



Mexican Hat, Utah, 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 near Mexican Hat, Utah, between 1957 and 1963. These operations created process-related waste 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 1989.

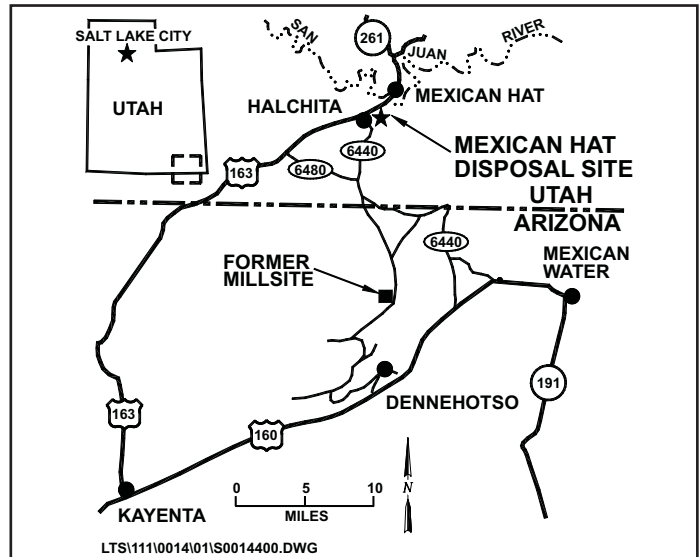
The U.S. Nuclear Regulatory Commission included the Mexican Hat Disposal Cell under general license in 1997. DOE is responsible, under the general license, for the long-term custody, monitoring, and maintenance of the site. The DOE Long-Term Surveillance and Maintenance (LTSM) Program at the DOE Grand Junction (Colorado) Office is responsible for the long-term safety and integrity of the disposal site. Because the site is on Navajo Nation land, the Navajo Nation retains title to the land and tailings.

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 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 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 at 24 inactive millsites 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.

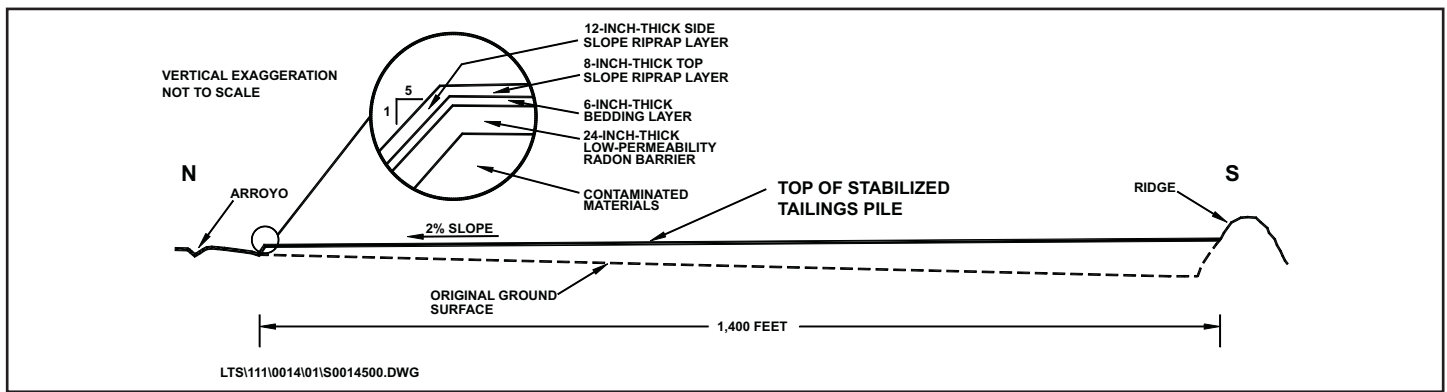
Mexican Hat Disposal Site

The Mexican Hat Disposal Site is approximately 1.5 miles southwest of the town of Mexican Hat on the Navajo Nation in San Juan County, Utah. Grazing is the predominant land use in this sparsely populated area.

