U.S. DEPARTMENT OF ENERGY | Legacy Management

Fact Sheet

Nevada Offsites

Central Nevada Test Area, Nevada

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 in the Hot Creek Valley of south-central Nevada, approximately 70 miles northeast of Tonopah. CNTA consists of three parcels of withdrawn federal land totaling 2,560 acres.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 The total acreage is currently withdrawn from all forms of appropriation associated with mining laws and leasing.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 CNTA in the early 1960s to develop alternative sites to the Nevada National Security Site (formerly known as the Nevada Test Site) for underground nuclear weapons testing. The 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. Three emplacement boreholes (UC-1, UC-3, and UC-4) were drilled on the three parcels. The underground nuclear test, identified as 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 Faultless test was estimated to be 0.2 to 1.0 megaton. The test resulted in a down-dropped fault block (also referred to as a graben) visible at land surface. It also created a cavity with a collapse chimney that extends into the overlying alluvium. The faulting and seismic results supported the indication that the site was not favorable for larger detonations. Two additional tests were planned (UC-3 and UC-4 boreholes), but no additional tests were conducted at CNTA.

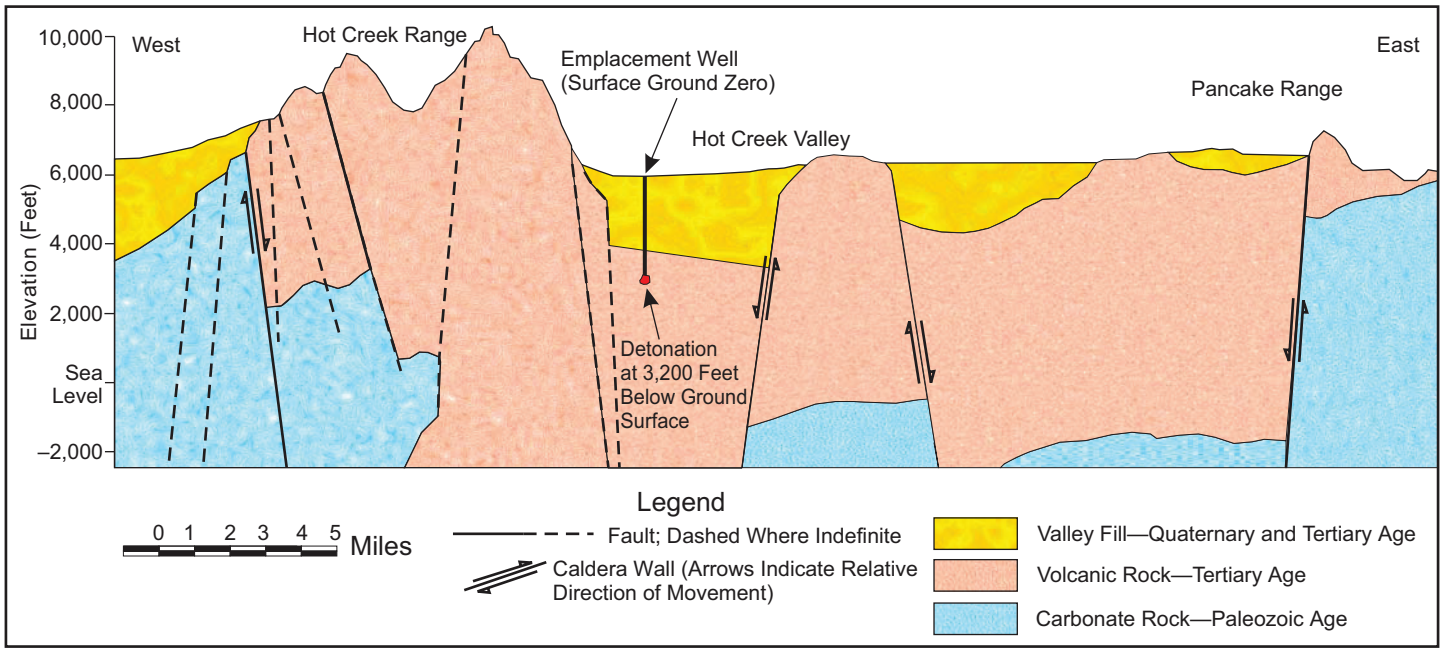
The Hot Creek Valley fill consists of poorly sorted alluvium composed primarily of volcanic rocks derived from the adjacent ranges. The alluvium is underlain by volcanic tuff and sedimentary rocks derived from volcanic material and welded tuffs interbedded within a volcanic rock sequence.

