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Historical Investigation Report for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary

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EXECUTIVE SUMMARY

This historical investigation report presents the results of previous surface and subsurface investigation activities conducted for solid waste management units (SWMUs) and areas of concern (AOCs) at Technical Area (TA) 49 of the Los Alamos National Laboratory that are outside the TA-49 nuclear environmental site (NES) boundary. TA-49 was used in the early 1960s for underground hydronuclear and related experiments. The SWMUS and AOCs outside of the TA-49 NES boundary addressed in this report include AOCs 49-005(b) and 49-008(a) and SWMU 49-006 (located within Area 5); AOCs 49-007(a) and 49-008(b) (located within Area 6 East); SWMU 49-004 (located within Area 6 West); AOC 49-002 and SWMU 49-005(a) (located within Area 10); and AOC 49-007(b) (located in the Hazardous Devices Team training area, west of Area 5).

Previous investigation results indicate sporadic detection of inorganic chemicals above background values (BVs), isotopes of plutonium, americium, and cesium above fallout values (FVs) in surface soil, sporadic detection of inorganic chemicals above BVs in subsurface fill and rock, and sporadic detection of organic chemicals and isotopes of cesium and plutonium in subsurface soil, fill, and rock. Plutonium-239/240 is the radionuclide detected above its FV most frequently. Total uranium is the inorganic chemical detected above its BV most frequently. Polychlorinated biphenyls are detected at low concentrations in Area 5 surface soil [AOC 49-008(a)] at locations associated with former transformer pads.

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1.0 INTRODUCTION

This historical investigation report (HIR) presents the surface and subsurface sampling and field-screening data collected during the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) activities conducted in 1995 and 1996 for solid waste management units (SWMUs) and areas of concern (AOCs) outside the nuclear environmental site (NES) boundary at Technical Area (TA) 49 of the Los Alamos National Laboratory (LANL or the Laboratory). Environmental investigations performed at TA-49 before the RFI activities are also discussed. This report addresses only SWMUs and AOCs at TA-49 (at Areas 5 and 6 East, 6 West, and 10) that are outside of the NES boundary. A separate HIR is provided for TA-49 sites within the NES boundary (Areas 1, 2, 2A, 2B, 3, 4, 11, and 12). Sites within the NES boundary are defined as Hazard Category 2 (HC-2) nuclear environmental sites due to their underground radionuclide inventory exceeding U.S. Department of Energy (DOE) Standard 1027 thresholds. This HIR is provided in accordance with the March 1, 2005, Compliance Order on Consent (Consent Order). The Consent Order was issued pursuant to the New Mexico Hazardous Waste Act, New Mexico Statutes Annotated (NMSA) 1978, § 74-4-10, and the New Mexico Solid Waste Act, NMSA 1978, § 74-9-36(D).

The SWMUs and AOCs addressed in this HIR include the following: SWMU 49-006 and AOCs 49-005(b) and 49-008(a) (located within Area 5); AOCs 49-007(a) and 49-008(b) (located within Area 6 East); SWMU 49-004 (located within Area 6 West); SWMU 49-005(a) and AOC 49-002 (located within Area 10); and AOC 49-007(b) (located in the Hazardous Devices Team [HDT] training area, west of Area 5).

Area 5 served as the main control area for underground hydronuclear safety and related experiments conducted at TA-49 from 1959 to 1961. Many experimental support activities were also located in this area. Area 6 East served as a general support area that contained storage and office buildings, craft structures, and storage for construction materials. Area 6 West served as a landfill for nonhazardous wastes and as an open-pit burning area for combustible construction wastes. Area 10 includes a former underground calibration chamber used for calibrating experimental shots and a small debris landfill. With the exception of SWMUs 49-007(a) and 49-007(b), sporadic and noncontinuous areas of surface soil contaminated with low concentrations of hazardous (primarily metals) and radioactive materials have historically been associated with each SWMU or AOC. AOCs 49-007(a) and 49-007(b) are each associated with septic systems that accommodate sanitary waste from structures in Area 6 East and the HDT training area, respectively, and each currently has a status of no further action (NFA) (EPA 2005, 088464, p. 8). SWMUs and AOCs addressed in this report are summarized in Table 1.0-1.

The location of TA-49 is shown in Figure 1.0-1. The locations of SWMUs and AOCs at TA-49 are shown in Figure 1.0-2.

Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with DOE policy.

2.0 BACKGROUND

2.1 General Site Information

TA-49, also known as the Frijoles Mesa site, occupies approximately 1280 acres along the south-central boundary of the Laboratory (Figure 1.0-1). The mesa is centrally located on the Pajarito Plateau at an average elevation of approximately 7140 ft above sea level (asl). The plateau is roughly midway between the Jemez Mountains to the west and the White Rock Canyon of the Rio Grande to the east. TA-49 is

located within the Ancho, North Ancho, and Water Canyon watersheds. The northern boundary of TA-49 is defined by the edge of the Frijoles Mesa, which overlooks Water Canyon, and forms the southern boundaries of TA-15 and TA-37. State Highway 4 forms the southwest boundary of TA-49 as well as the Laboratory's boundary with Bandelier National Monument. The southeast boundary of TA-49 is formed by TA-39.

A period of intense experimental activity at TA-49 took place from late 1959 to mid-1961, during which hydronuclear and related experiments deposited significant amounts of plutonium, uranium, lead, and beryllium in underground shafts. Thirty-five hydronuclear experiments and nine related calibration, equation-of-state, and criticality experiments involving some fissile material were conducted in 3-ft or 6-ft-diameter shafts at depths ranging between 31 ft and 108 ft below ground surface (bgs) (Purtymun and Stoker 1987, 006688, p. 2). In addition, at least 23 additional underground containment, equipment development, and mockup experiments were also carried out, which involved high explosives (HE) and, in a few cases, very small amounts of uranium-238 or radioactive tracer but no fissile material (LANL 1992, 007670, p. 7-2). The majority of underground experiments were conducted in the central portion of TA-49 at Areas 1, 2, 2A, 2B, 3, and 4 (Figure 1.0-2), which are all within the NES boundary.

An unusual aspect of the hydronuclear safety experiments is that the use of special nuclear materials required a close accounting of the quantities of uranium, plutonium, lead, and beryllium used. The quantities and locations of these contaminants are thus well known.

Explosives used in the experiments consisted largely of 2,4,6-trinitrotoluene (TNT), 1,3,5-trinitroperhydro-1,3,5-triazine (RDX, or research department explosive), and 1,3,5,7-tetranitro-1,3,5,7-tetrazocane (HMX, or high-melting explosive). It is highly likely that the explosives were completely consumed by the detonations (LANL 1992, 007670, p. 3-8). Based on the detailed historical information available, it is evident that other chemicals were used in limited quantities at TA-49, primarily for radiochemistry and photographic purposes and likely limited to Areas 5 and 11 (LANL 1992, 007670, p. 3-8).

Areas 5 and 6 East, 6 West, and 10 served as support areas for the hydronuclear experiments, and no hydronuclear experiments were conducted within them.

2.2 Site Operational History

Before 1959, the Laboratory recognized there were potential safety problems with nuclear weapons in the nation's stockpile. These problems were related to the possibility of a significant nuclear yield as a result of accidental detonation of the device's HE component. The possibility of detonation during the assembly stage or while the device was stored in the arsenal required further investigation. Underground experiments were designed and conducted to assess this potential problem. Historical aspects of the decision to conduct the experiments are contained in a Laboratory report (Thorn and Westervelt 1987, 006672, pp. 1-3). The favorable environmental setting of Frijoles Mesa, combined with its relatively remote location and the flat terrain that afforded desirable operational characteristics, led to its selection for the experiments. TA-49 was created in fall 1959 and underground experiments were conducted through August 1961.

In 1962 and 1963, after the hydronuclear experiments were completed, experiments were performed in Area 10, which involved firing assemblies to release pressurized gas that drove pistons against water in cylinders (LANL 1992, 007670, p. 3-9). In 1965, a Laboratory group studying atmospheric phenomena conducted lightning observation experiments using a photographic tower that remained in Area 5 after the hydronuclear experiments (LANL 1992, 007670, p. 6.4-2).

Pulsed gas laser and shock tube experiments were conducted briefly in 1967 and 1968 in unidentified parts of TA-49 (LANL 1992, 007670, p. 3-9). In the early 1970s, additional atmospheric observations were conducted from the Area 5 tower, and further shock tube work was carried out at an unidentified location. In 1977, a seismic study of TA-49 was performed in an area extending eastward from Area 5. No waste units were impacted by the seismic studies because SWMU areas were avoided and because the explosive quantities were very small (LANL 1992, 007670, p. 3-9).

Currently, there are only a few on-site uses of TA-49. The Laboratory's High-Power Microwave Group, ISR-6, occasionally uses building 49-115 (located within Area 6 East) and its immediate vicinity for equipment development and the roadway between Areas 10 and 12 as a microwave test range. The Laboratory's Emergency Response Services Team uses building 49-113 (located in the HDT training area) and the associated HE magazine (structure 49-114) for small-scale explosives training exercises. Building 49-113 is also used for routine classroom training.

2.3 Site Descriptions

2.3.1 Area 5

Area 5 served as the main control area for the hydronuclear and related experiments conducted at TA-49 from 1959 to 1961 (LANL 1992, 007670, p. 6.4-2) (Figure 1.0-2). Many experimental support activities were also located in this area. Area 5 originally consisted of an approximately 250-ft × 300-ft-fenced area that was later expanded by an additional area of 90 ft × 150 ft to the northeast corner of the site. A 1960 site sketch shows 25 structures (mostly transportables such as trailers) (LANL 1992, 007670, p. 6.4-6) (Figure 2.3-1), located in the eastern half of Area 5. An elevated tower (building 49-96), located in the northwest corner of Area 5, was used to photograph hydronuclear and related experiments in Areas 1 through 4. Photographic activities probably occurred for the most part in a trailer (J-13-3) that contained a darkroom with a drainline (LANL 1992, 007670, p. 6.4-2). Trailer J-11-4 housed a radiochemistry laboratory. Waste chemicals from operations in the laboratory were bottled for off-site disposal (LANL 1992, 007670, p. 6.4-8). Lead sheets (used in trailers J-11-4 and J-16-8) and lead bricks were used as shielding during the counting of low-level radioactive samples. Lead bricks also were stored on the north edge of Area 5 (LANL 1992, 007670, p. 6.4-8).

The Zia Engineering diary (1960-1962, 098490) indicates that in November 1959, two 24-in.-diameter × 40-ft-deep sump holes were drilled in Area 5 (LANL 1992, 007670, p. 6.4-8). Engineering drawings indicate that drainlines were to be run from the photography trailer J-10-1 to a sump located under the scope rack (LANL 1992, 007670, p. 6.4-8). However, the exact number of sumps drilled and their ultimate use is unknown (LANL 1992, 007670, p. 6.4-8). No sumps are shown on any of the engineering drawings of Area 5 (LANL 1997, 056594, p. 67). The sumps possibly were used to dispose of small volumes of waste chemicals, notably, spent photographic solutions (LANL 1992, 007670, p. 6.4-8). Engineering drawings also showed that the underground counting room (structure 49-67) was equipped with a concrete sump for drainage collection. However, the small size of the sump (1.5 × 1.5 ft) indicates that the volume of collected liquids (if any) was very small (LANL 1997, 056594, p. 67). The basement of the counting room was later used as a debris landfill and subsequently listed as AOC 49-005(b) (see section 2.3.1.1).

Electrical transformers were located directly outside the northeast and northwest corners of the Area 5 fence (Figure 2.3-2). Transformer oil of unknown composition was used, but the volume is likely to have been very small (LANL 1992, 007670, p. 6.4-8).

During 1960 or 1961, an 8-ft-deep × 6-ft-diameter hole in the floor of structure 49-8 (also known as the shed, Figure 2.3-1) was used in calibration activities (LANL 1992, 007670, p. 6.4-2). Encapsulated cobalt-60 and polonium–beryllium radioactive sources were probably used for calibration work in this structure and in adjacent structure 49-17. These radioactive sources were later removed from the site (LANL 1992, 007670, 6.4-8). There is no historical or anecdotal reason to suspect that contaminant releases resulted from these sources (LANL 1992, 007670, p. 6.4-8).

Activities in Area 5 after 1961 were very limited, and almost all structures were removed or destroyed between 1961 and 1984, primarily during routine equipment removal in 1964 and major cleanup campaigns in 1971 and 1984 (LANL 1992, 007670, p. 6.4-9). Other combustible structures were destroyed by the La Mesa forest fire in June 1977 (LANL 1992, 007670, p. 6.4-8).

AOCs and SWMUs associated with Area 5 include a small debris landfill [AOC 49-005(b)], a suspected sump associated with photographic activities (SWMU 49-006), and surface-soil contamination associated with historical operations, including the two transformer pads [AOC 49-008(a)].

2.3.1.1 AOC 49-005(b): Landfill

The AOC 49-005(b) landfill is contained within the concrete-walled basement of the former Area 5 counting room (structure 49-67) (LANL 1997, 056594, p. 73), which was used to dispose of uncontaminated construction debris from 1984 cleanup operations at Area 5 (Figure 2.3-2). The landfill dimensions are less than 10 ft × 10 ft × 10 ft (LANL 1992, 007670, p. 6.4-9).

2.3.1.2 SWMU 49-006: Sumps

SWMU 49-006 includes sumps that may have been associated with the Area 5 darkroom and photographic operations. As previously discussed, historic engineering documents discuss the construction of two sumps in Area 5 in 1959, although no other existing records or drawings confirm the presence of these sumps. Photographic wastes may have been discharged to the sump via a drainline from the trailer. A radiochemistry laboratory in one of the trailers historically located in Area 5 was another potential liquid waste source, although this waste is believed to have been disposed of off-site (LANL 1992, 007670, p. 6.4-8). Operations in the radiochemistry trailer included dissolving samples in perchloric, hydrofluoric, and hydrochloric acids and extraction with organic solvents (LANL 1992, 007670, p. 6.4-8).

2.3.1.3 AOC 49-008(a): Area of Potential Soil Contamination

AOC 49-008(a) consists of the surface soil located within the fence of Area 5 that may have been impacted by historical operations at the site. This AOC includes two electrical transformer pads previously discussed. It is not known whether the transformer oil contained polychlorinated biphenyls (PCBs); however, the RFI work plan described oil staining on the concrete pad that housed the northwest transformer station (structure 49-14) (LANL 1992, 007670, p. 6.4-8), and PCBs were detected in surface soil around the transformer pad located outside the northwest corner of the Area 5 fence during 1995 surface RFI activities (see section 3.1.3).

2.3.2 Area 6

Area 6 is divided into two geographically separate areas referred to as Area 6 West and Area 6 East. Area 6 West includes SWMU 49-004, an inactive open burning area and landfill historically used for the disposal of solid wastes generated from TA-49 experimental activities, located on the far northwest side of TA-49 (Figure 1.0-2). Area 6 East is a general support area that included storage, office buildings, and craft structures, located approximately 1000 ft southeast of Area 6 West (Figure 1.0-2). Area 6 East

includes an area of potential soil contamination [AOC 49-008(b)] and a septic system [AOC 49-007(a)] and may also have historically been the site of a small lead-casting shop (LANL 1992, 007670, p. 6.3-12).

2.3.2.1 Area 6 West: SWMU 49-004, Burn Site, and Landfill

SWMU 49-004 was used from late 1959 to mid-1961 for open-pit burning of combustible construction wastes and for burial of uncontaminated wastes generated during hydronuclear and related activities in other areas of TA-49 (LANL 1992, 007670, p. 6.3-7). Wastes disposed of at SWMU 49-004 reportedly were screened for radioactivity before burial to verify they were uncontaminated (LANL 1992, 007670, p. 6.3-6).

SWMU 49-004 was reopened during 1971 to dispose of uncontaminated wastes generated during a cleanup of TA-49. Most of these wastes were from TA-49, Area 11. Similarly, the site was reopened during a 1984 general cleanup of TA-49 when a disposal trench 30 ft wide × 100 ft long × 15 ft deep was constructed for uncontaminated solid wastes (LANL 1992, 007670, p. 6.3-7). A geophysical survey of the landfill conducted in 1991 (see section 2.5.2) indicated that the total landfill dimensions are approximately 35 ft × 330 ft, with the northernmost detectable geophysical anomaly about 50 ft from the edge of Water Canyon (LANL 1992, 007670, p. 6.3-11) (Figure 2.3-3).

The RFI work plan (LANL 1992, 007670) describes four open trenches that were located west of the landfill (Figure 2.3-3), although not part of SWMU 49-004. The work plan also indicates that these previously undocumented trenches were identified from a review of historical aerial photographs. The trenches were not present in photographs taken in 1935 but were present in photographs taken in 1954, 1965, and 1977. Construction of these trenches, therefore, appears to predate activities at TA-49. The trenches were examined during a 1991 field inspection and noted to be approximately 10 ft wide × 4–6 ft deep × 50–100 ft long. One trench appears to have been backfilled, and one passes through a prehistoric ruin. No evidence of debris is present in or around the trenches. The trenches are conceivably related to mine-claim activities before the Atomic Energy Commission acquired the property in the 1940s. However, investigation of available regional mining records showed no reference to the TA-49 area (LANL 1992, 007670, p. 6.3-12). The work plan also noted that interviews and archive searches identified no additional information concerning the trenches (LANL 1992, 007670, pp. 6.3-11-6.3-12).

As part of the 1995 Phase I RFI, a radiological survey was performed on a 10-ft × 10-ft grid over the four open trenches. No radiologically contaminated areas were detected (LANL 1997, 056594, p. 53). In addition, a single auger hole drilled through the bottom of three of the trenches did not find any foreign debris. Based on these observations, there appeared to be no material buried in the trenches (LANL 1997, 056594, p. 53).

2.3.2.2 Area 6 East: AOC 49-008(b), Area of Potential Soil Contamination

AOC 49-008(b) is an area of potential soil contamination located within Area 6 East that may have resulted from historical operations. Area 6 East occupies an approximately 150-ft × 700-ft area developed as a general support area for hydronuclear testing at TA-49 from 1959 to 1961 (Figure 2.3-4). This site included storage and office buildings and structures used by carpenters and electricians. A small lead-casting shop may also have been operated at Area 6 East. Materials formerly stored at Area 6 East included cables, pipes, and sand for backfilling experimental shafts. In addition, an area of approximately 400 ft^2 was used to store lumber, fencing, and steel. To maintain a separation between construction support activities and experimental testing activities, as well as for security and safety reasons, Area 6 East was deliberately placed away from the central testing area. There were no documented releases during the period of operation. All structures were removed in 1977 (LANL 2004, 088048, p. 3).

After 1977, building 49-115 (used for equipment development and storage) and five storage trailers were located in the area. Currently, the area contains building 49-115 and four storage trailers.

The only known contamination incident at Area 6 East is described in the RFI work plan (LANL 1992, 007670). Some of the contamination related to a 1960 release of radioactive material from experimental shaft 2-M at Area 2 was reportedly tracked into Area 6 East. However, it is likely that this contamination was low level, very localized, and quickly cleaned up (LANL 1992, 007670, pp. 6.3-12-6.3-13).

2.3.2.3 Area 6 East: AOC 49-007(a) Septic System

AOC 49-007(a) consists of the area immediately around the Area 6 East septic tank that serves building 49-115 (LANL 1992, 007670, p. 8-2) (Figure 2.3-4). The septic tank was installed in 1985 and used as a holding tank until 1991 (LANL 1992, 007670, p. 8-2). During this time, the contents were pumped into septic truck collectors when necessary and disposed of off-site (LANL 1992, 007670, p. 8-2). The tank was subsequently connected to an evapotranspiration (ET) field completed in 1991 (LANL 1992, 007670, p. 8-2).

The RFI work plan (LANL 1992, 007670) indicates there is no evidence that hazardous or radioactive materials were ever associated with this septic system, and it is very unlikely the septic system is a release site (LANL 1992, 007670, p. 8-4). This SWMU was approved for NFA (EPA 2005, 088464). Consequently, it is not addressed further in this HIR.

2.3.3 Area 10

Area 10 is the site of AOC 49-002, an underground calibration chamber and elevator shaft used for experimental measurements and calibrations in support of hydronuclear tests. Area 10 is also the site of SWMU 49-005(a), a small pit landfill dug in 1984 to dispose of uncontaminated debris generated during cleanup activities.

2.3.3.1 AOC 49-002: Underground Calibration Chamber and Shafts

AOC 49-002 consists of an underground experimental chamber and two associated shafts within Area 10 (Figures 2.3-5 through 2.3-7). This site was used for calibration tests associated with hydronuclear experiments performed elsewhere at TA-49 in 1960 and 1961 (LANL 1992, 007670, p. 6.5-2). Each shaft is approximately 6 to 7 ft in diameter × 64 ft deep. One shaft was used as an elevator shaft to transport personnel and equipment. The elevator building located over the shaft has been removed. The other shaft is known as the calibration shaft. The shafts are connected at the bottom by a tunnel or gallery 4 ft wide × 7 ft high × 12 ft long. The calibration shaft was used to place a portable pulse neutron source over calibration samples placed in the calibration room, which is 14 ft in diameter × 10 ft high and lined with 8 in. of reinforced concrete faced with a 1-in. steel plate. A hydraulic lift platform at the bottom of the calibration room was connected to a hydraulic oil reservoir at the surface. Still present is a concrete pad around the tops of the shafts that served as a foundation for the elevator building and shielding wall. The elevator shaft is believed to still be open, while the calibration shaft is believed to have been backfilled with soil and crushed tuff. The entrances to both shafts have been covered with concrete radiation shields. Other surface features, including the hydraulic oil reservoir, have been removed.

Materials used during calibration tests at this site included uranium, beryllium, and lead (for shielding) (LANL 1992, 007670, p. 6.5-2). Occasionally, small amounts (e.g., milligram quantities) of enriched uranium were released through spallation from critical assemblies during tests, although this material generally was cleaned up. The total volume of hydraulic oil in the lift system is estimated to be less than 100 gal. and is not believed to contain PCBs (LANL 1992, 007670, p. 6.5-6). Use of the site after 1961 did

not involve hazardous materials, except possibly small radioactive sources used for radiochemical counting (LANL 1992, 007670, p. 6.5-2).

2.3.3.2 SWMU 49-005(a): Landfill

SWMU 49-005(a) is an inactive landfill located approximately 50 to 100 ft east of the Area 10 underground calibration chamber and shafts (Figure 2.3-5). The landfill, described as a small pit, was reportedly constructed in 1984 as a disposal area for nonradiologically contaminated debris that resulted from the 1984 general surface cleanup of TA-49 (LANL 1997, 056594, p. 25). The exact characteristics of these wastes are not known but are believed to have been primarily wood and small pieces of metal (LANL 1997, 056594, p. 28).

2.3.4 HDT Area: AOC 49-007(b) Septic System

AOC 49-007(b) consists of the area immediately around the septic tank that serves building 49-113 and the associated structure within the HDT training area (LANL 1992, 007670, p. 8-2) (Figure 2.3-8). Information for this SWMU is the same as for AOC 49-007(a) (Area 6 East); the septic tank was also installed in 1985 and used as a holding tank until 1991 (LANL 1992, 007670, p. 8-2). During this time, the contents were pumped into septic truck collectors when necessary and disposed of off-site (LANL 1992, 007670, p. 8-2). The tank was subsequently connected to an ET field completed in 1991 (LANL 1992, 007670, p. 8-2).

The RFI work plan (LANL 1992, 007670) indicates there is no evidence that hazardous or radioactive materials were ever associated with this septic system, and it is very unlikely the septic system is a release site (LANL 1992, 007670, p. 8-4). This SWMU was approved for NFA (EPA 2005, 088464). Consequently, it is not addressed further in this HIR.

2.4 Site Conditions

2.4.1 Soil

Soil within the TA-49 areas is disturbed but was originally composed of Hackroy Series and Typic Eutroboralf soil. Native soil and fill are intermixed with patches of bedrock, which occurs predominantly near the edges of the mesa east of developed TA-49 areas. Hackroy soil is classified as Alfisols, in part reflecting the clayey subsurface horizon, and is described in “Soil Survey of Los Alamos County, New Mexico” (Nyhan et al. 1978, 005702). The surface layer of the Hackroy soil is described as a brown sandy loam, or loam, about 10 cm thick. The subsoil is a reddish-brown clay, gravelly clay, or clay loam about 20 cm thick. The depth to tuff bedrock and effective rooting depth is 20 to 50 cm (Nyhan et al. 1978, 005702, p. 25). The fine-loamy Typic Eutroboralf soil consists of deep, well-drained soil that formed in material weathered from tuff on nearly level to gently sloping mesa tops. The surface layer is a very dark grayish-brown loam, sandy loam or very fine sandy loam, about 5 cm thick. The subsoil is a brown loam over a clay loam about 55 cm thick. The substratum is a brown gravelly clay loam over reddish clay, which may or may not contain pumice. Permeability is considered moderately slow (Nyhan et al. 1978, 005702, p. 32).

2.4.2 Surface Water

Most Los Alamos surface water occurs as streams that are ephemeral (flowing in response to precipitation), intermittent (flowing in response to availability of snowmelt or groundwater discharge), or interrupted (alternation of perennial, ephemeral, and intermittent stretches) in canyons cut into the Pajarito Plateau (Nylander et al. 2003, 076059.49, p. 4-1). Surface-water runoff and infiltration are the

critical components that influence the surface hydrology at TA-49. These mechanisms are the predominant pathways in which contaminants could be mobilized and transported away from the site. There are no perennial sources of water at or near the sites, and there is no current evidence of a hydraulic connection between the surface water and groundwater at TA-49 (Weir and Purtymun 1962, 011890; Purtymun and Ahlquist 1986, 014722). Runoff control is provided by drainage ditches along the roads within TA-49. The surface hydrology features relevant to the site include the following (LANL 1992, 007670, p. 4-12):

- Areas and pathways of surface water runoff and sediment deposition
- Rates of soil erosion, transport, and sedimentation
- Locations and sizes of areas of disturbed and undisturbed surface soil in drainages
- Infiltration versus runoff ratios
- Presence and effectiveness of sorptive media and/or hydraulic properties in retarding infiltration of waterborne contaminants
- Rate of infiltrating water on mesa tops.

2.4.2.1 Surface-Water Runoff

Surface-water runoff could potentially carry contaminants off-site. Surface-water runoff on Frijoles Mesa flows northward to Water Canyon, eastward into a tributary canyon of Ancho Canyon, or southward into Ancho Canyon (Figure 2.4-1).

Runoff from summer storms on Pajarito Plateau typically reaches a maximum discharge in less than 2 h and has a duration of less than 24 h (Purtymun et al. 1980, 006048, p. 1). When the discharge rate is high, surface-water flow can carry large amounts of suspended and bed load sediment as far as the Rio Grande. Spring snowmelt occurs at a much less intense rate (e.g., over a period of several weeks to months compared with a 24-h period). This lower flow rate results in movement of sediment but with less surface erosion than is seen during the summer storms. Both Ancho and Water Canyons, downgradient of TA-49, experience ephemeral flow caused by runoff during the intense summer storms and snowmelt events.

Historical sediment samples collected from sediment-sampling location AB-3N (Figure 2.4-1) has yielded radionuclide concentrations above background (LANL 2007, 098644) (see section 3.4).

2.4.2.2 Surface-Water Quality

Surface-water quality data have been collected periodically over the past 30 yr at the surface-water sampling location “Water at Beta” (located approximately 2000 ft north and upgradient of TA-49 (Figure 2.4-1) and for the previous 7 yr at the location “Water below MDA (Material Disposal Area) AB” in Water Canyon, downgradient of TA-49 (LANL 2007, 098644). Surface-water samples were also collected in drainages leading from TA-49 at surface-water/sediment-sampling locations AB-1, AB-2, AB-3, AB-5, and AB-8 (Figure 2.4-1) following intense rainfall events in 1987 and 1988 but have not been collected in following years.

Although the RFI work plan (LANL 1992, 007670) indicated that no contamination of surface water by TA-49 contaminants had been indicated before 1992, concentrations of gross alpha, gross beta, isotopic plutonium, isotopic and total uranium, barium, and lead have been detected in surface-water samples collected periodically at Water at Beta and at Water below MDA AB from April 2000 to March 2007 (LANL 2007, 098644). Results for surface-water samples are addressed in section 3.4.

2.4.2.3 Surface-Water Infiltration

Surface-water infiltration provides a potential mechanism by which contaminants may move into the subsurface (LANL 1992, 007670, p. 4-13). Surface-water infiltration studies conducted at Pajarito Canyon have indicated that infiltration through mesa-top soil into the tuff is not significant (LANL 1992, 007670, p. 4-13). Surface-water infiltration pathways at TA-49 include

- native or disturbed soil,
- intact tuff,
- backfilled shafts, and
- fractured systems and boreholes.

ET processes limit the transfer of water to the Bandelier Tuff. The characteristics of the tuff (naturally low moisture content and high porosity) provide a large storage capacity for infiltrating fluids and likely inhibit infiltrating liquids from penetrating the thick unsaturated zone at TA-49 (LANL 1992, 007670, p. 4-14).

Site hydrogeologic characterization of TA-49 and periodic groundwater monitoring were conducted during a cooperative effort between the U.S. Geological Survey and the Laboratory, starting before TA-49 experiments began in late 1959 and continuing until 1970 (LANL 1992, 007670, p. 7-16). The initial investigation focused on ensuring that residual materials left in the experimental shafts would be contained indefinitely. The fundamental conclusion of these studies was that “recharge to the groundwater from Frijoles Mesa is very small or nonexistent; thus no contaminants in solution are likely to be carried to the groundwater beneath TA-49” (LANL 1992, 007670, p. 7-16).

2.4.3 Subsurface Conditions

The subsurface hydrology at TA-49 is dominated by unsaturated conditions. The upper 800 ft of the unsaturated zone is within the Bandelier Tuff (LANL 1992, 007670, p. 4-18). The top of the saturated zone (regional aquifer) occurs approximately 1170 ft below the surface of the mesa at deep test well DT-5A (Figure 2.4-2).

Relatively small volumes of water move beneath mesa tops on the Pajarito Plateau under natural conditions due to low rainfall, high evaporation, and efficient water use by vegetation. During wetter years, vegetation growth is enhanced and is capable of removing larger volumes of available moisture. Atmospheric evaporation may extend within mesas, further inhibiting downward liquid flow (Rogers and Gallaher 1995, 049824, p. 27). The water content of tuff in the unsaturated zone has generally been measured monthly or bimonthly within and around Area 2 at TA-49 since 2000 and tends to be low, between 5% and 10% by volume under natural conditions (LANL 2005, 092389, pp. A-1-A-3).

2.4.3.1 Geology

TA-49 lies on the east side of the Jemez Mountains volcanic field and on the western perimeter of the Española Basin of the Rio Grande rift. Factors that may affect the actual geometry and distribution of subsurface units beneath TA-49 include abrupt lateral and vertical facies variations in rock units, significant relief on paleotopographic surfaces on which rock units were deposited, and fault offsets in the older units that are masked by younger rocks. Exposed rock in the TA-49 vicinity is composed entirely of the Tshirege Member of the Bandelier Tuff (LANL 1992, 007670, p. 4-33).

In 1959 and 1960, five deep test wells (DT-5, DT-5A, DT-5P, DT-9, and DT-10) were drilled through Frijoles Mesa to determine the thickness of the tuff and volcanic sediment, to determine the hydrologic characteristics of the regional aquifer, and to test for the presence of perched water. No perched water was found beneath the zone of saturation, which is 1000 to 1200 ft below the mesa surface of TA-49 (Weir and Purtymun 1962, 011890, p. 5). Three of the five deep test wells (DT-5A, DT-9, and DT-10) were drilled into the regional aquifer and are used as groundwater-monitoring wells. The locations and basic construction of the three deep test wells are shown in Figures 2.4-2 and 2.4-3, respectively. Well details are summarized in Table 2.4-1.

During the initial site characterization in 1959 and 1960, four core holes (CH-1, CH-2, CH-3, and CH-4) were drilled beneath Areas 1, 2, 3, and 4, respectively, and cased with 2-in. galvanized pipe (Weir and Purtymun 1962, 011890, p. 29). The core holes, which ranged in depth from approximately 300 ft bgs (CH-3 and CH-4) to 500 ft bgs (CH-1 and CH-2), were drilled in the centers of the four main experimental shaft areas to detail the geologic and hydrologic characteristics of the underlying tuff. The surface geology of the area was mapped and correlated with subsurface geology, as determined from logs of the test wells and other holes. Core hole locations are shown in Figure 2.4-2. Core hole details are summarized in Table 2.4-1.

Using the 1960's nomenclature defined by Weir and Purtymun (1962, 011980), the rock column (from youngest to oldest) beneath TA-49 consists of the following.

- Approximately 640 to 670 ft of the Tshirege Member of the Bandelier Tuff is divided into six units, based mainly on physical and mineralogical characteristics imparted by cooling. These units include multiple rhyolitic ignimbrite flow units, a widespread pyroclastic surge bed up to several feet thick, and numerous thin discontinuous surge deposits.
- Approximately 200 ft of the Otowi Member of the Bandelier Tuff—The Otowi Member also includes up to 91 ft of the Guaje Pumice Bed.
- Approximately 500 to 600 ft of deposits consists of interbedded Puye Formation conglomerates and Tschicoma Formation latites and quartz latites.
- Approximately 50 to 90 ft of the Totavi Lentil conglomerate (of the Puye Formation) consists of characteristic quartzite cobbles and other typical Precambrian lithologies.
- There is an undetermined thickness (at least 290 ft) of undivided siltstones and sandstones of the Santa Fe Group.

Three additional boreholes (Alpha, Beta, and Gamma) were drilled in 1960 to provide additional geologic information (Weir and Purtymun 1962, 011890, pp. 27-28). Alpha was drilled just east of Area 5, Beta was drilled into the floor of Water Canyon, and Gamma was drilled into the floor of Ancho Canyon. Locations for these boreholes are shown in Figure 2.4-2. Borehole details are summarized in Table 2.4-1.

In 1994, a 700-ft borehole (location 49-02901) was drilled in Area 12, southeast of Area 2 (Figure 2.4-2), to provide supplementary geologic information. Stimac et al. (2002, 073391, p. 1) produced a report that details the petrologic log of borehole location 49-02901 (Figure 2.4-4). Using both geologic field observations of adjacent canyons and geologic logs from borehole location 49-02901, this study found the following.

- The exposed bedrock stratigraphic sequence in Water Canyon was restricted to units of the Tshirege Member of the Bandelier Tuff. The Tshirege Member consists of multiple ash flows that form a series of steplike vertical cliffs and sloping ledges along canyon walls. Canyon exposures

immediately north of borehole location 49-02901 consisted of, in descending order, units Qbt 4, Qbt 3, Qbt 2, Qbt 1v, and Qbt 1g of the Tshirege Member (Stimac et al. 2002, 073391, p. 1).

- The borehole extended beneath the level of adjacent canyon floors; therefore, several unexposed units were discovered. These unexposed units included, in descending order, the Tsankawi Pumice Bed, tephras and volcaniclastic sediment of the Cerro Toledo interval, and the Otowi Member of the Bandelier Tuff (Stimac et al. 2002, 073391, p. 1). The bottom of the borehole was terminated in the Otowi Member.
- Preliminary examination of moisture content indicated some lithologic control. The most prominent features of the moisture data indicated an abrupt increase in moisture content at the transition of the glassy (Qbt 1g) to devitrified (Qbt 1v) Tshirege Member and at the Tsankawi Pumice Bed (Stimac et al. 2002, 073391, p. 1).

In 1995, geologic logs, well construction records, and locations of wells drilled in Los Alamos were compiled and updated to address the evolution and current geologic nomenclature of the area (Purtymun 1995, 045344). These data were reinterpreted to match the stratigraphy reported in the Broxton and Reneau report (1995, 049726). Updated geologic nomenclature for the deep test wells and select boreholes within TA-49 are shown in Figures 2.4-4 through 2.4-14.

2.4.3.2 Groundwater

Alluvial Aquifers

Surface-water infiltration creates small, localized saturated zones in the alluvial fill of the canyon bottoms of Pajarito Plateau (LANL 1992, 007670, p. 4-21). Water infiltrates (LANL 2005, 092389) through the alluvium until it reaches less permeable layers, which slow or impede flow. The size of the perched water zones is affected by the rate of ET and the movement of water into underlying rock.

Three shallow monitoring wells installed in Water Canyon downgradient of TA-49 encountered no perched water zones during drilling activities in 1990 (LANL 1992, 007670, p. 4-21). Springs and seeps are known in the lower reaches of Water and Ancho Canyons, far downgradient of TA-49 (near the Rio Grande), but none have been identified within the boundaries of TA-49.

Lateral groundwater flow occurs between stratigraphic permeability barriers within the Bandelier Tuff. Lateral discharges from canyon walls or canyon bottoms could provide a potential for contaminant transport but has not been documented and is not likely, given the current average annual rainfall and infiltration quantities seen at TA-49 (LANL 1992, 007670, p. 4-21).

Perched Groundwater

The three test wells (DT-5A, DT-9, and DT-10), and other boreholes drilled within TA-49 have not indicated the presence of perched water in tuff or volcanics above the regional aquifer in spite of the presence of potential perching beds (Purtymun and Stoker 1987, 006688, p. 8). Perched groundwater beneath TA-49 also has not been indicated during subsurface moisture monitoring conducted at TA-49 from 2000 to 2005 (LANL 2005, 092389). The absence of perched water indicates that no recharge to the regional aquifer occurs through the Pajarito Plateau in the vicinity of TA-49 (Purtymun and Stoker 1987, 006688, p. 8).

Regional Groundwater

The regional aquifer of the Los Alamos area occurs at a depth of 1200 ft asl along the western edge of the Pajarito Plateau, 1000 ft asl beneath the mesa tops in the central part of the plateau, and 600 ft asl along the eastern edge (LANL 2006, 093925, p. 118). The regional aquifer is the only aquifer in the area capable of serving as a municipal water supply (LANL 2006, 093925, p. 118). Beneath TA-49, the potentiometric surface of the regional aquifer lies completely within the Puye sediment and the Cerros del Rio basalt. The regional groundwater moves eastward and discharges into the Rio Grande through seeps and springs (Purtymun and Ahlquist 1986, 014722, p. 8). Historically, water levels measured in the three deep test wells (DT-5A, DT-9, and DT-10) have indicated that the regional aquifer is at a depth of approximately 1170 ft bgs near the center of the four experimental areas (Purtymun and Ahlquist 1986, 014722, p. 8). The test wells and other holes drilled in the area indicated no perched water in the tuff or volcanics above the regional aquifer in spite of the presence of potential perching beds (Purtymun and Ahlquist 1986, 014722, p. 8).

Aquifer performance tests performed using the three deep test wells at TA-49 (DT-5A, DT-9, and DT-10) found the average groundwater velocity to be 345 ft/yr in the upper 490 ft of the aquifer. The gradient on the upper surface of the aquifer was approximately 40 to 60 ft/mi beneath the western and central part of the plateau in the volcanic sedimentary portion and then steepened to approximately 80 to 120 ft/mi as the aquifer moved in less permeable sediment of the Tesuque Formation (Purtymun and Ahlquist 1986, 014722, pp. 8-9).

Well DT-5A has shown an approximate 4-ft water-level decline from 1960 to 1964. This decline was attributed to pumping of supply wells located to the north. From 1960 to 1982, well DT-9 was instrumented with a water-stage recorder. The instrument indicated a 3-ft water-level decline during the 21-yr period. At well DT-10, water levels dropped 0.5 ft/yr from 1960 to 1967. The decreases in water level reflect the normal deep, groundwater-level trend for the region (Purtymun and Ahlquist 1986, 014722, p. 9). The wells have shown an approximate 12 to 16 ft overall water-level decline from 1960 to 2006 (LANL 2007, 095364). Figure 2.4-15 shows the elevation of the top of the regional aquifer and groundwater-flow direction at the Laboratory in March 2006 as reported in the 2007 general facility information document (LANL 2007, 095364, p. C-15).

General Groundwater Chemistry

Test wells DT-5A, DT-9, and DT-10 have been sampled approximately on an annual basis for general chemistry parameters from 1960 to 2007 (LANL 2007, 098644). Results of this sampling are currently reported in the Laboratory's annual environmental surveillance report (LANL 2007, 098644). Purtymum and Ahlquist (1986, 014722) reported water from the test wells is of a sodium-bicarbonate type and is similar for all three wells. Although not presented in this report, results of environmental surveillance sampling also show that total dissolved solids (TDS) generally has not exceeded 200 mg/L in these wells (LANL 2007, 098644).

2.5 Historical Investigation Activities

Environmental investigation activities at TA-49 began in 1959 during initial site development activities in support of the hydronuclear safety experiments. The majority of TA-49 field activities were conducted from 1993 to 2006 and were completed to meet the objectives of the RFI work plan (LANL 1992, 007670). Field-investigation activities for sites outside the NES boundary were conducted primarily during 1995 and 1996 as part of the RFI. The following sections provide a summary of the previous investigation activities completed to date at TA-49 sites outside the NES boundary. Specific field-sampling locations and analytical data generated during investigation activities are addressed in section 3.0.

2.5.1 Pre–RFI Activities

A surface-soil and vegetation investigation was conducted in 1987 by the Laboratory's Environmental Surveillance Group. This investigation, also referred to as the A411 survey, included sites within the NES boundary (Areas 1, 2, 2A, 2B, 3, 4, 11, and 12) and Area 6 West (SWMU 49-004). Results of this investigation indicate that localized and discontinuous but elevated levels of radionuclides, lead, and beryllium are present in surface soil at SWMU 49-004 (LANL 1992, 007670, p. 6.3-7).

