

Radioactive Waste Management

safety ❖ performance ❖ cleanup ❖ closure



The NNSS

For decades, the Nevada National Security Site (NNSS) has served as a vital waste disposal resource in the nation-wide cleanup of former nuclear research and testing facilities. State-of-the-art waste management sites at the NNSS offer a safe, permanent disposal option for U.S. Department of Energy/U.S. Department of Defense facilities generating cleanup-related **radioactive waste**.

LLW and MLLW

Waste management operations at the NNSS focus on the disposal of **low-level (LLW)** and **mixed low-level (MLLW)** radioactive waste, which typically consists of containerized debris, trash, soil, equipment, tools, and discarded personal protective clothing. LLW and MLLW containers can generally be handled without any special equipment or clothing, as the level of radioactivity is relatively low and the packaging provides the necessary protection. MLLW is disposed separately from LLW in a cell constructed with a multi-layered lining and a special leachate collection system, required under a Resource Conservation and Recovery Act permit.

Disposal Location

A combination of conditions, such as arid environment, deep groundwater, and site remoteness, make the NNSS a favorable location for LLW and MLLW disposal. Designated as a DOE Regional Disposal Site, the NNSS is permitted to accept LLW and MLLW at one of two approved waste management sites. The Area 5 Radioactive Waste Management Site, which is currently active, contains 200 acres of land developed for LLW and MLLW waste storage and burial-style disposal. The Area 3 Radioactive Waste Management Site, a 128-acre disposal area previously used for the disposal of larger or bulk-type LLW packages, became inactive in 2006.

Waste Approval

As part of the NNSS commitment to safety and the protection of workers and the environment, it is a required practice for Nevada Field Office personnel to review and approve waste prior to shipment. Approval is granted only after **waste generators** undergo a rigorous certification process and demonstrate compliance with the NNSS Waste Acceptance Criteria, a formal document that outlines specific requirements for LLW waste treatment, packaging, documentation, transportation, training, etc. Separate criteria are in place for MLLW, which contains hazardous components governed by the Resource Conservation and Recovery Act. The State of Nevada Division of Environmental Protection, with authority delegated by the U.S. Environmental Protection Agency, has issued special permits to the NNSS for activities involving hazardous waste.

Definitions

Low-Level Waste: Radioactive waste that cannot be characterized as high-level, transuranic, spent nuclear fuel, or by-product materials, such as uranium mill tailings.

Mixed Low-Level Waste: Waste that contains both hazardous and radioactive constituents. Hazardous constituents are toxic, corrosive, reactive, ignitable, or specifically identified by the U.S. Environmental Protection Agency as "hazardous."

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

Waste Generator: U.S. Department of Energy and U.S. Department of Defense sites or projects that generate low-level or mixed low-level radioactive waste.

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Shipment Acceptance

Before waste shipments are accepted at the NNSS, generators and their contracted shipping carriers must provide documentation consistent with the information submitted during the waste approval process. Once documentation has been verified, NNSS waste personnel conduct surveys of all trucks, trailers and containers entering Area 5 to make sure security seals are in place and packages are intact and appropriately labeled. If further verification is needed, waste packages may be inspected using on-site x-ray technology. Any waste found to be out of compliance will be rejected pending corrective action.



Waste packages are positioned in a disposal cell at the NNSS Area 5 Radioactive Waste Management Site

Monitoring

Area 5 personnel use special equipment to perform ongoing air, groundwater, and soil monitoring. Such monitoring activities provide early detection in the unlikely event contamination migrates from the immediate disposal area. Monitoring results to date have shown no radiological releases above regulatory limits. Regular performance assessments of the disposal facilities serve as an additional safety measure. Experts use special computer modeling software to perform these assessments, which evaluate the potential short-term and long-term risks associated with disposal.

Disposal Method

Once incoming waste passes final inspection, waste trucks are allowed access to one of several excavated disposal cells within the Area 5 Radioactive Management Site. Following off loading, waste is scanned and then stacked, one upon the other, in a stair-step configuration. Waste cells are organized using a 20' x 20' grid system, in which letters and numbers designate the location of waste packages. This tracking system helps waste personnel monitor the accumulation of radionuclide levels, and, if need be, retrieve specific waste packages once they are covered with soil.

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