Location of the Central Nevada Test Area, Nevada

Groundwater occurs in both the alluvial and volcanic sections. The depth to groundwater near the UC-1 emplacement borehole is about 500 feet below ground surface.

Surface Conditions

Drilling operations associated with the three emplacement boreholes (UC-1, UC-3, and UC-4) 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



Cross Section of the Central Nevada Test Area

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 amounts of lead and chromium. DOE closed two of the corrective action sites (Central Mud Pit associated with the UC-1 emplacement borehole and Mud Pit C associated with the UC-4 emplacement borehole) by installing engineered caps and closed nine additional sites through use of institutional controls. The Closure Report for CAU 417 was approved by the Nevada Division of Environmental Protection (NDEP) in 2001. DOE conducts post-closure monitoring of the engineered caps in support of the surface closure.

Subsurface Conditions

Subsurface contamination that resulted from the underground nuclear test is identified as CAU 443. This CAU consists of test-related radionuclides in and around the test cavity. The original corrective action strategy for the subsurface used a groundwater flow-and-transport model to help evaluate data and select a corrective action alternative. Model results were used to estimate a contaminant boundary, or restricted region, surrounding the nuclear detonation. The contaminant boundary is a probabilistic, model-forecasted perimeter that represents the maximum extent that groundwater contaminated with test-related radionuclides exceeding Safe Drinking Water Act standards 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 NDEPboundaries of the down-dropped fault-block.

The original corrective action strategy required installation of three wells for the dual purpose of monitoring and validation of the groundwater flow and transport model. Monitoring data and modeling results were compared as part of the validation process. It was concluded that the model could not be validated because it failed to adequately predict head levels in wells drilled subsequent to the modeling effort. This led to a revised corrective action strategy designed to validate the compliance boundary through monitoring and institutional controls, rather than relying predominantly on the numerical flow and transport model. The revised approach included enhancements to the monitoring well network, updates to the site conceptual model, and 5 years of monitoring to confirm that data were sufficient to proceed to closure. The closure Report for CAU 443 was approved by NDEP in 2016. DOE conducts post-closure monitoring in support of the subsurface closure.

Long-Term Hydrologic Monitoring Program

The U.S. Environmental Protection Agency monitored groundwater quality at and near CNTA annually from 1972 until 2008 as part of its Long-Term Hydrologic Monitoring Program (LTHMP). This program has included collecting and analyzing groundwater samples for tritium and gamma-emitting radionuclides. The LTHMP sampling network historically consisted of eight offsite sampling locations (six wells and two springs) and five onsite sampling locations (five wells). Since the program's inception, analytical results using conventional analytical methods have detected no radio- nuclides related to the underground nuclear test in any of the samples collected from the offsite locations. In support of these data, DOE developed a more refined monitoring network for the site that focused on monitoring wells within and near the UC-1 withdrawal. These wells were monitored annually from 2009 through 2015, and are now monitored regularly in accordance with the Closure Report for CAU 443.

Land Use

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 CNTA is used for livestock grazing and ranching, with recreational use during hunting season. No major changes in land use are anticipated. BLM approves all surface land uses that do 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.

Institutional Controls

CNTA has 11 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 the Federal Facility Agreement and Consent Order (FFACO1996, as amended). The FFACO is a three-party compliance agreement between DOE, the State of Nevada, and the U.S. Department of Defense. NDEP has regulatory authority over cleanup operations. As part of FFACO, the DOE 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 CNTA transferred from the DOE Office of Environmental Management to the DOE Office of Legacy Management (LM). LM has responsibility for (1) developing and implementing a site-specific Long-Term Management 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

Site-specific documents related to CNTA are available on the LM website at http://www.lm.doe.gov/CNTA/Sites.aspx.

For more information about LM activities at CNTA, contact:

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