2.5.2 Area 6 Geophysical Survey

In June 1991, a geophysical survey was carried out at the Area 6 open burning/landfill area (SWMU 49-004) to define the limits of the landfill (LANL 1992, 007670, p. 6.3-7). Strong magnetic and electromagnetic anomalies were observed for this area, likely a result of the considerable quantities of cable and other metallic debris known to be buried in the landfill (LANL 1992, 007670, p. 6.3-7). The results of this survey indicate that the total landfill dimensions are approximately 35 ft × 330 ft, with the northernmost detectable geophysical anomaly about 50 ft from the edge of Water Canyon (LANL 1992, 007670, p. 6.3-11). Attempts to use ground-penetrating radar to define the depth of the detected metal were unsuccessful, but a minimum of 4 ft of overfill is estimated (LANL 1992, 007670, p. 6.3-11).

2.5.3 1995 RFI Activities

RFI Phase I activities were conducted in 1995 at sites outside the NES boundary to assess whether chemicals of potential concern, including organic chemicals, inorganic chemicals, and radionuclides, were present above background concentrations and/or screening levels. Specifically, the objectives of the RFI were to

- confirm the nature of the contamination,
- determine the extent of contamination, and
- assess the potential for migration of contamination.

Investigation activities included radiological surveys and the collection of surface-soil and borehole samples for laboratory analysis of organic chemicals, inorganic chemicals, and radionuclides.

2.5.3.1 1995 Surface RFI

In 1995, a radiological survey was performed at Areas 5, 6, and 10 using a Violinist III Field Instrument Detecting Low Energy Radiation (FIDLER). The purpose of the survey was to detect the presence of low-energy, gamma-emitting radionuclides in surface soil. An area of elevated radioactivity was defined as having a FIDLER measurement corresponding to an activity of 10 pCi/g or greater (LANL 1997, 056594, p. 6). Soil was screened for plutonium-238, americium-241, and cesium-137. Results of the field screening were compared against site background concentrations.

With the exception of elevated concentrations of radionuclides at sporadic locations in the Area 6 open burning/landfill area (SWMU 49-004), no radionuclides were detected above BVs.

RFI surface sampling included the collection of surface-soil samples (0 to 6 in. bgs) from the Area 5 area of potential soil contamination [SWMU 49-008(a)], the Area 6 West open burning/landfill area (SWMU 49-004), the Area 6 East area of potential soil contamination [AOC 49-008(b)], the area around the Area 10 calibration chamber and elevator shaft (AOC 49-002), and the surface intervals of boreholes drilled in the Area 10 landfill [SWMU 49-005(a)]. Soil samples were generally submitted for analysis of inorganic chemicals (primarily target analyte list [TAL] metals) and radionuclides. and Area 5 transformer

pads [surface soil associated with SWMU 49-008(a)] and Area 10 former hydraulic reservoir (surface soil associated with AOC 49-002) were analyzed for semivolatile organic compounds (SVOCs) and PCBs. Surface soil from the Area 10 landfill [SWMU 49-005(a)] was also analyzed for SVOCs.

Results for surface RFI results are presented in section 3. RFI data presented in this report are also provided in Appendix B.

2.5.3.2 Subsurface RFI

RFI subsurface sampling activities included the collection of core samples from boreholes installed in the Area 5 landfill [AOC 49-005(b)] and sump (SWMU-49-006), the Area 6 West open burning/landfill area (SWMU 49-004), and the Area 10 landfill [SWMU 49-005(a)]. Samples were submitted for analysis of radionuclides, inorganic chemicals (primarily TAL metals), and SVOCs.

Results for subsurface RFI results are presented in section 3. RFI data presented in this report are also provided in Appendix B.

2.5.4 Investigations at Borehole Location 49-02901

This section describes additional investigation activities that were conducted at borehole location 49-02901. Although this borehole is located in Area 12, an area within the NES boundary not discussed in this report, information generated from these investigations provide TA-49 sitewide information relevant to all TA-49 SWMUs and AOCs.

In November 1997, the casing in borehole location 49-02901 was removed, and permeability, anemometry, and caliper measurements were made throughout the open borehole. The anemometry and permeability measurements are intended to provide a better understanding of the air-flow characteristics of the tuff at depth, projecting well below the adjacent canyon floor. Results of the study indicated high borehole production in areas that detected high permeabilities, although measurements near the bottom of the borehole are suspect because the borehole was enlarged beyond the sealing range of the packers used to conduct the tests (Wykoff et al. 1998, 098069).

In December 1997, a sensor bundle with thermocouple psychrometers, gypsum blocks, and platinum resistance temperature detectors was installed in the borehole for measurements of matric potential and temperature at 11 depths. Results of these tests are summarized in Mason and Lowry (1998, 098323).

Neeper and Gilkeson (1996, 070104) analyzed core data collected from borehole location 49-02901 and from boreholes in other material disposal areas at the Laboratory to provide total head gradients with depth. These data indicate that water flow is generally downward but with gradient reversals that may be due to atmospheric venting through boreholes or exposure to canyon walls. Gradient reversals present barriers to downward aqueous transport of contaminants.

Newman et al. (1997, 059371) estimated water fluxes based on chloride and stable isotope analysis of core collected from borehole location 49-02901 and from a 139-ft deep borehole located near well DT-10, known as TDBM-1. Chloride-based flux estimates for the zone above the Qbt 1v–Qbt 1g contact (also known as the vapor-phase notch) for both boreholes ranged from 0.01 to 0.2 cm/yr. These low flux rates are likely the result of evaporative removal of water in the mesa. Heavy stable isotope values from borehole location 49-02901 support this interpretation. Flux estimates for the zone below the Qbt 1v-Qbt 1g contact in borehole location 49-02901 ranged from 0.24 to 1 cm/yr. These deeper rates are likely apparent flux rates and may represent past conditions during the late Pleistocene and early Holocene epochs.

Chloride profiles for the two boreholes showed similar behavior in the top 30 ft. Below this depth, TDBM-1 showed a greater accumulation of chloride in Qbt3 3 than borehole location 49-02901 and indicates that water moves more slowly in the vicinity of TDBM-1. The difference in chloride concentrations and flux rates is probably caused by higher evaporation rates at TDBM-1 as a result of its proximity to the side of Frijoles Mesa. The chloride profiles were consistent with deep, as opposed to surface, evaporation effects, with water being removed from the mesa through vertical or horizontal fractures, or through high-permeability zones that are exposed on the mesa sides. In addition, borehole location 49-02901 had occurrences of isotopically heavy water below a depth of 50 ft, which are indicative of deep evaporation (Newman et al. 1997, 059371).

2.6 Environmental Surveillance and Monitoring Activities

2.6.1 Sediment and Surface-Water Monitoring

A sediment-sampling program was initiated by the Laboratory's Environmental Studies and Assessment Group in 1979. Twelve sediment stations were set up in and around TA-49 (Figure 2.4-1). Radionuclide analyses conducted annually at these stations since 1979 have included cesium-137, plutonium-238, plutonium-239/240, gross alpha, gross beta, gross gamma, and total uranium. Americium-241 and strontium-90 were added to the analytical suite in 1992. The most recent data are reported in the 2006 environmental surveillance report (LANL 2007, 098644) and are addressed in section 3.4.

2.6.2 Groundwater Monitoring

A groundwater-monitoring program was initiated at wells DT-5A, DT-9, and DT-10 in 1960. Groundwater samples are collected as part of annual environmental surveillance monitoring activities. Filtered and unfiltered groundwater samples from these locations are typically analyzed for general inorganic chemicals, explosive residues, metals, pesticides, PCBs, radiochemicals, SVOCs, and VOCs. The most recent data are reported in the 2006 environmental surveillance report (LANL 2007, 098644) and are addressed in section 3.4. Wells DT-5A, DT-9, and DT-10 are also monitored as part of the "2007 General Facility Information" (LANL 2007, 095364), which is required under the Consent Order. Results are reported as part of the periodic monitoring reports for Ancho Watershed.

3.0 INVESTIGATION RESULTS

Inorganic chemicals and radioactive isotopes of plutonium, americium, and cesium have been sporadically detected above background values (BVs) or fallout values (FVs) during previous investigations in surface-soil samples collected from SWMUs and AOCs outside the NES boundary. Inorganic chemicals have been detected sporadically above BVs in subsurface fill and rock; organic chemicals and isotopes of cesium and plutonium have been sporadically detected in subsurface soil, fill, and rock.

Samples collected from TA-49 have undergone analyses at both on-site and off-site laboratories. Because analytical practices and documentation of analyses vary in quality and completeness, analytical data presented in this report are either screening-level or decision-level quality. Screening-level data are appropriate for applications that only require determination of gross contamination areas and/or for site characterization. Screening-level data are often used to specify areas to collect decision-level sample data. Decision-level data are documented as appropriate for uses that require both hazardous substance identification and concentration. Decision-level data are also used to quantify the nature and extent of releases. Table 3.0-1 presents the analytical suite and request numbers of each sample collected from SWMUs and AOCs outside the NES boundary from which decision-level data were obtained. Table 3.0-2

presents the analytical suites and request numbers of each sample collected from SWMUs and AOCs outside the NES boundary from which screening-level data were obtained.

Inorganic chemical and radionuclide analytical results from previous investigations were compared with BVs and FVs (LANL 1998, 059730). Organic chemicals and anthropogenic radionuclides in soil deeper than 6 in. or in rock are considered to be present if they are detected.

In 1993, nine surface-soil samples were collected within TA-49 from undisturbed areas with no known contamination (Figure 3.0-1). Samples were submitted for laboratory analysis of metals, tritium, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Several inorganic chemicals and radionuclides were detected above BVs or FVs. Screening-level results are presented in Tables 3.0-3 and 3.0-4.

This section provides a summary of sampling results from pre–RFI and RFI activities conducted at each SWMU or AOC outside the NES boundary.

3.1 Area 5

Sample collection activities were conducted at two locations (49-05078 and 49-05079) within the Area 5 landfill [AOC 49-005(b)] and at one location (49-05095) associated with the suspected Area 5 sump (SWMU 49-006). These activities and results are addressed independently of surface-soil samples collected from AOC 49-008(a), potential soil contamination within Area 5.

3.1.1 AOC 49-005(b): Landfill

During the 1995 Phase I RFI, a radiological survey was conducted with both a FIDLER portable gamma spectrometry meter and by collecting soil samples. No radiological contaminated areas were identified and none of the measurements exceeded background. Based on the FIDLER survey results, no soil sampling sites were selected (Blair 1996, 055332, pp. 6-7).

Two boreholes were installed within the concrete-walled basement of the counting room, which forms the boundary of the landfill. Core samples collected from the boreholes were screened for beta/gamma radiation and VOCs. Alpha activity from the cores was not detected, and the beta/gamma measurements ranged between 120 and 200 counts per minute (cpm), which were within the normal background range of 150 to 250 cpm. All photoionization detector (PID) measurements of organic vapors were less than 1 part per million (ppm). Boreholes could only be drilled to a depth of 5 ft due to an obstruction assumed to be the concrete floor of the former counting room basement (LANL 1997, 056594, p. 74). Two surface-soil samples and two subsurface fill samples were submitted for laboratory analysis of metals, gamma-emitting radionuclides, and isotopic plutonium. Two surface-soil samples were submitted for analysis of total uranium, and two subsurface fill samples were submitted for analysis of SVOCs. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.1-1. Organic chemical sampling locations are shown in Figure 3.1-2. Radionuclide sampling locations and detected results are shown in Figure 3.1-3. All results obtained from AOC 49-005(b) are decision-level quality.

No SVOCs were detected in samples collected at AOC 49-005(b). Although mercury and thallium were not detected, detection limits for these analytes were above BVs in several samples. Potassium was detected above BV in one surface-soil sample. Total uranium was detected above BV in two surface-soil and two fill samples. Cesium-137 and plutonium-238 were each detected in one fill sample; plutonium-239/240 was detected in two fill samples.

Tables 3.1-1 and 3.1-2 summarize the frequency of inorganic chemicals and radionuclides, respectively, detected or detected above BVs in samples collected from AOC 49-005(b). Tables 3.1-3 and 3.1-4 present the inorganic chemical and radionuclide results, respectively, detected or detected above BVs at AOC 49-005(b).

3.1.2 SWMU 49-006: Sump

A 1995 Phase I investigation activities consisted of performing a radiological survey of the site and installing a borehole at the suspected sump location. Because no records defined the sump location, the sample location was based on the presence of vegetation believed to indicate increased moisture infiltration associated with a sump. This sample location was also near the location of the former photography trailer. One 10-ft deep borehole was drilled at this location, and a sample was collected at the surface. A second sample was collected from the 5- to 10-ft-depth interval. Each sample was field screened for beta/gamma radiation and VOCs and submitted for analysis of gamma-emitting radioisotopes, isotopic plutonium, and metals. The surface-soil sample was submitted for analysis of total uranium. The subsurface rock sample was submitted for analysis of SVOCs. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.1-1. Organic chemical sampling locations are shown in Figure 3.1-2. Radionuclide sampling locations and results detected are shown in Figure 3.1-3. All results obtained from AOC 49-006 are decision-level quality.

No organic chemicals were detected in samples collected at SWMU 49-006. Although antimony, mercury, selenium and thallium were not detected, detection limits for these analytes were above BVs in several samples. Cadmium, copper, lead, uranium, and zinc were detected above BVs in one surface-soil sample. Plutonium-238 was detected in one sample collected in unit Qbt 4.

Tables 3.1-5 and 3.1-6 summarize the frequency of inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from SWMU 49-006. Tables 3.1-7 and 3.1-8 present the inorganic chemical and radionuclide results detected or detected above BVs at SWMU 49-006.

3.1.3 AOC 49-008(a): Area of Potential Soil Contamination

During the 1995 Phase I investigation, a radiological survey was performed on 40-ft × 40-ft-grid centers (54 points total) within the fenced area of AOC 49-008(a), as described in the work plan (LANL 1992, 007670) using a FIDLER portable gamma spectrometer. No elevated radiation levels were detected. Surface-soil samples were collected from 54 locations on the same grid used in the radiological survey. These samples were field screened for gross beta/gamma radiation and VOCs and sent to a laboratory for analysis of gamma-emitting radionuclides using gamma spectroscopy. Additionally, 15 samples were randomly selected for analysis of TAL metals and isotopic plutonium. Nine of these surface-soil samples were analyzed for total uranium. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.1-1. Organic chemical sampling locations are shown in Figure 3.1-2. Radionuclide sampling locations and results detected above FVs are shown in Figure 3.1-3. Inorganic chemical and radionuclide results obtained from SWMU 49-008(a) are decision-level quality.

Surface-soil samples were collected at four locations at the two transformer pads (two at each location). Each sample location was screened for beta/gamma radiation and VOCs before sample collection. No elevated radiation levels were detected and VOCs were not detected above 1 ppm. The four samples were screened for gross alpha and beta radiation at the ESH-19 Counting Facility and for PCBs at the Laboratory Organic Analysis Group (CST-12). The gross alpha and beta results indicated that no

elevated radionuclides were present. Aroclor 1260 was detected at location 54-05091 at a concentration of 0.37 mg/kg and at location 54-05090 at a concentration of 2.4 mg/kg. PCB results are screening-level quality.

Although cadmium, mercury, and thallium were not detected, detection limits for these analytes were above BVs in several samples. Antimony, arsenic, cobalt, iron, lead, nickel, and silver were detected above BVs in one surface-soil sample. Copper was detected above BV in four surface-soil samples. Uranium was detected above BV in 15 surface-soil samples. Zinc was detected above BV in two surface-soil samples. Plutonium-239/240 was detected above its FV in one surface-soil sample. Europium-152 was detected in three surface-soil samples.

Tables 3.1-9 and 3.1-10 summarize the frequency of inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from AOC 49-008(a). Tables 3.1-11 and 3.1-12 present the inorganic chemical and radionuclide results detected or detected above BVs or FVs for AOC 49-008(a). A summary of the PCB screening-level sample results are presented in Table 3.1-13.

3.2 Area 6

Area 6 West consists of SWMU 49-004, where 52 samples were collected at 41 locations. Area 6 East consists of AOC 49-008(b), where 19 surface-soil samples were collected at 19 locations.

3.2.1 Area 6 West: SWMU 49-004, Burn Site and Landfill

3.2.1.1 Non–RFI Activities

Surface-soil and vegetation samples were collected from Area 6 West during the 1987 A411 environmental survey and analyzed for inorganic chemicals and radionuclides. Elevated concentrations of some radionuclides, lead, and beryllium were detected in soil samples but were found to be localized and discontinuous (LANL 1992, 007670, p. 6.3-7). Due to their quality, these data are not presented in this report.

3.2.1.2 RFI Activities

The 1995 Phase I RFI consisted of a radiological site survey and the collection of 26 surface-soil samples from 26 locations on a sampling grid defined by the 1991 geophysical survey. These samples were field screened for beta/gamma radiation and VOCs and submitted for analysis of gamma-emitting radionuclides. Thirteen of these samples were randomly selected for analysis of inorganic chemicals, including total uranium, and for isotopic plutonium. In addition, boreholes were drilled at seven locations, approximately 50 ft apart along the longitudinal axis of the disposal area. Boreholes were drilled to a depth of 15 ft or until undisturbed tuff was encountered. Cores were collected for each 5-ft interval, and samples were selected from each interval for analysis. All samples were field screened for beta/gamma radiation and VOCs and submitted for analysis of gamma-emitting radioisotopes. Nine samples (at least one from each borehole) were also submitted for analysis of inorganic chemicals, including total uranium, SVOCs, and isotopic plutonium. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.2-1. Organic chemical sampling locations and detected results are shown in Figure 3.2-2. Radionuclide sampling locations and results detected or detected above FVs are shown in Figure 3.2-3. Analytical results obtained from SWMU 49-004 are decision-level quality.

Antimony, cadmium, and thallium were not detected in any samples collected, and mercury and silver were not detected in most samples collected; however, the detection limits for these analytes were above BVs for most samples collected. Aluminum, barium, calcium, chromium, magnesium, nickel, and vanadium were detected above BVs in one rock sample. Mercury was detected above BV in one surface-soil sample, and silver was detected above BV in one surface fill sample. Lead was detected above BV in one surface-soil sample and one rock sample. Manganese was detected above BV in one surface-soil sample and one fill sample. Cobalt was detected above BV in one subsurface soil, one subsurface fill, and one rock sample. Copper was detected above BV in two surface-soil samples, two fill samples, and one rock sample. Potassium was detected above BV in six surface-soil samples. Zinc was detected above BV in nine surface-soil and one subsurface-soil samples. Total uranium was detected above BV in 14 surface-soil samples, 2 subsurface-soil samples, 3 fill, and 3 rock samples. In one fill samples, 2-chloronaphthalene was detected. Plutonium-238 was detected above FV in one surface-soil sample. Europium-152 was detected in two surface-soil samples. Americium-241 was detected above FV in three surface-soil samples and was detected in one subsurface-fill sample. Cesium-137 was detected above FV in four surface-soil samples. Plutonium-239/240 was detected above FV in seven surface-soil samples and was detected in four fill, two subsurface-soil, and two rock samples.

Tables 3.2-1, 3.2-2, and 3.2-3 summarize the frequency of inorganic chemicals, organic chemicals, and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from SWMU 49-004. Tables 3.2-4, 3.2.5, and 3.2-6 present inorganic chemicals, organic chemicals, and radionuclides, respectively, detected above BVs or FVs for SWMU 49-004.

3.2.2 Area 6 East: AOC 49-008(b): Area of Potential Soil Contamination

The 1995 Phase I investigation consisted of a radiological site survey and the collection of surface-soil samples. The radiological survey was conducted at 75 points located on a 40-ft grid. No elevated radiation levels were detected. Surface-soil samples were collected from 19 grid points (plus two duplicates for a total of 21 samples). Each sample was field screened for beta/gamma radiation and submitted for analysis of gamma-emitting radionuclides. In addition, 10 surface-soil samples were selected randomly for analysis of inorganic chemicals, including total uranium, and isotopic plutonium. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.2-4. Radionuclide sampling locations are shown in Figure 3.2-5. All results obtained from AOC 49-008(b) are decision-level quality

No radionuclides were detected or detected above BVs or FVs in samples collected at AOC 49-008(b). Although thallium was not widely detected, detection limits for this analyte were generally above BVs for most samples. Cadmium, mercury, and thallium were each detected in one surface-soil sample. Total uranium was detected above BV in eight surface-soil samples.

Tables 3.2-7 and 3.2-8 summarize the frequency of detects of inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from AOC 49-008(b). Table 3.2-9 presents the inorganic chemical results detected above BVs for AOC 49-008(b).

3.3 Area 10

Thirteen samples were collected at 13 locations around AOC 49-002 (calibration chamber and elevator shaft); four samples were collected from two locations within SWMU 49-005(a) (landfill).

3.3.1 AOC 49-002: Underground Calibration Chamber and Shafts

The 1995 Phase I RFI consisted of a site radiological survey and the collection of surface-soil samples from 13 of the survey points. Twelve of these locations were selected from a sampling grid placed around the concrete pads and radiation shields at the top of the shafts. All 12 locations were field screened for beta/gamma radiation and submitted for analysis of gamma-emitting radionuclides; of these, six samples were also submitted for analysis of inorganic chemicals and isotopic plutonium. The 13th sample was collected at the location of the former hydraulic oil reservoir. This sample was field screened for beta/gamma radiation and submitted for analysis of gamma-emitting radionuclides, isotopic plutonium, inorganic chemicals, SVOCs, and pesticides/PCBs. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.3-1. Organic chemical sampling locations are shown in Figure 3.3-2. Radionuclide sampling locations are shown in Figure 3.3-3. All results obtained from AOC 49-002 are decision-level quality.

No organic chemicals or radionuclides were detected in samples collected at AOC 49-002. Antimony and cadmium were not detected in most samples collected; however, the detection limits for these analytes were above BVs for most samples collected. Antimony and cadmium were each detected above BVs in one surface-soil sample. Copper, lead, and mercury were each detected above BVs in two surface-soil samples. Zinc was detected above BV in three surface-soil samples. Total uranium was detected above BV in seven surface-soil samples.

Tables 3.3-1 and 3.3-2 summarize the frequency of inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from AOC 49-002. Table 3.3-3 presents the inorganic chemical results detected above BVs for AOC 49-002.

3.3.2 SWMU 49-005(a): Landfill

The 1995 Phase I RFI consisted of a radiological survey of the site and the installation of two boreholes. The boreholes were installed to depths of 9 ft and 10 ft. A surface and a subsurface sample were collected from each borehole. Each sample was field screened for beta/gamma radiation and submitted for analysis of gamma-emitting radionuclides, isotopic plutonium, SVOCs, and inorganic chemicals. Two surface-soil samples were also analyzed for total uranium. Inorganic chemical sampling locations and results detected above BVs are shown in Figure 3.3-1. Organic chemical sampling locations are shown in Figure 3.3-2. Radionuclide sampling locations and results detected or detected above FVs are shown in Figure 3.3-3. All results obtained from SWMU 49-005(a) are decision-level quality.

No SVOCs were detected in samples collected at SWMU 49-005(a). Although antimony, mercury, selenium, and thallium were not detected, several of their detection limits were above BVs. Aluminum, barium, calcium, chromium, copper, magnesium, and nickel were detected above BVs in two rock samples. Arsenic, beryllium, and potassium were detected above BVs in one rock sample. Total uranium was detected above BV in one surface-soil sample and two rock samples. Plutonium-238 was detected above FV in one surface-soil sample and was detected in one rock sample. Plutonium-239/240 was detected above FV in one surface-soil sample.

Tables 3.3-4 and 3.3-5 summarize the frequency of inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs in samples collected from SWMU 49-005(a). Tables 3.3-6 and 3.3-7 present the inorganic chemicals and radionuclides, respectively, detected or detected above BVs or FVs at SWMU 49-005(a).

3.4 Environmental Surveillance and Monitoring Results

Environmental monitoring has been conducted at TA-49 since 1960. Because of the varying quality of analytical documentation available, analytical results before 2000 do not have the same level of surety as analytical results produced since 2000. Therefore, results presented in this report are limited to those produced since 2000. During July 2007, data were extracted from the Laboratory Water Quality Database, which presented data available for reporting at that time.

3.4.1 Groundwater Monitoring: Deep Test Wells DT-5A, DT-9, and DT-10

Groundwater monitoring has been conducted at three TA-49 groundwater wells, DT-5A, DT-9, and DT-10, since they were drilled in 1959–1960. Groundwater-monitoring data presented in this report are from 2000 to 2007 because documentation supporting analyses since 2000 are available. Refer to Figure 2.4-2 for the locations of the three TA-49 groundwater-monitoring wells.

Radionuclide analyses of groundwater from 1960 to 1990 have not detected contamination of the regional aquifer (LANL 1992, 007670, p. 4-25). The groundwater-monitoring data from 2000 to 2007 for deep test wells DT-5A, DT-9, and DT-10 indicate that the analytical results are less than the minimum detectable activity for the radionuclides analyzed. Results of analyses performed on deep test wells since 2000 are presented in Table 3.4-1.

3.4.2 Environmental Surveillance Sediment Sampling

Sediment samples have been collected annually since 1979 at 12 sediment sampling locations within TA-49 and in Ancho and Water Canyons downgradient of TA-49 and to the north and south of TA-49. Figure 2.4-1 shows the sediment-sampling locations at TA-49. Sediment data prepared for this report are from 2000 to 2006 because documentation supporting analyses since 2000 is available. Samples collected were analyzed for metals, including cyanide, pesticides/PCBs, SVOCs, gross alpha, gross beta, gross gamma, gamma-emitting isotopes, americium-241, isotopic uranium, isotopic plutonium, isotopic thorium, strontium-90, and tritium. Sediment analytical suites and request numbers are presented in Table 3.4-2.

Sediment sample results since 2000 are presented in Table 3.4-3.

3.4.3 Surface-Water Sampling

Since 2000, surface-water samples have been collected upgradient of TA-49 at sampling station Water at Beta (two samples), and downgradient of TA-49 at sampling station Water below MDA AB (17 samples) (Figure 2.4-1). General inorganic chemical, metal, and radionuclide results from Water below MDA AB are presented in Table 3.4-4. Table 3.4-5 presents general inorganic chemical, HE, metal, pesticide/PCB, radionuclide, SVOC, and VOC results from sampling station Water at Beta.

Surface-water samples were collected in 1997 and 1998 at sampling stations MDA AB-1, MDA AB-2, MDA AB-3, MDA AB-5, and MDA AB-8. No surface-water sampling has occurred at these locations since that time.

Although the data available do not meet minimum reporting standards, unfiltered water samples collected from sampling station Water at Beta and filtered water samples collected from location Water below MDA AB have been reported to contain low concentrations or nondetected concentrations of gross alpha, gross beta, isotopic plutonium, isotopic uranium, barium, lead, and total uranium. Unfiltered water

samples collected from sampling station Water below MDA AB generally contain concentrations of these analytes 2 orders of magnitude higher than water collected from sampling station Water at Beta.

4.0 REFERENCES AND MAP DATA SOURCES

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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4.2 Map Data Sources

Data sources used in original maps created for this report are described below. Themes used in base layouts for map creation are described first, followed by a separate table describing specialized themes

4.2.1 Data Sources for Base Themes

Legend Item	Data Source
2-ft elevation contour	Hypsography, 2 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
10-ft elevation contour	Hypsography, 10 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
100-ft elevation contour	Hypsography, 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
Fence	Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 6 January 2004; as published 10 September 2007.
Former Structure HDT activity-related structure	Former Structures of the Los Alamos Site; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0587; 1:2,500 Scale Data; 17 September 2007.
Structure	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 6 January 2004; as published 10 September 2007.
Paved road	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 6 January 2004; as published 10 September 2007.

Legend Item	Data Source
Unpaved road	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 6 January 2004; as published 10 September 2007.
TA boundary	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning and Project Initiation Group, Infrastructure Planning Division; 19 September 2007.

4.2.2 Data Source Statements for Specialized Themes

Legend Item	Data Source	Figures
Borehole	Features: 49-Alpha, 49-Beta, 49-Gamma— Penetrations; Los Alamos National Laboratory, Environment and Remediation Support Services, EP2007-0442; 1:2,500 Scale Data; 16 July 2007. All Other Features— Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0613; 27 September 2007.	2.4-2
Deep test well (monitoring well)	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0613; 27 September 2007.	2.4-1 2.4-2
Former structure *(Area 10 only)*	Polygon Feature, Approximate location of Buildings 49-61 and 49-62, TA-49 Area 10; 1:1,200 Scale Data; Apogen Technologies; ER ID (Krowell 2007, 098702); 15 October 2007.	2.3-5
General SWMU or AOC location (boundary not defined)	Not a feature layer; intended to illustrate extents of area-specific map figures	1.0-2 3.0-1
Sampling location with screening-level results Sampling location with decision-level results Sampling location with detected decision-level results Sampling location with nondetected decision-level results Sampling location with decision-level results above BV Sampling location with decision-level results detected or detected above FV	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0613; 27 September 2007.	3.0-1 3.1-1 3.1-2 3.1-3 3.2-1 3.2-2 3.2-3 3.2-4 3.2-5 3.3-1 3.3-2 3.3-3
Sediment and/or surface-water sampling location	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0613; 27 September 2007.	2.4-1

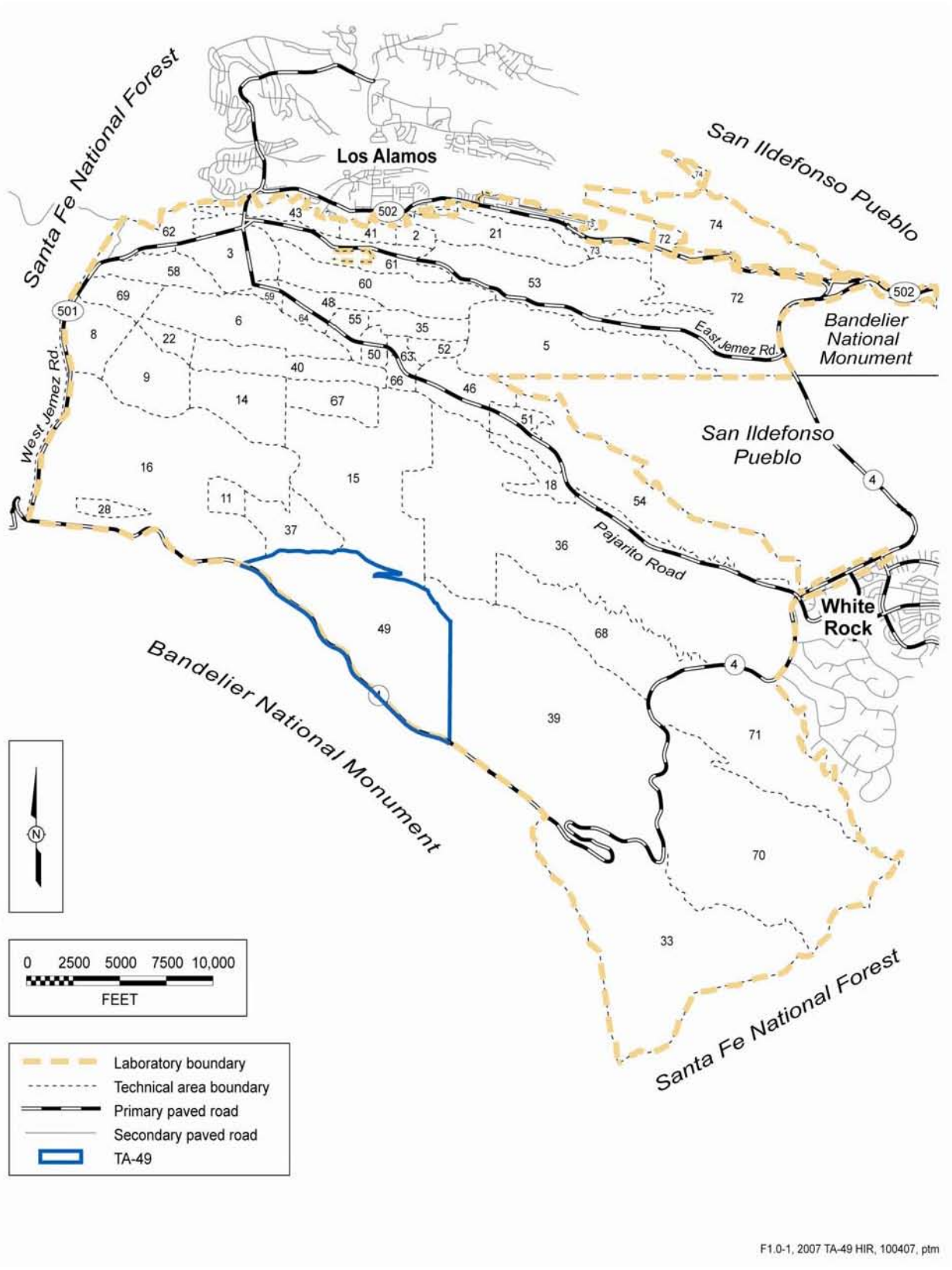
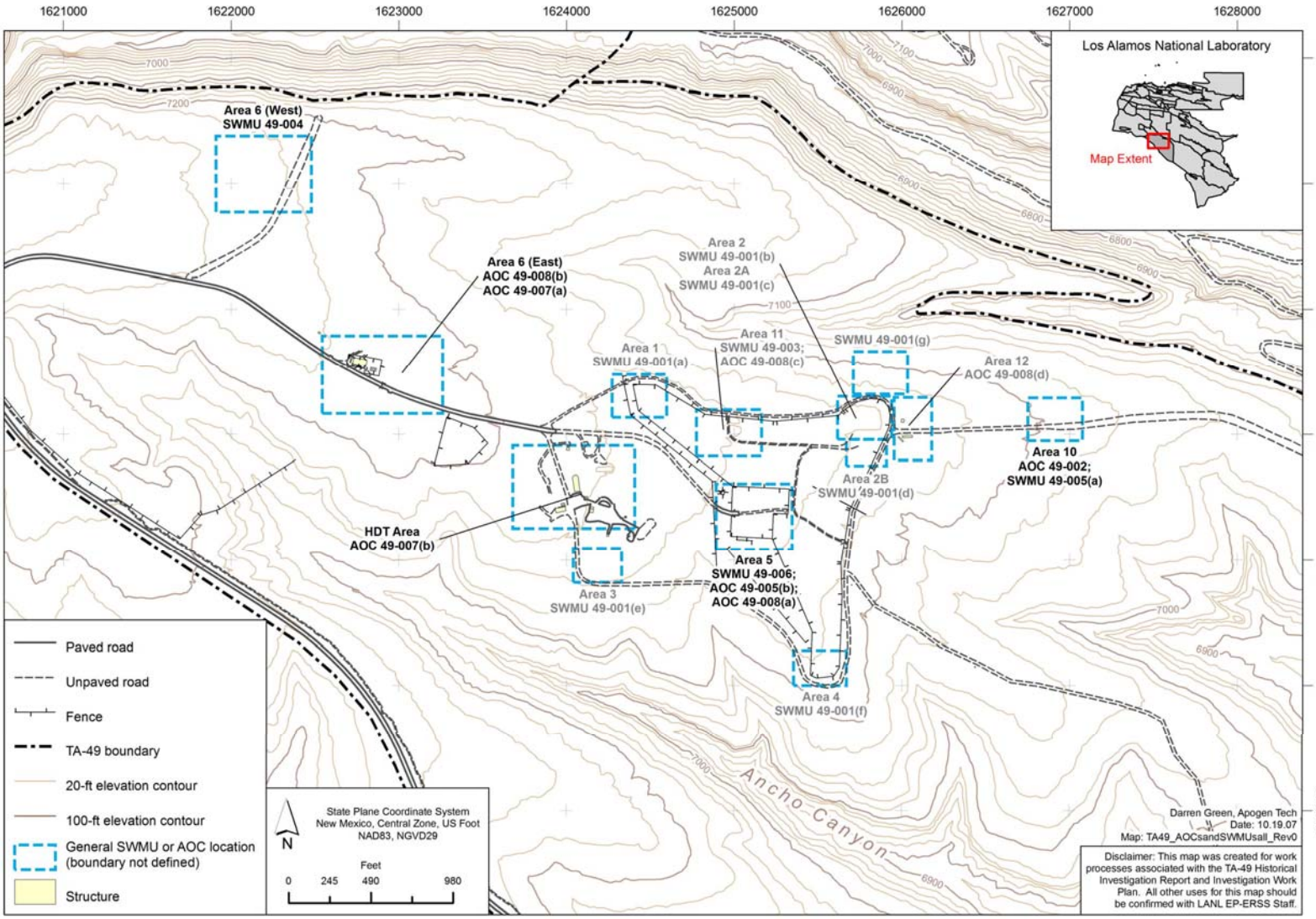
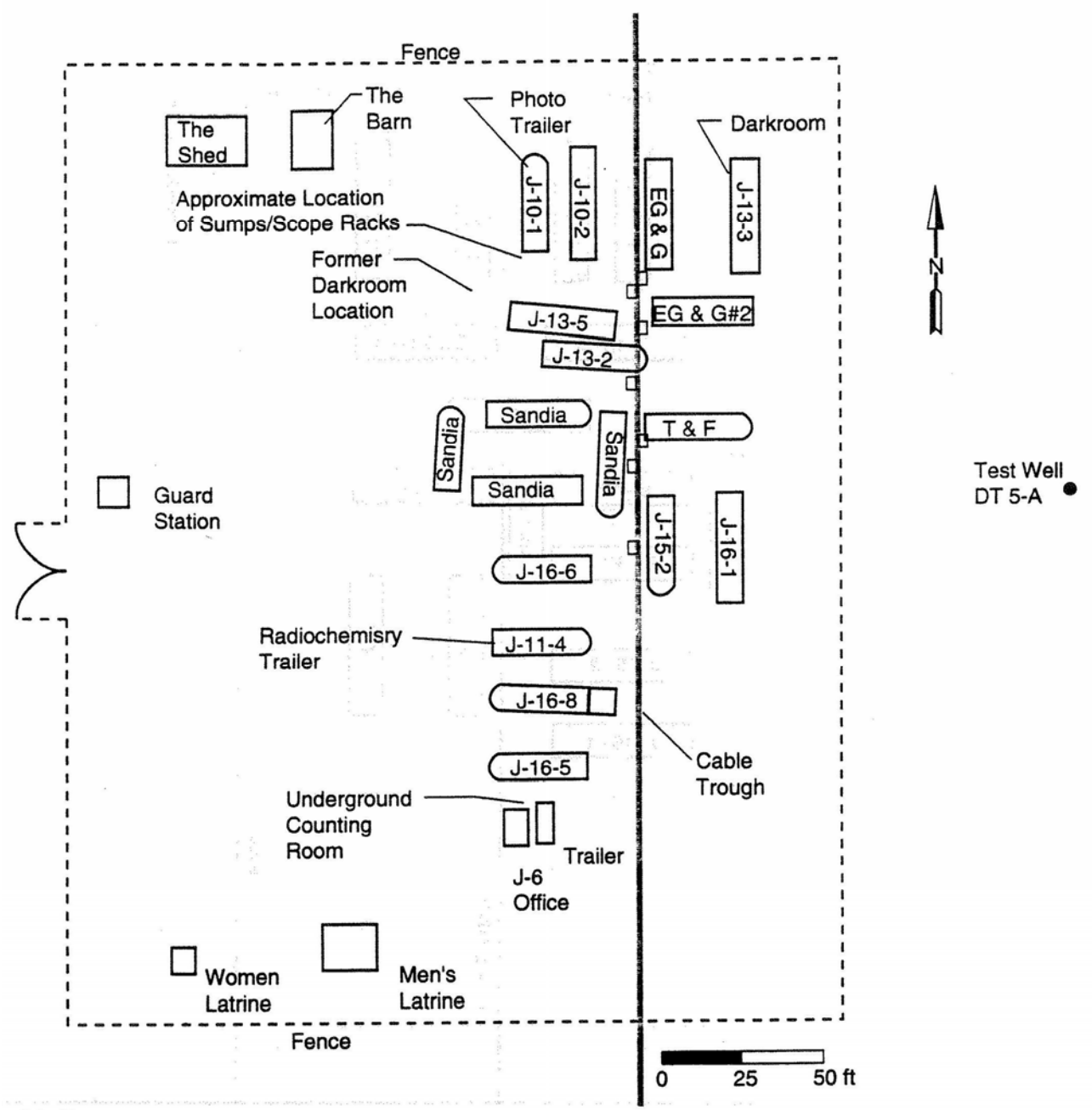


Figure 1.0-1 Location of TA-49



Note: Sites outside the NES boundary are in bold

Figure 1.0-2 TA-49 SWMUs and AOCs



Source: LANL (1992, 007670, Figure 6.4-2(b))

