



## Central Nevada Test Area, Nevada

### FACT SHEET

*This fact sheet provides information about the Central Nevada Test Area, Nevada. This site is managed by the U.S. Department of Energy Office of Legacy Management.*

### Site Description and History

The Central Nevada Test Area (CNTA) is located in the Hot Creek Valley of south-central Nevada, approximately 70 miles northeast of Tonopah. The CNTA consists of three parcels totaling 2,560 acres. The parcels are spaced approximately 3 miles apart along a roughly north-south line. The total acreage is currently withdrawn from all forms of appropriation associated with mining laws and leasing.

The U.S. Atomic Energy Commission, a predecessor agency of the U.S. Department of Energy (DOE), acquired the CNTA in the early 1960s to develop alternative sites to the Nevada Test Site for underground nuclear testing.

Three emplacement boreholes (UC-1, UC-3, and UC-4) were drilled on the three parcels at the CNTA for underground nuclear testing. The initial underground nuclear test at CNTA, code-named Project Faultless, was conducted in borehole UC-1 at a depth of 3,199 feet below ground surface on January 19, 1968. The yield of the Project Faultless test was estimated to be 0.2 to 1 megaton (TNT equivalent). Its purpose was to evaluate the environmental and structural effects that might be expected if subsequent, higher-yield underground nuclear tests were conducted in this vicinity. The test resulted in a down-dropped fault block visible at land surface. In addition, seismic results supported the indication that the site was not favorable for larger detonations. The nuclear detonation created a cavity with a radius of approximately 328 feet. The Faultless test did not release any radioactivity at the surface, and no additional tests were conducted at the CNTA.

The Hot Creek Valley fill consists of poorly sorted alluvium composed primarily of volcanic rocks derived from the adjacent ranges. The thickness of the alluvium ranges from about 1,960 to 2,410 feet.

The alluvium is underlain by volcanic tuff and sedimentary rocks derived from volcanic material and welded tuffs interbedded within a volcanic rock sequence. Groundwater occurs in both the alluvial and volcanic



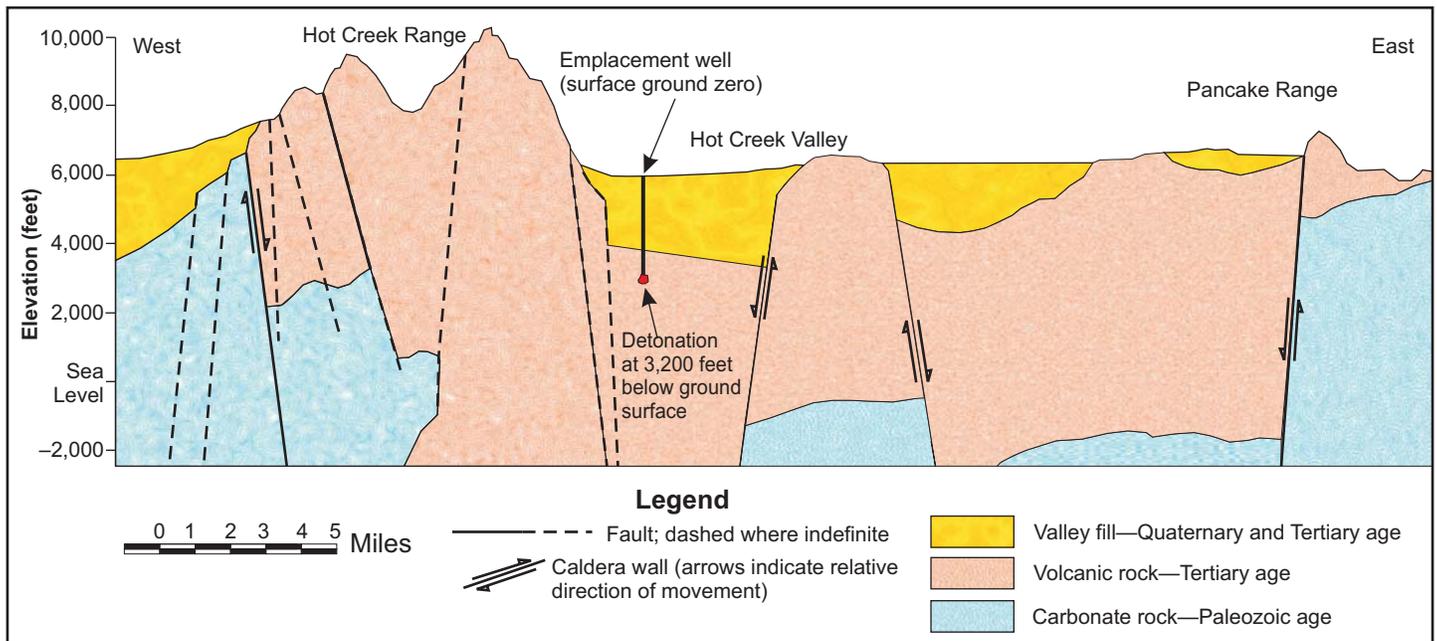
Location of the Central Nevada Test Area

sections. The depth to groundwater near the UC-1 emplacement borehole is about 500 feet below ground surface.

