

## UMTRCA Title I

### Riverton, Wyoming, Processing Site

*This fact sheet provides information about the Uranium Mill Tailings Radiation Control Act of 1978 Title I processing site at Riverton, Wyoming. This site is managed by the U.S. Department of Energy Office of Legacy Management.*

#### Site Description and History

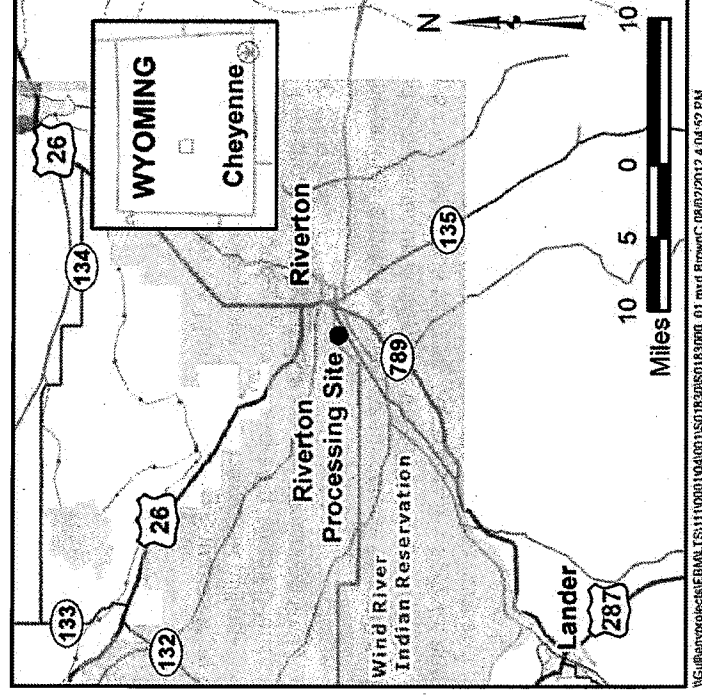
The former Riverton, Wyoming, Processing Site is in Fremont County, 2 miles southwest of the town of Riverton and within the boundaries of the Wind River Indian Reservation (Northern Arapaho and Eastern Shoshone,) on land now owned by Chemtrade Refinery Services. The site is the location of a former uranium- and vanadium-ore processing mill that operated from 1958 to 1963.

Past milling operations created radioactive mill tailings—a predominantly sandy material—and uranium, radium, and thorium contamination in soils and construction debris. A tailings pile covered about 72 acres of the 140-acre site to an average depth of 4 feet. In 1988, about 1.8 million cubic yards of the contaminated materials were removed from the site and relocated to the Gas Hills East disposal site 45 miles away. The U.S. Department of Energy (DOE) completed surface remediation of the Riverton site in 1989.

Milling operations at the site also caused surface and groundwater contamination. Three aquifers underlie the site; an unconfined surficial aquifer, an underlying semiconfined sandstone aquifer, and a deeper confined sandstone aquifer. Only groundwater in the surficial aquifer has been contaminated by ore processing operations at the site.