Figure 2.3-1 Early layout of Area 5 structures, August 29, 1960

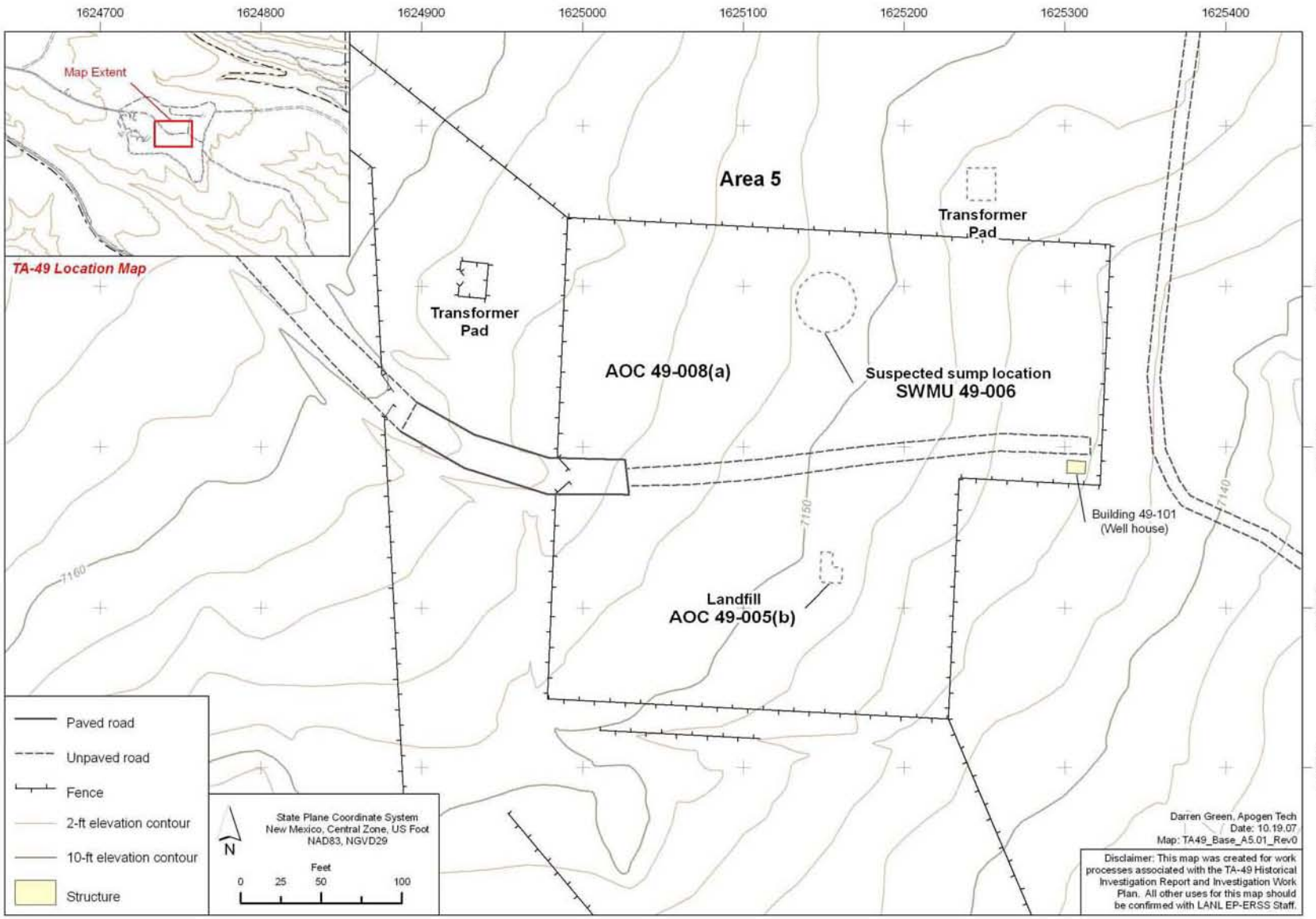


Figure 2.3-2 General site layout of Area 5

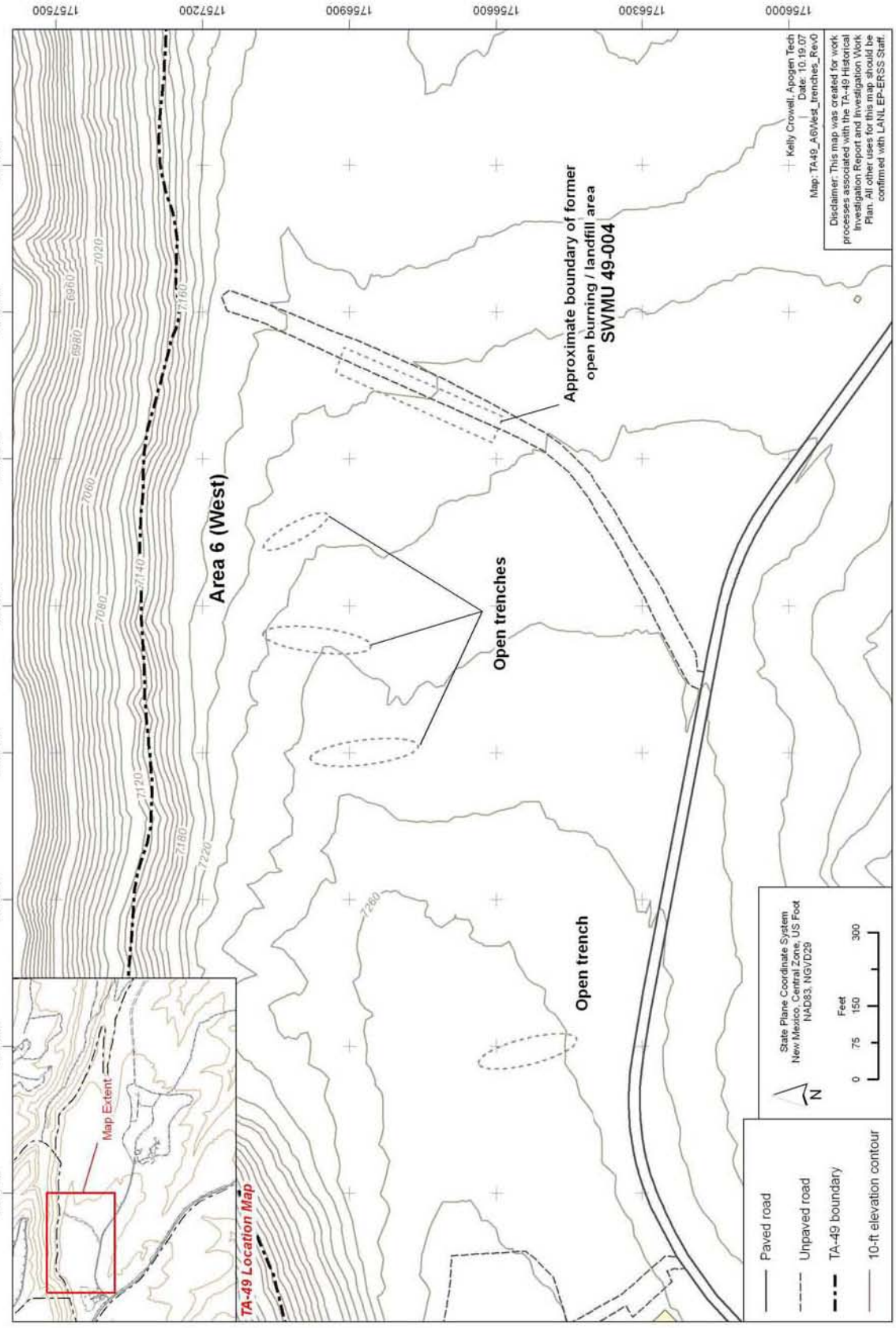


Figure 2.3-3 General site layout of Area 6 West

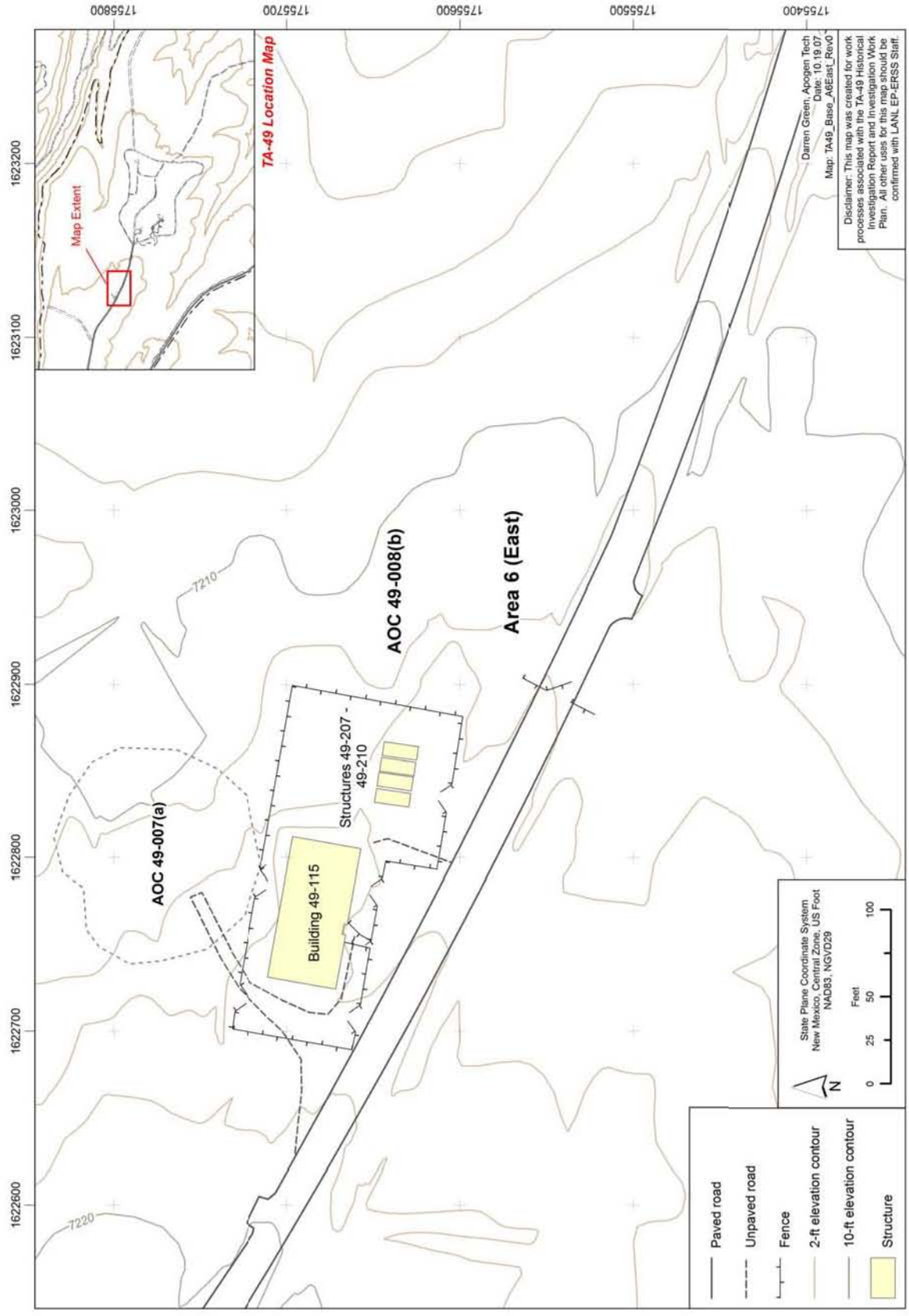


Figure 2.3-4 General site layout of Area 6 East

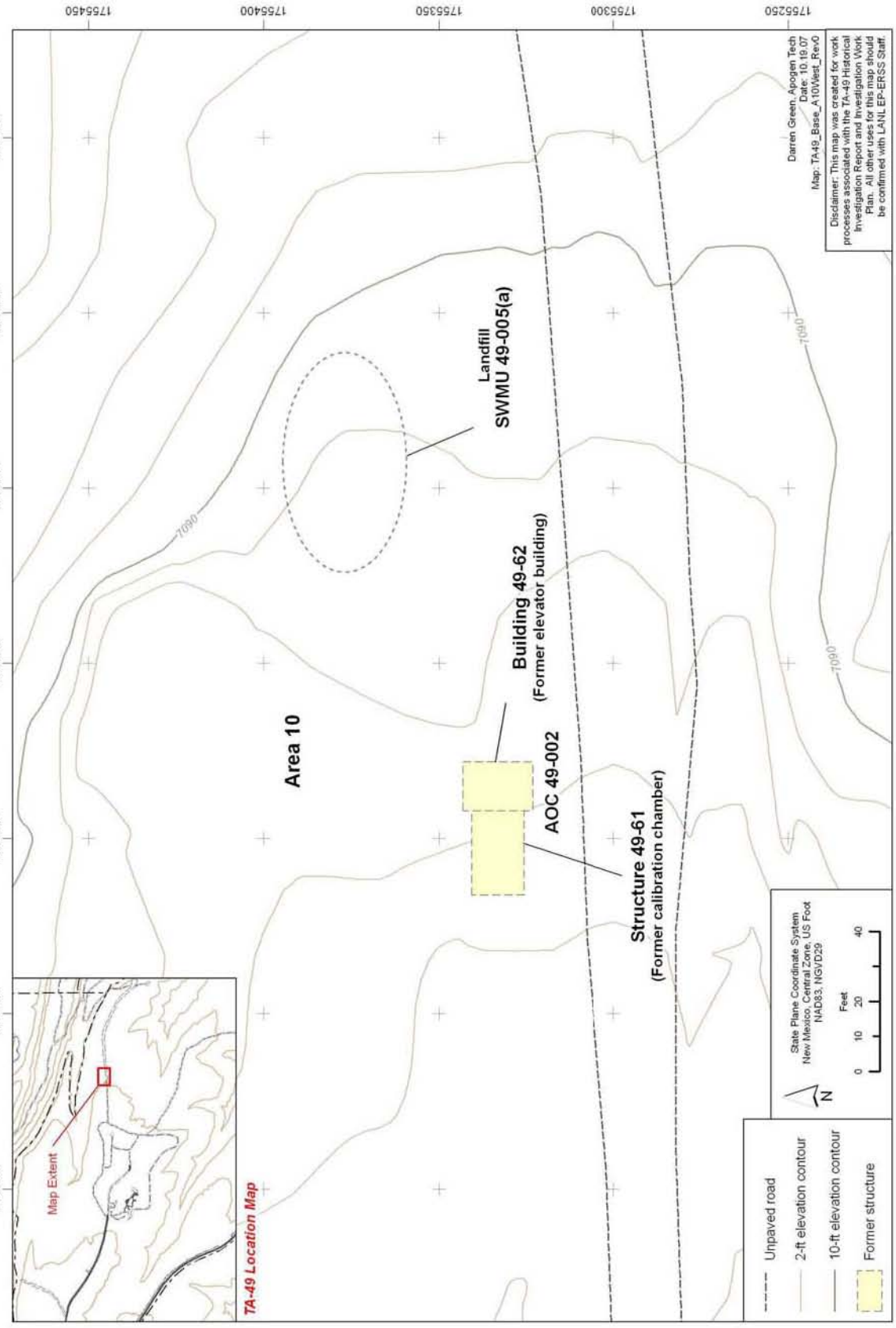
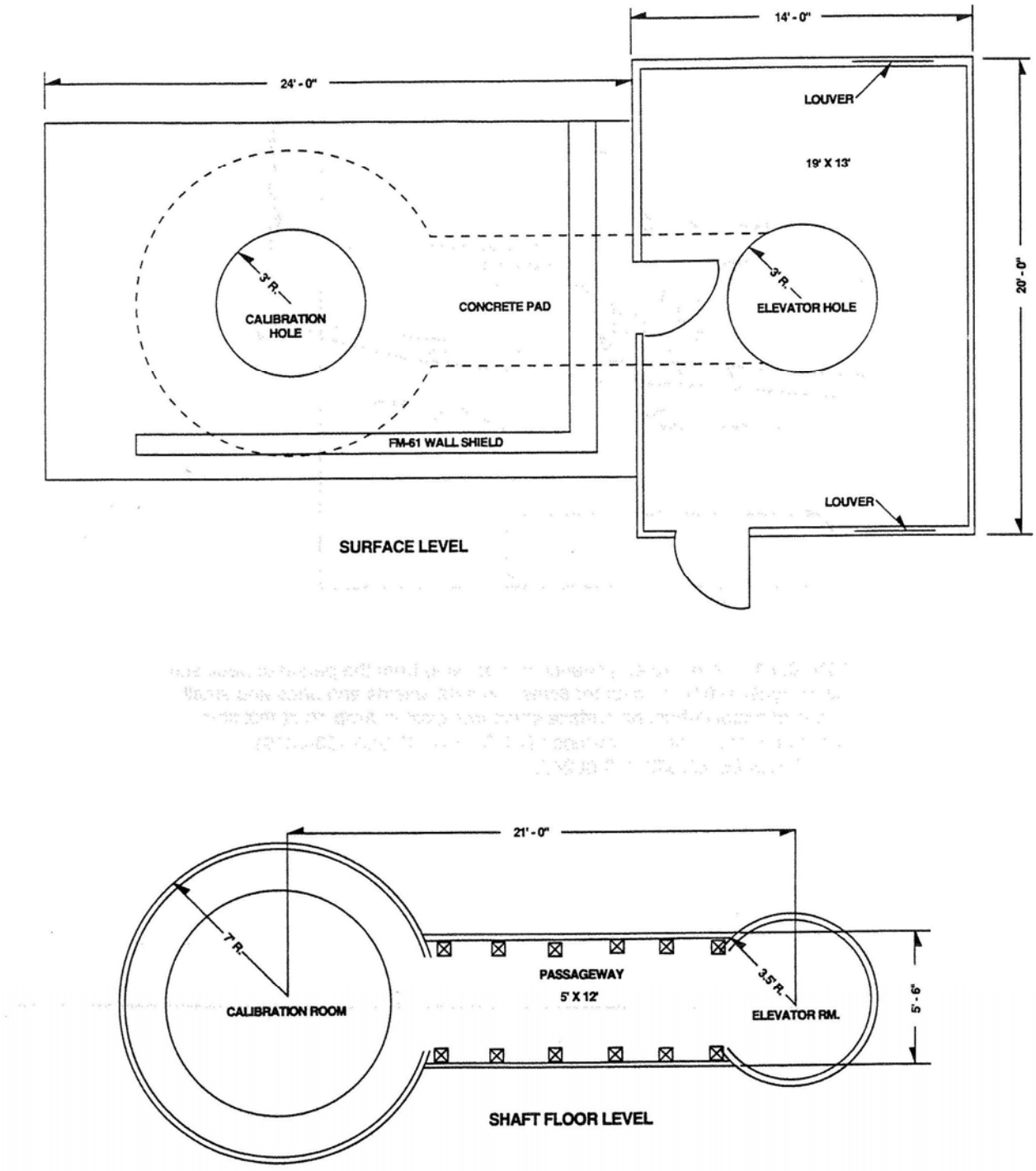
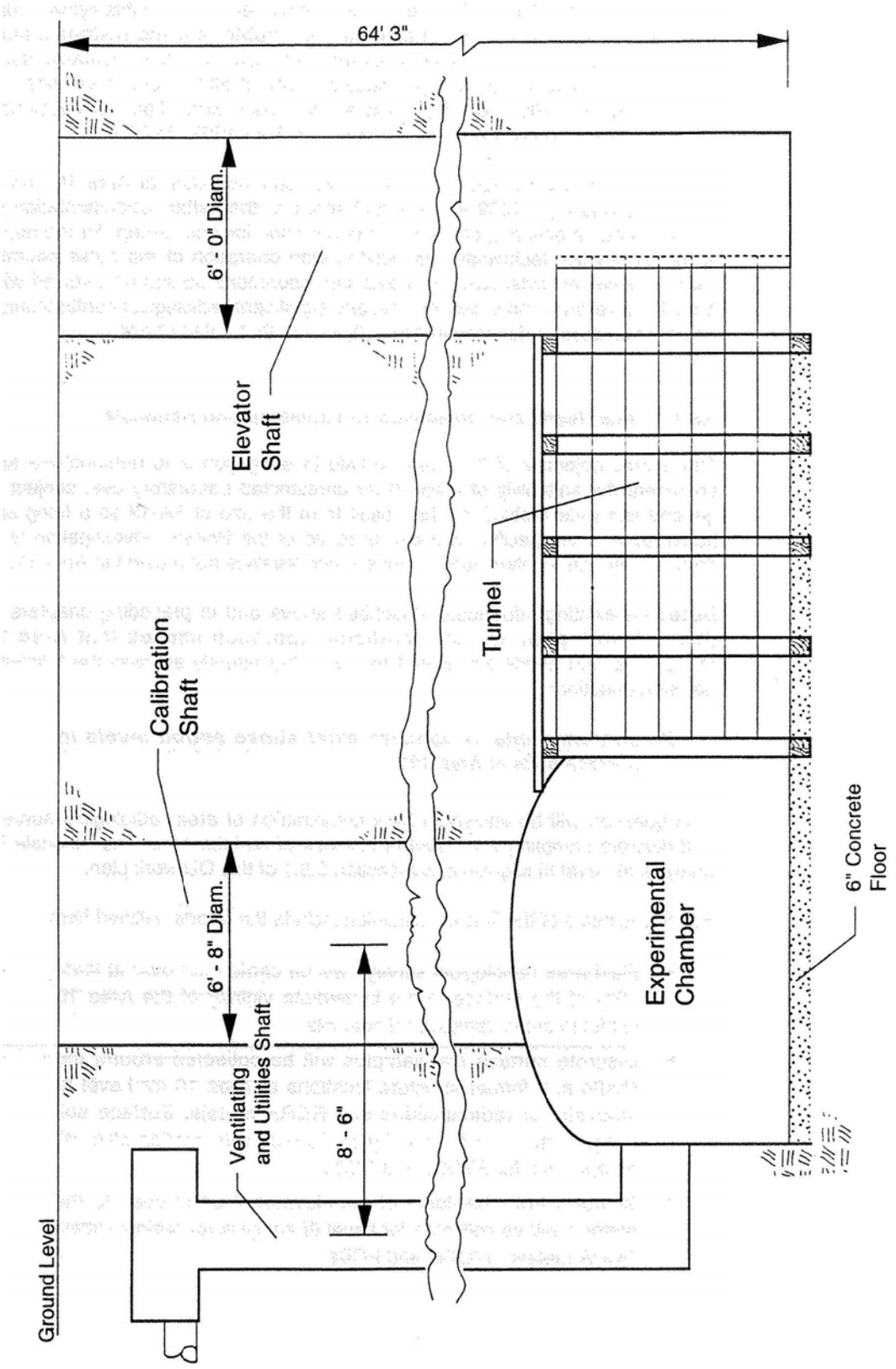


Figure 2.3-5 General site layout of Area 10



Source: LANL (1992, 007670, Figure 6.5-4)

Figure 2.3-6 Plan view of Area 10 calibration chamber and elevator



Source: LANL (1992, 007670, Figure 6.5-3)

Figure 2.3-7 Profile view of Area 10 calibration chamber and elevator

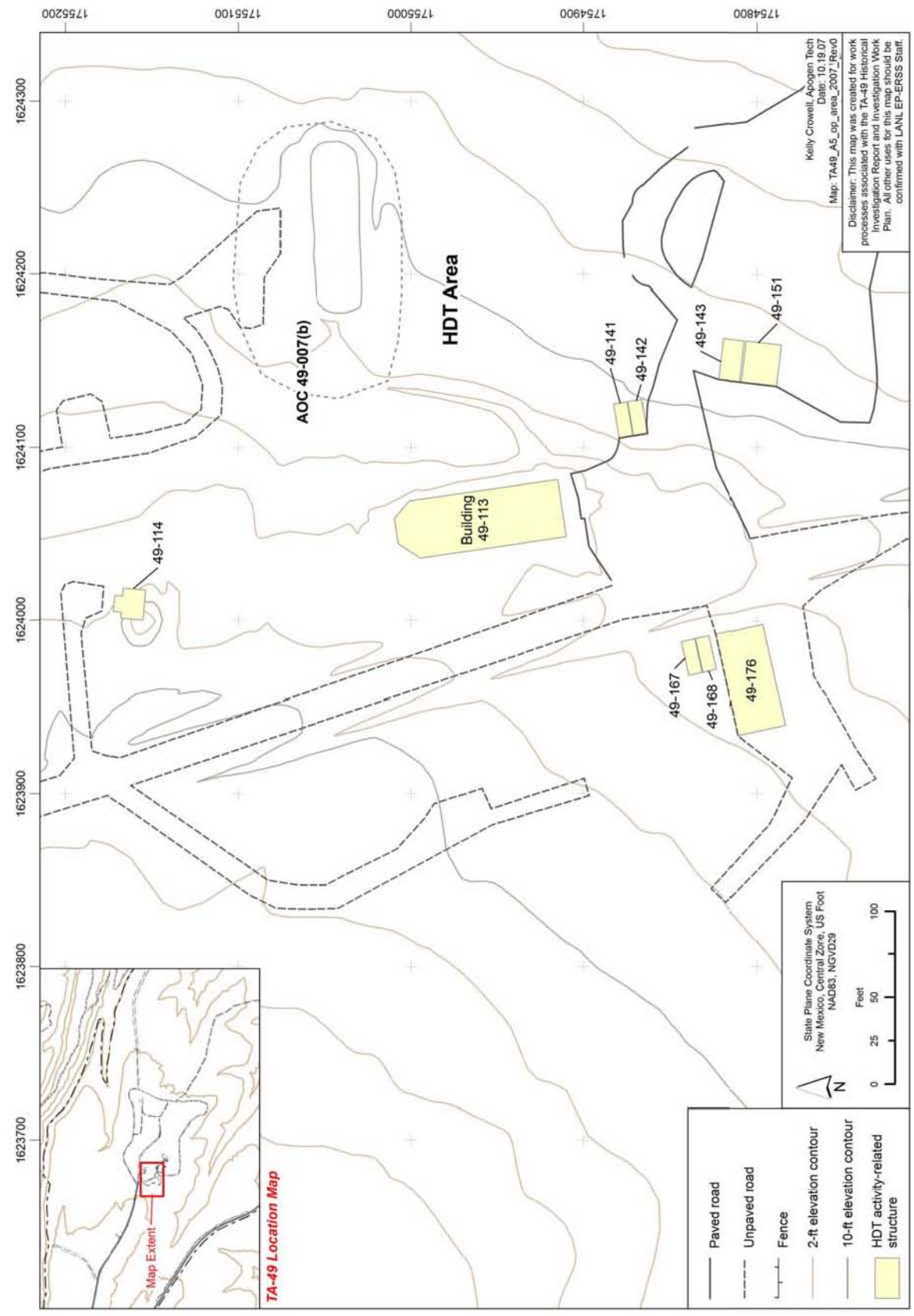


Figure 2.3-8 General site layout of HDT area and AOC 49-007(b)

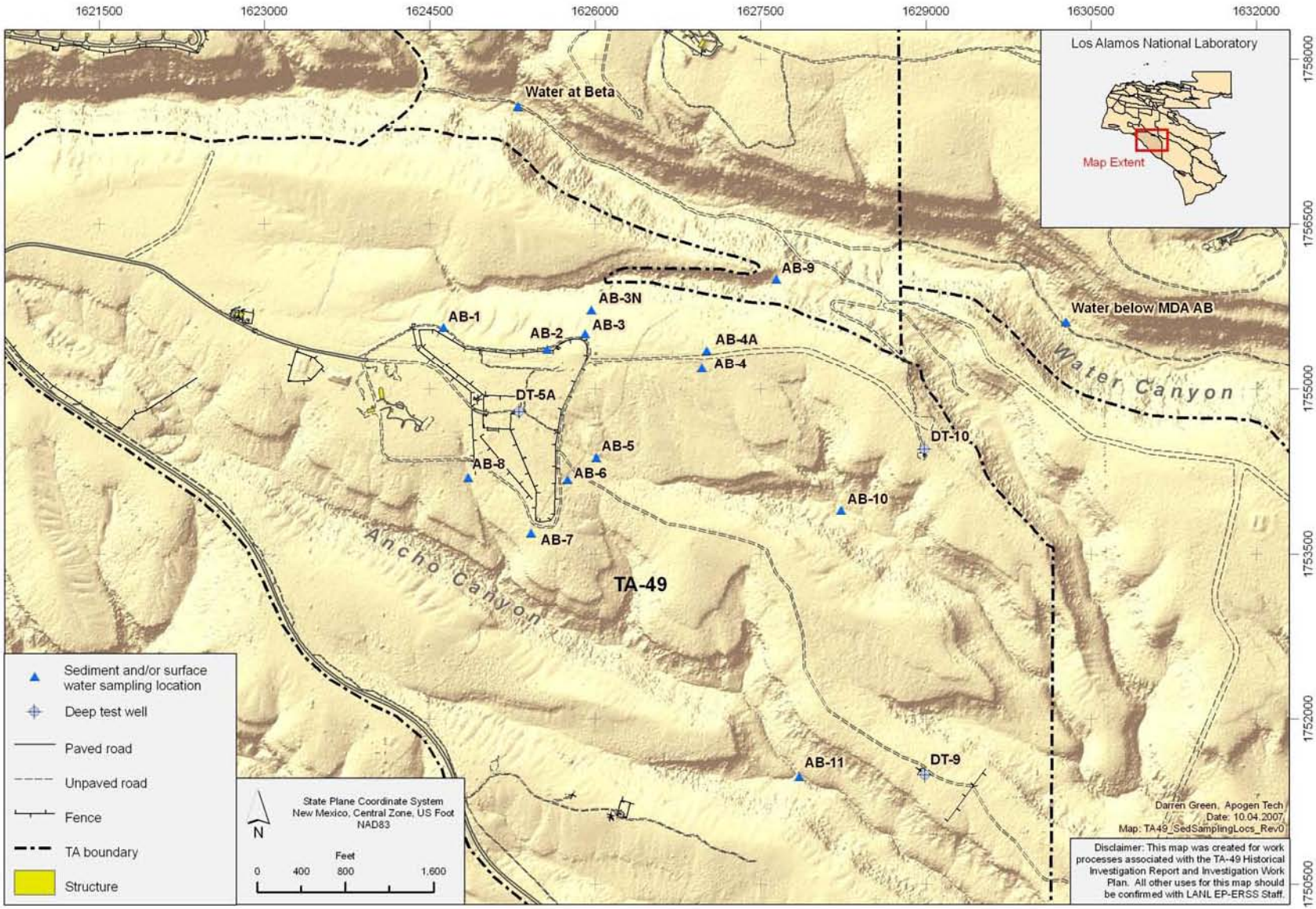


Figure 2.4-1 TA-49 sediment and surface-water sampling locations

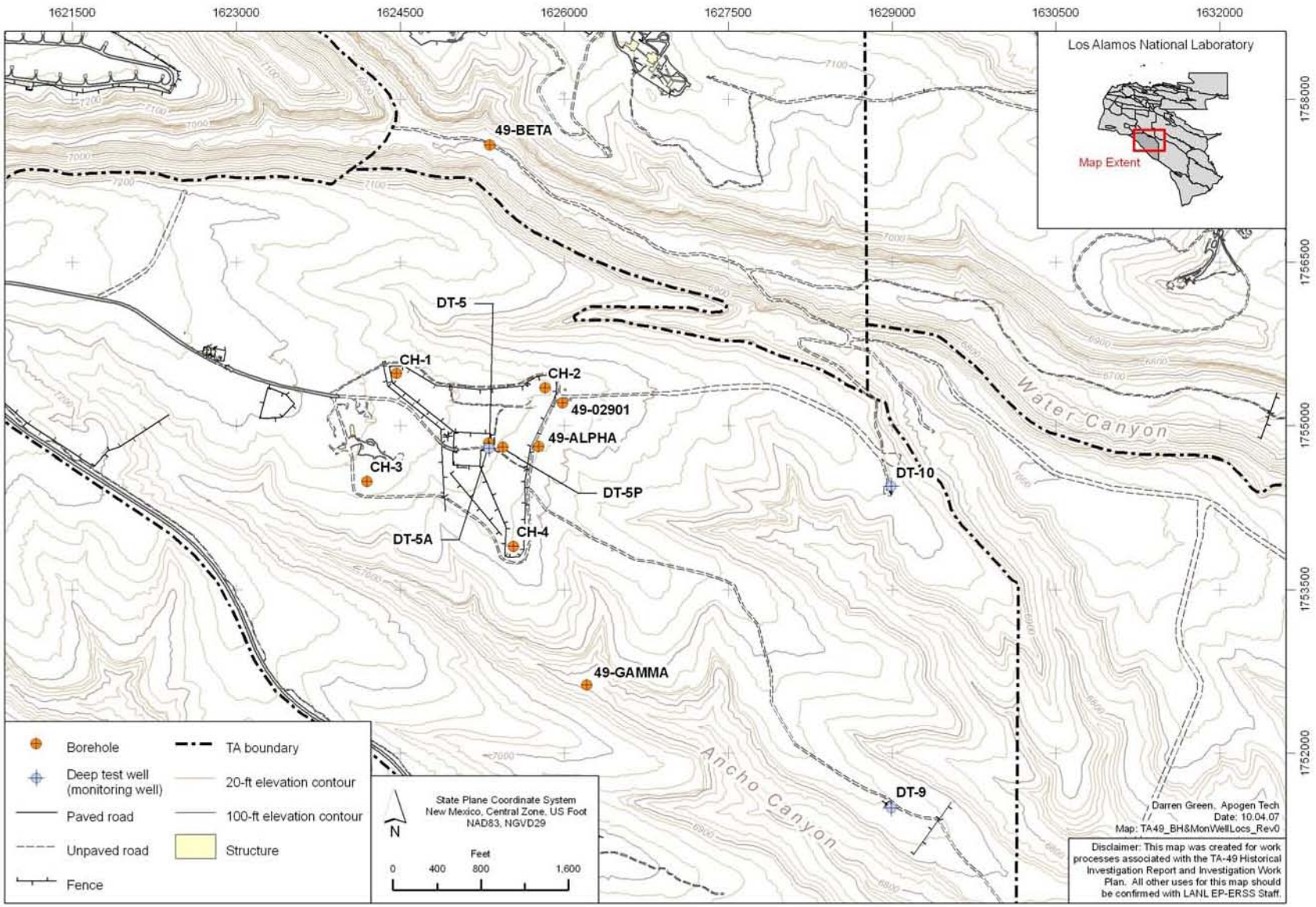
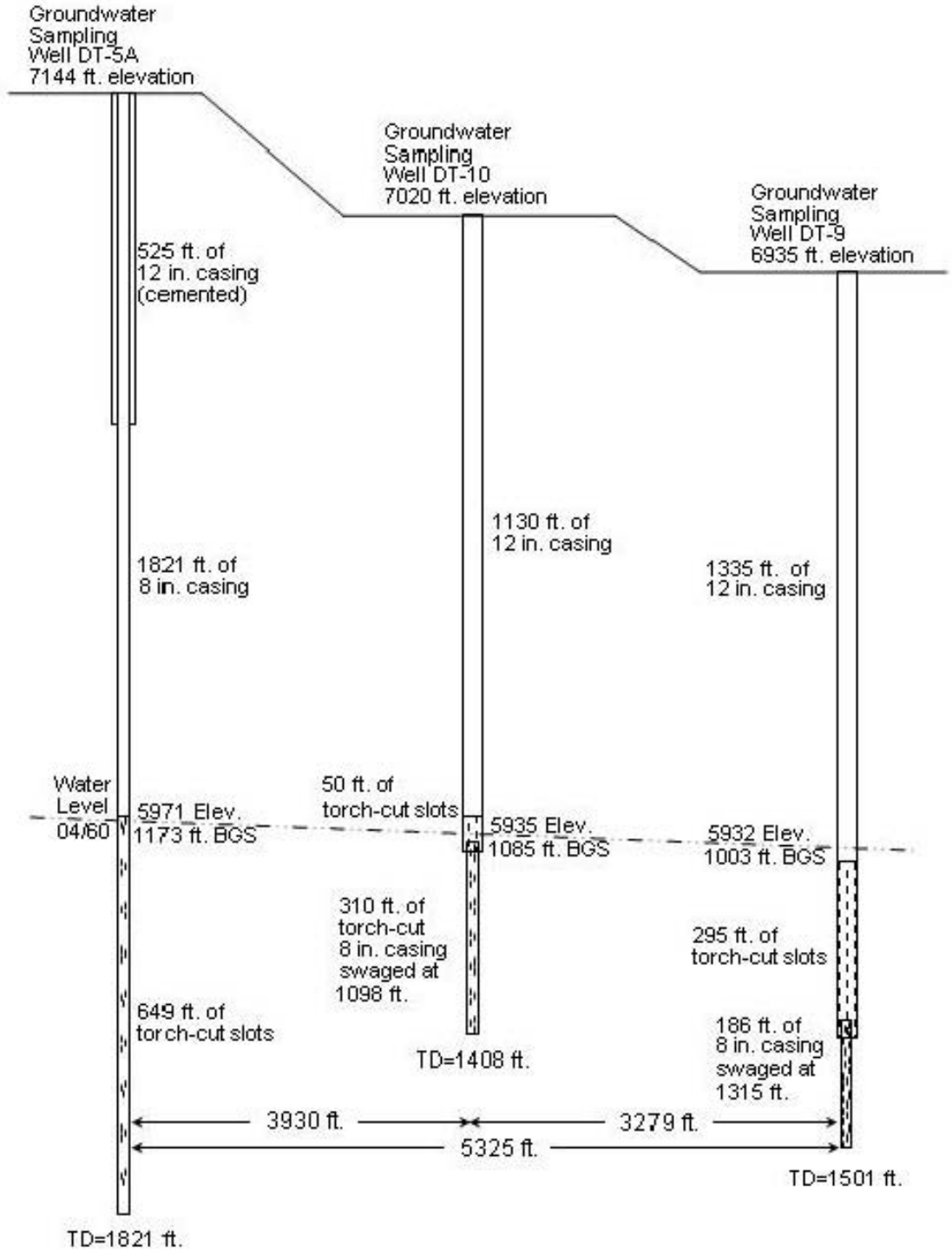
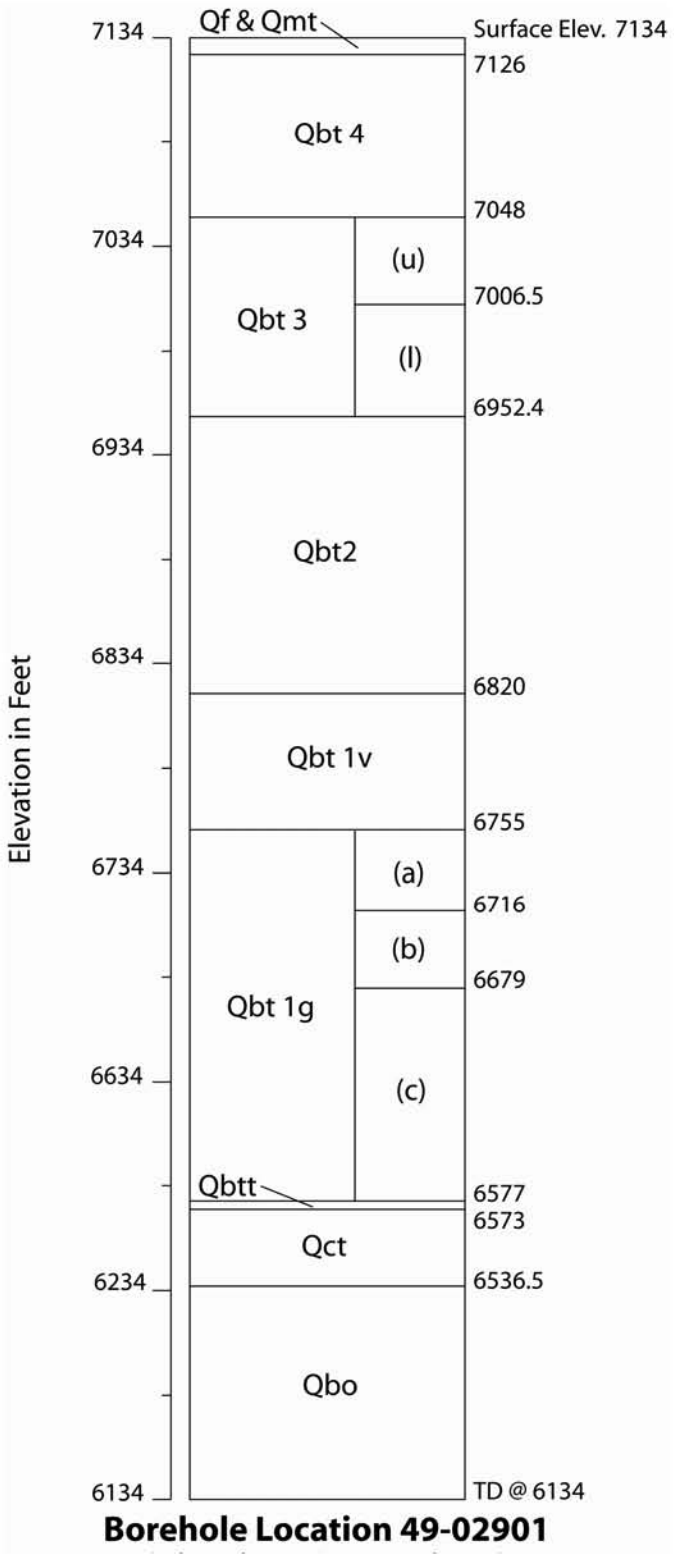


