Fact Sheet

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



Green River, Utah | Disposal Site

AN UMTRCA TITLE I SITE

This fact sheet provides information about the **Green River site.** Long-term stewardship responsibilities for this site are managed by the **U.S. Department of Energy Office of Legacy Management** under **Title I** of the **Uranium Mill Tailings Radiation Control Act of 1978.**

Site Information and History

The Green River disposal site is about 1.5 miles southeast of the city of Green River, Utah. The site consists of an engineered disposal cell and surrounding property where a former uranium mill and tailings pile were located.

Union Carbide Corporation constructed the uranium mill in 1957 and operated the facility from March 1958 through January 1961. Union Carbide owned the mill site property until the state of Utah acquired ownership in 1988. The U.S. Department of Energy (DOE) owns the disposal site, and the state of Utah owns the rest of the processing site property.

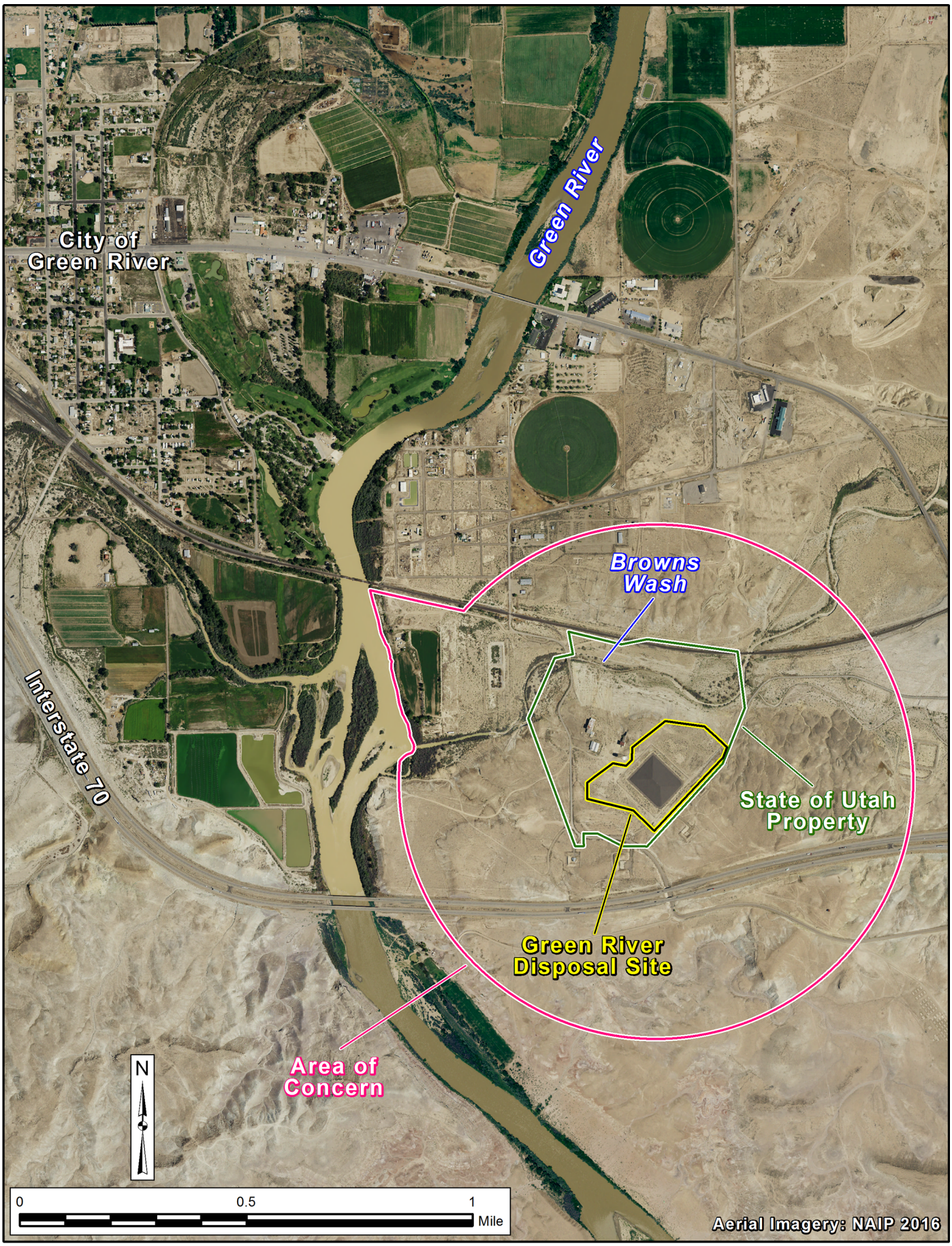
The mill operated as an upgrading facility for uranium ore. During its three years of operation, the mill processed 183,000 tons of ore and generated an estimated 114,000 cubic yards of radioactive tailings, a predominantly sandy material, that covered about 9 acres to an average depth of 7 feet.

