

Uranium Mill Tailings

Milling is the first step in making natural uranium ore into fuel for nuclear reactors. Uranium mills use chemicals to extract uranium and make “yellowcake,” a powder that can be processed into fuel. They produce “mill tailings,” a sandy waste containing heavy metals and radium, which is radioactive. Uranium mills in the United States are licensed by the NRC or the state.

The NRC has rules to protect public health and safety from the hazard these tailings may pose. As the radium decays over thousands of years, tailings produce a radioactive gas called radon. To keep them isolated, tailings are placed in piles for long-term storage or disposal. A tailings pile may be a large trench or a former mine pit and must meet NRC [criteria](#). They are usually lined, covered and monitored for leaks. The NRC also requires adequate funds to be available to decommission the site, properly close the tailings pile, and maintain and monitor the site over the long term.

Congress passed a law in 1978 that set up two programs to protect the public and the environment from uranium mill tailings. The Uranium Mill Tailings Radiation Control Act made sure older sites were cleaned up and managed. It also required newer sites to be licensed.

Title I – Legacy sites

Many sites that produced uranium for the early nuclear power and weapons programs closed prior to 1978. This was before requirements had been established for cleanup and long-term maintenance. The law put the Department of Energy (DOE) in charge of cleanup at 20 legacy sites. All of these sites are located in western states, except for two sites in Pennsylvania.

The NRC reviewed DOE’s plans for cleanup and long-term maintenance of the Title I sites. DOE has completed all surface cleanup and is continuing to clean up groundwater at several sites. DOE maintains these sites and provides long-term surveillance under a general license from the NRC.

Title II - Sites licensed in 1978 or later

Newer sites had to be licensed by the NRC or one of the five states that have licensing authority under agreements with the NRC. These states are Colorado, Illinois, Texas, Utah and Washington. For these sites:

- Private companies mill the uranium and are responsible for cleaning up any site contamination;
- Design of the tailings piles must be submitted for review with the license application;
- Plans to clean up any surface and/or groundwater contamination must be approved by the NRC or the Agreement State in which the site is located;

- When a site has ceased operations and is being prepared for closure, DOE develops a long-term surveillance plan for the site that must be reviewed by the NRC;
- When the NRC finds a site meets the cleanup standards or concurs that a state-licensed site meets the standards, and the tailings pile meets the approved design criteria, the NRC or state can terminate the license;
- After the NRC has accepted DOE's long-term surveillance plan and terminated the license, the site transfers to DOE for long-term surveillance and maintenance under a general license;
- A state can assume responsibility for long-term care and maintenance of the site, but to date, this has not occurred.

In 1983, EPA issued uranium mill tailings standards for both Title I and Title II sites. In 1985 and 1987, the NRC updated its [regulations](#) for Title II sites to be consistent with EPA's standards. In 1995, EPA issued final standards for cleaning up groundwater at Title I sites.

There are 11 NRC-licensed uranium mill sites that closed and are being decommissioned. Another 11 sites licensed by Agreement States are being decommissioned. Six sites are fully decommissioned (four NRC sites and two in Agreement States) and were transferred to DOE for long-term monitoring.

The NRC licensed a facility in Clive, Utah, in 1993 to take mill tailings for disposal. In 2004, Utah took over authority for the site as an Agreement State.

More information on [uranium mill tailings](#) and the NRC's [2015 decommissioning report](#) can be found on the NRC's website.

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