The Mexican Hat mill was operated by Texas-Zinc Minerals Corporation from 1957 to 1961 and by Atlas Minerals Corporation from 1961 to 1963. Uranium was extracted from sandstone ore, creating approximately 3,116,500 tons of tailings and other contaminated materials. These wastes were originally deposited on the site in two piles covering 69 acres.

The Navajo Nation and the U.S. Nuclear Regulatory Commission concurred in DOE's decision to consolidate the tailings on site in a U.S. Environmental Protection Agency-compliant disposal cell. Remedial action began at the Mexican Hat site in 1988 and was completed in September 1989.

Radioactive material from the former upper tailings pile, from demolished mill structures, and from contaminated vicinity properties was placed in a disposal cell constructed at the site of the former lower tailings pile. An additional 1,283,500 tons of tailings and associated waste were hauled from the Monument Valley, Arizona, millsite and placed in the cell. The disposal cell contains



North-South Cross Section of Mexican Hat Disposal Cell

4,400,000 dry tons of contaminated material with a total activity of 1,800 curies of radium-226.

The disposal cell is situated on a mesa and surrounded on three sides by arroyos that drain into the San Juan River. Sandstone and shale of the Halgaito Formation crop out above the site and underlie the disposal cell. Water is present intermittently in several seeps along the arroyos north and east of the site. DOE monitors water in these seeps to detect contamination that may have entered groundwater in the Halgaito Formation from the former milling operations or from the disposal cell. Water flowing from the seeps should diminish with time because the upper Halgaito Formation is unsaturated locally and is not recharged significantly by precipitation. Processing-related contaminants do not adversely affect water quality in the San Juan River or in the upper aquifer.

The uppermost aquifer beneath the Mexican Hat Disposal Cell is in the lower Halgaito Formation. Groundwater in this formation contains hydrogen sulfide and hydrocarbons and is not suitable for use. No site-derived contaminants have been identified in the aquifer in the lower Halgaito Formation. An upward hydraulic gradient within the lower Halgaito Formation and impermeable fine-grain rock separating the upper and lower units prevent contaminants in the upper Halgaito Formation from migrating downward.

Cell Design

The cell measures 1,200 feet by 1,800 feet at the base and occupies an area of 68 acres on the 119-acre site. It abuts a rock outcrop on the south and rises 50 feet above the surrounding land on the other sides. A posted wire fence surrounds the cell. A low-permeability radon barrier, consisting of clayey soil, covers the contaminated materials to prevent precipitation from percolating into the underlying tailings and to reduce radon emissions. The radon barrier is covered by granular bedding material and a layer of rock (riprap) on the top, the side slopes, and the aprons. The cell design promotes rapid runoff of precipitation to minimize leachate. Runoff water flows down the 20-percent side slopes into the surrounding rock apron.

The site location and design were selected to minimize the potential for erosion from on-site runoff or storm water flow. All surrounding remediated areas were regraded and reseeded with native species. Existing gullies in the vicinity of the cell were armored with riprap that was keyed into competent rock to prevent erosion. Riprap-protected diversion ditches were installed to channel runoff water away from the cell.

LTSM Program Activities

The LTSM Program manages the site according to a long-term surveillance plan (LTSP) prepared specifically for the Mexican Hat site. Under provisions of the LTSP, the LTSM Program (1) conducts annual inspections of this site to evaluate the condition of surface features, (2) performs site maintenance as necessary, and (3) monitors groundwater in the seeps.

Under the provisions of the LTSP, the LTSM Program will monitor the seeps below the disposal cell for flow rate and contaminant levels to demonstrate the effectiveness of the cell in isolating the encapsulated wastes from the local groundwater system. The upper Halgaito Formation is returning to its premilling, mostly unsaturated state and is not a water resource because of low yield. Therefore, site-related groundwater contamination does not pose a health risk, and no groundwater remediation is required. The disposal cell at Mexican Hat is designed and constructed to last for 200 to 1,000 years. However, the general license has no expiration date, and DOE understands that its responsibility for the safety and integrity of the Mexican Hat site will last indefinitely.

Contacts

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

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or visit the Internet site at

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