Figure 2.4-2 TA-49 deep test well and select borehole locations



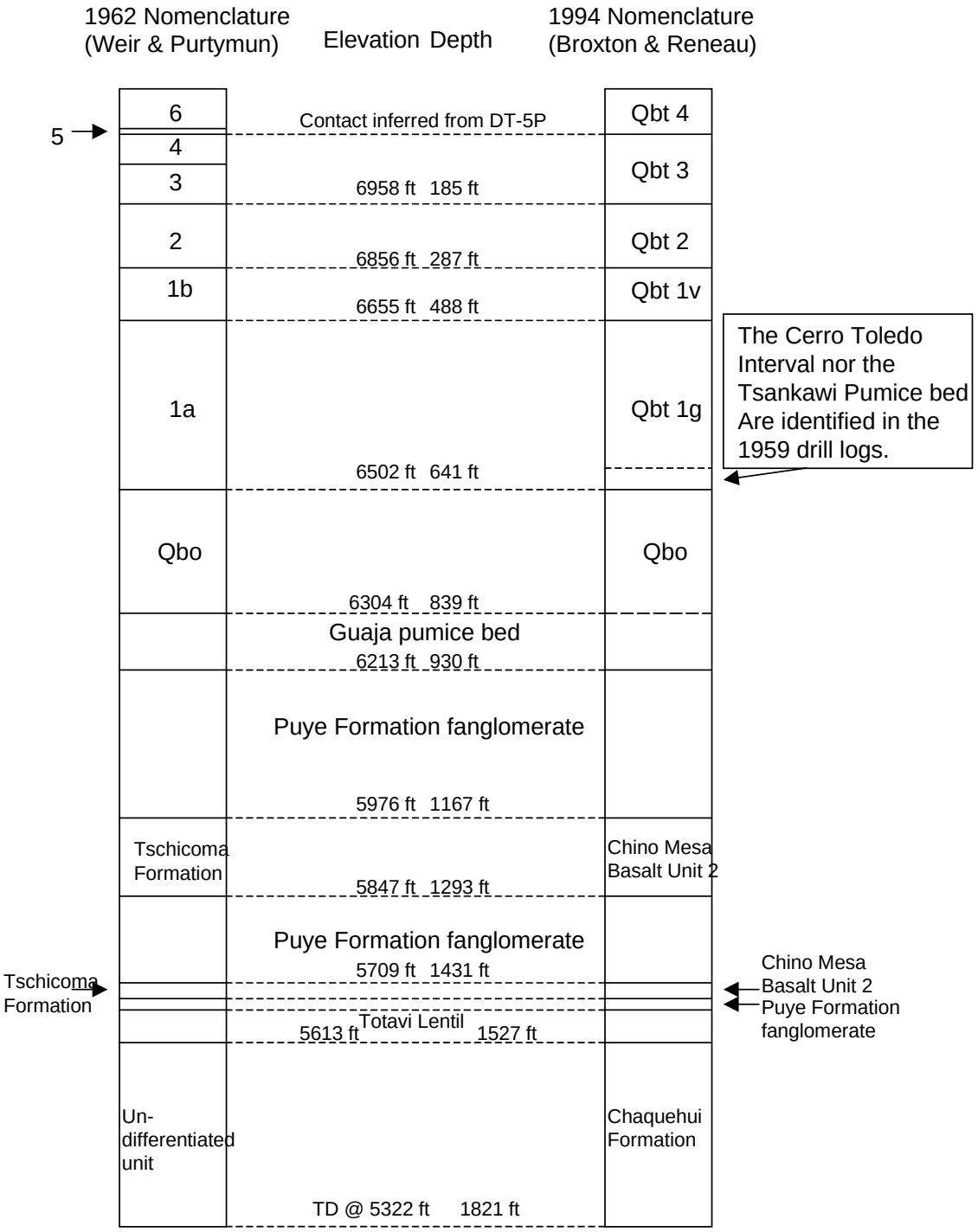
Adapted from Weir and Purtymun (1962, 011890)

Figure 2.4-3 Deep test well construction detail



Adapted from Stimac et. al. (2002, 073391)

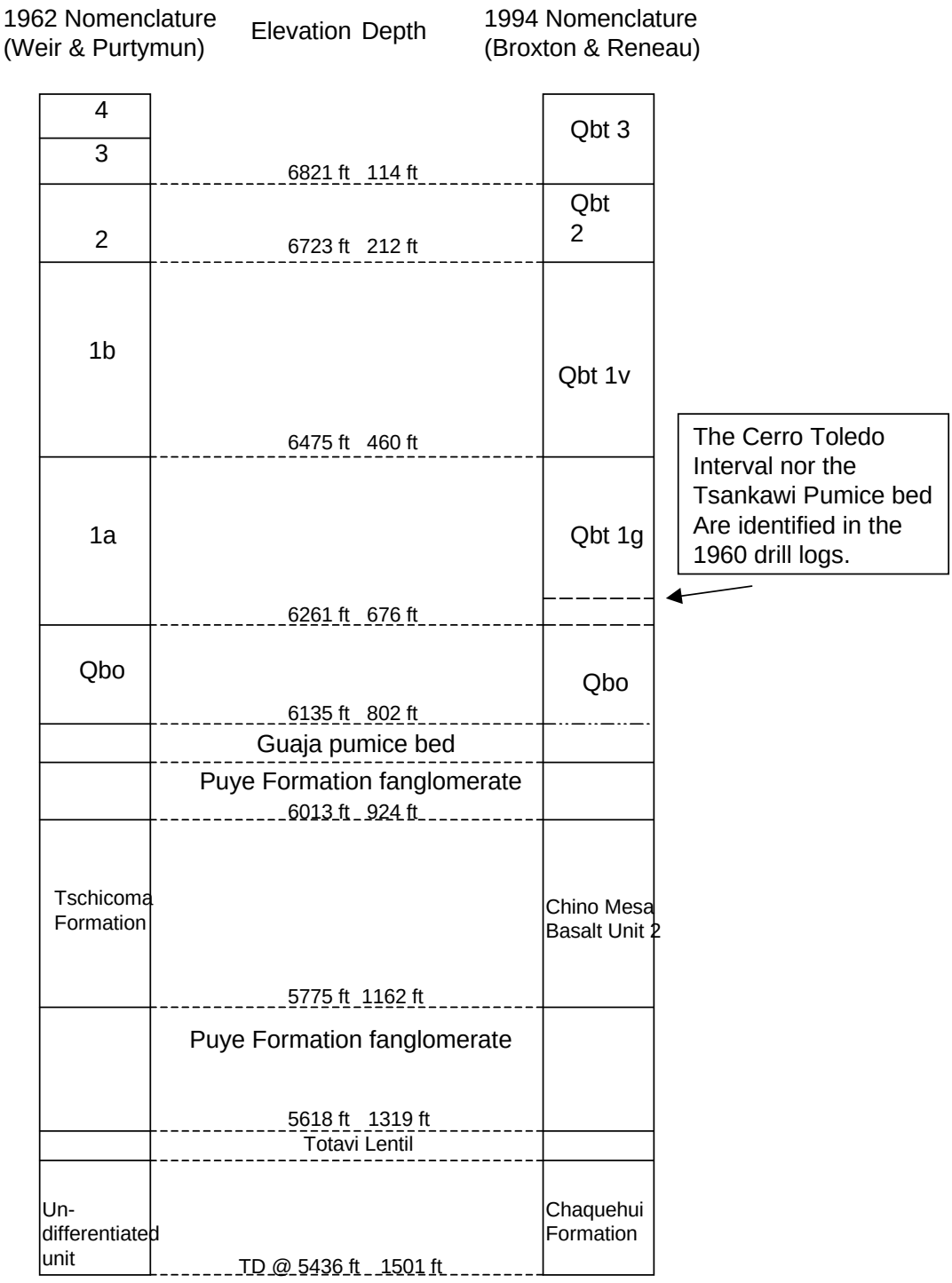
Figure 2.4-4 Stratigraphy of borehole location 49-02901



DT-5A

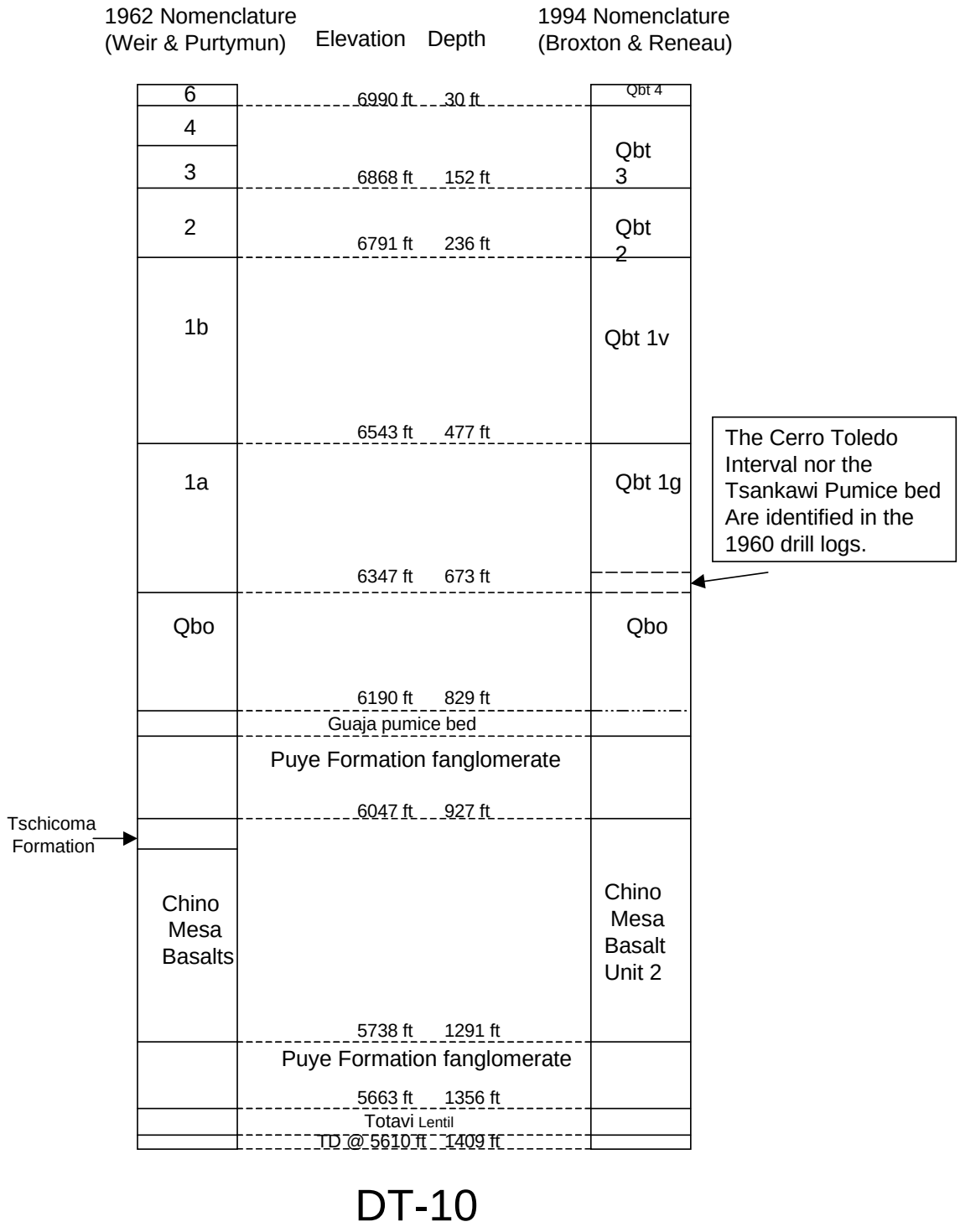
Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

Figure 2.4-5 Stratigraphy of deep test well DT-5A



Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

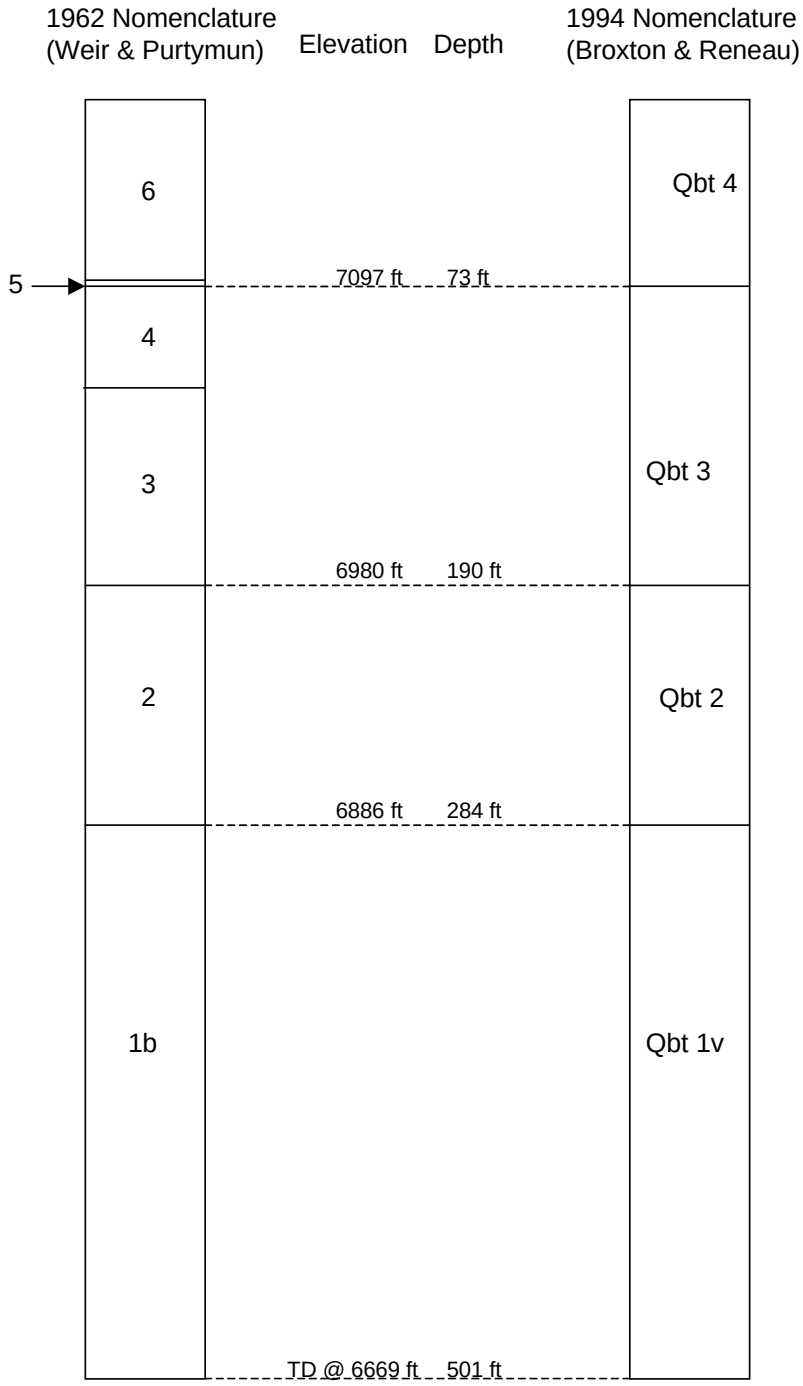
Figure 2.4-6 Stratigraphy of deep test well DT-9



DT-10

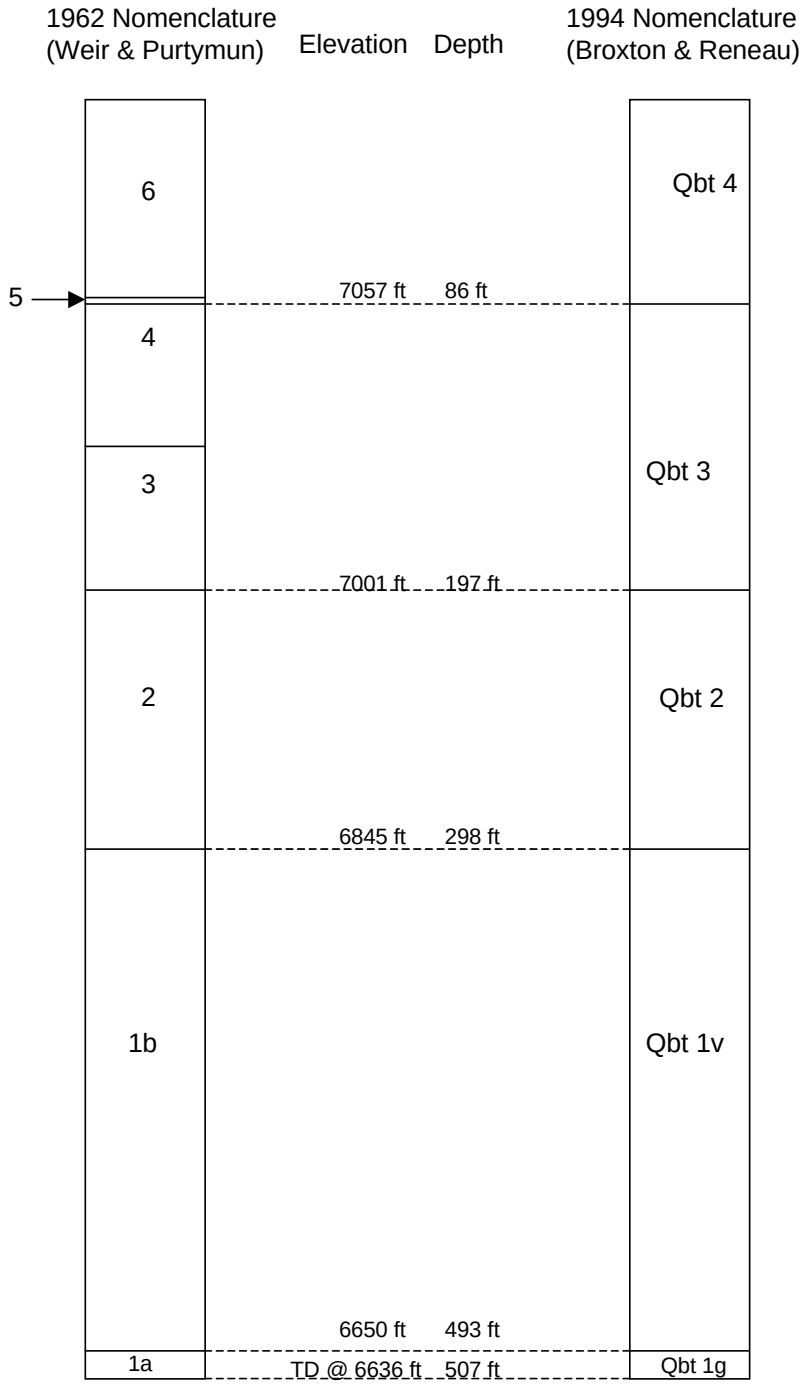
Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

Figure 2.4-7 Stratigraphy of deep test well DT-10



Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

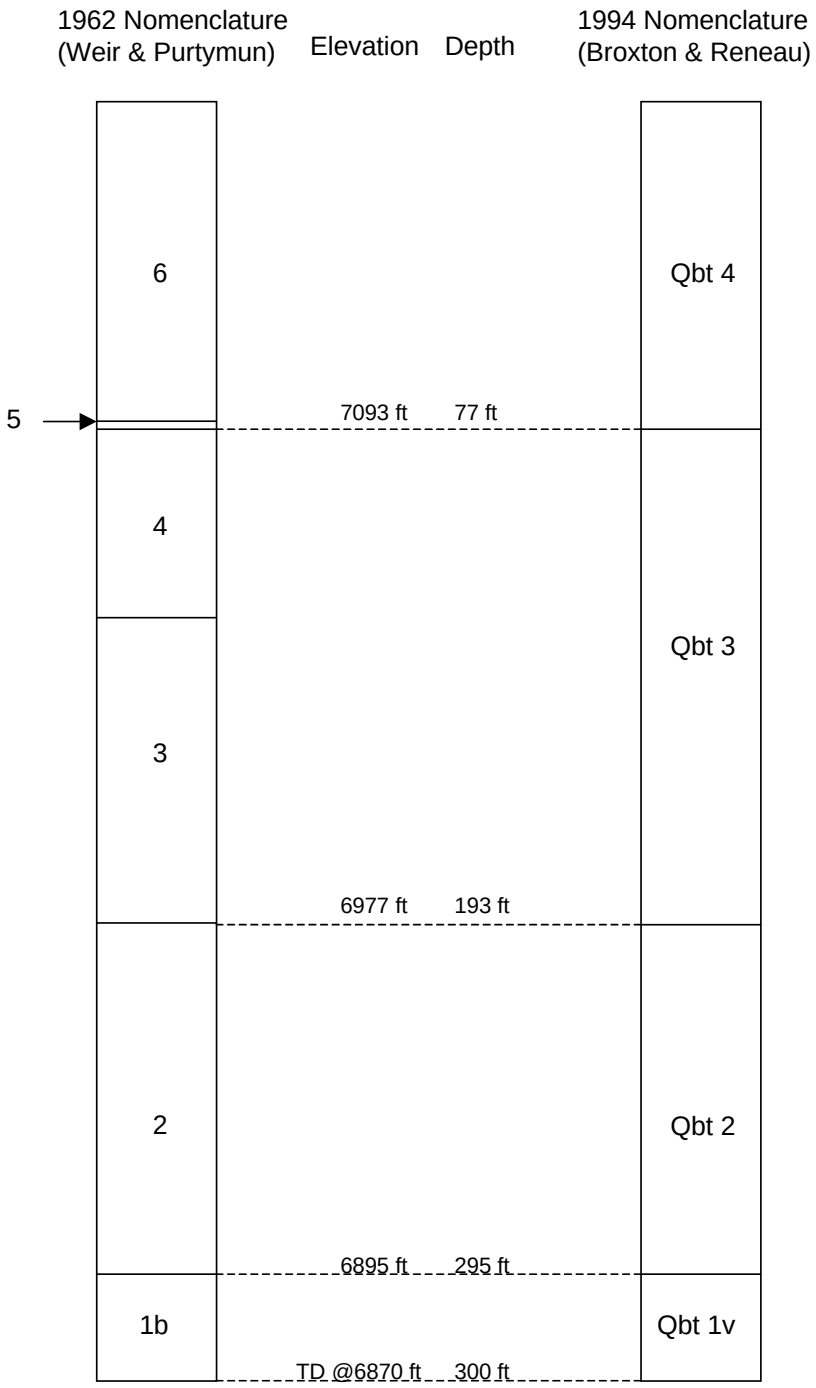
Figure 2.4-8 Stratigraphy of CH-1



Core hole -2

Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

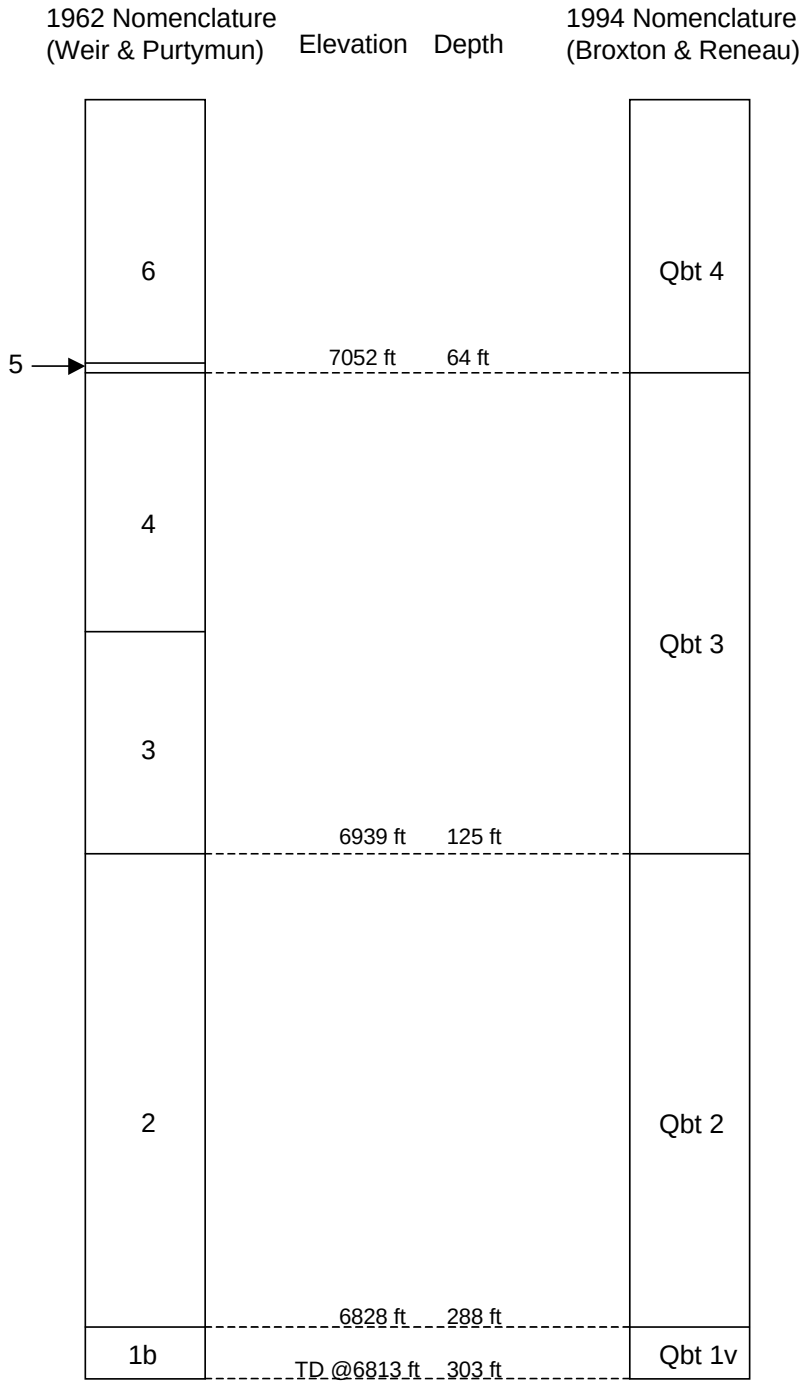
Figure 2.4-9 Stratigraphy of CH-2



Core hole -3

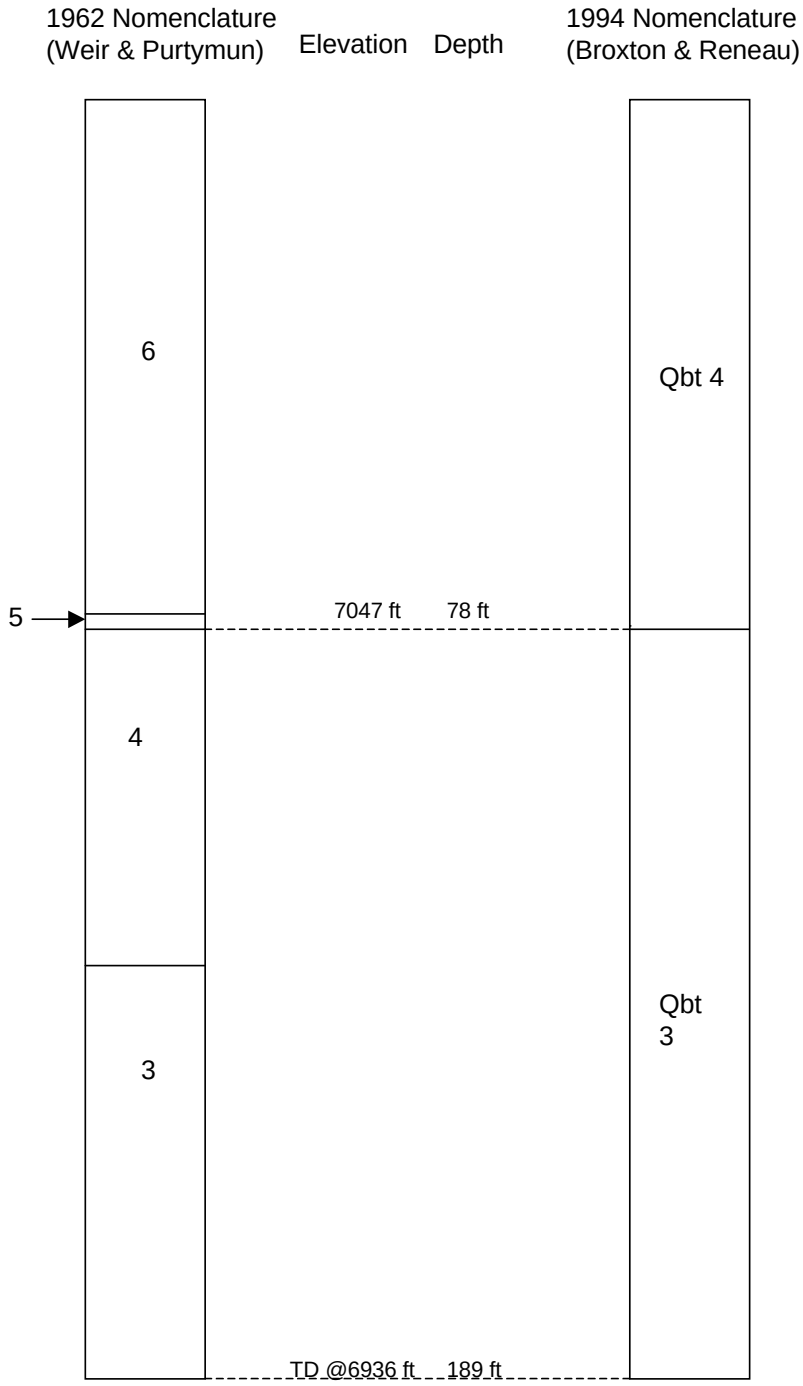
Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

Figure 2.4-10 Stratigraphy of CH-3



Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

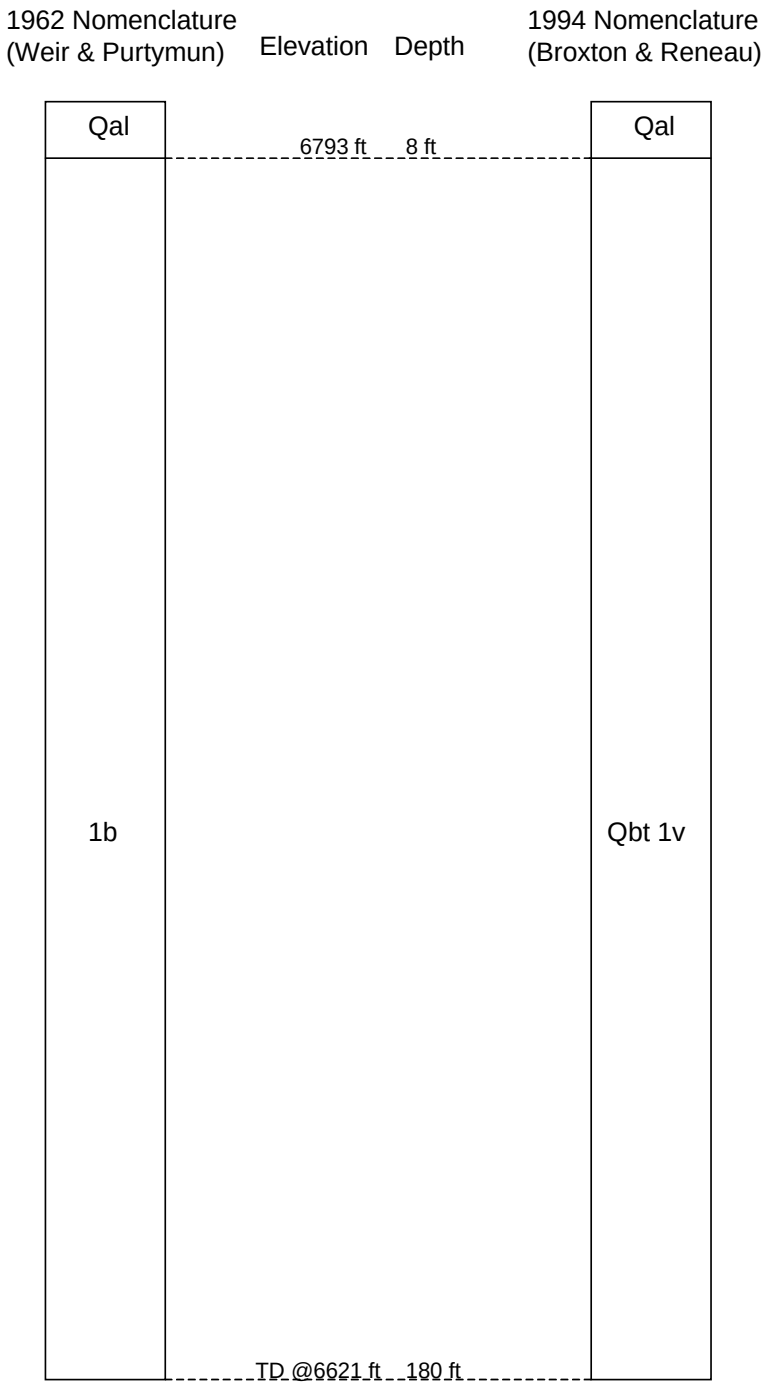
Figure 2.4-11 Stratigraphy of CH-4



Alpha hole

Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

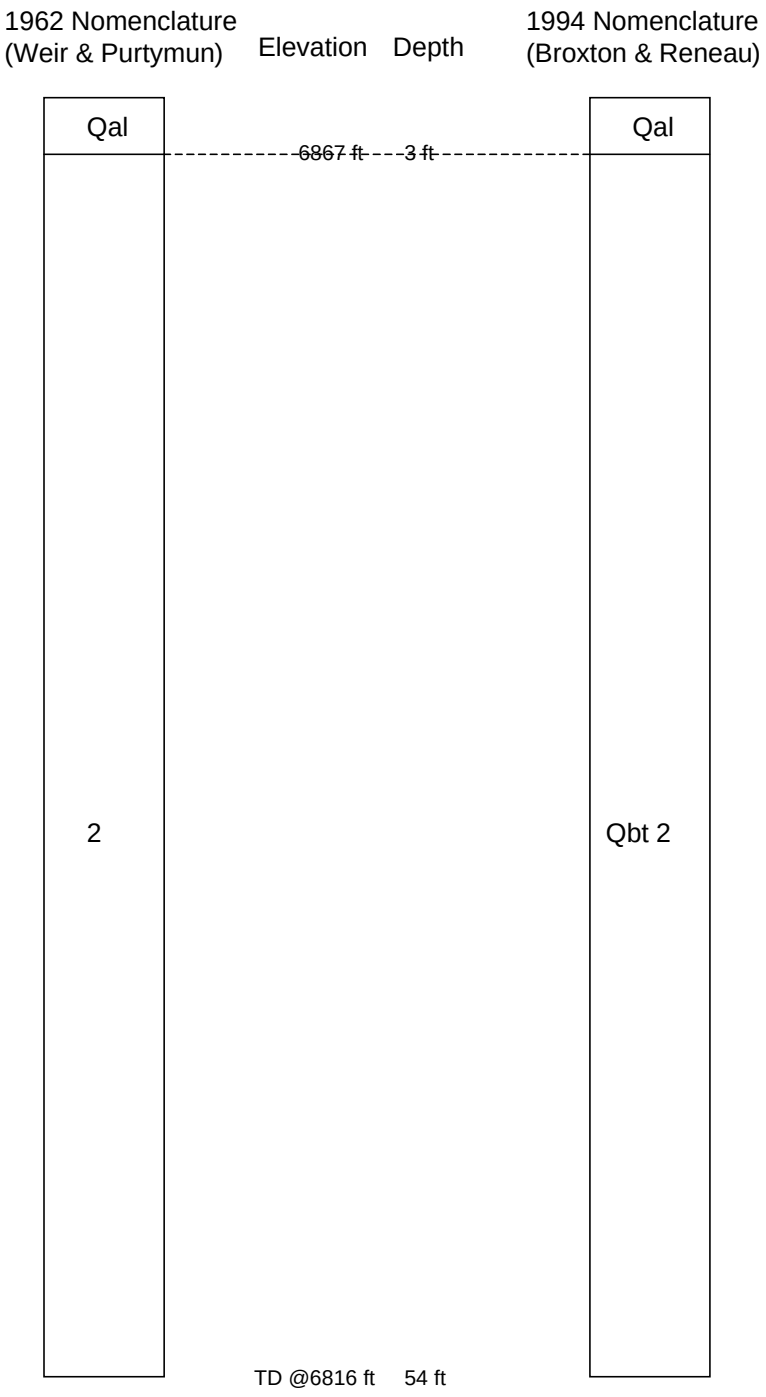
Figure 2.4-12 Stratigraphy of Alpha hole



Beta hole

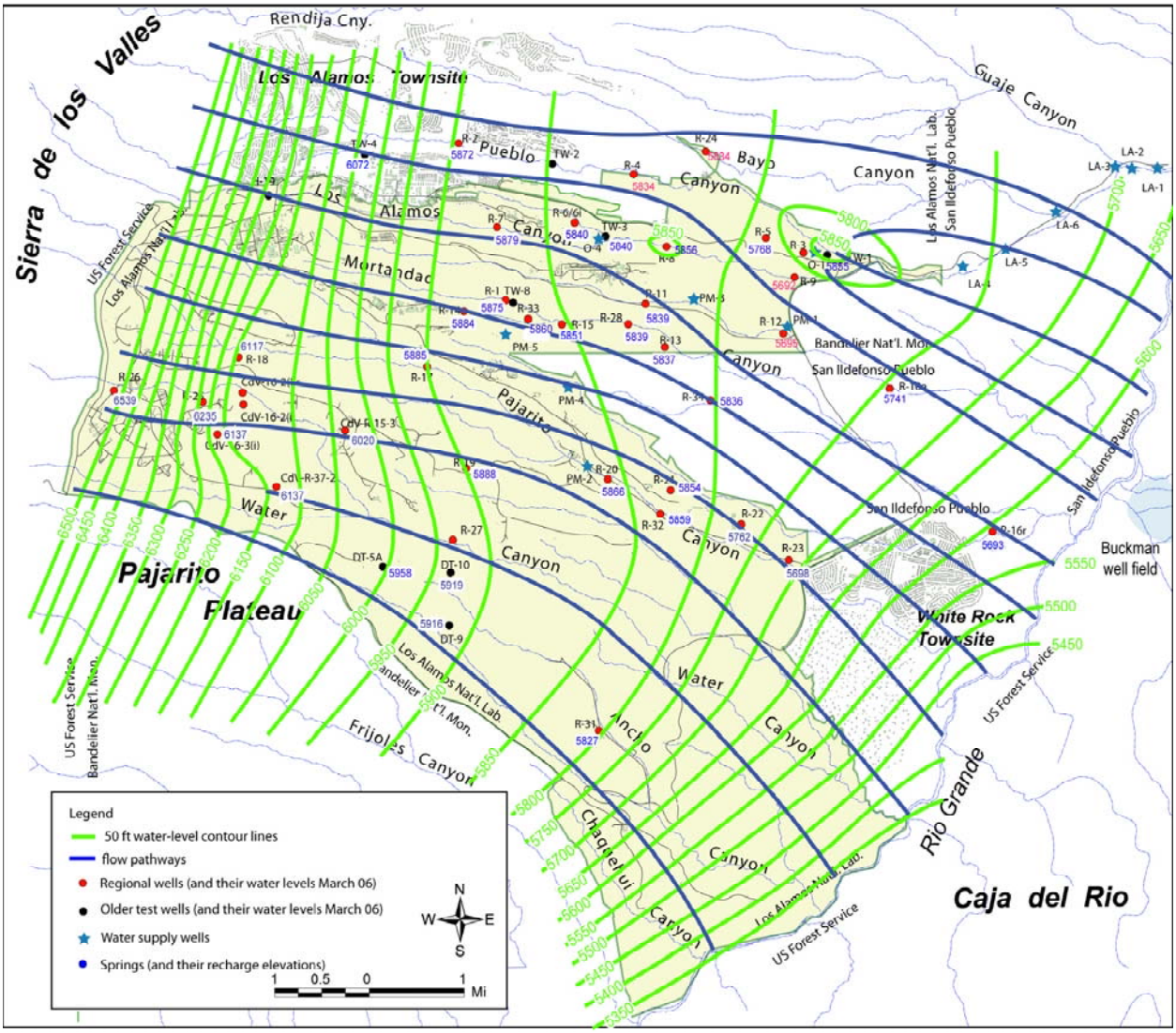
Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

Figure 2.4-13 Stratigraphy of Beta hole



Adapted from Weir and Purtymun (1962, 011890) and Broxton and Reneau (1995, 049726)

Figure 2.4-14 Stratigraphy of Gamma hole



Source: LANL (2007, 095364, p. C-15)

Figure 2.4-15 Contour map of average regional water-table elevations and flow pathways in March 2006

