

Environmental Restoration Project



ER Site No. 109: Firing Site (Bldg 9956)

ADS: 1335

Operable Unit: Southwest Test Area

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Site History

Site 109 is located in the North Thunder Range, 0.4 mile east of Technical Area III and approximately 6,000 feet west of Lovelace Road. The site is approximately 0.27 acre.

The terrain is generally flat with a gentle slope to the west. Vegetation consists predominantly of grasses including grama, muhly, dropseed, and galleta. Shrubs commonly associated with the grasslands include sand sage, winter fat, saltbrush, and rabbitbush. Cacti are common, and include cholla, pincushion, strawberry, and prickly pear.

The geology (in general) is characterized by a veneer of aeolian sediments underlain by alluvial fan deposits. Based on drilling records of similar deposits at Kirtland Air Force Base (KAFB), the alluvial materials are highly heterogeneous, composed primarily of medium to fine silty sands with frequent coarse sand, gravel, and cobble lenses. Depth to groundwater is approximately 480 feet below ground surface (bgs) based on monitoring well, CWL MW-5, located at the [Chemical Waste Landfill](#), approximately 1.2 miles southwest of the site and monitoring well, MWL MW-4, located at the [Mixed Waste Landfill](#), approximately 1 mile west of the site.

ER Site 109 was operational from 1963 to approximately 1969. The site had two general test locations used to study shock wave phenomena from explosive tests. One area (test pits) was located south/southeast of Building 9950, and the other area was located on a test pad on top of Building 9950. Building 9950 is an earthen-covered bunker, bermed on three sides. The two test locations are discussed below.

Test Pits South/Southeast of Building 9950

Tests were conducted by burying a unit consisting of an explosive charge of beryllium (Be)-

containing metal sheets, called coupons, and then detonating the unit in a test pit. The explosive tests were performed in excavated pits south/southeast of Building 9950. The tests were conducted between 50 to 150 feet south/southeast of Building 9950 due to instrumentation cabling constraints. A typical experiment was set up in the bottom of a pit, covered with a plywood box, and then covered with sand bags. The test pits were excavated 8 feet deep, 6 feet long, and about 3 to 4 feet wide in native soil. Once a test pit was used, another one was excavated in the same area.

The coupons used in the tests were called beryllides, a material containing some (probably less than 20 percent by volume) beryllium and were 1.5 inches in diameter and 0.25 to 0.125 inch thick. The shaped charges used in the tests were pads approximately 6 inches in diameter, typically containing 15 to 20 pounds of explosives with a maximum of 30 pounds of explosives. The explosives used included baratol, trinitrotoluene (TNT), Composition B, Boracitol, plastic-bonded hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), nitroguanadine, and detasheet/detacord. All explosives used in the tests were completely consumed upon detonation. After the test, the residues in the test pit were analyzed, and the pit was backfilled. No post-test cleanup was performed.

Fifteen lithium hydride tests may also have also been conducted in similar pits. Supervisors at the site were not aware of any tests involving depleted uranium (DU) or any other radioactive materials.

Additionally, there was a steel-lined pit just south of Building 9950. The SNL/NM Safety Department had the pit filled in to eliminate a fall hazard. No surficial evidence of this pit remains at the site. Personnel who worked at the site said they had no idea what the steel lined pit could have been used for and that it was not used by their organization for explosive tests.

Tests Conducted on Top of Building 9950

Hundreds of tests were conducted on a pad on top of Building 9950. Building 9950 is an earthen-covered bunker, bermed on three sides, that served as the control bunker for tests performed at the site. Approximately four tests were conducted per day, two to three times per week. The "experimental" coupons used in the tests were made of aluminum or copper, and were typically 1.5 inches in diameter and 0.25 to 0.125 inch thick. Other materials used in tests included lead, carbon, carbon/glass, and stainless steel. Shaped charges consisting of an uncased pad of explosives, approximately 8 inches in diameter, were used in the tests. Approximately 30 pounds of explosives were typically used. Another reference stated that the tests were fairly small, typically involving only a couple pounds of explosives. The explosives used in the tests typically included baratol, RDX, and cyclotetramethylene tetranitramine. All explosives used in the tests were consumed upon detonation. Test debris was driven into the earthen roof and not off of the roof of the bunker. One reference stated that there may be some residual barium in the roof soils from the baratol.

Two tests involving DU were conducted on the pad on top of Building 9950, but the residue was cleaned up. Tests using nitroguanadine were also conducted on the ground surface at the base of the earthen berm on the south side of Building 9950. These tests involved approximately 30 pounds of explosives per shot.

One interviewee indicated that flyer plate experiments were conducted on the pad on top of Building 9950. Another interviewee indicated that the flyer plate experiments were performed on the mesa southeast of the building. The tests used an 8-inch diameter explosive charge to accelerate a flyer plate through the air to a target. Explosives used were baratol and TNT. Very few (less than six) experiments were conducted due to spalling of the flyer plates. The flyer plates were made of standard materials such as aluminum, copper, and 4340 steel.

Constituents of Concern

DU
High Explosives
Beryllium
Lead

Current Hazards

There are no current hazards at this site related to contamination of the surface or subsurface soils.

Current Status of Work

Site characterization sampling is complete. A confirmatory sampling no further action (NFA) was submitted to New Mexico Environment Department (NMED) in August 1997. In December 1999, following review of SNLs response to a Request for Supplemental Information (RSI), NMED indicated that the site was acceptable for NFA. The NFA was approved by NMED in July 2000 after completing the public review and permit modification process.

Future Work Planned

No further work is planned.

Waste Volume Estimated/Generated

No waste.

Information for ER Site 109 was last updated Jan 22, 2003.