Tonopah Test Range

safety ❖ performance ❖ cleanup ❖ closure

History

High in the Great Basin desert, midway between Reno and Las Vegas, Nevada, the Tonopah Test Range lies nestled amongst the Cactus and Kawich mountains. The Tonopah Test Range encompasses 525 square miles within the boundaries of the Nevada Test and Training Range, which is controlled by the U.S. Air Force.

In the 1950s, field testing managers from Sandia National Laboratories were attracted to the Tonopah Test Range for many reasons. One of these factors is that the hidden valley formed by the surrounding parallel mountain ranges provides a safe and secure setting for secret testing. Also, the lack of dense vegetation due to the dry environment provides clear pathways for tracking aircraft and airborne weapons, and offers unobstructed views of test package impacts. The sparse vegetation also limits the available food supply, minimizing adverse effects to wildlife.

Federal Facility Agreement and Consent Order (FFACO)

The Federal Facility Agreement and Consent Order outlines cleanup and monitoring commitments for sites and requires State of Nevada approval for the remediation activities selected to achieve closure. Once the State has approved closure, a public notice of completion is issued to mark the end of the closure process.

The Atomic Energy Commission, predecessor to the U.S. Department of Energy (DOE), began testing weapon systems, research rockets, and artillery on the Tonopah Test Range in 1956. As a result of these non-nuclear yield tests, the environment was contaminated by unexploded ordnance, heavy metals, pesticides, total petroleum hydrocarbons, other hazardous materials and radioactive constituents.

The Environmental Restoration Project within the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office (NNSA/NFO) Environmental Management Program is remediating the Tonopah Test Range in response to the environmental concerns resulting from the contamination. Remediation efforts address surface and shallow subsurface soil contamination generated by historic nuclear weapon system storage-transportation tests and support activities. In order to determine the type and extent of contamination, workers conduct studies and surveys referred to as site characterization. During site characterization, underground storage tanks and sumps are located, pipes and cables are traced, leachfields and septic tanks are defined, and landfill boundaries are mapped. The potential risk to the public and the environment is also examined during this process.

Before site characterization starts, the contaminated sites are researched and work plans are developed. Scientists collect historic information, interpret aerial and ground photographs, and review engineering drawings. They may also conduct aerial surveys from helicopters with radiation detection equipment in order to map the general location and concentration of radioactive contamination in soil or debris caused by testing activities. Scientists use the information gathered during research and site characterization to select a closure approach for remediating the site. Remediation is then conducted by either the Industrial Sites Sub-Project or the Soils Sub-Project, depending upon the origin of the contamination.

Industrial Sites Sub-Project

The priority in which the Industrial Sites Sub-Project characterizes and remediates sites, called Corrective Action Sites, is based upon the type of hazard present, risk to people and the environment, availability of funding, and types of technologies available to conduct characterizations and expedite remediation.

Definitions

Contaminant: Substance that is not naturally found in a particular environment. Examples include radioactive materials, oils, solvents, gasoline, heavy metals (such as lead), and unexploded ordnance.

Corrective Action Site: A site that has been identified as potentially needing remediation.

Leachfield: Soil surrounding a septic tank that has absorbed escaped liquid and waste.

Nuclear Yield: The amount of energy released in the deliberate detonation of a nuclear weapon, measured in terms of kilotons or megatons of TNT (the chemical explosive trinitrotoluene) equivalent.

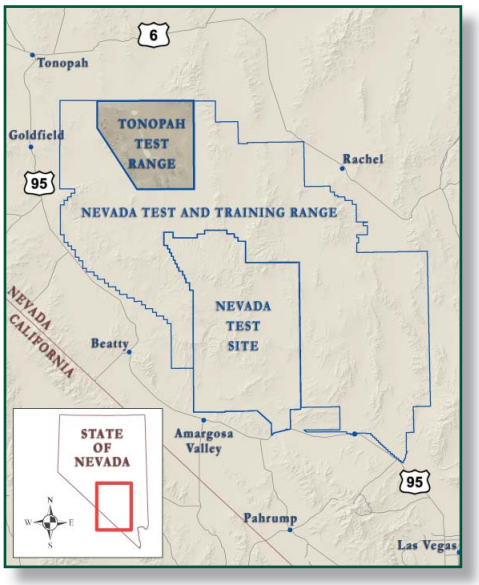
Remediate: The process of cleaning, removing and/or isolating materials contaminated by historic nuclear testing activities.

Tonopah Test Range

Corrective Action Sites which employ similar remediation techniques are grouped as follows:

- **Inactive Tanks** previously used for storage of fuel and other liquids
- **Contaminated Waste Sites** previously used as landfills and construction debris disposal areas
- **Septic Tanks and Lagoons** previously used to contain sewage, but also containing such contaminants as antifreeze, motor oil, paint and solvents
- **Drains and Sumps** previously used as underground discharge points for liquid waste
- **Ordnance Sites** previously used for aerial drops of bombs or pods containing hundreds of cluster bomblets

Soil excavation at a Contaminated Waste Site on the Tonopah Test Range.



The Tonopah Test Range is located northwest of the Nevada Test Site within the boundaries of the Nevada Test and Training Range.

A total of 64 Industrial Sites Corrective Action Sites are located on the Nevada Test and Training Range. All but one have been remediated and received completion approval by the State of Nevada Division of Environmental Protection. All Industrial Sites Corrective Action Sites are scheduled to be remediated and approved for final completion by 2012.

Soils Sub-Project

Contaminated soil on the Tonopah Test Range was generated by a joint exercise called Operation Roller Coaster, conducted in 1963 by the United Kingdom, the U.S. Department of Defense, and the Atomic Energy Commission. The project was an experimental series of four conventional explosive detonations of nuclear devices designed to determine if nuclear weapons could be accidentally set off and produce a nuclear yield. The devices were detonated at sites designated as Double Tracks and Clean Slate I, II, and III. These experiments proved that accidental yield-producing nuclear detonations would not occur. However during the experiments, the surface soil was contaminated by the plutonium and uranium contained within the nuclear weapons.

Although corrective action levels are being negotiated between the U.S. Air Force and NNSA/NFO, the Soils Sub-Project has conducted interim corrective actions at Double Tracks and Clean Slate I. The sites were characterized and soil was removed and properly disposed at a radioactive waste management site on the Nevada Test Site. Clean Slate II and III remediation activities are expected to begin in 2014. All Soils Sub-Project Corrective Action Sites, including those on the Nevada Test Site and Nevada Test and Training Range, are scheduled to be remediated and the completion approval obtained by 2022.

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