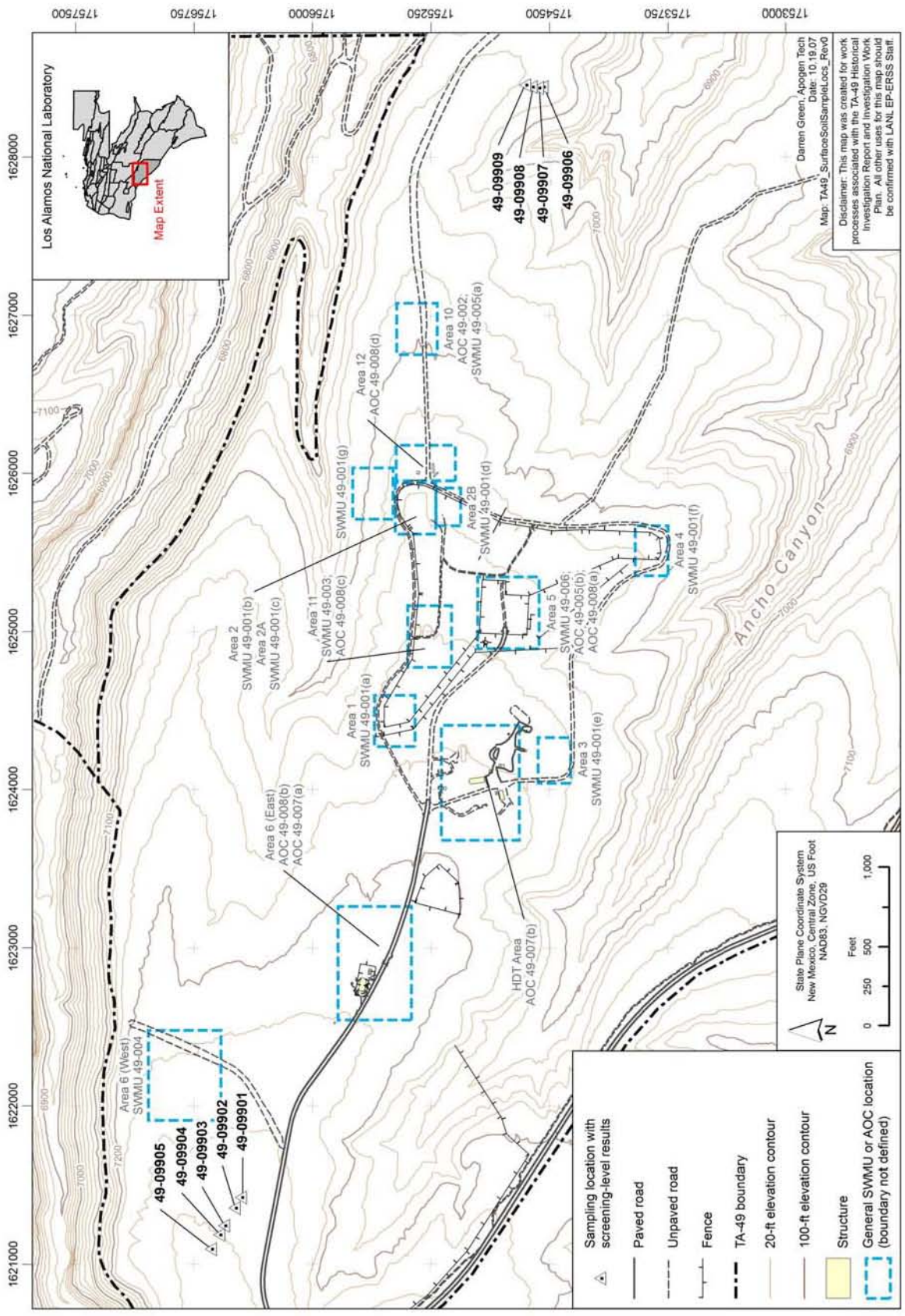


Figure 3.0-1 TA-49 background surface-soil sample locations

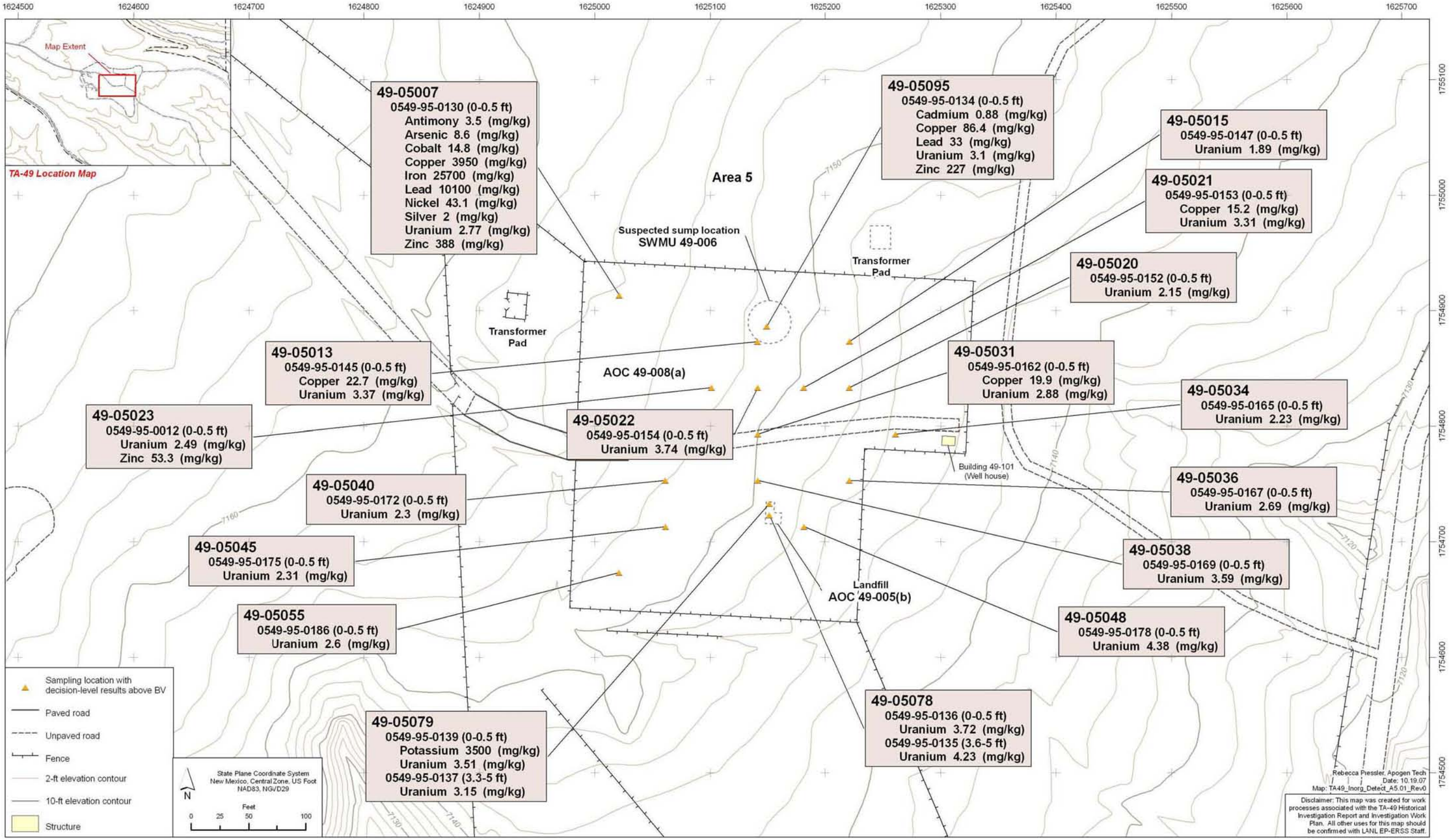


Figure 3.1-1 Area 5 inorganic chemical sampling locations and results above BVs

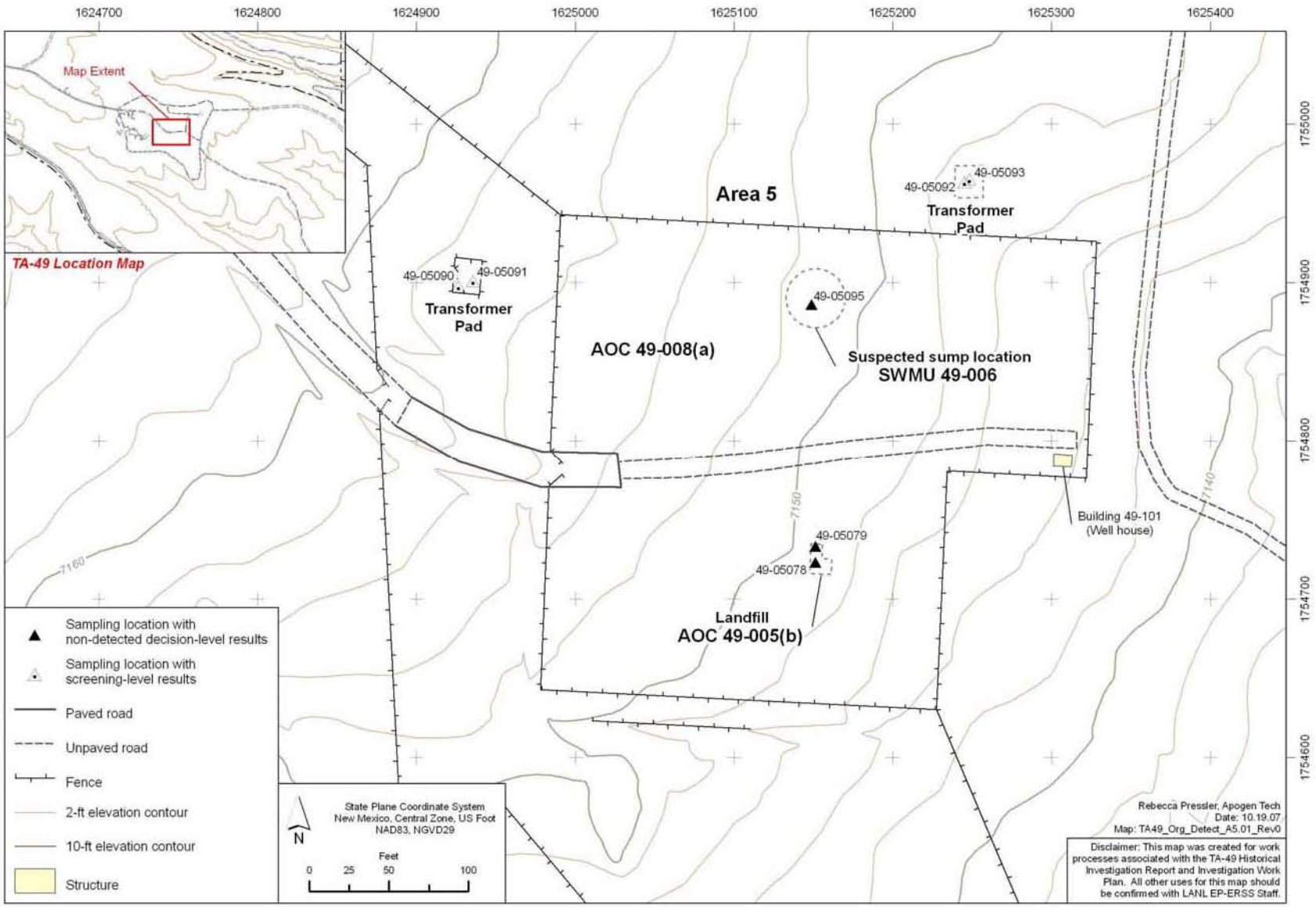


Figure 3.1-2 Area 5 organic chemical sampling locations

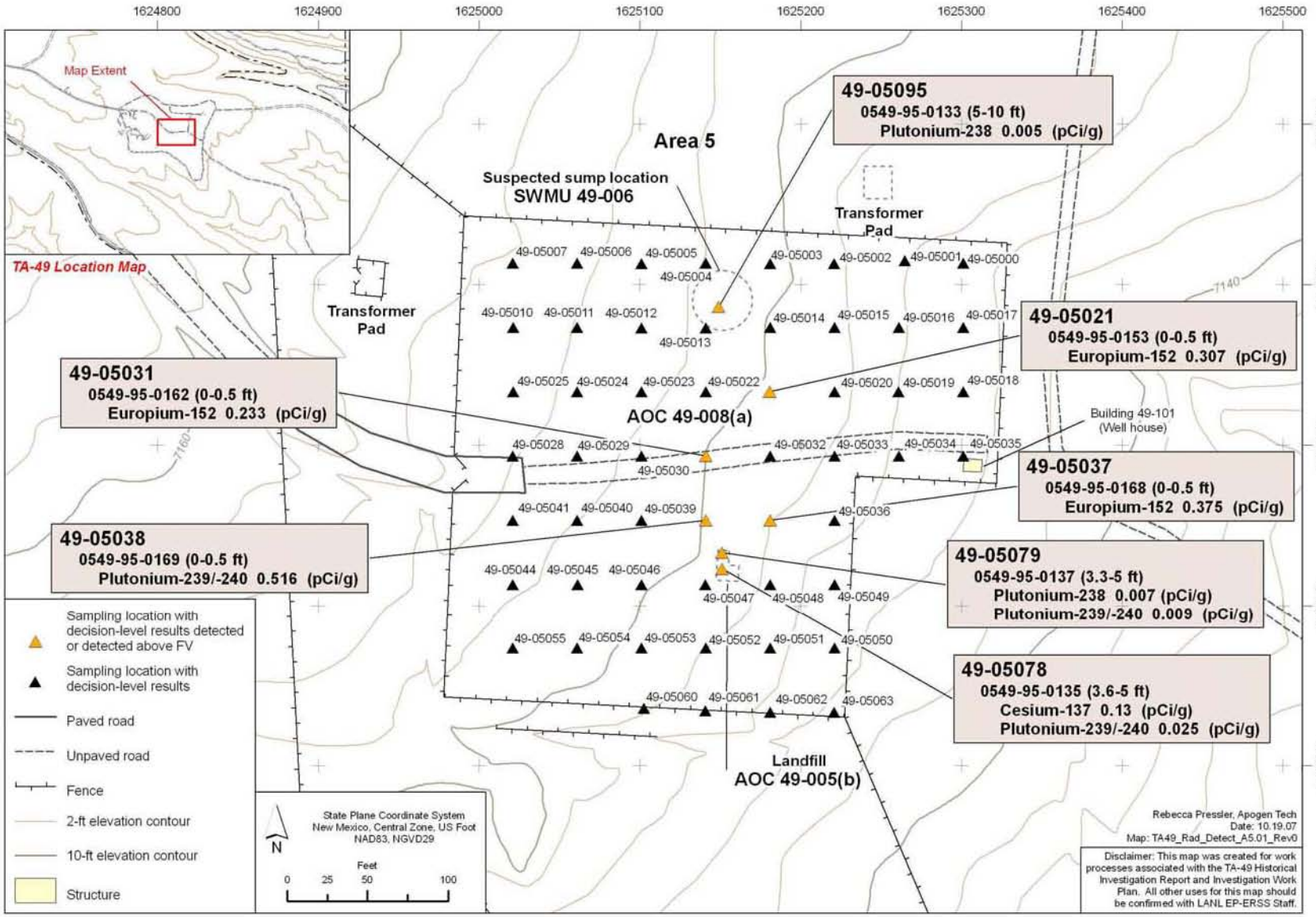


Figure 3.1-3 Area 5 radionuclide sampling locations and results detected or detected above FVs

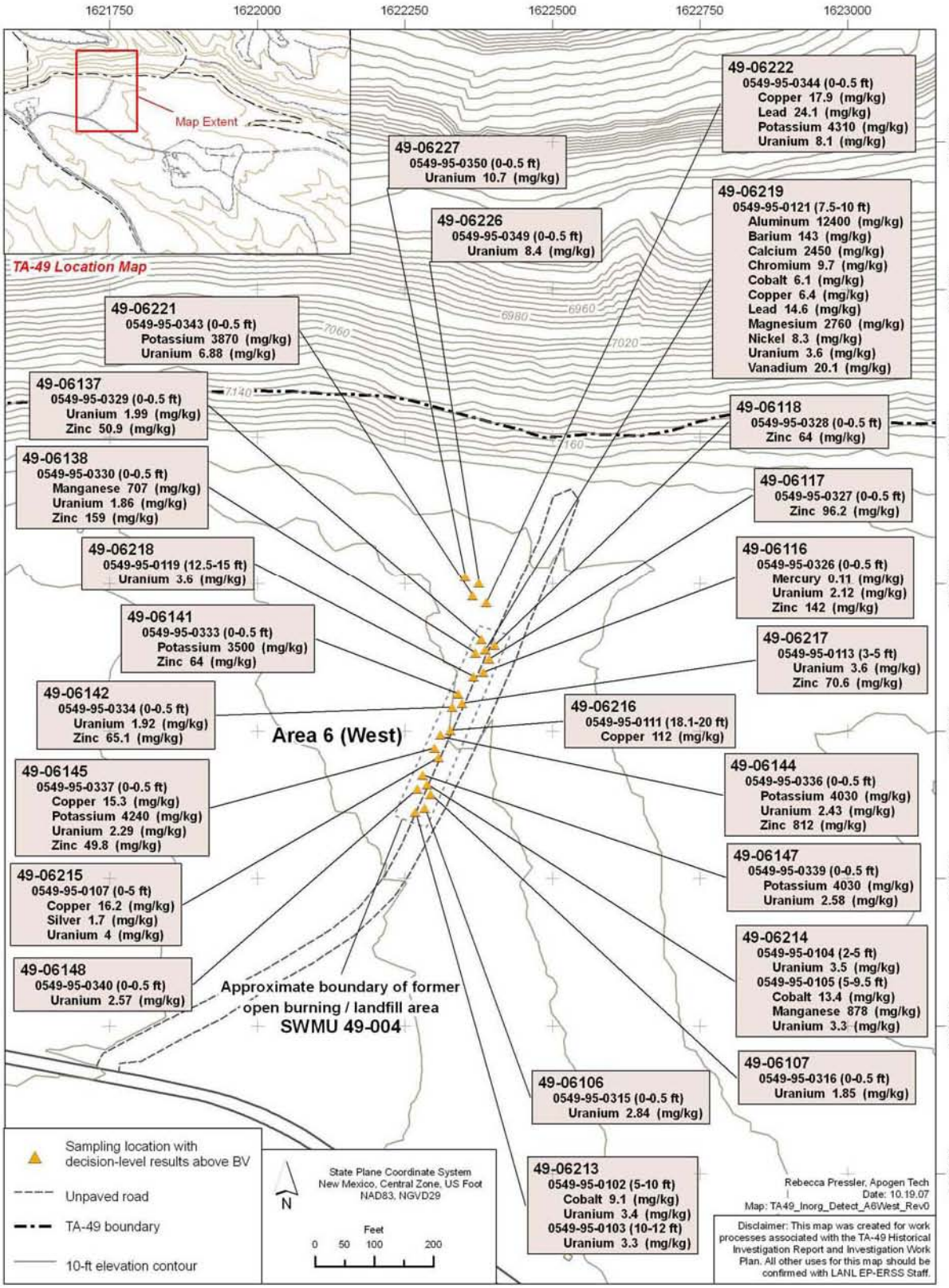


Figure 3.2-1 Area 6 (West) inorganic chemical sampling locations and results above BVs

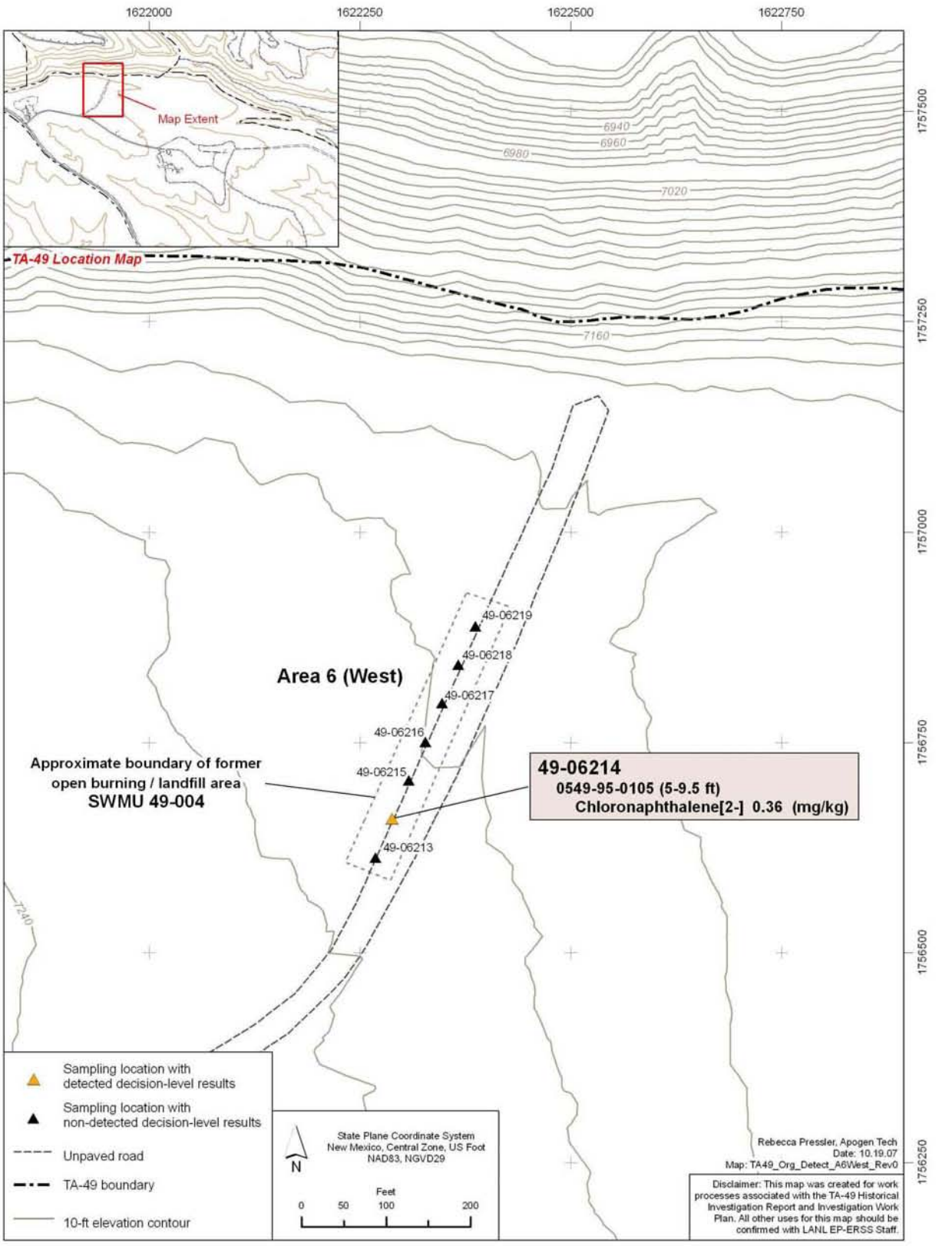


Figure 3.2-2 Area 6 (West) organic chemical sampling locations and detected results

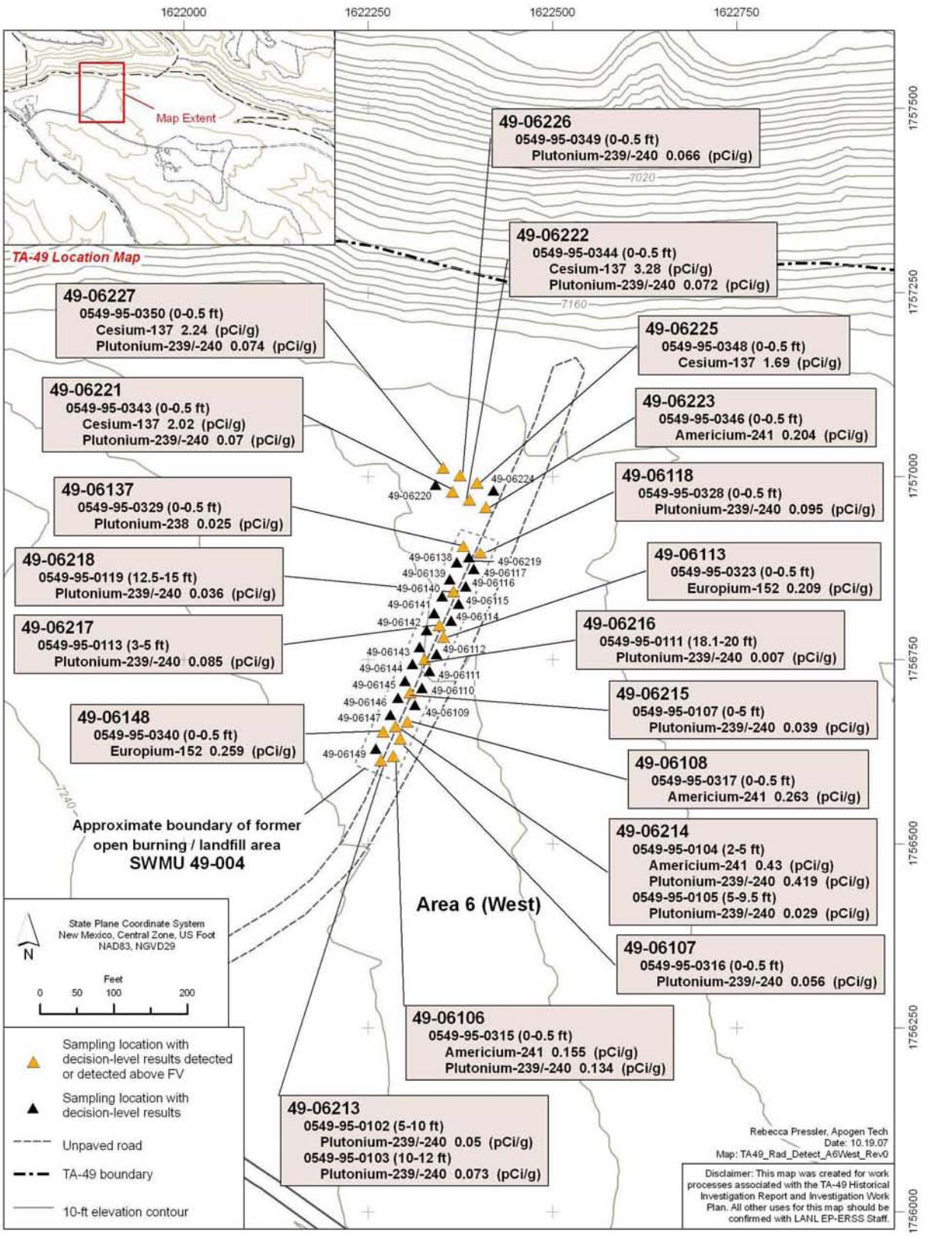


Figure 3.2-3 Area 6 (West) radionuclide sampling locations and results detected or detected above FVs

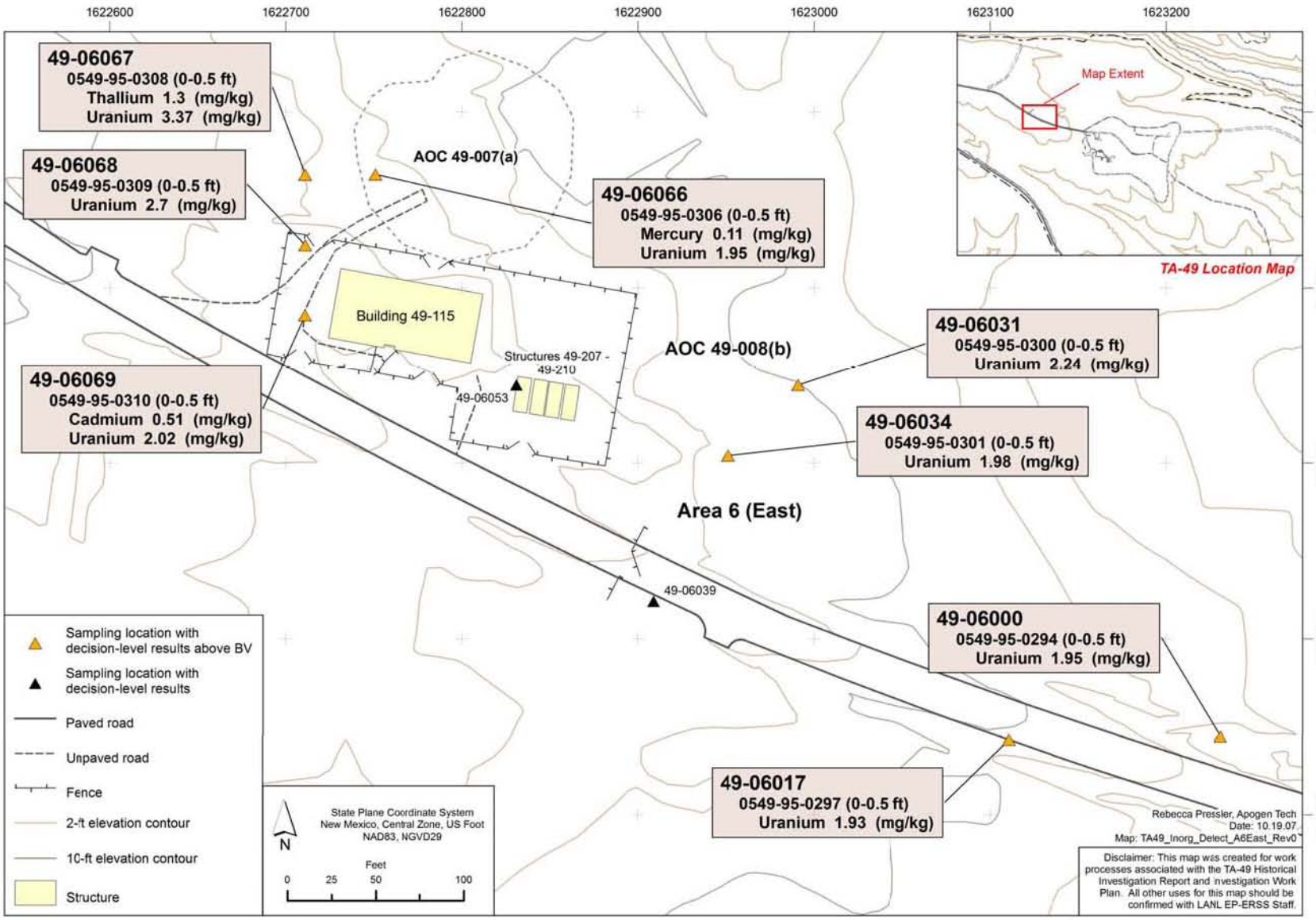


Figure 3.2-4 Area 6 (East) inorganic chemical sampling locations and results above BVs

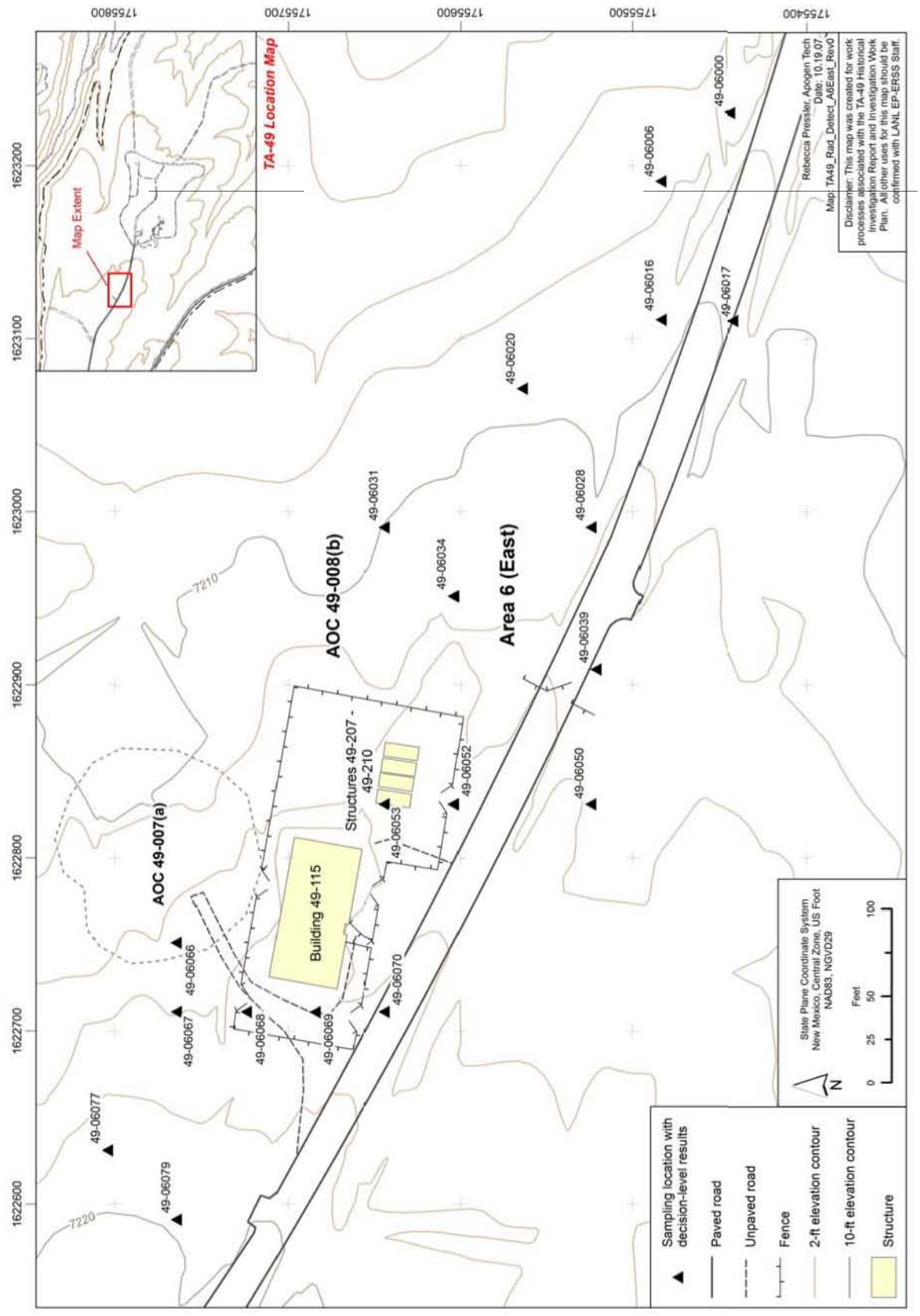


Figure 3.2-5 Area 6 (East) radionuclide sampling locations

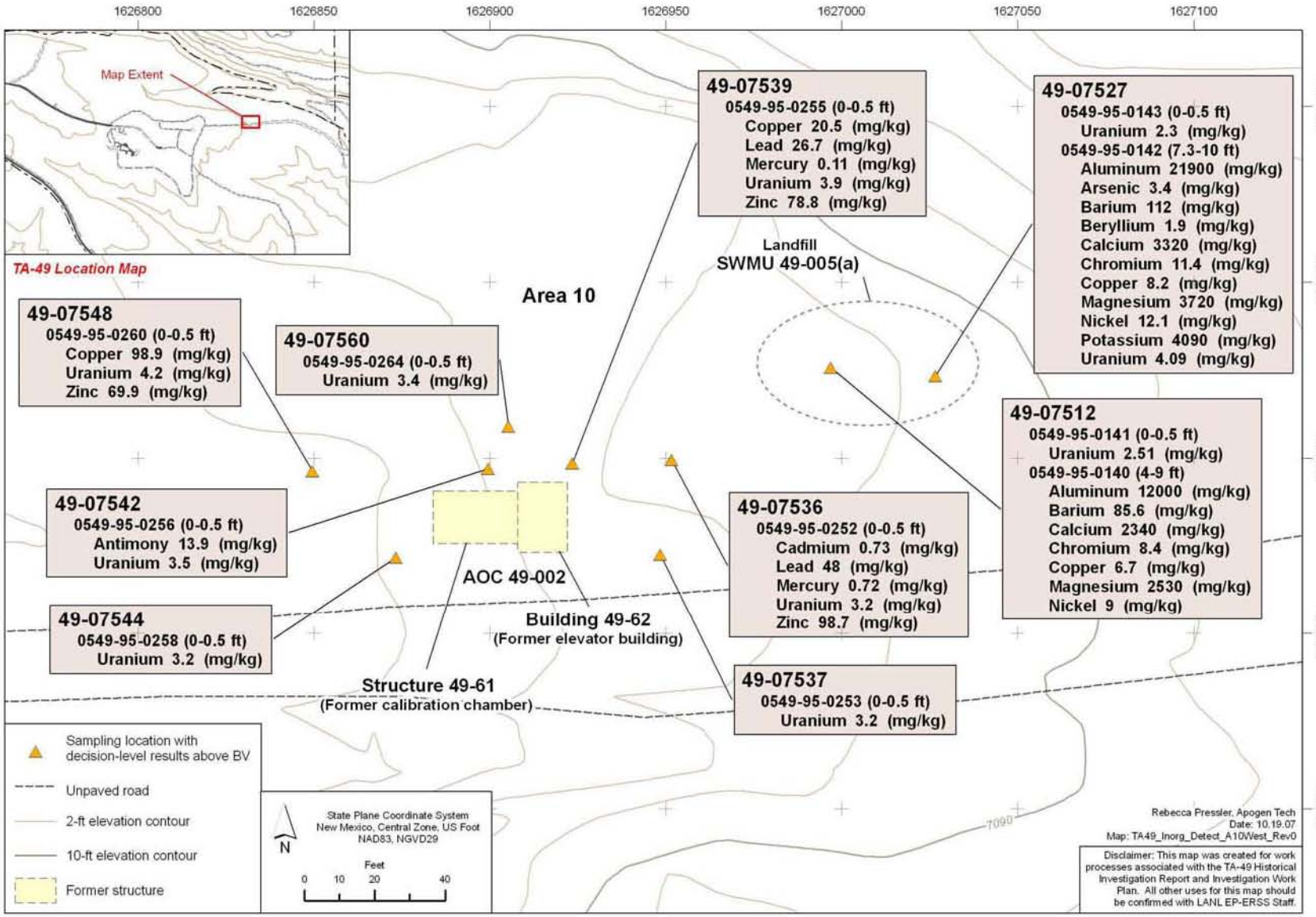


Figure 3.3-1 Area 10 inorganic chemical sampling locations and results above BVs

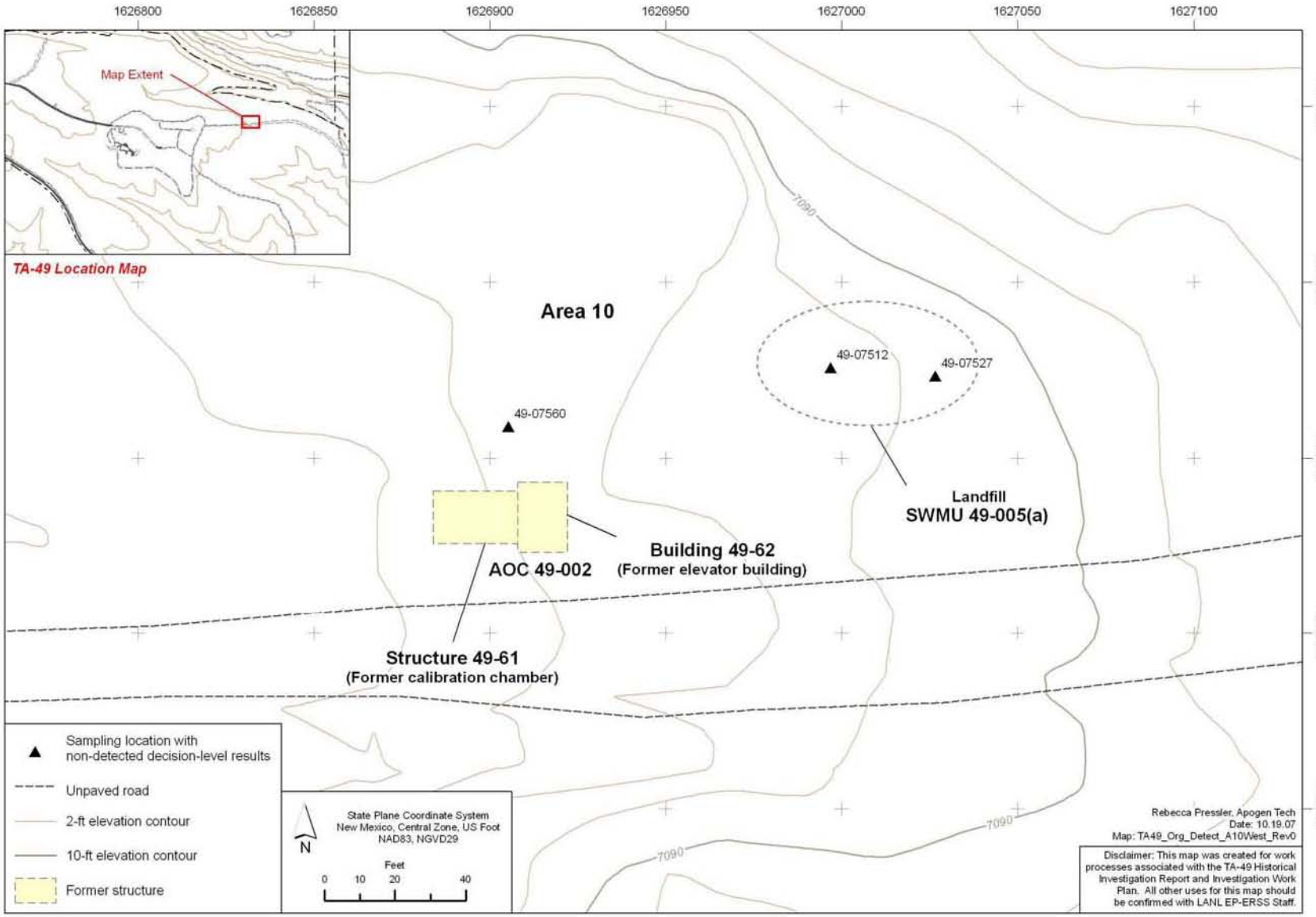


Figure 3.3-2 Area 10 organic chemical sampling locations

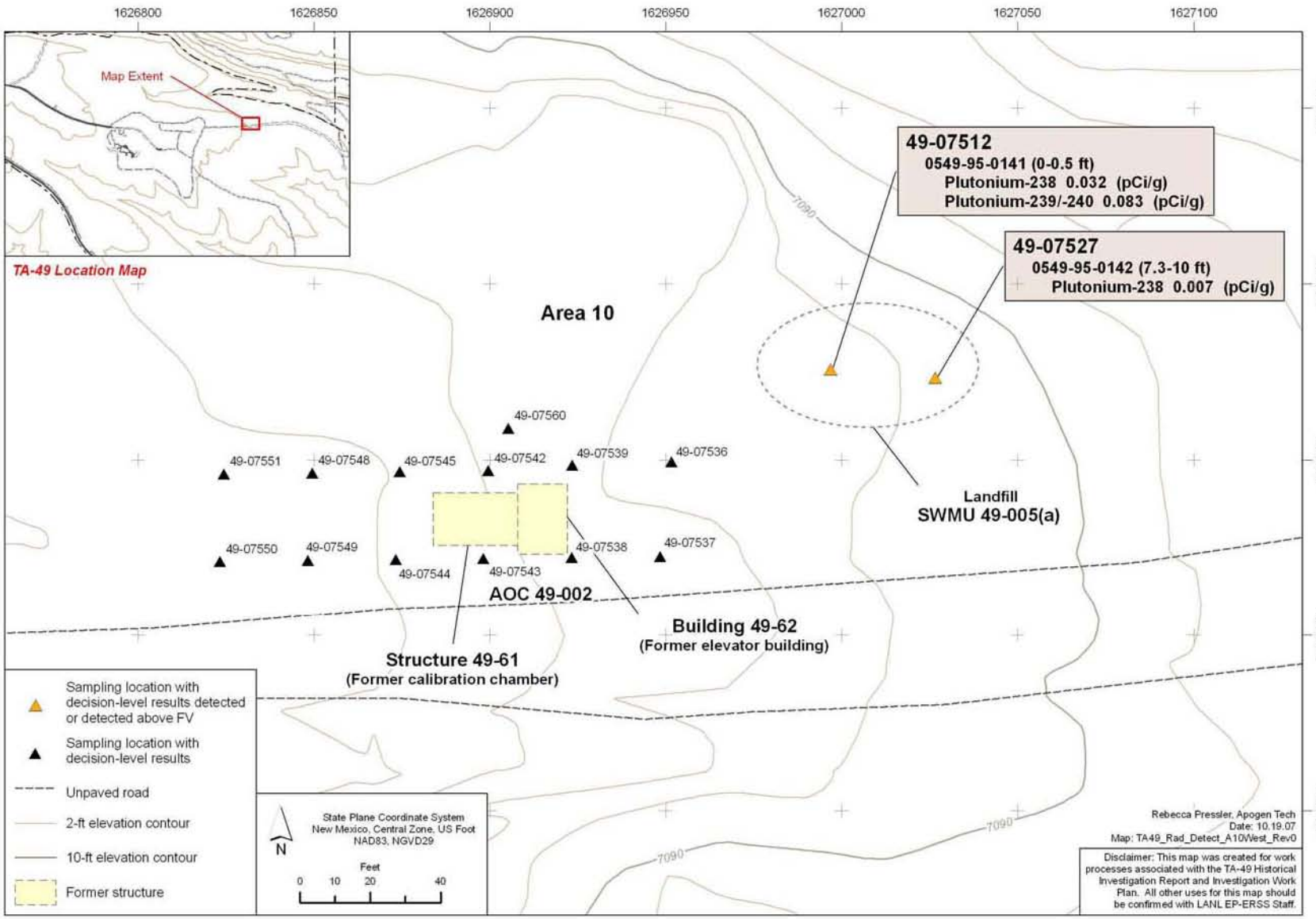


Figure 3.3-3 Area 10 radionuclide sampling locations and results detected or detected above FVs

Table 1.0-1
List of TA-49 SWMUs and AOCs Outside the NES Boundary

SWMU/AOC	Description	Regulatory Status	Reference/Location
AOC 49-002	Underground calibration chamber at Area 10	Under investigation	HIR sections 2.3.3, 2.3.3.1, 3.3, and 3.3.1
AOC 49-004	Open burning/landfill area at Area 6 West	Under investigation	HIR sections 2.3.2, 2.3.2.1, 3.2, 3.2.1, and 3.2.3
SWMU 49-005(a)	Small debris landfill at Area 10	Under investigation	HIR sections 2.3.3, 2.3.3.2, 3.3, and 3.3.2
AOC 49-005(b)	Small debris landfill at Area 5	Under investigation	HIR, sections 2.3.1, 2.3.1.1, 3.1, and 3.1.1
SWMU 49-006	Sump	Under investigation	HIR sections 2.3.1, 2.3.1.2, 3.1, and 3.1.2
AOC 49-007(a)	Septic system at Area 6 East	NFA approved by EPA (2005, 088464)	(EPA 2005, 088464); HIR section 2.3.2 and 2.3.2.3
AOC 49-007(b)	Septic system at HDT training area	NFA approved by EPA (2005, 088464)	(EPA 2005, 088464); HIR section 2.3.4
AOC 49-008(a)	Area of potential soil contamination at Area 5	AOC 49-008(a) is deferred per Table IV-2 of the Consent Order	HIR sections 2.3.1, 2.3.1.3, 3.1, and 3.1.3
AOC 49-008(b)	Area of potential soil contamination at Area 6 East	AOC 49-008(b) is deferred per Table IV-2 of the Consent Order.	HIR sections 2.3.2, 2.3.2.2, 3.2, and 3.2.2

Table 2.4-1
TA-49 Deep Test Well and Select Borehole Details

Well/ Borehole	Year Drilled	Elevation (ft)	Depth (ft)	Water Level Completion (ft)	Diam. (in.)	Construction Details	Location Northing	Location Easting	Logs*	Status
DT-5A	1959	7144	1821	1173	12	Cased—1821 ft, pump equipped	1754789 N	1625310 E	LL, IND, ML, SL, GRN, TEMP	Open, sampled quarterly
DT-9	1960	6935	1501	1103	12	Cased—1501 ft, pump equipped	1751498 N	1628993 E	IND, GRN, SL, TEMP, LL	Open, sampled quarterly
DT-10	1960	7020	1409	1085	12	Cased—1409 ft, pump equipped	1754448 N	1628994 E	IND, GRN, TEMP, SL	Open, sampled quarterly
CH-1	1959	7170	501	Dry	2	Cased—500 ft	1755478 N	1624469 E	GR	Open
CH-2	1959	7137	507	Dry	2	Cased—507 ft, grouted and abandoned	1755344 N	1625826 E	EL, GRN, TEMP	Grouted and abandoned
CH-3	1960	7170	300	Dry	2	Cased 10–300 ft	1754493 N	1624196 E	GR	Open
CH-4	1960	7116	303	Dry	2	Cased—303 ft	1753898 N	1625537 E	GR	Open
Alpha	1960	7125	189	Dry	24	Cased from 0 to 7 ft, open from 7 to 189 ft	1754807 N	1625769 E	IND, GRN, VL	Grouted and abandoned
Beta	1960	6801	180	Dry	24	Cased from 0 to 13 ft, open from 13 to 180 ft	83+63 S	91+89 E	VL	Open
Gamma	1960	6870	54	Dry	4	Cased from 0 to 8 ft, open from 8 to 54 ft	1752630 N	1626278 E	Geologic only	Grouted and abandoned
49-02901	1998	7134	700	Dry	8	Casing at surface only	1755209 N	1625985 E	INAA, QXRD, XRF	Open

* Geologic logs are available for all holes. Other borehole logs that are available include EL (electrical), GR (gamma ray), GRN (gamma ray neutron), INAA (instrumental neutron activation analyses), IND (induction/electrical and spontaneous potential), LL (lateral), QXRD (quantitative x-ray diffraction), SL (sonic), TEMP (temperature), VL (video), and XRF (x-ray fluorescence).

