ER Site No. 159: Bldg 935 Septic System

ADS: 1303
Operable Unit: Tech Area II

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Site History

Building 935 was constructed in 1963, and is located in the southwestern portion of Technical Area II (TA-II). It was a test facility for conducting experiments with electronic and explosive type neutron generators. The building is 1,875 sq. ft. and had space for an office, data acquisition and instrumentation, a machine shop, a restroom, a mechanical equipment room, an explosives assembly area, and three test cells. The building was originally designed with two test cells; a third was added in 1967. Engineering drawings also showed a darkroom sink; however, the darkroom never became operational. In addition to testing explosive type neutron generators, the facility supported other projects including preliminary packaging of neutron generators for environmental and systems tests; special weapon component testing using a centrifuge; and neutron measurements for Stockpile Integrated Laboratory Tests. Approximately 100 explosives test shots were conducted inside Building 935 each year, and electronic development work was occasionally conducted at the building. West of Building 935 was a 720-sq-ft trailer used for auxiliary storage and occasionally as a laboratory; two high explosives (HE) storage magazines (Buildings 936 and 937) are southeast of the building. These magazines housed explosive components used in the testing.

The neutron generator experiments were conducted in the test cells which have floor drains. Before the third cell was added in 1967, the drains discharged into a concrete-lined retention tank formerly located beneath the present location of the third test cell. The original retention tank was 27 cu ft and the liquid effluent discharged into an unlined, gravel-filled drywell west of the retention tank. During construction of the third test cell on the southwest side of Building 935, the original retention tank and drywell were moved southwest of the building. The test cell addition was constructed over the original locations of the retention tank and dry well. The present concrete-lined retention tank is visible on the surface and contains a metal discharge pipe that discharges into a gravel-filled drywell.

As a result of the neutron generator experiments, some fragments, including HE compounds, tritium, and possibly polychlorinated biphenyls (PCBs), may have been discharged into the floor

drains. In November 1989, the floor drains in the three test cells were sealed with metal plates and silicon sealant. Prior to sealing the test cell floor drain, standing water was observed in the drain trap. The origin of the water is not known.

The restroom and furnace room each contain floor drains; both drains discharged into the septic tank south of Building 935. The septic tank is a two-stage, below-grade, concrete tank with an estimated volume of 700 gallons, which discharged into a gravel-lined seepage pit. The seepage pit is 5-ft diameter by 13 ft-deep. In late 1991, the septic system for the building was shut down because potential contaminants were identified in the septic tank waste.

Experiments at Building 935 consisted primarily of explosively-activated neutron generators, which subsequently destroyed the test devices. The fragments were collected and disposed of offsite. Residual material from the experiments included metal that typically contained less than 100 microCurie activity of tritium. The amount of tritium released from an explosive neutron generator test was up to 4.8 microCurie. Building 935 was the largest single source of tritium waste (volume and total activity produced) at Sandia National Laboratories/New Mexico (SNL/NM).

The primary metals used in the neutron generator experiments included lead, zirconium, zinc, and lesser amounts of titanium, tin, niobium, and silver; and trace amounts of cobalt, bismuth, antimony, and manganese. Typical types of HE included hexanitrostilbene (HNS), hexanitroazobenzene (HNAB), TNT, and pentaerythritol tetranitrate (PETN). The amount of HE compounds used during these experiments was less than 2.5 grams. During an explosive test, carbon, water, nitrogen, and carbon monoxide were produced. Potting materials occasionally used with explosive neutron generators included epoxy resins, curing agents (diethanolamine hardener), and alumina (Al203).

The regional aquifer in the vicinity of ER Site 159 is within the upper unit of the Santa Fe Group. The depth to the regional aquifer in the nearest monitor well to ER Site 159(TA2-NW1-595) is approximately 520 feet (ft) below ground surface (fbgs) or 4,889.3 ft above mean sea level (famsl). A shallow water-bearing zone also exists in the vicinity of ER Site 159. The depth to the shallow zone ranges from approximately 267 to 320 fbgs (5,081 to 4,889 famsl). Monitor wells TA2-SW1-325, TA2-NW1-320, WYO-2, TA2-W-19, and TA2-W-01 are located in the vicinity of ER Site 159 and are screened in the shallow water-bearing zone. The area is essentially flat, with a gentle slope to the west of approximately 4 percent. Tijeras Arroyo, the largest drainage feature at SNL/NM, is located approximately one half mile from the site. The surface geology consists of unconsolidated alluvial and colluvial deposits derived from the Sandia and Manzanita Mountains. These deposits consist of sediments ranging from clay to gravel derived from the granitic rocks of the Sandia Mountains and greenstone, limestone, and quartzite derived from the Manzanita Mountains. Surficial deposits are underlain by the upper unit of the Santa Fe Group. In this area, the piedmont-slope alluvium may be up to 100 ft thick, and the upper Santa Fe unit is approximately 1,200 ft thick. The piedmont-slope alluvium, which was deposited by the ancestral Tijeras Arroyo, is generally coarse-grained sand and gravel. The upper Santa Fe unit was deposited from 5 to 1 million years ago and consists of coarse- to fine-grained fluvial deposits from the ancestral Rio Grande that intertongue with coarse-grained alluvial-fan/piedmont-veneer facies, which extend westward from the Sandia and Manzanita Mountains.

ER Site 159 is near the easternmost limit of the ancestral Rio Grande deposits. Several rift-bounding faults are located east of ER Site 159. The nearest is the Sandia fault-zone, characterized by north-trending, west-dipping normal faults. The westernmost fault is located approximately 1.2 miles east of the site.

Constituents of Concern

HE compounds
Metals (silver, lead, niobium, cobalt, bismuth, antimony, and zirconium)
Radionuclides, primarily tritium
Organic compounds from potting materials such as epoxy resins and curing agents
PCBs and oils

Current Hazards

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

Current Status of Work

Investigations to date have included passive soil vapor surveys, soil sampling, and surface radiation surveys.

Waste was removed from the septic tank, and the empty tank was inspected by New Mexico Environmental Department (NMED) in late 1995. Tank concrete samples were collected to verify that no COCs remain.

Based on an absence of contamination, ER Site 159 was proposed for No Further Action (NFA) in June 1995. Regulatory approval is pending results of the TA-II groundwater investigation.

Future Work Planned

Additional soil sampling was performed in 2000. An RSI data submittal with a revised risk assessment will be submitted to NMED.

Waste Volume Estimated/Generated

Sixteen drums of septic waste were generated and disposed.

Information for ER Site 159 was last updated Jan 24, 2003.