### Surface Conditions

The 1967 and 1969 land withdrawals made in preparation for testing at CNTA created three test areas, and emplacement boreholes (UC-1, UC-3, and UC-4) were drilled at each of the areas. Tests planned for UC-3 and UC-4 were cancelled. However, surface remediation was completed at all three sites.

Drilling operations associated with the three emplacement boreholes resulted in areas of surface contamination identified as Corrective Action Unit (CAU) 417. This CAU comprised 34 corrective action sites. DOE completed closure of these sites using a variety of methods, including removing industrial scrap, excavating and removing underground storage tanks and septic tanks, and excavating and removing contaminated soil. Mud pits used to contain drilling fluids were contaminated with diesel fuel and trace



*Cross Section of the Central Nevada Test Area*

amounts of lead, chromium, and tritium. DOE closed two of the corrective action sites (the Faultless device emplacement well and the emplacement well to the south) by installing engineered caps and closed nine additional sites through use of institutional controls.

Surface cleanup of the CNTA was completed in 2001 and was approved by the Nevada Division of Environmental Protection. DOE monitors the long-term performance of the surface cleanup on an annual basis.

### **Subsurface Conditions**

Subsurface contamination that resulted from underground nuclear testing at CNTA is identified as CAU 443. This CAU consists of test-related radionuclides in and around the test cavity. Because there is no known technology to remediate the residual subsurface radioactivity at the detonation level, groundwater flow and transport modeling was used to estimate a contaminant boundary or restricted region surrounding the nuclear detonation. The contaminant boundary represents the maximum extent that groundwater with test-related radionuclides exceeding Safe Drinking Water Act maximum contaminant levels is estimated to migrate in 1,000 years. The simulated contaminant boundary and surface effects from the detonation form the basis for establishing the compliance boundary, which has been negotiated with the Nevada Department of Environmental Protection. The compliance boundary corresponds approximately to the boundaries of the down-dropped fault-block within the land withdrawal boundary.

Corrective action associated with CAU 443 includes installation of monitoring wells, proof-of-concept monitoring, and validation of the compliance boundary. Validation of the compliance boundary, proof-of-concept

monitoring, and closure are the final elements of the corrective action strategy.

### **Long-Term Hydrologic Monitoring Program**

The U.S. Environmental Protection Agency has conducted a Long-Term Hydrologic Monitoring Program (LTHMP) at and near the CNTA since 1972. This program has included collecting and analyzing groundwater samples for tritium and gamma-emitting radionuclides. The LTHMP sampling network currently consists of eight off-site sampling locations (six wells and two springs) and five on-site sampling locations (five wells). Since its inception, analytical results obtained from samples collected at the offsite locations have indicated no detections of radionuclides from the underground nuclear test using conventional analytical methods. In support of these data, a more refined monitoring network is being developed for CNTA that will focus the monitoring to wells within and near the UC-1 withdrawal.

### **Land Use**

The CNTA is on land administered by the U.S. Bureau of Land Management (BLM). DOE established two land withdrawals through Public Land Orders 4338 and 4748 in 1967 and 1969, respectively. Public land surrounding the CNTA is used for livestock grazing and ranching, with recreational use during hunting season. No major changes in land use are anticipated. The BLM approves all surface land uses, as long as it does not interfere with long-term performance and monitoring of the surface-remediated areas. Land associated with the remediated areas is restricted from any use that could alter or modify the buried contaminated soil.

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## ***Institutional Controls***

The CNTA has nine surface restricted areas where engineered institutional controls and notices are in place. These controls consist of warning signs, concrete monuments with attached warning signs, enclosures around soil contaminated with diesel fuel, and use restrictions that prohibit intrusive activities.

A notice of restrictions associated with the subsurface is provided on the monument at the emplacement borehole, now known as surface ground zero (SGZ). The restrictions on the monument prohibit unauthorized drilling, excavating, and removal of materials for a horizontal distance of 3,300 feet from SGZ. This distance extends beyond the current land withdrawal boundary.

## **Regulatory Setting**

Environmental restoration at CNTA is regulated under a 1996 Federal Facility Agreement and Consent Order (FFACO). The FFACO is a three-party compliance agreement between DOE, the State of Nevada, and the U.S. Department of Defense. The Nevada Division of Environmental Protection has regulatory authority over cleanup operations. As part of the FFACO, DOE's Office of Environmental Management was responsible for remediating the site and maintaining it in a manner protective of human health and the environment.

## **Legacy Management Activities**

On October 1, 2006, responsibility for the CNTA transferred from the DOE Office of Environmental Management to the DOE Office of Legacy Management. The Office of Legacy Management has responsibility for (1) developing and implementing a site-specific long-term surveillance and maintenance plan for the site, (2) accepting the transfer of records and real property, (3) managing site records, (4) implementing and managing existing agreements and programs with regulatory agencies, and (5) responding to stakeholder inquiries.

## **Contacts**

Documents related to the Central Nevada Test Area Site are available on the DOE Office of Legacy Management website at

<http://www.LM.doe.gov/land/sites/nv/central/central.htm>.

For more information about DOE Office of Legacy Management activities at the CNTA, contact

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