Table 3.0-1
Samples Collected from TA-49 Sites Outside the NES Boundary from Which Decision-Level Data Were Obtained

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
Area 5	**AOC 49-005(b)**										
0549-95-0136	49-05078	0–0.5	Soil	719	720	—*	—	—	720	720	—
0549-95-0135	49-05078	3.6–5	Fill	728	—	—	726	—	728	728	—
0549-95-0139	49-05079	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0137	49-05079	3.3–5	Fill	728	—	—	726	—	728	728	—
Area 5	**SWMU 49-006**										
0549-95-0134	49-05095	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0133	49-05095	5–10	Qbt 4	728	—	—	726	—	728	728	—
Area 5	**AOC 49-008(a)**										
0549-95-0123	49-05000	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0124	49-05001	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0125	49-05002	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0126	49-05003	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0127	49-05004	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0128	49-05005	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0129	49-05006	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0130	49-05007	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0131	49-05010	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0132	49-05011	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0144	49-05012	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0145	49-05013	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0146	49-05014	0–0.5	Soil	—	—	—	—	—	720	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0549-95-0147	49-05015	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0148	49-05016	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0149	49-05017	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0150	49-05018	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0151	49-05019	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0152	49-05020	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0153	49-05021	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0154	49-05022	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0012	49-05023	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0156	49-05024	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0157	49-05025	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0158	49-05028	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0159	49-05029	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0161	49-05030	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0162	49-05031	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0163	49-05032	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0164	49-05033	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0165	49-05034	0–0.5	Soil	719	720	—	—	—	720	720	—
0549-95-0166	49-05035	0–0.5	Soil	—	—	—	—	—	720	—	—
0549-95-0167	49-05036	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0168	49-05037	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0169	49-05038	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0171	49-05039	0–0.5	Soil	—	—	—	—	—	728	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0549-95-0172	49-05040	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0173	49-05041	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0174	49-05044	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0175	49-05045	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0176	49-05046	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0177	49-05047	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0178	49-05048	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0179	49-05049	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0180	49-05050	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0181	49-05051	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0182	49-05052	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0184	49-05053	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0185	49-05054	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0186	49-05055	0–0.5	Soil	728	—	—	—	—	728	728	—
0549-95-0187	49-05060	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0188	49-05061	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0189	49-05062	0–0.5	Soil	—	—	—	—	—	728	—	—
0549-95-0190	49-05063	0–0.5	Soil	—	—	—	—	—	728	—	—
Area 6 West	**SWMU 49-004**										
0549-95-0315	49-06106	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0316	49-06107	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0317	49-06108	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0318	49-06109	0–0.5	Soil	—	—	—	—	—	786	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0549-95-0319	49-06110	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0321	49-06111	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0322	49-06112	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0323	49-06113	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0324	49-06114	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0325	49-06115	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0326	49-06116	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0327	49-06117	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0328	49-06118	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0329	49-06137	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0330	49-06138	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0331	49-06139	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0332	49-06140	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0333	49-06141	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0334	49-06142	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0335	49-06143	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0336	49-06144	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0337	49-06145	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0338	49-06146	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0339	49-06147	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0340	49-06148	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0341	49-06149	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0101	49-06213	2–5	Soil	—	—	—	—	—	687	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0549-95-0102	49-06213	5–10	Soil	687	—	—	682	—	687	687	—
0549-95-0103	49-06213	10–12	Qbt 4	687	—	—	682	—	687	687	—
0549-95-0104	49-06214	2–5	Fill	687	—	—	682	—	687	687	—
0549-95-0105	49-06214	5–9.5	Fill	687	—	—	682	—	687	687	—
0549-95-0106	49-06214	10–12.5	Qbt 4	—	—	—	—	—	687	—	—
0549-95-0107	49-06215	0–5	Fill	687	—	—	682	—	687	687	—
0549-95-0108	49-06215	6–9.5	Fill	—	—	—	—	—	687	—	—
0549-95-0110	49-06216	1.5–4	Fill	—	—	—	—	—	687	—	—
0549-95-0111	49-06216	18.1–20	Fill	728	—	—	726	—	728	728	—
0549-95-0112	49-06216	20–22	Fill	—	—	—	—	—	728	—	—
0549-95-0113	49-06217	3–5	Soil	687	—	—	682	—	687	687	—
0549-95-0114	49-06217	8–10	Soil	—	—	—	—	—	687	—	—
0549-95-0117	49-06218	3–5	Soil	—	—	—	—	—	687	—	—
0549-95-0118	49-06218	8–10	Qbt 4	—	—	—	—	—	687	—	—
0549-95-0119	49-06218	12.5–15	Qbt 4	687	—	—	682	—	687	687	—
0549-95-0120	49-06219	3–5	Soil	—	—	—	—	—	687	—	—
0549-95-0121	49-06219	7.5–10	Qbt 4	687	—	—	682	—	687	687	—
0549-95-0342	49-06220	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0343	49-06221	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0344	49-06222	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0346	49-06223	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0347	49-06224	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0348	49-06225	0–0.5	Soil	—	—	—	—	—	786	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0549-95-0349	49-06226	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0350	49-06227	0–0.5	Soil	783	786	—	—	—	786	786	—
Area 6 East	**AOC 49-008(b)**										
0549-95-0294	49-06000	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0295	49-06006	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0296	49-06016	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0297	49-06017	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0298	49-06020	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0299	49-06028	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0300	49-06031	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0301	49-06034	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0302	49-06039	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0303	49-06050	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0304	49-06052	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0305	49-06053	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0306	49-06066	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0308	49-06067	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0309	49-06068	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0310	49-06069	0–0.5	Soil	783	786	—	—	—	786	786	—
0549-95-0312	49-06070	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0313	49-06077	0–0.5	Soil	—	—	—	—	—	786	—	—
0549-95-0314	49-06079	0–0.5	Soil	—	—	—	—	—	786	—	—

Table 3.0-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	Am-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
Area 10	**AOC 49-002**										
0549-95-0252	49-07536	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0253	49-07537	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0254	49-07538	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0255	49-07539	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0256	49-07542	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0257	49-07543	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0258	49-07544	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0259	49-07545	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0260	49-07548	0–0.5	Soil	795	—	—	—	—	795	795	—
0549-95-0261	49-07549	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0262	49-07550	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0263	49-07551	0–0.5	Soil	—	—	—	—	—	795	—	—
0549-95-0264	49-07560	0–0.5	Soil	795	—	793	793	—	795	795	—
Area 10	**SWMU 49-005(a)**										
0549-95-0141	49-07512	0–0.5	Soil	719	720	—	718	—	720	720	—
0549-95-0140	49-07512	4–9	Qbt 4	728	—	—	726	—	728	728	—
0549-95-0143	49-07527	0–0.5	Soil	719	720	—	718	—	720	720	—
0549-95-0142	49-07527	7.3–10	Qbt 4	728	—	—	726	—	728	728	—

* — = Analytical suite was not requested.

Table 3.0-2
Samples Collected from TA-49 Sites Outside the NES Boundary from Which Screening-Level Data Were Obtained

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCB
Area 5	**49-008(a)**								
0549-95-0001	49-05090	0–0.5	Soil	—*	—	—	—	—	226
0549-95-0003	49-05091	0–0.5	Soil	—	—	—	—	—	226
0549-95-0004	49-05092	0–0.5	Soil	—	—	—	—	—	226
0549-95-0005	49-05093	0–0.5	Soil	—	—	—	—	—	226
MDA AB	**49-001(a)-00**								
AAA1739	49-09901	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1741	49-09902	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1742	49-09903	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1743	49-09904	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1744	49-09905	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1745	49-09906	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1747	49-09907	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1748	49-09908	0–0.5	Soil	14553	14553	14553	14553	14552	—
AAA1749	49-09909	0–0.5	Soil	14553	14553	14553	14553	14552	—

* — = Analytical suite was not requested.

Table 3.0-3
Summary of Inorganic Chemical Screening-Level Results from TA-49 Background Samples

Sample ID	Location ID	Depth	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Nickel	Selenium	Silver	Thallium
Soil BV[a]				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**
MDA AB	**49-001(a)-00**														
AAA1739	49-09901	0–0.5	Soil	<11.2[b]	3.2	168	0.77	1.2	8.1	15.1	<0.02	8.7	<0.6	<1.4	<1
AAA1741	49-09902	0–0.5	Soil	<11.2	3.2	162	0.73	1.1	8.4	20.3	<0.02	8.1	<0.6	<1.4	<1
AAA1742	49-09903	0–0.5	Soil	<11.2	5	158	0.68	1.3	8.7	13.6	<0.02	9.7	<0.6	<1.4	<1
AAA1743	49-09904	0–0.5	Soil	<11.2	3.1	131	0.63	1.2	7.9	14.6	<0.02	6.9	<0.6	<1.4	<1
AAA1744	49-09905	0–0.5	Soil	<11.2	3.4	140	0.56	1.1	7.3	16	<0.02	6.9	<0.6	<1.4	<1
AAA1745	49-09906	0–0.5	Soil	<11.2	2.4	100	0.62	0.96	6.3	10.6	<0.02	6	<0.6	<1.4	<1
AAA1747	49-09907	0–0.5	Soil	<11.2	2.2	132	0.69	1.1	6.5	15.8	<0.02	6.8	<0.6	<1.4	<1
AAA1748	49-09908	0–0.5	Soil	<11.2	1.3	94.7	0.59	1.4	8.6	12.1	<0.02	6.3	<0.6	<1.4	<1
AAA1749	49-09909	0–0.5	Soil	<11.2	2.2	99.3	0.78	<0.8	8.4	10.9	<0.02	7.8	<0.6	<1.4	<1

Notes: All results are in mg/kg. Values shaded in gray are above BVs.

[a] BVs are from LANL(1998, 059730).

[b] < = Result is not detected at the concentration reported.

Table 3.0-4
Summary of Radionuclide Screening-Level Results from TA-49 Background Samples

Sample ID	Location ID	Depth	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Potassium-40	Radium-226	Thorium-232	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil BV[a]				**1.65**	**0.023**	**0.054**	**36.8**	**2.59**	**2.33**	**na**[b]	**2.59**	**0.2**	**2.29**
AAA1739	49-09901	0–0.5	Soil	—[c]	—	<0.01[d]	19.377	2.995	3.28	<0.00209	1.341	<0.067	1.477
AAA1741	49-09902	0–0.5	Soil	—	—	0.035	24.222	<2.288	<3.185	<0.00320	1.989	<0.086	2.218
AAA1742	49-09903	0–0.5	Soil	—	—	—	22.706	—	—	<0.00038	1.249	<0.09	1.399
AAA1743	49-09904	0–0.5	Soil	—	—	<0.009	14.248	<1.827	<2.585	<0.00038	1.365	<0.18	1.555
AAA1744	49-09905	0–0.5	Soil	1.079	—	0.024	29.31	1.945	3.129	<0.01412	1.507	<0.103	1.817
AAA1745	49-09906	0–0.5	Soil	—	—	<0.011	26.247	—	—	<-0.00088	1.239	<0.114	1.387
AAA1747	49-09907	0–0.5	Soil	2.448	0.023	0.058	28.313	—	2.867	0.01282	1.495	<0.098	1.94
AAA1748	49-09908	0–0.5	Soil	<0.862	—	0.018	21.292	2.844	2.741	0.00930	1.195	<0.066	1.341
AAA1749	49-09909	0–0.5	Soil	—	—	—	32.231	1.718	2.812	<0.00723	1.28	<0.082	1.372

Notes: All values are in pCi/g. Values shaded in gray are above BVs or FVs.

[a] BVs are from LANL (1998, 059730).

[b] na = Not available.

[c] — = Sample was not analyzed or analysis was rejected.

[d] < = Result is not detected at the concentration reported.

Table 3.1-1
Frequency of Inorganic Chemicals above BVs at Area 5: AOC 49-005(b)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	2	2	15900–17000	29200	0/2	0/0
Aluminum	Fill	2	2	13600–13900	29200	0/2	0/0
Antimony	Soil	2	0	[0.82–0.83]	0.83	0/2	0/2
Antimony	Fill	2	0	[0.74–0.78]	0.83	0/2	0/2
Arsenic	Soil	2	0	[2–2.7]	8.17	0/2	0/2
Arsenic	Fill	2	2	1.3–2.5	8.17	0/2	0/0
Barium	Soil	2	2	175–199	295	0/2	0/0
Barium	Fill	2	2	150–192	295	0/2	0/0
Beryllium	Soil	2	2	0.79–0.82	1.83	0/2	0/0
Beryllium	Fill	2	2	0.71–0.75	1.83	0/2	0/0
Cadmium	Soil	2	0	[0.12–0.17]	0.4	0/2	0/2
Cadmium	Fill	2	2	0.14–0.15	0.4	0/2	0/0
Calcium	Soil	2	2	1910–2020	6120	0/2	0/0
Calcium	Fill	2	2	1980–2920	6120	0/2	0/0
Chromium	Soil	2	2	11–12.4	19.3	0/2	0/0
Chromium	Fill	2	2	9.5–9.9	19.3	0/2	0/0
Cobalt	Soil	2	2	6.5–7.9	8.64	0/2	0/0
Cobalt	Fill	2	2	5.2–7.5	8.64	0/2	0/0
Copper	Soil	2	2	8.6–9	14.7	0/2	0/0
Copper	Fill	2	2	6.9–8.5	14.7	0/2	0/0
Iron	Soil	2	2	13800–14500	21500	0/2	0/0
Iron	Fill	2	2	12100–12300	21500	0/2	0/0
Lead	Soil	1	1	16.3–16.3	22.3	0/1	0/0
Lead	Fill	2	2	13.2–16	22.3	0/2	0/0

Table 3.1-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Magnesium	Soil	2	2	2290–2420	4610	0/2	0/0
Magnesium	Fill	2	2	1980–2090	4610	0/2	0/0
Manganese	Soil	2	2	496–648	671	0/2	0/0
Manganese	Fill	2	2	414–618	671	0/2	0/0
Mercury	Soil	2	0	[0.1–0.12]	0.1	0/2	1/2
Mercury	Fill	2	0	[0.11–0.12]	0.1	0/2	2/2
Nickel	Soil	2	2	8.8–9.1	15.4	0/2	0/0
Nickel	Fill	2	2	7.6–8.5	15.4	0/2	0/0
Potassium	Soil	1	1	3500–3500	3460	1/1	0/0
Potassium	Fill	2	2	2610–3200	3460	0/2	0/0
Selenium	Soil	2	0	[0.89–0.91]	1.52	0/2	0/2
Selenium	Fill	2	0	[0.81–0.85]	1.52	0/2	0/2
Silver	Soil	2	0	[0.19–0.2]	1	0/2	0/2
Silver	Fill	2	1	[0.18]–0.28	1	0/2	0/1
Sodium	Soil	1	1	173–173	915	0/1	0/0
Sodium	Fill	2	2	162–186	915	0/2	0/0
Thallium	Soil	2	0	[1.5–1.5]	0.73	0/2	2/2
Thallium	Fill	2	0	[1.4–1.4]	0.73	0/2	2/2
Uranium	Soil	2	2	3.51–3.72	1.82	2/2	0/0
Uranium	Fill	2	2	3.15–4.23	1.82	2/2	0/0
Vanadium	Soil	2	2	26.4–27.5	39.6	0/2	0/0
Vanadium	Fill	2	2	20.7–22.7	39.6	0/2	0/0
Zinc	Soil	2	2	37–38.1	48.8	0/2	0/0
Zinc	Fill	2	2	35–36.5	48.8	0/2	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.1-2
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 5: AOC 49-005(b)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	2	0	[-0.055–0.0273]	0.013	0/2
Americium-241	Fill	2	0	[-0.069–0.04]	0.013	0/2
Cesium-137	Soil	2	1	[0.059]–0.136	1.65	0/2
Cesium-137	Fill	2	1	[0.069]–0.13	1.65	1/2
Cobalt-60	Soil	2	0	[-0.017–0.006]	na[c]	0/2
Cobalt-60	Fill	2	0	[-0.033–-0.006]	na	0/2
Europium-152	Soil	2	0	[0.089–0.149]	na	0/2
Europium-152	Fill	2	0	[-0.016–0.209]	na	0/2
Plutonium-238	Soil	2	2	0.005–0.018	0.023	0/2
Plutonium-238	Fill	2	1	[-0.005]–0.007	0.023	1/2
Plutonium-239/240	Soil	2	1	[0]–0.014	0.054	0/2
Plutonium-239/240	Fill	2	2	0.009–0.025	0.054	2/2
Ruthenium-106	Soil	2	0	[-0.087–0.192]	na	0/2
Ruthenium-106	Fill	2	0	[-0.146–-0.135]	na	0/2
Sodium-22	Soil	2	0	[-0.051–0.017]	na	0/2
Sodium-22	Fill	2	0	[0.005–0.039]	na	0/2

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = Not available.

Table 3.1-3
Summary of Inorganic Chemicals above BVs at Area 5: AOC 49-005(b)

Sample ID	Location ID	Depth (ft)	Media	Mercury	Potassium	Thallium	Uranium
Soil BV[a]				**0.1**	**3460**	**0.73**	**1.82**
0549-95-0136	49-05078	0.00–0.50	Soil	0.12 (U)	—[b]	1.5 (U)	3.72
0549-95-0135	49-05078	3.60–5.00	Fill	0.12 (U)	—	1.4 (U)	4.23
0549-95-0139	49-05079	0.00–0.50	Soil	—	3500	1.5 (U)	3.51
0549-95-0137	49-05079	3.30–5.00	Fill	0.11 (U)	—	1.4 (U)	3.15

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.1-4
Summary of Radionuclides Detected at Area 5: AOC 49-005(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**
0549-95-0135	49-05078	3.60–5.00	Fill	0.13	—[b]	0.025
0549-95-0137	49-05079	3.30–5.00	Fill	—	0.007	0.009

Notes: All values are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] — = Not detected.

Table 3.1-5
Frequency of Inorganic Chemicals above BVs at Area 5: SWMU 49-006

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	1	1	11600–11600	29200	0/1	0/0
Aluminum	Qbt 4	1	1	1480–1480	7340	0/1	0/0
Antimony	Soil	1	0	[0.84–0.84]	0.83	0/1	1/1
Antimony	Qbt 4	1	0	[0.75–0.75]	0.5	0/1	1/1
Arsenic	Soil	1	0	[4.3–4.3]	8.17	0/1	0/1
Arsenic	Qbt 4	1	0	[1–1]	2.79	0/1	0/1
Barium	Soil	1	1	153–153	295	0/1	0/0
Barium	Qbt 4	1	1	17.9–17.9	46	0/1	0/0
Beryllium	Soil	1	0	[0.62–0.62]	1.83	0/1	0/1
Beryllium	Qbt 4	1	0	[0.28–0.28]	1.21	0/1	0/1
Cadmium	Soil	1	1	0.88–0.88	0.4	1/1	0/0
Cadmium	Qbt 4	1	0	[0.06–0.06]	1.63	0/1	0/1
Calcium	Soil	1	1	2480–2480	6120	0/1	0/0
Calcium	Qbt 4	1	1	839–839	2200	0/1	0/0
Chromium	Soil	1	1	9.9–9.9	19.3	0/1	0/0
Chromium	Qbt 4	1	1	2.3–2.3	7.14	0/1	0/0
Cobalt	Soil	1	1	7.4–7.4	8.64	0/1	0/0
Cobalt	Qbt 4	1	0	[0.72–0.72]	3.14	0/1	0/1
Copper	Soil	1	1	86.4–86.4	14.7	1/1	0/0
Copper	Qbt 4	1	1	1.7–1.7	4.66	0/1	0/0
Iron	Soil	1	1	12000–12000	21500	0/1	0/0
Iron	Qbt 4	1	1	3230–3230	14500	0/1	0/0
Lead	Soil	1	1	33–33	22.3	1/1	0/0
Lead	Qbt 4	1	1	2.4–2.4	11.2	0/1	0/0

Table 3.1-5 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Magnesium	Soil	1	1	1890–1890	4610	0/1	0/0
Magnesium	Qbt 4	1	1	714–714	1690	0/1	0/0
Manganese	Soil	1	1	422–422	671	0/1	0/0
Manganese	Qbt 4	1	1	114–114	482	0/1	0/0
Mercury	Soil	1	0	[0.12–0.12]	0.1	0/1	1/1
Mercury	Qbt 4	1	0	[0.1–0.1]	0.1	0/1	0/1
Nickel	Soil	1	1	8.3–8.3	15.4	0/1	0/0
Nickel	Qbt 4	1	1	2.1–2.1	6.58	0/1	0/0
Potassium	Soil	1	1	2230–2230	3460	0/1	0/0
Potassium	Qbt 4	1	1	499–499	3500	0/1	0/0
Selenium	Soil	1	0	[0.91–0.91]	1.52	0/1	0/1
Selenium	Qbt 4	1	0	[0.82–0.82]	0.3	0/1	1/1
Silver	Soil	1	0	[0.75–0.75]	1	0/1	0/1
Silver	Qbt 4	1	0	[0.18–0.18]	1	0/1	0/1
Sodium	Soil	1	1	329–329	915	0/1	0/0
Sodium	Qbt 4	1	1	265–265	2770	0/1	0/0
Thallium	Soil	1	0	[1.5–1.5]	0.73	0/1	1/1
Thallium	Qbt 4	1	0	[1.4–1.4]	1.1	0/1	1/1
Uranium	Soil	1	1	3.1–3.1	1.82	1/1	0/0
Uranium	Qbt 4	1	1	1.75–1.75	2.4	0/1	0/0
Vanadium	Soil	1	1	23.6–23.6	39.6	0/1	0/0
Vanadium	Qbt 4	1	1	1.7–1.7	17	0/1	0/0
Zinc	Soil	1	1	227–227	48.8	1/1	0/0
Zinc	Qbt 4	1	1	14.6–14.6	63.5	0/1	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.1-6
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 5: SWMU 49-006

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	1	0	[-0.152–-0.152]	0.013	0/1
Americium-241	Qbt 4	1	0	[0.123–0.123]	na[c]	0/1
Cesium-137	Soil	1	1	0.464–0.464	1.65	0/1
Cesium-137	Qbt 4	1	0	[-0.019–-0.019]	na	0/1
Cobalt-60	Soil	1	0	[0.014–0.014]	na	0/1
Cobalt-60	Qbt 4	1	0	[0.038–0.038]	na	0/1
Europium-152	Soil	1	0	[0.139–0.139]	na	0/1
Europium-152	Qbt 4	1	0	[0.071–0.071]	na	0/1
Plutonium-238	Soil	1	1	0.009–0.009	0.023	0/1
Plutonium-238	Qbt 4	1	1	0.005–0.005	na	1/1
Plutonium-239/240	Soil	1	1	0.025–0.025	0.054	0/1
Plutonium-239/240	Qbt 4	1	0	[-0.007–-0.007]	na	0/1
Ruthenium-106	Soil	1	0	[0.214–0.214]	na	0/1
Ruthenium-106	Qbt 4	1	0	[-0.177–-0.177]	na	0/1
Sodium-22	Soil	1	0	[0.007–0.007]	na	0/1
Sodium-22	Qbt 4	1	0	[0.025–0.025]	na	0/1

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = Not available.

Table 3.1-7
Summary of Inorganic Chemicals above BVs at Area 5: SWMU 49-006

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Lead	Mercury	Selenium	Thallium	Uranium	Zinc
Soil BV[a]				**0.83**	**0.4**	**14.7**	**22.3**	**0.1**	**1.52**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**0.5**	**1.63**	**4.66**	**11.2**	**0.1**	**0.3**	**1.1**	**2.4**	**63.5**
0549-95-0134	49-05095	0.00–0.50	Soil	0.84 (UJ)	0.88 (J)	86.4	33	0.12 (U)	—[b]	1.5 (U)	3.1	227
0549-95-0133	49-05095	5.00–10.00	Qbt 4	0.75 (UJ)	—	—	—	—	0.82 (U)	1.4 (U)	—	—

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.1-8
Summary of Radionuclides Detected at Area 5: SWMU 49-006

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238
Qbt 2,3,4 BV/FV[a]				na[b]
0549-95-0133	49-05095	5.00–10.00	Qbt 4	0.005

Note: All values are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = Not available.

Table 3.1-9
Frequency of Inorganic Chemicals above BVs at Area 5: AOC 49-008(a)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	17	17	3410–17000	29200	0/17	0/0
Aluminum	Fill	2	2	13600–13900	29200	0/2	0/0
Aluminum	Qbt 4	1	1	1480–1480	7340	0/1	0/0
Antimony	Soil	17	1	[0.73]–3.5	0.83	1/17	1/16
Antimony	Fill	2	0	[0.74–0.78]	0.83	0/2	0/2
Antimony	Qbt 4	1	0	[0.75–0.75]	0.5	0/1	1/1
Arsenic	Soil	17	5	[1]–8.6	8.17	1/17	0/12
Arsenic	Fill	2	2	1.3–2.5	8.17	0/2	0/0
Arsenic	Qbt 4	1	0	[1–1]	2.79	0/1	0/1
Barium	Soil	17	17	41.1–199	295	0/17	0/0
Barium	Fill	2	2	150–192	295	0/2	0/0
Barium	Qbt 4	1	1	17.9–17.9	46	0/1	0/0
Beryllium	Soil	17	5	[0.23]–0.85	1.83	0/17	0/12
Beryllium	Fill	2	2	0.71–0.75	1.83	0/2	0/0
Beryllium	Qbt 4	1	0	[0.28–0.28]	1.21	0/1	0/1
Cadmium	Soil	17	4	[0.04]–0.88	0.4	1/17	1/13
Cadmium	Fill	2	2	0.14–0.15	0.4	0/2	0/0
Cadmium	Qbt 4	1	0	[0.06–0.06]	1.63	0/1	0/1
Calcium	Soil	17	17	914–3820	6120	0/17	0/0
Calcium	Fill	2	2	1980–2920	6120	0/2	0/0
Calcium	Qbt 4	1	1	839–839	2200	0/1	0/0
Chromium	Soil	17	17	3.2–12.5	19.3	0/17	0/0
Chromium	Fill	2	2	9.5–9.9	19.3	0/2	0/0
Chromium	Qbt 4	1	1	2.3–2.3	7.14	0/1	0/0

Table 3.1-9 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Cobalt	Soil	17	16	1.5–14.8	8.64	1/17	0/1
Cobalt	Fill	2	2	5.2–7.5	8.64	0/2	0/0
Cobalt	Qbt 4	1	0	[0.72–0.72]	3.14	0/1	0/1
Copper	Soil	17	17	3.9–3950	14.7	5/17	0/0
Copper	Fill	2	2	6.9–8.5	14.7	0/2	0/0
Copper	Qbt 4	1	1	1.7–1.7	4.66	0/1	0/0
Iron	Soil	17	17	5310–25700	21500	1/17	0/0
Iron	Fill	2	2	12100–12300	21500	0/2	0/0
Iron	Qbt 4	1	1	3230–3230	14500	0/1	0/0
Lead	Soil	16	16	7–10100	22.3	2/16	0/0
Lead	Fill	2	2	13.2–16	22.3	0/2	0/0
Lead	Qbt 4	1	1	2.4–2.4	11.2	0/1	0/0
Magnesium	Soil	17	17	470–2420	4610	0/17	0/0
Magnesium	Fill	2	2	1980–2090	4610	0/2	0/0
Magnesium	Qbt 4	1	1	714–714	1690	0/1	0/0
Manganese	Soil	17	17	156–648	671	0/17	0/0
Manganese	Fill	2	2	414–618	671	0/2	0/0
Manganese	Qbt 4	1	1	114–114	482	0/1	0/0
Mercury	Soil	17	0	[0.1–0.12]	0.1	0/17	13/17
Mercury	Fill	2	0	[0.11–0.12]	0.1	0/2	2/2
Mercury	Qbt 4	1	0	[0.1–0.1]	0.1	0/1	0/1
Nickel	Soil	17	17	2.6–43.1	15.4	1/17	0/0
Nickel	Fill	2	2	7.6–8.5	15.4	0/2	0/0
Nickel	Qbt 4	1	1	2.1–2.1	6.58	0/1	0/0
Potassium	Soil	16	16	628–3500	3460	1/16	0/0
Potassium	Fill	2	2	2610–3200	3460	0/2	0/0

Table 3.1-9 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Potassium	Qbt 4	1	1	499–499	3500	0/1	0/0
Selenium	Soil	17	0	[0.79–0.92]	1.52	0/17	0/17
Selenium	Fill	2	0	[0.81–0.85]	1.52	0/2	0/2
Selenium	Qbt 4	1	0	[0.82–0.82]	0.3	0/1	1/1
Silver	Soil	17	3	[0.17]–2	1	1/17	0/14
Silver	Fill	2	1	[0.18]–0.28	1	0/2	0/1
Silver	Qbt 4	1	0	[0.18–0.18]	1	0/1	0/1
Sodium	Soil	16	16	124–894	915	0/16	0/0
Sodium	Fill	2	2	162–186	915	0/2	0/0
Sodium	Qbt 4	1	1	265–265	2770	0/1	0/0
Thallium	Soil	17	0	[1.3–1.5]	0.73	0/17	17/17
Thallium	Fill	2	0	[1.4–1.4]	0.73	0/2	2/2
Thallium	Qbt 4	1	0	[1.4–1.4]	1.1	0/1	1/1
Uranium	Soil	18	18	1.89–4.38	1.82	18/18	0/0
Uranium	Fill	2	2	3.15–4.23	1.82	2/2	0/0
Uranium	Qbt 4	1	1	1.75–1.75	2.4	0/1	0/0
Vanadium	Soil	17	17	7.5–29.8	39.6	0/17	0/0
Vanadium	Fill	2	2	20.7–22.7	39.6	0/2	0/0
Vanadium	Qbt 4	1	1	1.7–1.7	17	0/1	0/0
Zinc	Soil	17	17	27.4–388	48.8	3/17	0/0
Zinc	Fill	2	2	35–36.5	48.8	0/2	0/0
Zinc	Qbt 4	1	1	14.6–14.6	63.5	0/1	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.1-10
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 5: AOC 49-008(a)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	57	0	[-0.208–0.167]	0.013	0/57
Americium-241	Fill	2	0	[-0.069–0.04]	0.013	0/2
Americium-241	Qbt 4	1	0	[0.123–0.123]	na[c]	0/1
Cesium-137	Soil	57	51	[0.001]–1.09	1.65	0/57
Cesium-137	Fill	2	1	[0.069]–0.13	1.65	1/2
Cesium-137	Qbt 4	1	0	[-0.019–-0.019]	na	0/1
Cobalt-60	Soil	57	0	[-0.076–0.067]	na	0/57
Cobalt-60	Fill	2	0	[-0.033–-0.006]	na	0/2
Cobalt-60	Qbt 4	1	0	[0.038–0.038]	na	0/1
Europium-152	Soil	57	3	[-0.239]–[0.392]	na	3/57
Europium-152	Fill	2	0	[-0.016–0.209]	na	0/2
Europium-152	Qbt 4	1	0	[0.071–0.071]	na	0/1
Plutonium-238	Soil	18	13	[-0.02]–0.02	0.023	0/18
Plutonium-238	Fill	2	1	[-0.005]–0.007	0.023	1/2
Plutonium-238	Qbt 4	1	1	0.005–0.005	na	1/1
Plutonium-239/240	Soil	18	12	[0]–0.516	0.054	1/18
Plutonium-239/240	Fill	2	2	0.009–0.025	0.054	2/2
Plutonium-239/240	Qbt 4	1	0	[-0.007–-0.007]	na	0/1
Ruthenium-106	Soil	57	0	[-0.322–0.361]	na	0/57
Ruthenium-106	Fill	2	0	[-0.146–-0.135]	na	0/2
Ruthenium-106	Qbt 4	1	0	[-0.177–-0.177]	na	0/1
Sodium-22	Soil	57	0	[-0.051–0.042]	na	0/57
Sodium-22	Fill	2	0	[0.005–0.039]	na	0/2
Sodium-22	Qbt 4	1	0	[0.025–0.025]	na	0/1

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = Not available.

Table 3.1-11
Summary of Inorganic Chemicals above BVs at Area 5: AOC 49-008(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Cobalt	Copper	Iron	Lead
Soil BV[a]				**0.83**	**8.17**	**0.4**	**8.64**	**14.7**	**21500**	**22.3**
0549-95-0130	49-05007	0.00–0.50	Soil	3.5 (J-)	8.6	0.61 (U)	14.8	3950	25700	10100
0549-95-0145	49-05013	0.00–0.50	Soil	—[b]	—	—	—	22.7	—	—
0549-95-0147	49-05015	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0152	49-05020	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0153	49-05021	0.00–0.50	Soil	—	—	—	—	15.2	—	—
0549-95-0154	49-05022	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0012	49-05023	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0162	49-05031	0.00–0.50	Soil	—	—	—	—	19.9	—	—
0549-95-0165	49-05034	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0167	49-05036	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0169	49-05038	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0172	49-05040	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0175	49-05045	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0178	49-05048	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0186	49-05055	0.00–0.50	Soil	—	—	—	—	—	—	—

Table 3.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Mercury	Nickel	Silver	Thallium	Uranium	Zinc
Soil BV[a]				**0.1**	**15.4**	**1**	**0.73**	**1.82**	**48.8**
0549-95-0130	49-05007	0.00–0.50	Soil	0.11 (U)	43.1	2 (J)	1.5 (U)	2.77	388
0549-95-0145	49-05013	0.00–0.50	Soil	0.11 (U)	—	—	1.5 (U)	3.37	—
0549-95-0147	49-05015	0.00–0.50	Soil	0.12 (U)	—	—	1.4 (U)	1.89	—
0549-95-0152	49-05020	0.00–0.50	Soil	0.11 (U)	—	—	1.5 (U)	2.15	—
0549-95-0153	49-05021	0.00–0.50	Soil	0.12 (U)	—	—	1.4 (U)	3.31	—
0549-95-0154	49-05022	0.00–0.50	Soil	0.11 (U)	—	—	1.5 (U)	3.74	—
0549-95-0012	49-05023	0.00–0.50	Soil	0.11 (U)	—	—	1.4 (U)	2.49	53.3
0549-95-0162	49-05031	0.00–0.50	Soil	—	—	—	1.4 (U)	2.88	—
0549-95-0165	49-05034	0.00–0.50	Soil	0.11 (U)	—	—	1.5 (U)	2.23	—
0549-95-0167	49-05036	0.00–0.50	Soil	0.12 (U)	—	—	1.5 (U)	2.69	—
0549-95-0169	49-05038	0.00–0.50	Soil	—	—	—	—	3.59	—
0549-95-0172	49-05040	0.00–0.50	Soil	—	—	—	1.3 (U)	2.3	—
0549-95-0175	49-05045	0.00–0.50	Soil	—	—	—	1.3 (U)	2.31	—
0549-95-0178	49-05048	0.00–0.50	Soil	0.11 (U)	—	—	1.5 (U)	4.38	—
0549-95-0186	49-05055	0.00–0.50	Soil	0.11 (U)	—	—	1.3 (U)	2.6	—

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.1-12
Summary of Radionuclides Detected or Detected above BVs/FVs at Area 5: AOC 49-008(a)

Sample ID	Location ID	Depth (ft)	Media	Europium-152	Plutonium-239/240
Soil BV/FV[a]				na[b]	**0.054**
0549-95-0153	49-05021	0.00–0.50	Soil	0.307	—[c]
0549-95-0162	49-05031	0.00–0.50	Soil	0.233	—
0549-95-0168	49-05037	0.00–0.50	Soil	0.375	—
0549-95-0169	49-05038	0.00–0.50	Soil	—	0.516

Notes: All values are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = No BVs/FVs are available.

[c] — = Not detected or detected above FV.

Table 3.1-13
Summary of PCB Screening-Level Results at Area 5: AOC 49-008(a)

Sample ID	Location ID	Depth	Media Code	Aroclor-1242	Aroclor-1254	Aroclor-1260	Aroclors (Mixed)
0549-95-0001	49-05090	0–0.5	Soil	<0.25*	<0.25	2.4	2.4
0549-95-0003	49-05091	0–0.5	Soil	<0.23	<0.23	0.37	<0.23
0549-95-0004	49-05092	0–0.5	Soil	<0.22	<0.22	<0.22	<0.22
0549-95-0005	49-05093	0–0.5	Soil	<0.25	<0.25	<0.25	<0.25

Note: All values are in mg/kg.

* < = Result is not detected at the concentration reported.