#### 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. The radioactive materials were



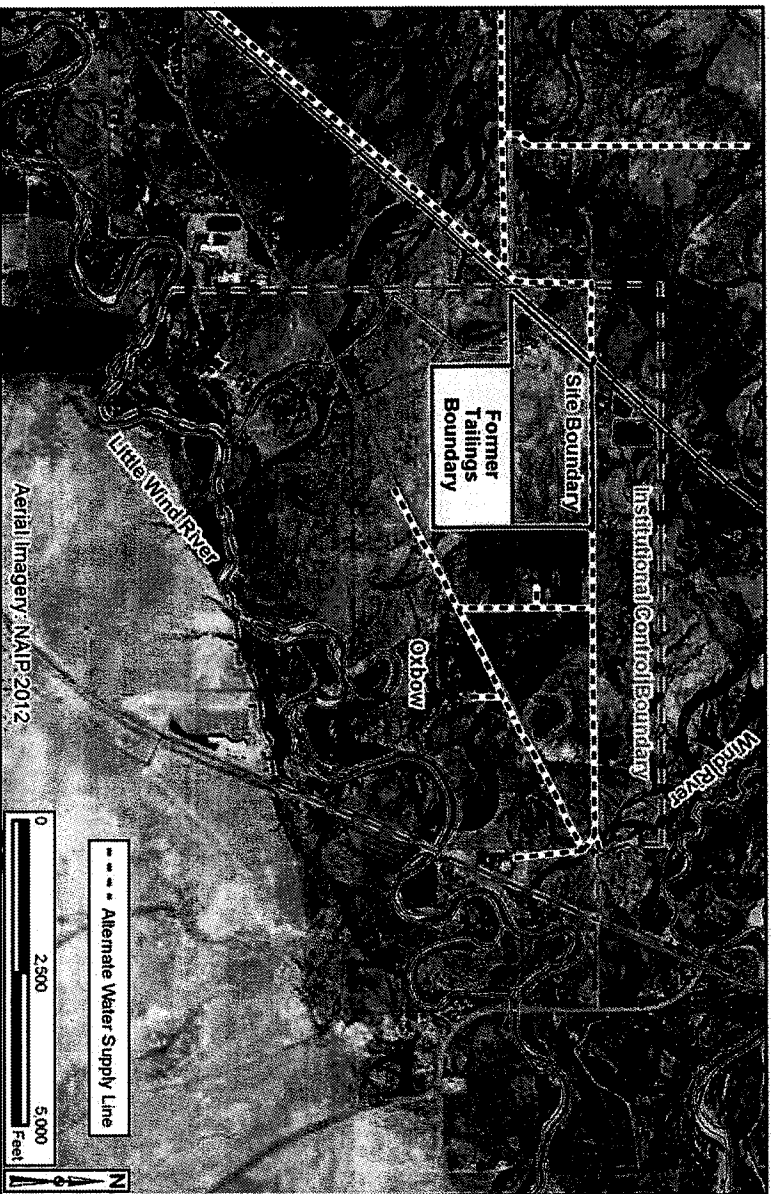
*Location of the Riverton, Wyoming, Processing Site*

encapsulated in U.S. Nuclear Regulatory Commission (NRC)-approved disposal cells. The NRC general license for UMTRCA Title I sites is established in 10 CFR 40.27.

#### Processing Site

The site is on alluvial deposits between the Wind River, 1 mile north, and the Little Wind River, about 3,200 feet south.

The surficial aquifer consists of 15 to 20 feet of alluvial sand and gravel; depth to groundwater typically ranges from 3 to 6 feet below ground surface. Groundwater flow is generally



*Institutional Control Boundary, Site Boundary, Former Tailings Boundary, and Alternate Water Supply Lines at the Riverton Processing Site*

to the southeast toward the Little Wind River. Samples from the surficial aquifer have shown concentrations of milling-related molybdenum and uranium measuring 10 to 40 times greater than their respective maximum concentration limits under 40 CFR 192.

The semiconfined aquifer consists of sandstone 15 to 30 feet thick and is continuous throughout the Riverton site. A layer of shale 5 to 10 feet thick partially separates the surficial and semiconfined aquifers. Concentrations of molybdenum and uranium in the semiconfined aquifer typically have been low and within the range of background concentrations.

**Compliance Strategy**

The groundwater compliance strategy for the Riverton site is natural flushing in conjunction with institutional controls and monitoring. Groundwater modeling conducted in the 1990s predicted that site-related molybdenum and uranium in the surficial aquifer would flush naturally to levels below their maximum concentration limits within the 100-year time frame allowed in 40 CFR 192. Recent monitoring results indicate natural flushing of the surficial aquifer is occurring at the Riverton site, but the rate at which it is occurring might not meet the 100-year regulatory time frame.

More information will be needed and additional work conducted to gain a better understanding of the site before a final decision can be made regarding the natural flushing compliance strategy or before an alternate compliance strategy can be selected. DOE will continue to collect samples at groundwater and surface water monitoring locations

to track the progress of natural flushing and to verify that contaminant concentrations are decreasing as predicted.

**Institutional Controls**

Institutional controls at the Riverton site consist of three components:

- An alternate drinking water supply system
- Restrictions on new wells and land use
- A deed restriction on state-owned property at the site

DOE funded an alternate drinking water supply system in 1998 to provide potable water to residents within the institutional controls boundary. A unidirectional flushing program is conducted to control naturally occurring radionuclide build-up within the system.

