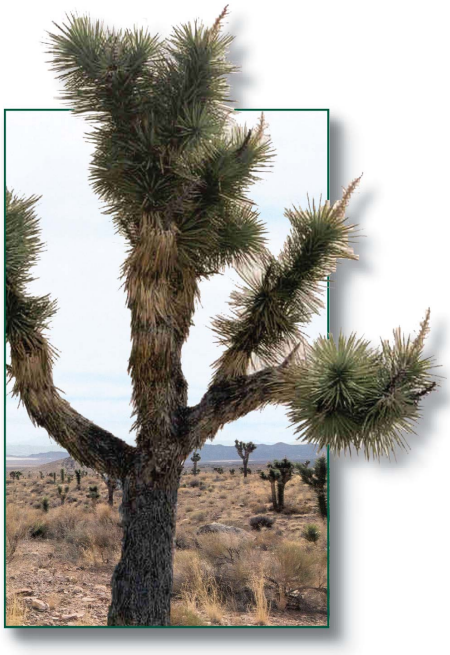
Transuranic Radioactive Waste

safety ❖ performance ❖ cleanup ❖ closure



Background

Transuranic radioactive waste is one of several types of waste handled by the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office at the Nevada Test Site. Transuranic waste contains man-made radioactive elements heavier than uranium, such as plutonium, hence the name "trans" or "beyond" uranium.

Most of the transuranic waste managed at the Nevada Test Site was generated as part of a nuclear weapons research and development program at Lawrence Livermore National Laboratory near Oakland, California. This legacy waste, which was shipped to the Nevada Test Site for temporary storage between 1974 and 1990, includes protective clothing and miscellaneous equipment contaminated with transuranic elements. Additionally, a small quantity of the transuranic waste stored at the Nevada Test Site was generated by environmental restoration activities on the Nevada Test Site and the Tonopah Test Range. The majority of this waste is considered mixed transuranic because of a hazardous waste component which requires it to be managed in accordance with the Federal Facility Compliance Act and Consent Order.

Between January 2004 and November 2005, 1,860 drums of this legacy waste was shipped to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico for permanent disposal. The transuranic waste remaining at the Nevada Test Site, as of July 1, 2007, consists of 58 boxes, 2 spheres, and approximately 100 drums which did not meet WIPP's disposal requirements.

The Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico, is the world's first underground repository licensed to permanently dispose of transuranic waste. Disposal rooms at the WIPP are mined to depths of 2,150 feet below the surface and are surrounded by a 2,000 foot thick salt formation that has been stable for more than 200 million years.

Waste Characterization and Repackaging

In order for the remaining transuranic waste to meet requirements for permanent disposal, further characterization and repackaging is required. Some of the remaining transuranic waste at the Nevada Test Site contain items that are prohibited by the WIPP or by the Nevada Test Site Waste Acceptance Criteria. Such items need to be removed from their current containers, treated, and prepared for disposal at an appropriate facility. Additionally, some transuranic waste is contained in boxes that are considered oversized and cannot currently fit within approved WIPP transportation containers. All remaining waste will either undergo size-reduction and/or additional characterization to determine the appropriate disposal path that meets all applicable laws and regulations. These activities will take place at the Nevada Test Site or at another facility in the U.S. Department of Energy complex.

Definitions

Hazardous Waste: As defined by the U.S. Environmental Protection Agency, waste that is harmful to human health or the environment. Substances such as ethyl alcohol, Freon, and various metals are considered hazardous waste.

Radioactive Waste: Materials with no future use that have been contaminated by a nuclear process, thereby containing unstable elements (such as hydrogen, plutonium, or uranium) which emit radiation.

Transuranic Waste: Waste contaminated with elements that have an atomic number greater than Uranium (92) and contains more than 100 nanocuries of alpha-emitting isotopes per gram, with half-lives greater than 20 years.

Waste Characterization: The process of identifying the components of hazardous or radioactive waste.

Transuranic Radioactive Waste

The remaining drums and boxes of transuranic waste require size-reduction and/or additional characterization.

For more information, please contact:
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A TRUPACT-II container is loaded at the Nevada Test Site.

Each truck can transport up to three TRUPACT-II containers at one time.

Waste Storage and Handling

The remaining containers of transuranic waste are stored on the TRU Pad, located at the Nevada Test Site Area 5 Radioactive Waste Management Complex. This 2.1-acre asphalt pad has a protective waterproof layer to prevent moisture from seeping into the soil as well as an eight-inch curb to prevent run-on and runoff.

Because most transuranic elements decay by emitting alpha particles, the least penetrating form of radiation, a sheet of paper or the outer layer of skin are adequate barriers. However, an alpha-emitting isotope can enter the body through inhalation, ingestion, or through a cut on the skin. Therefore, transuranic waste requires special handling, storage, and disposal.

To ensure the safety of Nevada Test Site personnel, the public, and the environment, Nevada Site Office waste management specialists regularly inspect waste packages to verify that labels are intact and legible and that the containers remain structurally sound. Access to the facility is also controlled. These precautions are part of a comprehensive health and safety program.

Waste Transportation to WIPP

All transuranic waste destined for WIPP is shipped inside specially designed containers. These containers, known as Transuranic Package Transporter Model II (TRUPACT-II), can hold up to fourteen 55-gallon waste drums, two standard waste boxes, or one 10-drum overpack. Each truck can transport up to three TRUPACT-II containers at one time. All waste shipments must meet stringent U.S. Nuclear Regulatory Commission and U.S. Department of Transportation requirements before transport. Decisions regarding routes are determined through negotiations with the states in which proposed routes are located. Responsibility for transuranic waste shipments from the Nevada Test Site to any off-site location lies with WIPP personnel.

For information on all Nevada Site Office Environmental Management activities visit:
www.nv.doe.gov/envmgt

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