The processing site was remediated from November 1988 through September 1989, and all mill tailings and other contaminated materials were stabilized in an on-site disposal cell. The cell also received contaminated material from 17 vicinity properties. The area of the former tailings pile and all areas disturbed at the site during remedial action were backfilled, graded to promote surface drainage, and re-vegetated. Several of the mill buildings were cleaned up and remain on-site, but are in disrepair. The former processing site has no current beneficial use.

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 (Public Law 95-604), and DOE remediated 22 inactive uranium-ore processing sites under the Uranium Mill Tailings Remedial Action Project in accordance with standards promulgated by the U.S. Environmental Protection Agency in Title 40 Code of Federal Regulations (CFR), Part 192. Subpart B of 40 CFR 192 regulated cleanup of contaminated groundwater at the processing sites. An engineered cell was constructed for surficial isolation of radioactive materials. The site has been and will continue to be maintained in accordance with the general license issued by the U.S. Nuclear Regulatory Commission for UMTRCA Title I sites (10 CFR 40.27). The Green River site was included under the general license in 1998.

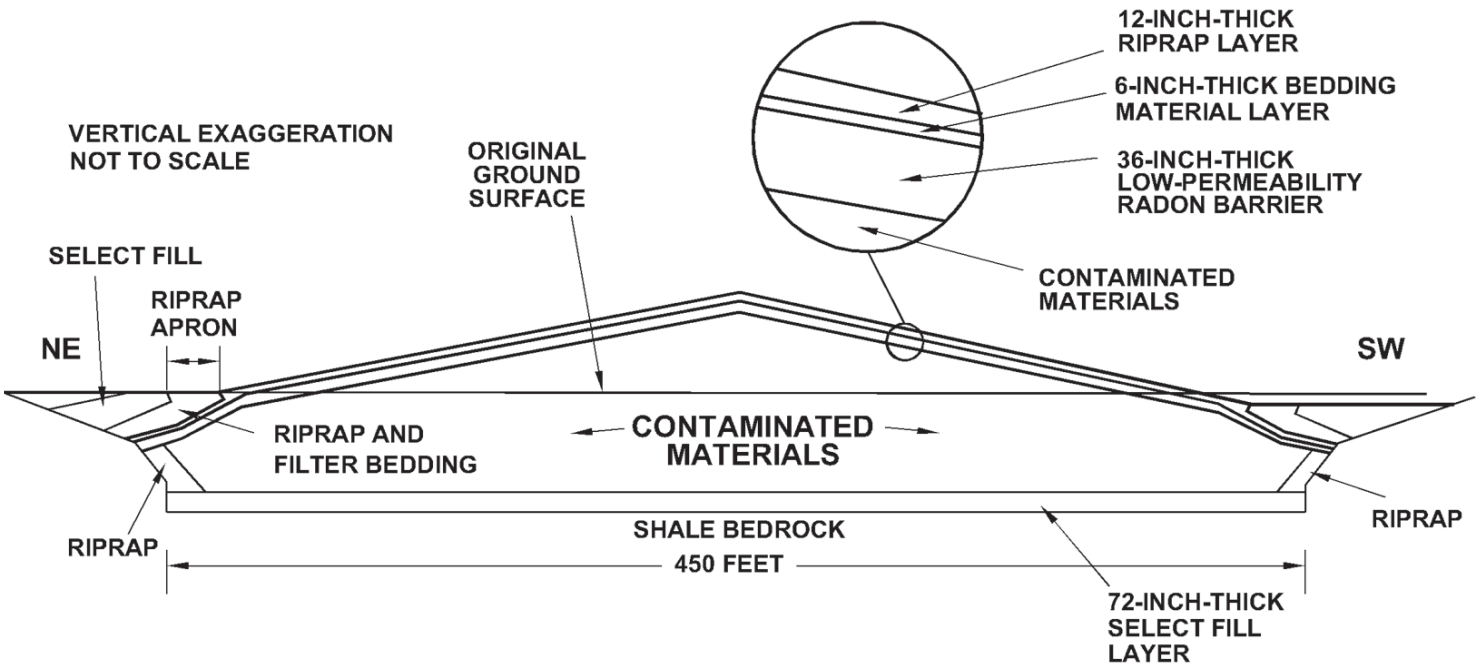
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Green River Site Features.

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Northeast-Southwest Cross-Section of the Green River Disposal Cell.

Disposal Site

Groundwater in the Browns Wash alluvium and middle sandstone unit of the Cedar Mountain Formation beneath the former processing site is contaminated by past ore-processing activities. Constituents in the Browns Wash alluvium with concentrations above standards or relevant benchmarks are ammonia, manganese, nitrate, selenium, sodium, sulfate, and uranium. With the exception of ammonia and manganese, the concentrations of these constituents are elevated in groundwater of the middle sandstone unit of the Cedar Mountain Formation. Arsenic levels are also elevated in the Cedar Mountain groundwater.