Requirements on new wells and land use within the institutional controls boundary include:

- Tribal Ordinance that places restrictions on well installation, prohibits surface impoundments, and authorizes access to inspect and sample new wells
- State of Wyoming Department of Environmental Quality notification of existing groundwater contamination to persons on privately owned land who apply for a gravel pit
- Wyoming State Engineer's Office notification to DOE when permit applications are received for wells or surface impoundments

---

A perpetual deed restriction for the former mill site property prohibits well drilling and restricts land development.

### **Legacy Management Activities**

The DOE Office of Legacy Management (LM) will manage the Riverton processing site according to a site-specific Long-Term Management Plan that specifies environmental and institutional control monitoring requirements. Monitoring during the natural flushing period is referred to as verification monitoring because its purpose is to verify that the strategy is progressing as predicted, and that institutional controls are in place and functioning as intended. LM will collect annual groundwater and surface water samples in September, when surface water concentrations are typically highest. Data from the annual sampling events will be used to assess variations in contaminant concentrations attributable to seasonal fluctuations, and to track contaminant concentrations over time.

Additional field investigations are being conducted to gain new insights into site conditions and processes in order to refine the conceptual site model and to further assess the viability of the natural flushing compliance strategy.

### **Contacts**

Documents related to the Riverton processing site are available on the LM website at <http://www.lm.doe.gov/riverton/Sites.aspx>.

For more information about LM activities at the Riverton processing site, contact:

U.S. Department of Energy  
Office of Legacy Management  
2597 Legacy Way, Grand Junction, CO 81503  
(970) 248-6070 (monitored continuously), or  
(877) 695-5322 (toll-free)



## Wyoming Uranium Site FAQs

What type of uranium sites does the WDEQ regulate?

WDEQ regulates both inactive and active uranium sites, in conjunction with the Nuclear Regulatory Commission (NRC), the U.S. Department of Energy (DOE), and the U.S. Environmental Protection Agency (EPA).

**Inactive Sites:** The inactive sites include old mines (open pit and underground), mill sites, ore storage areas, and processing facilities. Reclamation of the old mines was regulated by the WDEQ Land Quality Division (LQD) (307-777-7756), unless the mine predated the first State reclamation laws passed in 1969 or was abandoned when the uranium market collapsed in the early 1980s. Reclamation of many of the prelaw and abandoned mines, most of which are in the Gas Hills in central Wyoming, has been completed by the WDEQ Abandoned Mine Land Division (307-777-6145).

The inactive mill sites and associated ore storage areas and processing facilities have been, or are being reclaimed under the requirements of the State reclamation laws and the Uranium Mill Tailings Radiation Control Act (UMTRCA) enacted by Congress in 1978. Older sites (in use before 1978) generally fall under the provisions of **Title I** of UMTRCA (see Question #2) while newer sites (in use after 1978) generally fall under **Title II** (see Question #3).

**Active Sites:** The active uranium sites are primarily in situ uranium mines and associated processing facilities, although the sites also include areas of exploration and completion of open pit mine reclamation. There is also one mill site on standby (see Questions #2 and #5):

How many UMTRCA Title I sites are there? Where are they located?

There are two Title I sites in Wyoming: the **Spook Site** located in Converse county (operated from 1962-1965) and the **Riverton Site** located near Riverton (operated from 1958 to 1963). These sites have been reclaimed and are under the control of the DOE's Office of Legacy Management, Grand Junction, CO (970-248-6000), although general information about these sites can be obtained from the Lander Office of the WDEQ LQD (John Erickson, 307-335-6939, [john.erickson@wyo.gov](mailto:john.erickson@wyo.gov)).

How many UMTRCA Title II sites are there? Where are they located?

There are nine Title II sites in Wyoming. Reclamation has been completed at some sites and is underway at others. The NRC has stringent requirements for removal of the facilities and capping of the mill tailings, which generally have the highest concentrations of contaminants and therefore the greatest risk to human health and the environment. Once the sites are reclaimed, they are turned over

to the DOE for long-term care and monitoring. This long term care is to ensure that the covers, or caps over the mill tailings do not erode or develop other problems over time, as well as making sure fencing, warning signs, and other physical controls are maintained in good condition. On-going groundwater monitoring is designed to track levels of existing contamination, to observe if contaminant concentrations increase beyond safe levels over time, and to ensure contaminated groundwater does not migrate past the boundaries of the secured area. The WDEQ Water Quality Division (WQD) and LQD work with NRC and DOE to ensure the remediation work is sufficient to protect Wyoming resources and residents.