Table 3.2-1
Frequency of Inorganic Chemicals above BVs at Area 6 West: SWMU 49-004

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	19	19	7760–19100	29200	0/19	0/0
Aluminum	Fill	4	4	4620–14100	29200	0/4	0/0
Aluminum	Qbt 4	3	3	3210–12400	7340	1/3	0/0
Antimony	Soil	19	0	[0.65–6.4]	0.83	0/19	2/19
Antimony	Fill	4	0	[0.78–6]	0.83	0/4	3/4
Antimony	Qbt 4	3	0	[5.7–6.5]	0.5	0/3	3/3
Arsenic	Soil	19	11	1.5–4	8.17	0/19	0/8
Arsenic	Fill	4	4	1.7–3.2	8.17	0/4	0/0
Arsenic	Qbt 4	3	3	0.77–1.4	2.79	0/3	0/0
Barium	Soil	19	19	123–223	295	0/19	0/0
Barium	Fill	4	4	39–162	295	0/4	0/0
Barium	Qbt 4	3	3	25.4–143	46	1/3	0/0
Beryllium	Soil	19	19	0.59–1.2	1.83	0/19	0/0
Beryllium	Fill	4	3	[0.55]–1	1.83	0/4	0/1
Beryllium	Qbt 4	3	3	0.17–0.64	1.21	0/3	0/0
Cadmium	Soil	19	7	[0.04]–[0.69]	0.4	0/19	2/12
Cadmium	Fill	4	0	[0.05–0.64]	0.4	0/4	3/4
Cadmium	Qbt 4	3	1	[0.6]–0.76	1.63	0/3	0/2
Calcium	Soil	19	19	1940–4740	6120	0/19	0/0
Calcium	Fill	4	4	1320–3730	6120	0/4	0/0
Calcium	Qbt 4	3	3	519–2450	2200	1/3	0/0
Chromium	Soil	19	19	6.6–13.8	19.3	0/19	0/0
Chromium	Fill	4	4	3.4–11.7	19.3	0/4	0/0
Chromium	Qbt 4	3	3	2.3–9.7	7.14	1/3	0/0

Table 3.2-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Cobalt	Soil	19	19	4.5–9.1	8.64	1/19	0/0
Cobalt	Fill	4	3	[0.85]–13.4	8.64	1/4	0/1
Cobalt	Qbt 4	3	3	1.6–6.1	3.14	1/3	0/0
Copper	Soil	19	19	7.4–17.9	14.7	2/19	0/0
Copper	Fill	4	4	8.5–6300	14.7	2/4	0/0
Copper	Qbt 4	3	3	2.2–6.4	4.66	1/3	0/0
Iron	Soil	19	19	8610–17200	21500	0/19	0/0
Iron	Fill	4	4	5520–16100	21500	0/4	0/0
Iron	Qbt 4	3	3	5130–12400	14500	0/3	0/0
Lead	Soil	19	19	13–24.1	22.3	1/19	0/0
Lead	Fill	4	4	2.7–19.9	22.3	0/4	0/0
Lead	Qbt 4	3	3	5.8–14.6	11.2	1/3	0/0
Magnesium	Soil	19	19	1740–3120	4610	0/19	0/0
Magnesium	Fill	4	4	1040–2910	4610	0/4	0/0
Magnesium	Qbt 4	3	3	642–2760	1690	1/3	0/0
Manganese	Soil	19	19	330–707	671	1/19	0/0
Manganese	Fill	4	4	175–878	671	1/4	0/0
Manganese	Qbt 4	3	3	139–316	482	0/3	0/0
Mercury	Soil	18	1	[0.06]–[0.11]	0.1	1/18	3/17
Mercury	Fill	4	0	[0.05–0.12]	0.1	0/4	1/4
Mercury	Qbt 4	3	0	[0.05–0.06]	0.1	0/3	0/3
Nickel	Soil	19	19	6.1–13.9	15.4	0/19	0/0
Nickel	Fill	4	4	3.3–12.2	15.4	0/4	0/0
Nickel	Qbt 4	3	3	2.7–8.3	6.58	1/3	0/0
Potassium	Soil	19	19	1820–4310	3460	6/19	0/0
Potassium	Fill	4	4	1120–2120	3460	0/4	0/0

Table 3.2-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Potassium	Qbt 4	3	3	631–2290	3500	0/3	0/0
Selenium	Soil	19	1	[0.24]–[0.82]	1.52	0/19	0/18
Selenium	Fill	4	0	[0.21–0.85]	1.52	0/4	0/4
Selenium	Qbt 4	3	1	[0.21]–0.25	0.3	0/3	0/2
Silver	Soil	19	1	[0.22]–[1.6]	1	0/19	9/18
Silver	Fill	4	1	[0.18]–1.7	1	1/4	0/3
Silver	Qbt 4	3	0	[0.52–0.59]	1	0/3	0/3
Sodium	Soil	19	19	105–342	915	0/19	0/0
Sodium	Fill	4	4	236–479	915	0/4	0/0
Sodium	Qbt 4	3	3	336–976	2770	0/3	0/0
Thallium	Soil	19	0	[0.44–1.4]	0.73	0/19	17/19
Thallium	Fill	4	0	[0.43–1.4]	0.73	0/4	1/4
Thallium	Qbt 4	3	0	[0.42–0.48]	1.1	0/3	0/3
Uranium	Soil	19	19	1.59–10.7	1.82	16/19	0/0
Uranium	Fill	4	4	1.63–4	1.82	3/4	0/0
Uranium	Qbt 4	3	3	3.3–3.6	2.4	3/3	0/0
Vanadium	Soil	19	19	14.5–31.2	39.6	0/19	0/0
Vanadium	Fill	4	4	4.2–31.8	39.6	0/4	0/0
Vanadium	Qbt 4	3	3	3.7–20.1	17	1/3	0/0
Zinc	Soil	19	19	27.5–812	48.8	10/19	0/0
Zinc	Fill	4	4	28.3–42.4	48.8	0/4	0/0
Zinc	Qbt 4	3	3	26.8–32.7	63.5	0/3	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.2-2
Frequency of Organic Chemicals Detected at Area 6 West: SWMU 49-004

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	Frequency of Detects	EQL[b]
Chloronaphthalene[2-]	Fill	4	1	[0.35]–[0.38]	1/4	0.39

[a] Values in square brackets indicate detection limits for nondetects.

[b] Estimated quantitation limit is the maximum nondetect result.

Table 3.2-3
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 6 West: SWMU 49-004

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	40	3	[-0.251]–0.263	0.013	3/40
Americium-241	Fill	7	1	[-0.029]–0.43	0.013	1/7
Americium-241	Qbt 4	5	0	[0.25–0.34]	na[c]	0/5
Cesium-134	Soil	6	0	[0.07–0.11]	na	0/6
Cesium-134	Fill	5	0	[0.04–0.12]	na	0/5
Cesium-134	Qbt 4	5	0	[0.11–0.18]	na	0/5
Cesium-137	Soil	40	21	[0.03]–3.28	1.65	4/40
Cesium-137	Fill	7	0	[-0.05–0.09]	1.65	0/7
Cesium-137	Qbt 4	5	0	[0.08–0.12]	na	0/5
Cobalt-60	Soil	40	0	[-0.06–0.09]	na	0/40
Cobalt-60	Fill	7	0	[-0.036–0.08]	na	0/7
Cobalt-60	Qbt 4	5	0	[0.05–0.08]	na	0/5
Europium-152	Soil	34	2	[-0.084]–[0.285]	na	2/34
Europium-152	Fill	2	0	[0.185–0.235]	na	0/2
Plutonium-238	Soil	19	8	[-0.007]–0.025	0.023	1/19

Table 3.2-3 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Plutonium-238	Fill	4	1	[0.002]–0.007	0.023	0/4
Plutonium-238	Qbt 4	3	0	[0.002–0.003]	na[c]	0/3
Plutonium-239/240	Soil	19	19	0.011–0.134	0.054	9/19
Plutonium-239/240	Fill	4	4	0.007–0.419	0.054	4/4
Plutonium-239/240	Qbt 4	3	2	[0.02]–0.073	na	2/3
Ruthenium-106	Soil	40	0	[-0.233–0.7]	na	0/40
Ruthenium-106	Fill	7	0	[-0.032–0.68]	na	0/7
Ruthenium-106	Qbt 4	5	0	[0.28–0.85]	na	0/5
Sodium-22	Soil	40	0	[-0.024–0.064]	na	0/40
Sodium-22	Fill	7	0	[-0.039–0.07]	na	0/7
Sodium-22	Qbt 4	5	0	[0.03–0.07]	na	0/5
Uranium-235	Soil	6	0	[0.11–0.14]	0.2	0/6
Uranium-235	Fill	5	0	[0.12–0.14]	0.2	0/5
Uranium-235	Qbt 4	5	0	[0.12–0.19]	0.09	0/5

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = Not available.

Table 3.2-4
Summary of Inorganic Chemicals above BVs at Area 6 West: SWMU 49-004

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium
Soil BV[a]				**29200**	**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**
Qbt 2,3,4 BV				**7340**	**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**
0549-95-0315	49-06106	0.00–0.50	Soil	—[b]	—	—	—	—	—	—	—	—	—
0549-95-0316	49-06107	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0326	49-06116	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0327	49-06117	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0328	49-06118	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0329	49-06137	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0330	49-06138	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0333	49-06141	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0334	49-06142	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0336	49-06144	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0337	49-06145	0.00–0.50	Soil	—	—	—	—	—	—	—	15.3	—	—
0549-95-0339	49-06147	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0340	49-06148	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0102	49-06213	5.00–10.00	Soil	—	6 (UJ)	—	0.69 (U)	—	—	9.1 (J)	—	—	—
0549-95-0103	49-06213	10.00–12.00	Qbt 4	—	5.7 (UJ)	—	—	—	—	—	—	—	—
0549-95-0104	49-06214	2.00–5.00	Fill	—	5.8 (UJ)	—	0.62 (U)	—	—	—	—	—	—
0549-95-0105	49-06214	5.00–9.50	Fill	—	6 (UJ)	—	0.64 (U)	—	—	13.4	—	—	—
0549-95-0107	49-06215	0.00–5.00	Fill	—	6 (UJ)	—	0.64 (U)	—	—	—	16.2	—	—
0549-95-0111	49-06216	18.10–20.00	Fill	—	—	—	—	—	—	—	112	—	—
0549-95-0113	49-06217	3.00–5.00	Soil	—	6.4 (UJ)	—	0.68 (U)	—	—	—	—	—	—
0549-95-0119	49-06218	12.50–15.00	Qbt 4	—	6.5 (UJ)	—	—	—	—	—	—	—	—
0549-95-0121	49-06219	7.50–10.00	Qbt 4	12400	6.2 (UJ)	143 (J-)	—	2450	9.7	6.1 (J)	6.4	14.6	2760
0549-95-0343	49-06221	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0344	49-06222	0.00–0.50	Soil	—	—	—	—	—	—	—	17.9	24.1	—
0549-95-0349	49-06226	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—
0549-95-0350	49-06227	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—

Table 3.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Potassium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil/Fill BV[a]				**671**	**0.1**	**15.4**	**3460**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 BV				**482**	**0.1**	**6.58**	**3500**	**1**	**1.16**	**2.4**	**17**	**63.5**
0549-95-0315	49-06106	0.00–0.50	Soil	—	—	—	—	—	1.2 (U)	2.84	—	—
0549-95-0316	49-06107	0.00–0.50	Soil	—	—	—	—	—	1.2 (U)	1.85	—	—
0549-95-0326	49-06116	0.00–0.50	Soil	—	0.11	—	—	—	1.2 (U)	2.12	—	142
0549-95-0327	49-06117	0.00–0.50	Soil	—	—	—	—	—	1.3 (U)	—	—	96.2
0549-95-0328	49-06118	0.00–0.50	Soil	—	—	—	—	—	1.2 (U)	—	—	64
0549-95-0329	49-06137	0.00–0.50	Soil	—	—	—	—	—	1.3 (U)	1.99	—	50.9
0549-95-0330	49-06138	0.00–0.50	Soil	707 (J-)	0.11 (U)	—	—	—	1.3 (U)	1.86	—	159
0549-95-0333	49-06141	0.00–0.50	Soil	—	—	—	3500	—	1.3 (U)	—	—	64
0549-95-0334	49-06142	0.00–0.50	Soil	—	—	—	—	1.4 (U)	1.3 (U)	1.92	—	65.1
0549-95-0336	49-06144	0.00–0.50	Soil	—	—	—	4030	1.4 (U)	1.3 (U)	2.43	—	812
0549-95-0337	49-06145	0.00–0.50	Soil	—	0.11 (U)	—	4240	1.5 (U)	1.3 (U)	2.29	—	49.8
0549-95-0339	49-06147	0.00–0.50	Soil	—	—	—	4030	1.5 (U)	1.3 (U)	2.58	—	—
0549-95-0340	49-06148	0.00–0.50	Soil	—	—	—	—	1.4 (U)	1.3 (U)	2.57	—	—
0549-95-0102	49-06213	5.00–10.00	Soil	—	—	—	—	—	—	3.4	—	—
0549-95-0103	49-06213	10.00–12.00	Qbt 4	—	—	—	—	—	—	3.3	—	—
0549-95-0104	49-06214	2.00–5.00	Fill	—	—	—	—	—	—	3.5	—	—
0549-95-0105	49-06214	5.00–9.50	Fill	878 (J)	—	—	—	—	—	3.3	—	—
0549-95-0107	49-06215	0.00–5.00	Fill	—	—	—	—	1.7 (J)	—	4	—	—
0549-95-0111	49-06216	18.10–20.00	Fill	—	0.12 (U)	—	—	—	1.4 (U)	—	—	—
0549-95-0113	49-06217	3.00–5.00	Soil	—	—	—	—	—	—	3.6	—	70.6
0549-95-0119	49-06218	12.50–15.00	Qbt 4	—	—	—	—	—	—	3.6	—	—

Table 3.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Potassium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil/Fill BV[a]				**671**	**0.1**	**15.4**	**3460**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 BV				**482**	**0.1**	**6.58**	**3500**	**1**	**1.16**	**2.4**	**17**	**63.5**
0549-95-0121	49-06219	7.50–10.00	Qbt 4	—	—	8.3 (J)	—	—	—	3.6	20.1	—
0549-95-0343	49-06221	0.00–0.50	Soil	—	—	—	3870	1.5 (U)	1.3 (U)	6.88	—	—
0549-95-0344	49-06222	0.00–0.50	Soil	—	0.11 (U)	—	4310	1.6 (U)	1.4 (U)	8.1	—	—
0549-95-0349	49-06226	0.00–0.50	Soil	—	—	—	—	1.4 (U)	1.2 (U)	8.4	—	—
0549-95-0350	49-06227	0.00–0.50	Soil	—	—	—	—	1.4 (U)	1.3 (U)	10.7	—	—

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.2-5
Summary of Decision-Level Organic Chemical Results Detected at Area 6 West: SWMU 49-004

Sample ID	Location ID	Depth (ft)	Media	Chloronaphthalene[2-]
0549-95-0105	49-06214	5.00–9.50	Fill	0.36

Note: All values are in mg/kg.

Table 3.2-6
Summary of Radionuclides Detected or Detected above BVs/FVs at Area 6 West: SWMU 49-004

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Europium-152	Plutonium-238	Plutonium-239/240
Soil BV/FV[a]				**0.013**	**1.65**	**na**[b]	**0.023**	**0.054**
Qbt 2,3,4 BV				**na**	**0.1**	**na**	**na**	**na**
0549-95-0105	49-06214	5.00–9.50	Fill	—[c]	—	—	—	0.029
0549-95-0107	49-06215	0.00–5.00	Fill	—	—	—	—	0.039
0549-95-0111	49-06216	18.10–20.00	Fill	—	—	—	—	0.007
0549-95-0315	49-06106	0.00–0.50	Soil	0.155	—	—	—	0.134
0549-95-0316	49-06107	0.00–0.50	Soil	—	—	—	—	0.056
0549-95-0317	49-06108	0.00–0.50	Soil	0.263	—	—	—	—
0549-95-0323	49-06113	0.00–0.50	Soil	—	—	0.209	—	—
0549-95-0328	49-06118	0.00–0.50	Soil	—	—	—	—	0.095
0549-95-0329	49-06137	0.00–0.50	Soil	—	—	—	0.025	—
0549-95-0340	49-06148	0.00–0.50	Soil	—	—	0.259	—	—
0549-95-0102	49-06213	5.00–10.00	Soil	—	—	—	—	0.05
0549-95-0103	49-06213	10.00–12.00	Qbt 4	—	—	—	—	0.073
0549-95-0104	49-06214	2.00–5.00	Fill	0.43	—	—	—	0.419
0549-95-0113	49-06217	3.00–5.00	Soil	—	—	—	—	0.085
0549-95-0119	49-06218	12.50–15.00	Qbt 4	—	—	—	—	0.036
0549-95-0343	49-06221	0.00–0.50	Soil	—	2.02	—	—	0.07
0549-95-0344	49-06222	0.00–0.50	Soil	—	3.28	—	—	0.072
0549-95-0346	49-06223	0.00–0.50	Soil	0.204	—	—	—	—
0549-95-0348	49-06225	0.00–0.50	Soil	—	1.69	—	—	—
0549-95-0349	49-06226	0.00–0.50	Soil	—	—	—	—	0.066
0549-95-0350	49-06227	0.00–0.50	Soil	—	2.24	—	—	0.074

Note: All values are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = No BVs/FVs are available.

[c] — = Not detected above BV/FV.

Table 3.2-7
Frequency of Inorganic Chemicals above BVs at Area 6 East: AOC 49-008(b)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	10	10	2160–21000	29200	0/10	0/0
Antimony	Soil	10	0	[0.66–0.7]	0.83	0/10	0/10
Arsenic	Soil	10	0	[0.97–4.3]	8.17	0/10	0/10
Barium	Soil	10	10	73.2–208	295	0/10	0/0
Beryllium	Soil	10	7	[0.08]–1.1	1.83	0/10	0/3
Cadmium	Soil	10	6	[0.17]–0.51	0.4	1/10	0/4
Calcium	Soil	10	10	1780–2810	6120	0/10	0/0
Chromium	Soil	10	10	4–13.1	19.3	0/10	0/0
Cobalt	Soil	10	10	1.6–6.9	8.64	0/10	0/0
Copper	Soil	10	9	[4.8]–9.8	14.7	0/10	0/1
Iron	Soil	10	10	3790–16300	21500	0/10	0/0
Lead	Soil	10	10	4.4–18.2	22.3	0/10	0/0
Magnesium	Soil	10	10	849–2940	4610	0/10	0/0
Manganese	Soil	10	10	253–556	671	0/10	0/0
Mercury	Soil	10	1	[0.0001]–0.11	0.1	1/10	0/9
Nickel	Soil	10	10	2.5–9.3	15.4	0/10	0/0
Potassium	Soil	10	10	622–2680	3460	0/10	0/0
Selenium	Soil	10	0	[0.72–0.76]	1.52	0/10	0/10
Silver	Soil	10	1	[0.16]–[0.34]	1	0/10	0/9
Sodium	Soil	10	10	62.1–180	915	0/10	0/0
Thallium	Soil	10	1	[1.2]–[1.3]	0.73	1/10	9/9
Uranium	Soil	10	10	1.59–3.37	1.82	8/10	0/0
Vanadium	Soil	10	10	8.7–27.7	39.6	0/10	0/0
Zinc	Soil	10	10	16.6–36.7	48.8	0/10	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.2-8
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 6 East: AOC 49-008(b)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	19	0	[-0.133–0.126]	0.013	0/19
Cesium-137	Soil	19	14	[-0.026]–1.01	1.65	0/19
Cobalt-60	Soil	19	0	[-0.026–0.044]	na[c]	0/19
Europium-152	Soil	19	0	[-0.007–0.22]	na	0/19
Plutonium-238	Soil	10	7	[-0.013]–0.016	0.023	0/10
Plutonium-239/240	Soil	10	6	[0.002]–0.034	0.054	0/10
Ruthenium-106	Soil	19	0	[-0.355–0.2]	na	0/19
Sodium-22	Soil	19	0	[-0.024–0.033]	na	0/19

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = No BVs/FVs are available.

Table 3.2-9
Summary of Inorganic Chemicals above BVs at Area 6 East: AOC 49-008(b)

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Mercury	Thallium	Uranium
Soil BV[a]				**0.4**	**0.1**	**0.73**	**1.82**
0549-95-0294	49-06000	0.00–0.50	Soil	—[b]	—	1.3 (U)	1.95
0549-95-0297	49-06017	0.00–0.50	Soil	—	—	1.2 (U)	1.93
0549-95-0300	49-06031	0.00–0.50	Soil	—	—	1.2 (U)	2.24
0549-95-0301	49-06034	0.00–0.50	Soil	—	—	1.2 (U)	1.98

Table 3.2-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Mercury	Thallium	Uranium
Soil BV[a]				**0.4**	**0.1**	**0.73**	**1.82**
0549-95-0302	49-06039	0.00–0.50	Soil	—	—	1.3 (U)	—
0549-95-0305	49-06053	0.00–0.50	Soil	—	—	1.3 (U)	—
0549-95-0306	49-06066	0.00–0.50	Soil	—	0.11	1.2 (U)	1.95
0549-95-0308	49-06067	0.00–0.50	Soil	—	—	1.3 (J)	3.37
0549-95-0309	49-06068	0.00–0.50	Soil	—	—	1.2 (U)	2.7
0549-95-0310	49-06069	0.00–0.50	Soil	0.51 (J)	—	1.3 (U)	2.02

Notes: All values are in mg/kg.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.3-1
Frequency of Inorganic Chemicals above BVs at Area 10: AOC 49-002

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	7	7	4240–10200	29200	0/7	0/0
Antimony	Soil	7	1	[5.5]–13.9	0.83	1/7	6/6
Arsenic	Soil	7	7	1.6–6.5	8.17	0/7	0/0
Barium	Soil	7	7	76.5–183	295	0/7	0/0
Beryllium	Soil	7	7	0.5–0.85	1.83	0/7	0/0
Cadmium	Soil	7	1	[0.59]–0.73	0.4	1/7	6/6
Calcium	Soil	7	7	1820–4000	6120	0/7	0/0
Chromium	Soil	7	7	5.4–8.2	19.3	0/7	0/0
Cobalt	Soil	7	7	3.5–7	8.64	0/7	0/0
Copper	Soil	7	7	5–98.9	14.7	2/7	0/0

Table 3.3-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Iron	Soil	7	7	5990–10500	21500	0/7	0/0
Lead	Soil	7	7	9.1–48	22.3	2/7	0/0
Magnesium	Soil	7	7	1130–1950	4610	0/7	0/0
Manganese	Soil	7	7	196–343	671	0/7	0/0
Mercury	Soil	7	2	[0.05]–0.72	0.1	2/7	0/5
Nickel	Soil	7	7	3.9–7.4	15.4	0/7	0/0
Potassium	Soil	7	1	[850]–1960	3460	0/7	0/6
Selenium	Soil	7	6	[0.24]–0.84	1.52	0/7	0/1
Silver	Soil	7	0	[0.51–0.74]	1	0/7	0/7
Sodium	Soil	7	7	62.7–209	915	0/7	0/0
Thallium	Soil	7	0	[0.4–0.42]	0.73	0/7	0/7
Uranium	Soil	7	7	3.2–4.2	1.82	7/7	0/0
Vanadium	Soil	7	7	11.1–21.1	39.6	0/7	0/0
Zinc	Soil	7	7	30.4–98.7	48.8	3/7	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.3-2
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 10: AOC 49-002

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV Value[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	13	0	[0.25–0.34]	0.013	0/13
Cesium-134	Soil	13	0	[0.05–0.15]	na[c]	0/13
Cesium-137	Soil	13	6	[0.09]–0.89	1.65	0/13
Cobalt-60	Soil	13	0	[0.02–0.11]	na	0/13
Plutonium-238	Soil	7	0	[0.002–0.006]	0.023	0/7
Plutonium-239/240	Soil	7	4	[0.004]–0.029	0.054	0/7
Ruthenium-106	Soil	13	0	[0.24–0.81]	na	0/13
Sodium-22	Soil	13	0	[0.01–0.06]	na	0/13
Uranium-235	Soil	13	0	[0.12–0.18]	0.2	0/13

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = No BVs/FVs are available.

Table 3.3-3
Summary of Inorganic Chemicals above BVs at Area 10: AOC 49-002

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Lead	Mercury	Uranium	Zinc
Soil BV[a]				**0.83**	**0.4**	**14.7**	**22.3**	**0.1**	**1.82**	**48.8**
0549-95-0252	49-07536	0.00–0.50	Soil	5.7 (U)	0.73 (J)	—[b]	48 (J-)	0.72	3.2	98.7
0549-95-0253	49-07537	0.00–0.50	Soil	5.5 (U)	0.59 (U)	—	—	—	3.2	—
0549-95-0255	49-07539	0.00–0.50	Soil	5.6 (U)	0.6 (U)	20.5	26.7 (J-)	0.11	3.9	78.8
0549-95-0256	49-07542	0.00–0.50	Soil	13.9	0.59 (U)	—	—	—	3.5	—
0549-95-0258	49-07544	0.00–0.50	Soil	5.5 (U)	0.59 (U)	—	—	—	3.2	—
0549-95-0260	49-07548	0.00–0.50	Soil	5.6 (U)	0.59 (U)	98.9	—	—	4.2	69.9
0549-95-0264	49-07560	0.00–0.50	Soil	5.6 (U)	0.6 (U)	—	—	—	3.4	—

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.3-4
Frequency of Inorganic Chemicals above BVs at Area 10: SWMU 49-005(a)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	Soil	2	2	5760–5800	29200	0/2	0/0
Aluminum	Qbt 4	2	2	12000–21900	7340	2/2	0/0
Antimony	Soil	2	0	[0.79–0.79]	0.83	0/2	0/2
Antimony	Qbt 4	2	0	[0.75–0.81]	0.5	0/2	2/2
Arsenic	Soil	2	0	[1.2–1.3]	8.17	0/2	0/2
Arsenic	Qbt 4	2	2	1.7–3.4	2.79	1/2	0/0
Barium	Soil	2	2	62.1–67.1	295	0/2	0/0
Barium	Qbt 4	2	2	85.6–112	46	2/2	0/0
Beryllium	Soil	2	0	[0.51–0.52]	1.83	0/2	0/2
Beryllium	Qbt 4	2	2	1.2–1.9	1.21	1/2	0/0
Cadmium	Soil	2	0	[0.1–0.12]	0.4	0/2	0/2
Cadmium	Qbt 4	2	2	0.12–0.14	1.63	0/2	0/0
Calcium	Soil	2	2	1450–1510	6120	0/2	0/0
Calcium	Qbt 4	2	2	2340–3320	2200	2/2	0/0
Chromium	Soil	2	2	4.4–4.6	19.3	0/2	0/0
Chromium	Qbt 4	2	2	8.4–11.4	7.14	2/2	0/0
Cobalt	Soil	2	2	2.1–2.4	8.64	0/2	0/0
Cobalt	Qbt 4	2	2	2.1–2.6	3.14	0/2	0/0
Copper	Soil	2	2	4.9–5.3	14.7	0/2	0/0
Copper	Qbt 4	2	2	6.7–8.2	4.66	2/2	0/0
Iron	Soil	2	2	6370–6980	21500	0/2	0/0
Iron	Qbt 4	2	2	10500–12400	14500	0/2	0/0
Lead	Soil	2	2	13.2–19.2	22.3	0/2	0/0
Lead	Qbt 4	2	2	6.3–10.1	11.2	0/2	0/0

Table 3.3-4 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	BV[b] (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Magnesium	Soil	2	2	988–1070	4610	0/2	0/0
Magnesium	Qbt 4	2	2	2530–3720	1690	2/2	0/0
Manganese	Soil	2	2	244–253	671	0/2	0/0
Manganese	Qbt 4	2	2	103–213	482	0/2	0/0
Mercury	Soil	2	0	[0.11–0.11]	0.1	0/2	2/2
Mercury	Qbt 4	2	0	[0.1–0.12]	0.1	0/2	1/2
Nickel	Soil	2	2	3.9–4.6	15.4	0/2	0/0
Nickel	Qbt 4	2	2	9–12.1	6.58	2/2	0/0
Potassium	Soil	2	2	1110–1280	3460	0/2	0/0
Potassium	Qbt 4	2	2	2260–4090	3500	1/2	0/0
Selenium	Soil	2	0	[0.85–0.86]	1.52	0/2	0/2
Selenium	Qbt 4	2	0	[0.81–0.88]	0.3	0/2	2/2
Silver	Soil	2	0	[0.18–0.19]	1	0/2	0/2
Silver	Qbt 4	2	2	0.25–0.36	1	0/2	0/0
Sodium	Soil	2	2	144–156	915	0/2	0/0
Sodium	Qbt 4	2	2	398–1720	2770	0/2	0/0
Thallium	Soil	2	0	[1.4–1.4]	0.73	0/2	2/2
Thallium	Qbt 4	2	0	[1.4–1.5]	1.1	0/2	2/2
Uranium	Soil	2	2	2.3–2.51	1.82	2/2	0/0
Uranium	Qbt 4	2	2	2.13–4.09	2.4	1/2	0/0
Vanadium	Soil	2	2	8.9–9.5	39.6	0/2	0/0
Vanadium	Qbt 4	2	2	13–16.4	17	0/2	0/0
Zinc	Soil	2	2	25.9–28.5	48.8	0/2	0/0
Zinc	Qbt 4	2	2	29.2–30.9	63.5	0/2	0/0

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs are from LANL (1998, 059730).

Table 3.3-5
Frequency of Radionuclides Detected or Detected above BVs/FVs at Area 10: SWMU 49-005(a)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	BV/FV[b] (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	2	0	[-0.011–0.037]	0.013	0/2
Americium-241	Qbt 4	2	0	[-0.024–0.032]	na[c]	0/2
Cesium-137	Soil	2	2	0.649–0.681	1.65	0/2
Cesium-137	Qbt 4	2	0	[-0.011–0.001]	na	0/2
Cobalt-60	Soil	2	0	[0.011–0.038]	na	0/2
Cobalt-60	Qbt 4	2	0	[-0.004–0.016]	na	0/2
Europium-152	Soil	2	0	[0.054–0.148]	na	0/2
Europium-152	Qbt 4	2	0	[-0.056–0.191]	na	0/2
Plutonium-238	Soil	2	1	[-0.002]–0.032	0.023	1/2
Plutonium-238	Qbt 4	2	1	[0]–0.007	na	1/2
Plutonium-239/240	Soil	2	2	0.02–0.083	0.054	1/2
Plutonium-239/240	Qbt 4	2	0	[0–0.002]	na	0/2
Ruthenium-106	Soil	2	0	[-0.086–-0.071]	na	0/2
Ruthenium-106	Qbt 4	2	0	[-0.196–0.204]	na	0/2
Sodium-22	Soil	2	0	[-0.02–0.002]	na	0/2
Sodium-22	Qbt 4	2	0	[-0.018–-0.002]	na	0/2

[a] Values in square brackets indicate detection limits for nondetects.

[b] BVs/FVs are from LANL (1998, 059730).

[c] na = No BVs/FVs are available.

Table 3.3-6
Summary of Inorganic Chemicals above BVs at Area 10: SWMU 49-005(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium
Soil/Fill BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**6120**	**19.3**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**2200**	**7.14**
0549-95-0141	49-07512	0.00–0.50	Soil	—[b]	—	—	—	—	—	—
0549-95-0140	49-07512	4.00–9.00	Qbt 4	12000	0.75 (UJ)	—	85.6	—	2340	8.4
0549-95-0143	49-07527	0.00–0.50	Soil	—	—	—	—	—	—	—
0549-95-0142	49-07527	7.30–10.00	Qbt 4	21900	0.81 (UJ)	3.4	112	1.9	3320	11.4
Soil BV	14.7	4610	0.1	15.4	3460	1.52	0.73	1.82	Soil BV	14.7
Qbt 2,3,4 BV	4.66	1690	0.1	6.58	3500	0.3	1.1	2.4	Qbt 2,3,4 BV	4.66
0549-95-0141	49-07512	0.00–0.50	Soil	—	—	0.11 (U)	—	—	—	1.4 (U)
0549-95-0140	49-07512	4.00–9.00	Qbt 4	6.7	2530	—	9	—	0.81 (U)	1.4 (U)
0549-95-0143	49-07527	0.00–0.50	Soil	—	—	0.11 (U)	—	—	—	1.4 (U)
0549-95-0142	49-07527	7.30–10.00	Qbt 4	8.2	3720	0.12 (U)	12.1	4090	0.88 (U)	1.5 (U)

Notes: All values are in mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] — = Not detected above BV.

Table 3.3-7
Summary of Radionuclides Detected or Detected above BVs/FVs at Area 10: SWMU 49-005(a)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238	Plutonium-239/240
Soil BV/FV[a]				**0.023**	**0.054**
Qbt 2,3,4 BV				na[b]	na
0549-95-0141	49-07512	0.00–0.50	Soil	0.032	0.083
0549-95-0142	49-07527	7.30–10.00	Qbt 4	0.007	—[c]

Note: All values are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = No BV/FVs available.

[c] — = Not detected or not detected above BV/FV.

Table 3.4-1
Groundwater Screening-Level Results from Wells DT-5A, DT-9, and DT-10 (2000 to 2007)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-10	GENINORG	Alkalinity-CO_3	Filtered	mg/L	na[a]	—[b]	—	—	—	—	< 1.45	0.856	0.945
Test Well DT-10	GENINORG	Alkalinity-CO_3	Unfiltered	mg/L	na	< 1[c]	< 1.45	< 1.45	< 1.45	< 1.45	—	0.924	—
Test Well DT-10	GENINORG	Alkalinity-CO_3+HCO_3	Filtered	mg/L	na	—	—	—	—	—	63.7	63.9	61.6
Test Well DT-10	GENINORG	Alkalinity-CO_3+HCO_3	Unfiltered	mg/L	na	65.9	56.4	65.7	56	110	—	64.5	
Test Well DT-10	GENINORG	Alkalinity-HCO_3	Unfiltered	mg/L	na	65.3	55.8	64.8	55.4	109	—	—	—
Test Well DT-10	GENINORG	Calcium	Filtered	mg/L	na	—	—	—	—	—	11.1	11.8	11.3
Test Well DT-10	GENINORG	Calcium	Unfiltered	mg/L	na	11.7	11.1	11.7	12.6	12.7	11.7	12.2	11.5
Test Well DT-10	GENINORG	Chloride	Filtered	mg/L	na	—	—	—	—	—	1.45	1.58	1.62
Test Well DT-10	GENINORG	Chloride	Unfiltered	mg/L	na	1.61	1.44	1.57	1.64	1.57	—	1.53	—
Test Well DT-10	GENINORG	Fluoride	Filtered	mg/L	1.6	—	—	—	—	—	< 0.03	0.211	0.266
Test Well DT-10	GENINORG	Fluoride	Unfiltered	mg/L	1.6	0.256	0.271	0.324	0.21	0.166	—	0.208	—
Test Well DT-10	GENINORG	Hardness	Filtered	mg/L	na	—	—	—	—	—	41.5	44.2	42.6
Test Well DT-10	GENINORG	Hardness	Unfiltered	mg/L	na	43.9	41	43.5	47.2	47.4	43.7	45.7	43.4
Test Well DT-10	GENINORG	Magnesium	Filtered	mg/L	na	—	—	—	—	—	3.34	3.59	3.49
Test Well DT-10	GENINORG	Magnesium	Unfiltered	mg/L	na	3.57	3.24	3.46	3.84	3.82	3.53	3.71	3.56
Test Well DT-10	GENINORG	Nitrate–nitrite as N	Filtered	mg/L	10.0	—	—	—	—	—	0.189	0.209	0.24
Test Well DT-10	GENINORG	Nitrate–nitrite as N	Unfiltered	mg/L	10.0	0.23	0.23	0.22	0.2	0.17	—	0.219	—
Test Well DT-10	GENINORG	Perchlorate	Filtered	µg/L	na	—	—	—	—	—	0.164	0.171	0.177
Test Well DT-10	GENINORG	Perchlorate	Unfiltered	µg/L	na	< 1.04	< 0.958	< 0.958	< 4	0.172	—	—	—
Test Well DT-10	GENINORG	pH	Filtered	SU	na	—	—	—	—	—	7.72	8.31	8.22
Test Well DT-10	GENINORG	pH	Unfiltered	SU	na	—	8.19	7.55	7.68	8.04	—	8.22	—
Test Well DT-10	GENINORG	Potassium	Filtered	mg/L	na	—	—	—	—	—	1.24	1.33	1.28
Test Well DT-10	GENINORG	Potassium	Unfiltered	mg/L	na	1.25	1.33	1.36	1.45	1.37	1.3	1.35	1.33
Test Well DT-10	GENINORG	Silicon dioxide	Filtered	mg/L	na	—	—	—	—	—	58.4	63.9	64.3
Test Well DT-10	GENINORG	Silicon dioxide	Unfiltered	mg/L	na	63.9	60.7	—	60.8	64.8	61.6	64.6	—
Test Well DT-10	GENINORG	Sodium	Filtered	mg/L	na	—	—	—	—	—	10.4	11.1	10.7
Test Well DT-10	GENINORG	Sodium	Unfiltered	mg/L	na	10.8	11	12	11.4	11.2	11	11.2	10.9
Test Well DT-10	GENINORG	Specific conductance	Filtered	uS/cm	na	—	—	—	—	—	120	137	139
Test Well DT-10	GENINORG	Specific conductance	Unfiltered	uS/cm	na	119	114	124	141	134	—	135	—
Test Well DT-10	GENINORG	Sulfate	Filtered	mg/L	na	—	—	—	—	—	0.974	1.36	1.51
Test Well DT-10	GENINORG	Sulfate	Unfiltered	mg/L	na	1.34	1.35	1.37	1.36	1.22	—	1.37	—
Test Well DT-10	GENINORG	Suspended sediment concentration	Unfiltered	mg/L	na	—	—	—	—	—	1.4	—	—
Test Well DT-10	GENINORG	Total dissolved solids	Filtered	mg/L	na	133	146	134	134	116	164	31	162
Test Well DT-10	GENINORG	Total Kjeldahl nitrogen	Filtered	mg/L	na	—	—	—	—	—	< 0.01	0.052	< 0.145
Test Well DT-10	GENINORG	Total Kjeldahl nitrogen	Unfiltered	mg/L	na	—	—	—	—	—	—	0.105	< 0.145
Test Well DT-10	GENINORG	Total organic carbon	Unfiltered	mg/L	na	—	—	—	—	—	—	0.347	0.683

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-10	GENINORG	Total phosphate as phosphorus	Filtered	mg/L	na	—	—	—	—	—	< 0.023	< 0.048	0.079
Test Well DT-10	GENINORG	Total phosphate as phosphorus	Unfiltered	mg/L	na	< 0.02	0.07	0.04	< 0.025	< 0.044	—	< 0.051	—
Test Well DT-10	GENINORG	Total suspended solids	Unfiltered	mg/L	na	< 0.777	< 0.699	< 0.35	5.3	—	—	—	—
Test Well DT-10	ISOTOPE	Carbon-14% modern carbon, denormalized	Filtered	%Modern	na	—	—	—	—	—	73.09	—	—
Test Well DT-10	ISOTOPE	Carbon-14% modern carbon, normalized	Filtered	%Modern	na	—	—	—	—	—	71.72	—	—
Test Well DT-10	ISOTOPE	Carbon-14 yr unadjusted, based on denormalized fraction	Filtered	yr	na	—	—	—	—	—	2465	—	—
Test Well DT-10	ISOTOPE	Delta C-13 relative to Pee Dee Belemnite	Filtered	o/oo	na	—	—	—	—	—	-12.5	—	—
Test Well DT-10	METALS	Aluminum	Filtered	µg/L	na	—	—	—	—	—	< 68	< 68	< 68
Test Well DT-10	METALS	Alumin	Unfiltered	µg/L	na	< 49.5	< 14.6	51.2	< 53.8	—	< 68	< 68	< 68
Test Well DT-10	METALS	Antimony	Filtered	µg/L	6	—	—	—	—	—	< 0.5	< 0.5	< 0.5
Test Well DT-10	METALS	Antimony	Unfiltered	µg/L	6	< 0.179	0.209	< 0.111	< 0.28	< 0.28	< 0.5	< 0.5	< 0.5
Test Well DT-10	METALS	Barium	Filtered	µg/L	2000	—	—	—	—	—	6.3	7	7.1
Test Well DT-10	METALS	Barium	Unfiltered	µg/L	2000	7.04	7.55	7.09	8.32	7.08	7	8.6	7.6
Test Well DT-10	METALS	Boron	Filtered	µg/L	na	—	—	—	—	—	11.3	11.7	13.1
Test Well DT-10	METALS	Boron	Unfiltered	µg/L	na	19.1	< 3.61	16.1	20.1	11.1	12	10.6	11.4
Test Well DT-10	METALS	Chromium	Filtered	µg/L	100	—	—	—	—	—	2.4	< 5.3	3.5
Test Well DT-10	METALS	Chromium	Unfiltered	µg/L	100	3.68	2.65	2.47	9.42	7.75	2.3	< 9.2	2.7
Test Well DT-10	METALS	Cobalt	Filtered	µg/L	na	—	—	—	—	—	< 1	< 1	< 1
Test Well DT-10	METALS	Cobalt	Unfiltered	µg/L	na	0.77	< 0.419	4.31	< 3.67	0.868	< 1	< 1	< 1
Test Well DT-10	METALS	Copper	Filtered	µg/L	1300	—	—	—	—	—	< 3	< 3	< 3
Test Well DT-10	METALS	Copper	Unfiltered	µg/L	1300	< 1.84	< 0.834	< 2.67	2.86	< 1.4	< 3	< 3	< 3
Test Well DT-10	METALS	Iron	Filtered	µg/L	na	—	—	—	—	—	18.5	< 18	< 18
Test Well DT-10	METALS	Iron	Unfiltered	µg/L	na	145	169	34.3	915	142	< 132	672	234
Test Well DT-10	METALS	Lead	Filtered	µg/L	150	—	—	—	—	—	2.6	< 0.5	< 0.5
Test Well DT-10	METALS	Lead	Unfiltered	µg/L	150	< 1.83	0.701	0.101	0.855	0.703	1.1	1.2	0.68
Test Well DT-10	METALS	Manganese	Filtered	µg/L	na	—	—	—	—	—	< 2	< 2	2.7
Test Well DT-10	METALS	Manganese	Unfiltered	µg/L	na	6.08	6.31	< 2.94	51.8	26.4	13.5	47.4	13.1
Test Well DT-10	METALS	Molybdenum	Filtered	µg/L	na	—	—	—	—	—	< 2	< 2	< 2
Test Well DT-10	METALS	Molybdenum	Unfiltered	µg/L	na	< 1.97	1.67	0.951	< 2.88	< 1.4	< 2	< 2	< 2
Test Well DT-10	METALS	Nickel	Filtered	µg/L	na	—	—	—	—	—	< 0.94	0.56	0.73
Test Well DT-10	METALS	Nickel	Unfiltered	µg/L	na	< 1.84	< 0.815	1.49	5.82	< 4.14	11.4	3.7	1
Test Well DT-10	METALS	Strontium	Filtered	µg/L	na	—	—	—	—	—	45.5	48.1	47.8
Test Well DT-10	METALS	Strontium	Unfiltered	µg/L	na	47.9	49.2	50.3	53.7	53.1	47.9	49.7	48.9
Test Well DT-10	METALS	Thallium	Filtered	µg/L	2000	—	—	—	—	—	< 0.4	< 0.4	0.62
Test Well DT-10	METALS	Thallium	Unfiltered	µg/L	2000	< 0.019	< 0.077	0.275	< 0.02	< 0.089	< 0.4	< 0.4	< 0.4
Test Well DT-10	METALS	Uranium	Filtered	µg/L	5000	—	—	—	—	—	0.59	0.63	0.55
Test Well DT-10	METALS	Uranium	Unfiltered	µg/L	5000	—	—	—	0.547	0.498	0.59	0.63	0.47