Compliance Strategies

The DOE Office of Legacy Management (LM) manages the Green River site and has previously proposed separate compliance strategies for the two groundwater zones that were affected by past ore-processing operations. LM is currently working on a programmatic approach to Groundwater Compliance Action Plans (GCAP) and is planning to revise the previously proposed GCAP to address significant data gaps and develop effective compliance strategies that can be successfully implemented. When the final GCAP is approved, the strategies will be implemented in conjunction with groundwater and surface water monitoring.

Browns Wash Alluvium: The previously proposed compliance strategy for groundwater in the Browns Wash alluvium is no further remediation and application of supplemental standards. The strategy of supplemental standards is an alternative to maximum concentration limits established in 40 CFR 192 and may be applied at locations where groundwater is classified as "limited use" because it meets any of several criteria including widespread ambient contamination or low yield (less than 150 gallons per day) (40 CFR 192.11[e]). Field investigations and data analysis are being planned as part of the programmatic GCAP to determine if application of supplemental standards is appropriate.

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Cedar Mountain Formation: The previously proposed compliance strategy for groundwater in the middle sandstone unit of the Cedar Mountain Formation is no further remediation and application of alternate concentration limits (ACLs). ACLs may be adopted within specified areas when established maximum concentration limits are unattainable or when no applicable standards exist. However, the ACLs must not pose a present or potential future hazard to human health or the environment. LM has previously proposed ACLs for arsenic, nitrate, selenium, and uranium in groundwater in the middle sandstone unit of the Cedar Mountain Formation. The concentrations of these constituents in groundwater are either elevated above the maximum concentration limits in 40 CFR 192 or they exceed applicable benchmark values. ACLs and institutional controls will be evaluated in the next several years as part of the programmatic GCAP to implement a compliance strategy that is protective of human health and the environment.

Monitoring Program: DOE has been monitoring groundwater and surface water at the site since completion of the disposal cell. Upon approval of the GCAP, DOE will continue to collect groundwater and surface water samples consistent with the requirements of the compliance strategy. Groundwater samples will be collected from monitoring wells screened in the Browns Wash alluvium and in the Cedar Mountain Formation; surface water samples will be collected from locations in Browns Wash and the Green River.

Institutional Controls

Institutional controls are restrictions that effectively protect human health and the environment by limiting or prohibiting access to contaminated materials. The final GCAP for Green River will include robust institutional controls for groundwater in Browns Wash and the middle sandstone unit of the Cedar Mountain Formation.

At the request of LM and with concurrence from the Utah Division of Radiation Control, the State of Utah Division of Water Rights has included into their Area of Concern (AOC) program an area that falls mostly within a circle of approximately 3,000-foot radius and centered on the disposal cell. The AOC restricts the use of groundwater within this prescribed area.

Disposal Cell Design

The disposal cell occupies 6 acres on the 21.5-acre site and contains about 382,000 cubic yards of contaminated material with a total activity of 30 curies of radium-226. A posted security fence surrounds the disposal cell.

The cell was excavated to bedrock and lined with 6 feet of low-permeability soil. Most of the contaminated materials are below grade. The cell cover is a multi-component system designed to isolate the contaminated materials. The cover consists of (1) a low-permeability radon barrier (first layer placed over compacted tailings), (2) a granular bedding material layer, and (3) a layer of rock (riprap) placed on granular bedding material above grade. The cell design promotes rapid runoff of precipitation to minimize infiltration. The excavated walls around the edge of the disposal cell are lined with riprap and bedding material. A large riprap apron extends outward from the edge of the disposal cell for about 20 feet. Precipitation flows down the 20 percent side slopes into the surrounding rock apron.

The disposal cell was located and designed to prevent or minimize erosion from storm water. The cell is located 75 feet above the Browns Wash floodplain. Existing gullies were filled and re-graded during cell construction, and all disturbed areas surrounding the disposal cell were re-seeded with native vegetation.

Legacy Management Activities

LM is responsible for ensuring that the selected groundwater compliance strategy for the Green River disposal site is protective of human health and the environment. LM will also monitor the effectiveness of institutional controls.

LM manages the disposal site according to the site-specific Long-Term Surveillance Plan to ensure that the disposal cell continues to prevent release of contaminants to the environment. Under provisions of this plan, LM conducts annual inspections of the site to evaluate the condition of surface features, performs site maintenance as necessary, and monitors groundwater to ensure the continued integrity of the disposal cell.

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In accordance with 40 CFR 192.02(a), the disposal cell is designed to be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years. However, the general license has no expiration date, and LM's responsibility for the safety and integrity of the Green River disposal site will last indefinitely.

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 **Green River, Utah, Disposal Site** are available on the LM website at **www.energy.gov/lm/green-river-utah-disposal-site.**

For more information about LM activities at the **Green River, Utah, Disposal Site**, contact:

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