All but one of the Title II sites in Wyoming are adjacent to an open pit mine which supplied the mill. The Title II sites and the current status of the site and adjacent mine are:

- *Exxon Highlands* north of Glenrock. The mill site is regulated by NRC and WQD. The adjacent open pit mine and pit lake are regulated by LQD.
- *Bear Creek* near Glenrock. The mill site has been remediated and reclaimed and is in the process of transfer to DOE. Reclamation of the adjacent open pit mine, regulated by LQD, is essentially complete.
- *Petronomics* in Shirley Basin. The mill site has been remediated and reclaimed, and transferred to DOE. Reclamation of the adjacent open pit mine, regulated by LQD, is essentially complete.
- *Pathfinder* in Shirley Basin. The mill site is regulated by NRC and WQD. The adjacent open pit mine and pit lakes are regulated by LQD.
- *Kennecott Sweetwater* south of Jeffery City. The mill is on standby and is regulated by the NRC and WQD. The adjacent open pit mine and pit lake are regulated by LQD.
- *UMETCO* in the Gas Hills north of Jeffery City. The mill site has been remediated and reclaimed, and is in the process of transfer to DOE. Reclamation of the adjacent open pit mine is regulated by LQD.
- *ANC (American Nuclear Corporation)* in the Gas Hills. The mill site is regulated by NRC and LQD. The mine operator forfeited the reclamation bond so the adjacent open pit mine is being reclaimed by LQD.
- Pathfinder *Lucky Mc* in the Gas Hills. The mill site is regulated by NRC and WQD. The adjacent open pit mine is regulated by LQD.
- *Western Nuclear Splitrock Mill* near Jeffery City. The mill site is regulated by NRC and WQD. All of the mines which supplied this mill are several miles from the mill and are regulated by LQD.

Is there any active uranium mining in Wyoming?

All of the active uranium mines use 'in situ' (in place) solution mining techniques and process the ore through ion exchange. These mines are regulated by the LQD under State law and the auspices of the DEQ's Underground Injection Control (UIC) Program and by the NRC. Most of these mines are in the Powder

River Basin, either at the southern end near Glenrock or in the west-central portion of the Basin near Pumpkin Buttes. One in situ mine has also been permitted in the Gas Hills but is not yet in operation. The Lost Creek In Situ Recovery Mine in the Great Divide Basin, Red Desert, has been permitted by LQD and began operation in August 2013. In addition, uranium exploration is being conducted in several areas of the State. Contact Miles Bennett with the LQD, at 307-675-5618 or [miles.bennett@wyo.gov](mailto:miles.bennett@wyo.gov), for information on the active mines and exploration activities.

Where can I find more information?

<http://www.nrc.gov/> This site is the main web page for the Nuclear Regulatory Commission. It has information on the NRC, including documents, regulations, news articles, information on sites and facilities, as well as links to other sources of information.

<http://www.lm.doe.gov/> This is the main site for the Legacy Management Office of the Department of Energy in Washington DC. It has information concerning the program, regulations and a map of all the sites and facilities Legacy management regulates. This site also has a list of links to related web sites.

<http://www.lm.doe.gov/GrandJunction/Sites.aspx> The main offices for the Legacy Management program are located in Grand Junction Colorado.

<http://www.swri.edu/4org/d20/d20home.htm> This site links you to Southwest Research Institute. There are several technical publications and research papers concerning uranium sites on this site.

<http://www.epa.gov/safewater/uic/index.html> This link takes you to the main US Environmental Protection Agency web site. There is a host of information here on numerous types of contaminants, including radionuclides. Federal regulations, clean-up standards, and discussions of clean up technologies are also provided.

Who are the WDEQ points of contact for Title II sites?

Land Quality Division: contact Miles Bennett (307) 675-5618  
([miles.bennett@wyo.gov](mailto:miles.bennett@wyo.gov)).

Water Quality Division: contact Deb Harris (307) 335-6980  
([deborah.harris@wyo.gov](mailto:deborah.harris@wyo.gov)).

