at the DOE Grand Junction Office for sites in the LTSM Program.

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act in 1978 (Public Law 95–604) that specified remedial action for 24 inactive processing sites where uranium was produced for the Federal Government. DOE remediated these sites under the Uranium Mill Tailings Remedial Action Project and encapsulated the radioactive material in U.S. Nuclear Regulatory Commission-approved disposal cells. Cleanup standards were promulgated by the U.S. Environmental Protection Agency in Title 40 *Code of Federal Regulations* (CFR) Part 192. The U.S. Nuclear Regulatory Commission license was issued in accordance with 10 CFR 40.



Maybell Disposal Site

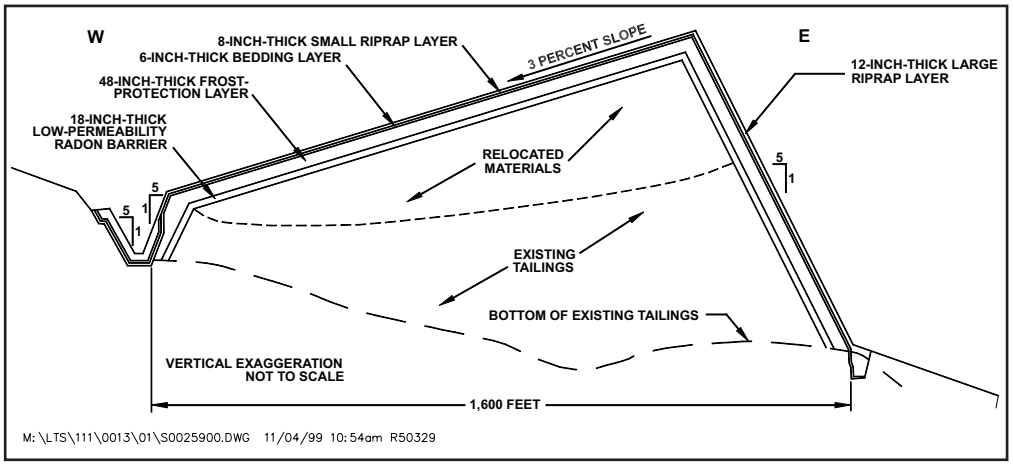
The Maybell Disposal Site is located in Moffat County, Colorado, approximately 25 miles west of Craig. Numerous abandoned uranium mines remain near the site. Land surrounding the disposal site is used primarily for livestock grazing in this semiarid region.

Land at the Maybell Disposal Site was originally owned by both public and private entities. The portion of the disposal site located on property administered by the U.S. Bureau of Land Management was permanently withdrawn and transferred to DOE in 1995. The State of Colorado purchased the privately held portion of the disposal site and transferred title to DOE.

The disposal site is situated in a small valley drained by Johnson Wash, an ephemeral stream that drains into the Yampa River to the south. As much as 25 feet of alluvial and colluvial material covers the site, below which lie Browns Park Formation sandstones. The uppermost aquifer is unconfined in the upper sandstone unit. Minor recharge from precipitation occurs in the vicinity of the disposal cell, but the aquifer is generally of low yield.

Trace Elements Corporation established the Maybell millsite in 1955. In 1957, Union Carbide Corporation (now UMETCO) assumed control of the site and commenced mill operations. The Maybell mill operated until 1964, processing 2.6 million tons of uranium ore. All uranium produced at the Maybell mill was sold to the U.S. Atomic Energy Commission. UMETCO dismantled the mill and

stabilized the tailings pile at the site in 1971. UMETCO is reclaiming residues from a heap-leach operation in the vicinity of the Maybell Disposal Site. Those residues will be encapsulated in a separate disposal cell that will also become the responsibility of the LTSM Program.



West–East Cross Section of Maybell Disposal Cell

Remedial action at the processing site began in 1995 in accordance with an approved remedial action plan. Contaminated materials (including mill tailings, debris from demolished mill structures, and materials removed from contaminated vicinity properties) were placed in the disposal cell. The cell was closed in July 1998. The U.S. Nuclear Regulatory Commission concurred with DOE that the cell complied with U.S. Environmental Protection Agency standards and accepted the disposal site under the general license. Disposal cell contents consist of 4,291,928 dry tons of contaminated material, with a total activity of 455 curies of radium-226.

Uranium mineralization and mining activities in this district have resulted in elevated ground water concentrations of arsenic, cadmium, lead, molybdenum, selenium, and uranium. Locally, water used in milling operations resulted in a rise in the ground water table beneath the disposal site. Because of ambient conditions, the ground water is not a current or potential source of drinking water and is classified as limited use.

Cell Design

The roughly pentagonal-shaped disposal cell measures approximately 1,600 feet by 2,400 feet and rises 30 feet above the surrounding terrain. It occupies 66 acres of the 250-acre site. The existing tailings pile was recontoured and additional residual radioactive material was added. A posted wire fence surrounds the cell.

The cover of the Maybell disposal cell is a multicomponent system designed to encapsulate and protect the contaminated materials for 1,000 years. A low-permeability radon barrier (the first layer placed over the compacted tailings) reduces radon emissions and minimizes precipitation from percolating through the contaminated materials and into the underlying soils. This layer consists of compacted clayey soils amended with bentonite. A frost-protection layer of compacted soil protects the radon barrier from freeze-thaw damage. A bedding layer of coarse sand and fine gravel was placed over the frost-protection layer and was covered with a riprap erosion-protection layer. This final rock layer protects the cell against wind and water erosion and discourages cell intrusion.

Maximum cell surface grades are 3 percent on the top slope and 20 percent on the side slopes. A riprap apron was placed around the perimeter of the disposal cell to provide added protection at the toe of the cell and to channel runoff water away from the cell. A rock-lined interceptor ditch abuts the west up-slope portion of the disposal cell to divert surface flow away from the cell and toward Johnson Wash to the east. Disturbed areas were graded to promote positive drainage and reseeded with native grasses.

LTSM Program Activities

The LTSM Program conducts annual inspections of this site to evaluate the condition of surface features and to determine if any actions are required to maintain site integrity and security. These inspections will continue indefinitely. Potential concerns at the Maybell Disposal Site include settlement because of large quantities of encapsulated moisture from processing residues and seeps from that moisture. The LTSM Program will monitor cell cover settlement and revegetation success until at least 2003.

In accordance with the long-term surveillance plan, DOE measures ground-water levels downgradient of the Maybell Disposal Cell to monitor for potential transient drainage from the cell and the dissipation of the ground-water mound.

Contacts

For more information about the LTSM Program or about the Maybell Disposal Site, contact

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http://www.gjo.doe.gov/programs/ltsm

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