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-10	METALS	Vanadium	Filtered	µg/L	na	—	—	—	—	—	3.6	4.4	3.8
Test Well DT-10	METALS	Vanadium	Unfiltered	µg/L	na	4.41	4.44	4.33	< 5.44	< 5.68	4	4.8	3.8
Test Well DT-10	METALS	Zinc	Filtered	µg/L	na	—	—	—	—	—	94.4	112	74.2
Test Well DT-10	METALS	Zinc	Unfiltered	µg/L	na	75.2	87	76.3	92.7	63.4	97.8	136	100
Test Well DT-10	RAD	Gross alpha	Filtered	pCi/L	na	—	—	—	—	—	1.36	2.58	—
Test Well DT-10	RAD	Gross alpha	Unfiltered	pCi/L	na	< 0.416	< -0.257	< 0.366	< -0.199	< 1.18	1.9	< -0.393	—
Test Well DT-10	RAD	Radium-226	Unfiltered	pCi/L	na	—	—	—	< 0.325	0.618	—	—	—
Test Well DT-10	RAD	Tritium	Unfiltered	pCi/L	na	< -180	< 0	< 27.3	< -47.2	303	< -65.5	< 0.22351	—
Test Well DT-10	RAD	Uranium-234	Filtered	pCi/L	na	—	—	—	—	—	0.502	0.445	—
Test Well DT-10	RAD	Uranium-234	Unfiltered	pCi/L	na	0.535	0.457	0.203	0.425	0.383	0.644	0.466	—
Test Well DT-10	RAD	Uranium-235/uranium-236	Filtered	pCi/L	na	—	—	—	—	—	< 0.00376	< 0.0233	—
Test Well DT-10	RAD	Uranium-235/uranium-236	Unfiltered	pCi/L	na	< 0.0304	< 0.0035	< -0.0000638	< 0.0265	0.046	< 0.0459	< 0.0167	—
Test Well DT-10	RAD	Uranium-238	Filtered	pCi/L	na	—	—	—	—	—	0.192	0.214	—
Test Well DT-10	RAD	Uranium-238	Unfiltered	pCi/L	na	0.162	0.225	0.0794	0.168	0.155	0.31	0.182	—
Test Well DT-10	SVOA	Bis(2-ethylhexyl)phthalate	Unfiltered	µg/L	na	< 0.32	—		< 10	2.7	< 9.8	< 10.2	< 10.4
Test Well DT-10	VOA	Acetone	Unfiltered	µg/L	na	—	—	—	< 5	< 5	< 5	3.75	< 5
Test Well DT-5A	GENINORG	Alkalinity-CO_3	Filtered	mg/L	na	—	—	—	—	—	< 1.45	< 0.725	< 0.725
Test Well DT-5A	GENINORG	Alkalinity-CO_3	Unfiltered	mg/L	na	< 1	< 0.725	< 1.45	< 1.45	< 1.45	—	0.753	—
Test Well DT-5A	GENINORG	Alkalinity-CO_3+HCO_3	Filtered	mg/L	na	—	—	—	—	—	54.1	52.3	49.4
Test Well DT-5A	GENINORG	Alkalinity-CO_3+HCO_3	Unfiltered	mg/L	na	52.5	47.5	51.5	53	49.4	—	55	—
Test Well DT-5A	GENINORG	Alkalinity-HCO_3	Unfiltered	mg/L	na	52.2	47.2	51.1	52.6	49.1	—	—	—
Test Well DT-5A	GENINORG	Calcium	Filtered	mg/L	na	—	—	—	—	—	9.33	8.74	8.63
Test Well DT-5A	GENINORG	Calcium	Unfiltered	mg/L	na	8.68	8.47	8.6	9.02	8.54	9.09	8.87	8.8
Test Well DT-5A	GENINORG	Chloride	Filtered	mg/L	na	—	—	—	—	—	1.54	1.7	1.64
Test Well DT-5A	GENINORG	Chloride	Unfiltered	mg/L	na	1.65	1.46	1.6	1.68	1.67	—	1.69	—
Test Well DT-5A	GENINORG	Fluoride	Filtered	mg/L	1.6	—	—	—	—	—	0.229	0.224	0.25
Test Well DT-5A	GENINORG	Fluoride	Unfiltered	mg/L	1.6	0.244	0.25	0.301	0.268	0.226	—	0.229	—
Test Well DT-5A	GENINORG	Hardness	Filtered	mg/L	na	—	—	—	—	—	34.4	32.3	32
Test Well DT-5A	GENINORG	Hardness	Unfiltered	mg/L	na	32	30.8	31.5	32.7	31.7	33.6	32.7	32.6
Test Well DT-5A	GENINORG	Magnesium	Filtered	mg/L	na	—	—	—	—	—	2.71	2.54	2.54
Test Well DT-5A	GENINORG	Magnesium	Unfiltered	mg/L	na	2.52	2.35	2.42	2.47	2.51	2.64	2.57	2.59
Test Well DT-5A	GENINORG	Nitrate–nitrite as N	Filtered	mg/L	10.0	—	—	—	—	—	0.249	0.301	0.33
Test Well DT-5A	GENINORG	Nitrate–nitrite as N	Unfiltered	mg/L	10.0	0.31	0.29	0.32	< 0.02	0.3	—	0.3	—
Test Well DT-5A	GENINORG	Perchlorate	Filtered	µg/L	na	—	—	—	—	—	0.294	0.242	0.258
Test Well DT-5A	GENINORG	Perchlorate	Unfiltered	µg/L	na	< 1.04	< 0.958	< 0.958	< 4	0.219	—	—	—
Test Well DT-5A	GENINORG	pH	Filtered	SU	na	—	—	—	—	—	7.42	7.96	7.91
Test Well DT-5A	GENINORG	pH	Unfiltered	SU	na	—	7.95	7.77	7.89	8.01	—	8.14	—
Test Well DT-5A	GENINORG	Potassium	Filtered	mg/L	na	—	—	—	—	—	1.79	1.82	1.79

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-5A	GENINORG	Potassium	Unfiltered	mg/L	na	1.64	1.75	1.8	1.85	1.59	1.74	1.84	1.83
Test Well DT-5A	GENINORG	Silicon dioxide	Filtered	mg/L	na	—	—	—	—	—	73.4	71.4	69.3
Test Well DT-5A	GENINORG	Silicon dioxide	Unfiltered	mg/L	na	67.3	66.9	—	47.7	66.3	71.4	72.1	—
Test Well DT-5A	GENINORG	Sodium	Filtered	mg/L	na	—	—	—	—	—	11.3	11.1	11.2
Test Well DT-5A	GENINORG	Sodium	Unfiltered	mg/L	na	10.8	11.1	11.7	11.4	10.3	11.2	11.2	11.4
Test Well DT-5A	GENINORG	Specific conductance	Filtered	uS/cm	na	—	—	—	—	—	115	119	138
Test Well DT-5A	GENINORG	Specific conductance	Unfiltered	uS/cm	na	105	3.28	106	319	116	—	119	—
Test Well DT-5A	GENINORG	Sulfate	Filtered	mg/L	na	—	—	—	—	—	1.53	1.44	1.5
Test Well DT-5A	GENINORG	Sulfate	Unfiltered	mg/L	na	1.48	1.35	1.54	1.11	1.49	—	1.46	—
Test Well DT-5A	GENINORG	Suspended sediment concentration	Unfiltered	mg/L	na	—	—	—	—	—	2	—	—
Test Well DT-5A	GENINORG	Total dissolved solids	Filtered	mg/L	na	129	140	132	106	117	131	94	140
Test Well DT-5A	GENINORG	Total Kjeldahl nitrogen	Filtered	mg/L	na	—	—	—	—	—	0.088	0.28	< 0.145
Test Well DT-5A	GENINORG	Total Kjeldahl nitrogen	Unfiltered	mg/L	na	—	—	—	—	—	—	< 0.01	< 0.145
Test Well DT-5A	GENINORG	Total organic carbon	Unfiltered	mg/L	na	—	—	—	—	—	—	0.484	0.796
Test Well DT-5A	GENINORG	Total phosphate as phosphorus	Filtered	mg/L	na	—	—	—	—	—	0.051	< 0.061	0.046
Test Well DT-5A	GENINORG	Total phosphate as phosphorus	Unfiltered	mg/L	na	0.02	0.06	0.04	< 0.043	< 0.011	—	< 0.067	—
Test Well DT-5A	GENINORG	Total suspended solids	Unfiltered	mg/L	na	< 1.17	< 0.699	0.4	8.21	2	—	—	—
Test Well DT-5A	ISOTOPE	Carbon-14% modern carbon, denormalized	Filtered	%Modern	na	—	—	—	—	—	71.31	—	—
Test Well DT-5A	ISOTOPE	Carbon-14% modern carbon, normalized	Filtered	%Modern	na	—	—	—	—	—	70.19	—	—
Test Well DT-5A	ISOTOPE	Carbon-14 yr unadjusted, based on denormalized fraction	Filtered	yr	na	—	—	—	—	—	2663	—	—
Test Well DT-5A	ISOTOPE	Delta C-13 relative to Pee Dee Belemnite	Filtered	o/oo	na	—	—	—	—	—	-14	—	—
Test Well DT-5A	METALS	Aluminum	Filtered	µg/L	na	—	—	—	—	—	< 68	< 68	< 68
Test Well DT-5A	METALS	Aluminum	Unfiltered	µg/L	na	< 20.5	< 7.57	86.6	< 78.7	—	< 68	< 68	< 68
Test Well DT-5A	METALS	Antimony	Filtered	µg/L	6	—	—	—	—	—	< 0.5	< 0.5	< 0.5
Test Well DT-5A	METALS	Antimony	Unfiltered	µg/L	6	< 0.18	1.21	< 0.111	< 0.28	< 0.28	< 0.5	< 0.5	< 0.5
Test Well DT-5A	METALS	Arsenic	Filtered	µg/L	10	—	—	—	—	—	< 6	< 1.5	2.1
Test Well DT-5A	METALS	Arsenic	Unfiltered	µg/L	10	< 2.57	< 2.33	< 4.57	< 2.24	< 2.2	< 6	1.6	2.4
Test Well DT-5A	METALS	Barium	Filtered	µg/L	2000	—	—	—	—	—	24.4	23.5	23.9
Test Well DT-5A	METALS	Barium	Unfiltered	µg/L	2000	22.8	24.5	24.2	17.6	23.6	25.3	24.8	24.6
Test Well DT-5A	METALS	Boron	Filtered	µg/L	na	—	—	—	—	—	< 10	< 10	12
Test Well DT-5A	METALS	Boron	Unfiltered	µg/L	na	20	7.23	13.8	8.92	11.5	< 10	10	11.5
Test Well DT-5A	METALS	Chromium	Filtered	µg/L	100	—	—	—	—	—	2.3	2.7	1.5
Test Well DT-5A	METALS	Chromium	Unfiltered	µg/L	100	1.59	1.65	1.56	< 1.9	2.43	2.6	2.7	1.9
Test Well DT-5A	METALS	Cobalt	Filtered	µg/L	na	—	—	—	—	—	< 1	< 1	1
Test Well DT-5A	METALS	Cobalt	Unfiltered	µg/L	na	4.96	< 0.419	< 0.295	< 0.543	< 0.54	< 1	< 1	< 1
Test Well DT-5A	METALS	Copper	Filtered	µg/L	1300	—	—	—	—	—	< 3	—	< 3
Test Well DT-5A	METALS	Copper	Unfiltered	µg/L	1300	< 1.84	< 0.83	< 2.67	—	14.5	< 3	—	< 3

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-5A	METALS	Iron	Filtered	µg/L	na	—	—	—	—	—	23.9	26.4	22.8
Test Well DT-5A	METALS	Iron	Unfiltered	µg/L	na	65.5	104	66.4	558	201	276	103	63.3
Test Well DT-5A	METALS	Lead	Filtered	µg/L	150	—	—	—	—	—	< 0.5	< 0.5	< 0.5
Test Well DT-5A	METALS	Lead	Unfiltered	µg/L	150	< 1.83	0.505	0.39	3.87	0.72	0.9	0.8	0.84
Test Well DT-5A	METALS	Manganese	Filtered	µg/L	na	—	—	—	—	—	5.4	8.4	10.6
Test Well DT-5A	METALS	Manganese	Unfiltered	µg/L	na	9.91	8.72	3.22	26	16	34.8	21.6	13.4
Test Well DT-5A	METALS	Molybdenum	Filtered	µg/L	na	—	—	—	—	—	2.3	< 2	< 2
Test Well DT-5A	METALS	Molybdenum	Unfiltered	µg/L	na	1.49	< 1.28	0.944	< 2.66	< 1.4	2.4	< 2	< 2
Test Well DT-5A	METALS	Nickel	Filtered	µg/L	na	—	—	—	—	—	0.71	< 0.5	0.81
Test Well DT-5A	METALS	Nickel	Unfiltered	µg/L	na	< 2.18	1.7	< 0.743	< 2.08	< 0.69	0.64	< 0.5	0.92
Test Well DT-5A	METALS	Strontium	Filtered	µg/L	na	—	—	—	—	—	48.1	44.9	44.6
Test Well DT-5A	METALS	Strontium	Unfiltered	µg/L	na	44.6	47.3	46.9	46.4	43.9	46.9	45.5	45.5
Test Well DT-5A	METALS	Thallium	Filtered	µg/L	2000	—	—	—	—	—	< 0.4	< 0.4	0.54
Test Well DT-5A	METALS	Thallium	Unfiltered	µg/L	2000	< 0.269	< 0.077	0.106	< 0.062	< 0.114	< 0.4	< 0.4	< 0.4
Test Well DT-5A	METALS	Uranium	Filtered	µg/L	5000	—	—	—	—	—	< 0.43	< 0.3	0.31
Test Well DT-5A	METALS	Uranium	Unfiltered	µg/L	5000	—	—	—	0.12	0.304	< 0.35	< 0.28	0.29
Test Well DT-5A	METALS	Vanadium	Filtered	µg/L	na	—	—	—	—	—	8.3	8.1	8.9
Test Well DT-5A	METALS	Vanadium	Unfiltered	µg/L	na	8.14	8.32	7.97	< 1.47	7.04	8.3	8.4	8.2
Test Well DT-5A	METALS	Zinc	Filtered	µg/L	na	—	—	—	—	—	228	212	177
Test Well DT-5A	METALS	Zinc	Unfiltered	µg/L	na	260	246	207	111	245	245	230	194
Test Well DT-5A	RAD	Gross beta	Filtered	pCi/L	na	—	—	—	—	—	< 1.61	< 1.19	—
Test Well DT-5A	RAD	Gross beta	Unfiltered	pCi/L	na	< 0.861	< 1.33	< 1.43	< 1.79	2.17	< 1.34	< 0.361	—
Test Well DT-5A	RAD	Radium-226	Unfiltered	pCi/L	na	—	—	—	0.623	< 0.22	—	—	—
Test Well DT-5A	RAD	Tritium	Unfiltered	pCi/L	na	< -178	< 0	< -54.3	216	< -39	< 80.5	< 0	—
Test Well DT-5A	RAD	Uranium-234	Filtered	pCi/L	na	—	—	—	—	—	0.228	0.152	—
Test Well DT-5A	RAD	Uranium-234	Unfiltered	pCi/L	na	0.319	0.192	< 0.0855	0.0883	0.227	0.217	0.201	—
Test Well DT-5A	RAD	Uranium-235/uranium-236	Filtered	pCi/L	na	—	—	—	—	—	< 0.0223	< -0.0033	—
Test Well DT-5A	RAD	Uranium-235/uranium-236	Unfiltered	pCi/L	na	< -0.00316	< 0.0052	< -0.00322	< 0.0278	0.0501	< 0.0194	< 0.0135	—
Test Well DT-5A	RAD	Uranium-238	Filtered	pCi/L	na	—	—	—	—	—	0.105	0.144	—
Test Well DT-5A	RAD	Uranium-238	Unfiltered	pCi/L	na	0.119	0.128	< 0.0153	< 0.0328	0.0874	0.0921	0.0985	—
Test Well DT-5A	VOA	Acetone	Unfiltered	µg/L	na	—	—	—	9.3	< 5	< 5	—	1.45
Test Well DT-5A	VOA	Acetonitrile	Unfiltered	µg/L	na	—	—	—	—	—	10.2	< 25	< 25
Test Well DT-9	GENINORG	Alkalinity-CO_3+HCO_3	Filtered	mg/L	na	—	—	—	—	—	52.9	54.4	55
Test Well DT-9	GENINORG	Alkalinity-CO_3+HCO_3	Unfiltered	mg/L	na	—	49.4	56.6	< 51.6	65.6	—	54.4	—
Test Well DT-9	GENINORG	Alkalinity-HCO_3	Unfiltered	mg/L	na	—	48.9	56.1	51.2	< 64.6	—	—	—
Test Well DT-9	GENINORG	Calcium	Filtered	mg/L	na	—	—	—	—	—	10.1	9.81	9.97
Test Well DT-9	GENINORG	Calcium	Unfiltered	mg/L	na	—	9.61	9.7	9.82	9.94	10.1	10.4	9.97
Test Well DT-9	GENINORG	Chloride	Filtered	mg/L	na	—	—	—	—	—	1.58	1.47	1.69

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-9	GENINORG	Chloride	Unfiltered	mg/L	na	—	1.69	7.14	1.71	1.64	—	1.54	—
Test Well DT-9	GENINORG	Cyanide (total)	Filtered	mg/L	na	—	—	—	—	—	< 0.0025	< 0.0015	—
Test Well DT-9	GENINORG	Cyanide (total)	Unfiltered	mg/L	na	—	< 0.00276	< 0.00289	0.0023	< 0.00172	—	< 0.0015	0.00302
Test Well DT-9	GENINORG	Fluoride	Filtered	mg/L	1.6	—	—	—	—	—	0.164	0.241	0.319
Test Well DT-9	GENINORG	Fluoride	Unfiltered	mg/L	1.6	—	0.315	0.551	0.32	0.202	—	0.235	—
Test Well DT-9	GENINORG	Hardness	Filtered	mg/L	na	—	—	—	—	—	36.5	35.6	36.9
Test Well DT-9	GENINORG	Hardness	Unfiltered	mg/L	na	—	34.6	35	35.7	36.2	36.7	37.8	36.1
Test Well DT-9	GENINORG	Magnesium	Filtered	mg/L	na	—	—	—	—	—	2.75	2.7	2.86
Test Well DT-9	GENINORG	Magnesium	Unfiltered	mg/L	na	—	2.56	2.61	2.71	2.77	2.76	2.86	2.74
Test Well DT-9	GENINORG	Nitrate–nitrite as N	Filtered	mg/L	10.0	—	—	—	—	—	0.273	0.301	0.336
Test Well DT-9	GENINORG	Nitrate–nitrite as N	Unfiltered	mg/L	10.0	—	0.31	0.32	0.31	0.31	—	0.315	—
Test Well DT-9	GENINORG	Perchlorate	Filtered	µg/L	na	—	—	—	—	—	0.247	0.26	0.306
Test Well DT-9	GENINORG	Perchlorate	Unfiltered	µg/L	na	—	< 0.958	< 0.958	< 0.989	< 4	—	—	—
Test Well DT-9	GENINORG	pH	Filtered	SU	na	—	—	—	—	—	7.32	7.93	8.06
Test Well DT-9	GENINORG	pH	Unfiltered	SU	na	—	8.04	7.9	7.83	7.75	—	8	—
Test Well DT-9	GENINORG	Potassium	Filtered	mg/L	na	—	—	—	—	—	0.971	0.948	1.08
Test Well DT-9	GENINORG	Potassium	Unfiltered	mg/L	na	—	0.973	0.947	0.952	0.951	0.969	0.996	0.92
Test Well DT-9	GENINORG	Silicon dioxide	Filtered	mg/L	na	—	—	—	—	—	< 66.8	68	76.3
Test Well DT-9	GENINORG	Silicon dioxide	Unfiltered	mg/L	na	—	66.2	0.586	62.6	68.9	< 68.3	71.8	—
Test Well DT-9	GENINORG	Sodium	Filtered	mg/L	na	—	—	—	—	—	10.9	10.8	11.5
Test Well DT-9	GENINORG	Sodium	Unfiltered	mg/L	na	—	10.7	11.1	10.4	10.9	10.9	11.2	10.5
Test Well DT-9	GENINORG	Specific conductance	Filtered	µS/cm	na	—	—	—	—	—	112	114	1290
Test Well DT-9	GENINORG	Specific conductance	Unfiltered	µS/cm	na	—	125	3.67	123	116	—	114	—
Test Well DT-9	GENINORG	Sulfate	Filtered	mg/L	na	—	—	—	—	—	1.16	1.39	1.66
Test Well DT-9	GENINORG	Sulfate	Unfiltered	mg/L	na	—	1.59	1.78	1.49	1.4	—	1.44	—
Test Well DT-9	GENINORG	Suspended sediment concentration	Unfiltered	mg/L	na	—	—	—	—	—	6	—	—
Test Well DT-9	GENINORG	Total dissolved solids	Filtered	mg/L	na	—	143	134	137	111	66.7	54	140
Test Well DT-9	GENINORG	Total Kjeldahl nitrogen	Filtered	mg/L	na	—	—	—	—	—	< 0.01	< 0.1	3.65
Test Well DT-9	GENINORG	Total Kjeldahl nitrogen	Unfiltered	mg/L	na	—	—	—	—	—	—	< 0.1	< 0.145
Test Well DT-9	GENINORG	Total organic carbon	Unfiltered	mg/L	na	—	—	—	—	—	—	0.513	0.635
Test Well DT-9	GENINORG	Total phosphate as phosphorus	Filtered	mg/L	na	—	—	—	—	—	< 0.041	< 0.063	0.052
Test Well DT-9	GENINORG	Total phosphate as phosphorus	Unfiltered	mg/L	na	—	0.05	0.05	< 0.026	0.03	—	< 0.064	—
Test Well DT-9	GENINORG	Total suspended solids	Unfiltered	mg/L	na	—	< 0.699	0.6	2.1	< 1.27	—	—	—
Test Well DT-9	ISOTOPE	Carbon-14% modern carbon, denormalized	Filtered	%Modern	na	—	—	—	—	—	64.26	—	—
Test Well DT-9	ISOTOPE	Carbon-14% modern carbon, normalized	Filtered	%Modern	na	—	—	—	—	—	63.14	—	—
Test Well DT-9	ISOTOPE	Carbon-14 yr unadjusted, based on denormalized fraction	Filtered	yr	na	—	—	—	—	—	3499	—	—
Test Well DT-9	ISOTOPE	Delta C-13 relative to Pee Dee Belemnite	Filtered	o/oo	na	—	—	—	—	—	-13.1	—	—

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-9	METALS	Aluminum	Filtered	µg/L	na	—	—	—	—	—	< 68	< 68	< 68
Test Well DT-9	METALS	Aluminum	Unfiltered	µg/L	na	—	< 7.57	57	< 53.9	< 19.1	< 68	< 68	< 68
Test Well DT-9	METALS	Antimony	filtered	µg/L	6	—	—	—	—	—	< 0.5	< 0.5	< 0.5
Test Well DT-9	METALS	Antimony	Unfiltered	µg/L	6	—	0.531	< 0.111	< 0.28	< 0.28	< 0.5	< 0.5	< 0.5
Test Well DT-9	METALS	Barium	Filtered	µg/L	2000	—	—	—	—	—	15.9	16.1	16.9
Test Well DT-9	METALS	Barium	Unfiltered	µg/L	2000	—	17.1	16.2	17.7	16.5	16.1	16.9	18.7
Test Well DT-9	METALS	Boron	Filtered	µg/L	na	—	—	—	—	—	10.5	10.2	11.3
Test Well DT-9	METALS	Boron	Unfiltered	µg/L	na	—	11.4	18.2	< 29.2	12.9	11.1	11.3	10.8
Test Well DT-9	METALS	Cadmium	Filtered	µg/L	5	—	—	—	—	—	< 0.1	< 0.1	< 0.1
Test Well DT-9	METALS	Cadmium	Unfiltered	µg/L	5	—	< 0.066	< 0.05	< 0.04	0.095	< 0.1	< 0.1	< 0.1
Test Well DT-9	METALS	Chromium	Filtered	µg/L	100	—	—	—	—	—	2.2	2	3.7
Test Well DT-9	METALS	Chromium	Unfiltered	µg/L	100	—	1.94	1.7	4.95	2.68	2.2	2.1	4.1
Test Well DT-9	METALS	Cobalt	Filtered	µg/L	na	—	—	—	—	—	< 1	4.1	< 1
Test Well DT-9	METALS	Cobalt	Unfiltered	µg/L	na	—	< 0.419	4.31	< 1.17	< 0.54	< 1	< 1	< 1
Test Well DT-9	METALS	Iron	Filtered	µg/L	na	—	—	—	—	—	< 18	< 18	31.1
Test Well DT-9	METALS	Iron	Unfiltered	µg/L	na	—	< 3.27	76.8	285	< 34.9	37.2	28.4	454
Test Well DT-9	METALS	Lead	Filtered	µg/L	150	—	—	—	—	—	< 0.5	0.77	< 0.5
Test Well DT-9	METALS	Lead	Unfiltered	µg/L	150	—	1.12	0.23	< 2.52	0.552	0.61	0.72	0.96
Test Well DT-9	METALS	Manganese	Filtered	µg/L	na	—	—	—	—	—	< 2	7.7	2.2
Test Well DT-9	METALS	Manganese	Unfiltered	µg/L	na	—	< 0.338	< 2.94	41.3	3.33	6.3	3.1	31.2
Test Well DT-9	METALS	Nickel	Filtered	µg/L	na	—	—	—	—	—	0.77	0.92	0.61
Test Well DT-9	METALS	Nickel	Unfiltered	µg/L	na	—	< 0.815	1	< 2.58	< 0.69	0.86	< 0.5	1.1
Test Well DT-9	METALS	Strontium	Filtered	µg/L	na	—	—	—	—	—	48.6	46.7	49.3
Test Well DT-9	METALS	Strontium	Unfiltered	µg/L	na	—	50.4	49.4	48.3	47.6	48.8	49.8	48.6
Test Well DT-9	METALS	Thallium	Filtered	µg/L	2000	—	—	—	—	—	< 0.4	< 0.4	< 0.4
Test Well DT-9	METALS	Thallium	Unfiltered	µg/L	2000	—	< 0.077	0.065	< 0.02	0.213	< 0.4	< 0.4	< 0.4
Test Well DT-9	METALS	Uranium	Filtered	µg/L	5000	—	—	—	—	—	0.43	0.42	0.43
Test Well DT-9	METALS	Uranium	Unfiltered	µg/L	5000	—	—	—	0.346	0.405	0.43	0.41	0.44
Test Well DT-9	METALS	Vanadium	Filtered	µg/L	na	—	—	—	—	—	5.3	6.1	6.6
Test Well DT-9	METALS	Vanadium	Unfiltered	µg/L	na	—	6.1	5.41	5.46	4.99	5.6	6.6	6.2
Test Well DT-9	METALS	Zinc	Filtered	µg/L	na	—	—	—	—	—	103	113	89.7
Test Well DT-9	METALS	Zinc	Unfiltered	µg/L	na	—	124	83.8	753	90.4	109	121	109
Test Well DT-9	PEST/PCB	Aroclor-1254	Unfiltered	µg/L	na	—	—	< 0.1	—	0.44	< 0.099	< 0.1	< 0.116
Test Well DT-9	RAD	Gross beta	Filtered	pCi/L	na	—	—	—	—	—	< 2.29	< 1.3	—
Test Well DT-9	RAD	Gross beta	Unfiltered	pCi/L	na	—	< 1.28	< 1.25	2.34	< 1.92	2.97	< 0.901	—
Test Well DT-9	RAD	Radium-226	Unfiltered	pCi/L	na	—	—	—	< 0.322	0.904	—	—	—
Test Well DT-9	RAD	Uranium-234	Filtered	pCi/L	na	—	—	—	—	—	0.377	0.253	—
Test Well DT-9	RAD	Uranium-234	Unfiltered	pCi/L	na	—	0.283	0.148	< 0.233	0.301	0.369	0.272	—

Table 3.4-1 (continued)

Location	Analyte Suite	Analyte	Field Prep	Units	MCL/WQCC	2000	2001	2002	2003	2004	2005	2006	2007
Test Well DT-9	RAD	Uranium-238	Filtered	pCi/L	na	—	—	—	—	—	0.124	0.11	—
Test Well DT-9	RAD	Uranium-238	Unfiltered	pCi/L	na	—	0.142	< 0.0472	0.111	0.125	0.115	0.107	—
Test Well DT-9	SVOA	Bis(2-ethylhexyl)phthalate	Unfiltered	µg/L	na	—	—	0.68	—	2.8	< 20.8	—	< 11
Test Well DT-9	SVOA	Dichlorobenzene[1,4-]	Unfiltered	µg/L	na	—	—	< 10.3	—	< 10.2	< 20.8	—	< 11
Test Well DT-9	VOA	Acetone	Unfiltered	µg/L	na	—	—	4.8	—	< 5	< 5	< 5	< 5
Test Well DT-9	VOA	Dichlorobenzene[1,4-]	Unfiltered	µg/L	na	—	—	0.26	—	< 1	< 1	< 1	< 1
Test Well DT-9	VOA	Methylene chloride	Unfiltered	µg/L	na	—	—	0.79	—	< 5	< 5	< 4.94	< 5
Test Well DT-9	VOA	Toluene	Unfiltered	µg/L	1	—	—	0.21	—	< 1	< 1	< 1	< 1

[a] na = Not available.

[b] — = Analysis not requested or analysis rejected.

[c] < = Result is not detected at the concentration reported.

Table 3.4-2
Sediment Samples Collected and Analyses Request Numbers (2000 to 2006)

Year	Location Name	Sample ID	Field Matrix	Am-241	Cyanide	Gamma Spectroscopy	Gross Alpha/ Non-volatile Beta	Gross Gamma	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	Percent Moisture	Pesticides/PCBs	Sr-90	SVOC	Tritium
2000	MDA AB-1	CC00041S1BA	Sediment	100045130	—*	100045130	100045130	100045130	100045130	—	100045130	100045130	100045130	100045113	100045115	100045113	100045130
2000	MDA AB-1	CC00042S1BA	Sediment	100045130	—	100045130	100045130	100045130	100045130	—	100045130	100045130	100045130	100045113	100045115	100045113	100045130
2000	MDA AB-10	CM00041S01A	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-11	CM00041S11A	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-11	CM00042S11A	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-2	CC00041S2BA	Sediment	100045130	—	100045130	100045130	100045130	100045130	—	100045130	100045130	100045130	100045113	100045115	100045113	100045130
2000	MDA AB-3	CM00041S3BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-4	CM00041S4BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-4A	CM00041SA4A	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-5	CM00041S5BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-6	CM00041S6BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-7	CM00041S7BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-8	CM00041S8BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2000	MDA AB-9	CM00041S9BA	Sediment	100044820	—	100044820	100044820	100044820	100044820	—	—	100044820	100044820	100044806	—	100044806	100044820
2001	MDA AB-1	GU01051S1BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-1	GU01052S1BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-10	GU01051S01A	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-11	GU01051S11A	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-2	GU01051S2BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-3	GU01051S3BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-3N	GU01051SN3A	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-4	GU01051S4BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-4A	GU01051SA4A	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-5	GU01051S5BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-5	GU01052S5BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-6	GU01051S6BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-7	GU01051S7BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-8	GU01051S8BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2001	MDA AB-9	GU01051S9BA	Sediment	42934	42934	42934	42934	—	42934	42934	42934	42934	—	—	42934	—	42934
2002	MDA AB-1	GU02031S1BA	Sediment	58561	—	58561	58561	—	58561	58561	58561	—	—	58561	58561	58561	58561
2002	MDA AB-10	GU02031S01A	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-11	GU02031S11A	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232

Table 3.4-2 (continued)

Year	Location Name	Sample ID	Field Matrix	Am-241	Cyanide	Gamma Spectroscopy	Gross Alpha/ Non-volatile Beta	Gross Gamma	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	Percent Moisture	Pesticides/PCBs	Sr-90	SVOC	Tritium
2002	MDA AB-2	GU02031S2BA	Sediment	58561	—	58561	58561	—	58561	58561	58561	—	—	58561	58561	58561	58781
2002	MDA AB-3	GU02031S3BA	Sediment	58561	—	58561	58561	—	58561	58561	58561	—	—	58561	58561	58561	58561
2002	MDA AB-4	GU02031S4BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	—
2002	MDA AB-4A	GU02031SA4A	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-5	GU02031S5BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-6	GU02031S6BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-7	GU02031S7BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-7	GU02032S7BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-8	GU02031S8BA	Sediment	58232	—	58232	58232	—	58232	58232	58232	—	—	58232	58232	58232	58232
2002	MDA AB-9	GU02031S9BA	Sediment	58561	—	58561	58561	—	58561	58561	58561	—	—	58561	58561	58561	58561
2002	MDA AB-9	GU02032S9BA	Sediment	58561	—	58561	58561	—	58561	58561	58561	—	—	58561	58561	58561	58561
2003	MDA AB-1	GN03070S1BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-10	GN03070S01A01	Sediment	84018	—	84018	84018	—	84018	84018	84018	—	—		84018		84018
2003	MDA AB-11	GN03070S11A01	Sediment	84018	—	84018	84018	—	84018	84018	84018	—	—		84018		84018
2003	MDA AB-2	GN03070S2BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-3	GN03070S3BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-4	GN03070S4BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-4A	GN03070SA4A01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-5	GN03070S5BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-6	GN03070S6BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-7	GN03070S7BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-7	GN03070S7BA90	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-8	GN03070S8BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-9	GN03070S9BA01	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2003	MDA AB-9	GN03070S9BA90	Sediment	83847	—	83847	83847	—	83847	83847	83847	—	—		83847		83847
2004	MDA AB-1	GN04060S1BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-10	GN04060S01A01	Sediment	115477	115477	115477	115477	—	115477	115477	115477	115477	—		115477		115477
2004	MDA AB-11	GN04060S11A01	Sediment	115477	115477	115477	115477	—	115477	115477	115477	115477	—		115477		115477
2004	MDA AB-2	GN04060S2BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-3	GN04060S3BA01	Sediment	115219	115219	115219	115219	—	—	115219	115219	115219	—		115219		115219
2004	MDA AB-3	GN04060S3BA90	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-4	GN04060S4BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219

Table 3.4-2 (continued)

Year	Location Name	Sample ID	Field Matrix	Am-241	Cyanide	Gamma Spectroscopy	Gross Alpha/ Non-volatile Beta	Gross Gamma	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	Percent Moisture	Pesticides/PCBs	Sr-90	SVOC	Tritium
2004	MDA AB-4A	GN04060SA4A01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-5	GN04060S5BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-6	GN04060S6BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-7	GN04060S7BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-8	GN04060S8BA01	Sediment	115219	115219	115219	115219	—	115219	115219	115219	115219	—		115219		115219
2004	MDA AB-9	GN04060S9BA01	Sediment	115477	115477	115477	115477	—	115477	115477	115477	115477	—		115477		115477
2005	MDA AB-10	GN05070S01A01	Sediment	140431	—	140431	140431	—	140431	140431	140431	140431	—		140431		140431
2005	MDA AB-11	GN05070S11A01	Sediment	140431	—	140431	140431	—	140431	140431	140431	140431	—		140431		140431
2005	MDA AB-9	GN05070S9BA01	Sediment	140431	—	140431	140431	—	140431	140431	140431	140431	—		140431		140431
2006	MDA AB-10	GN060600S01A01	Sediment	167964	167964	167964	167964	—	167964	167964	167964	167964	—		167964		167964
2006	MDA AB-11	GN060600S11A01	Sediment	167964	167964	167964	167964	—	167964	167964	167964	167964	—		167964		167964
2006	MDA AB-9	GN060600S9BA01	Sediment	167964	167964	167964	167964	—	167964	167964	167964	167964	—		167964		167964

Note: Request numbers identify each analytical suite.
* — = Analysis not requested.

Table 3.4-3
Detected Sediment Sample Screening-Level Results (2000 to 2006)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-1	GENINORG	Cyanide (total)	mg/kg	0.82	—[b]	0.166	—	—	1.09	—	—
MDA AB-1	METALS	Aluminum	mg/kg	15400	5130	8910	—	—	13700	—	—
MDA AB-1	METALS	Antimony	mg/kg	0.83	—	0.055	—	—	—	—	—
MDA AB-1	METALS	Arsenic	mg/kg	3.98	1.4	2.69	—	—	3.73	—	—
MDA AB-1	METALS	Barium	mg/kg	127	107	95.3	—	—	134	—	—
MDA AB-1	METALS	Beryllium	mg/kg	1.31	49.2	0.671	—	—	0.848	—	—
MDA AB-1	METALS	Boron	mg/kg	nac	48.2	1.6	—	—	3.76	—	—
MDA AB-1	METALS	Cadmium	mg/kg	0.4	47.7	0.317	—	—	0.531	—	—
MDA AB-1	METALS	Chromium	mg/kg	10.5	53.1	6.96	—	—	9.62	—	—
MDA AB-1	METALS	Cobalt	mg/kg	4.73	50.5	4.08	—	—	5.18	—	—
MDA AB-1	METALS	Copper	mg/kg	11.2	55	5.48	—	—	9.06	—	—
MDA AB-1	METALS	Iron	mg/kg	13800	6160	9460	—	—	13500	—	—
MDA AB-1	METALS	Lead	mg/kg	19.7	15.2	11.6	—	—	14.7	—	—
MDA AB-1	METALS	Manganese	mg/kg	543	237	358	—	—	473	—	—
MDA AB-1	METALS	Mercury	mg/kg	0.1	0.0199	0.009	—	—	0.0168	—	—
MDA AB-1	METALS	Molybdenum	mg/kg	na	49.2	—	—	—	0.615	—	—
MDA AB-1	METALS	Nickel	mg/kg	9.38	50.2	5.47	—	—	7.39	—	—
MDA AB-1	METALS	Selenium	mg/kg	0.3	0.7	—	—	—	—	—	—
MDA AB-1	METALS	Silver	mg/kg	1	40.1	—	—	—	—	—	—
MDA AB-1	METALS	Thallium	mg/kg	0.73	—	0.179	—	—	0.169	—	—
MDA AB-1	METALS	Vanadium	mg/kg	19.7	55.4	16.6	—	—	22.5	—	—
MDA AB-1	METALS	Zinc	mg/kg	60.2	89.4	29.4	—	—	217	—	—
MDA AB-1	RAD	Americium-241	pCi/g	0.04	0.0071	0.0172	—	—	—	—	—
MDA AB-1	RAD	Cesium-137	pCi/g	0.9	0.38	0.265	0.299	0.396	0.29	—	—
MDA AB-1	RAD	Gross alpha	pCi/g	na	9.26	14	24.5	14.5	21.3	—	—
MDA AB-1	RAD	Gross beta	pCi/g	na	5.99	36.3	11.9	37.3	35.1	—	—
MDA AB-1	RAD	Gross gamma	pCi/g	na	3.6	—	9.32	7.78	9.91	—	—
MDA AB-1	RAD	Plutonium-239/240	pCi/g	0.068	0.0179	0.0176	—	0.0313	—	—	—
MDA AB-1	RAD	Potassium-40	pCi/g	na	23.7	27.1	26.4	22.5	25.7	—	—
MDA AB-1	RAD	Strontium-90	pCi/g	1.04	—	0.127	—	—	—	—	—
MDA AB-1	RAD	Thorium-228	pCi/g	2.28	—	1.21	1.22	1.48	1.49	—	—
MDA AB-1	RAD	Thorium-230	pCi/g	2.29	—	0.718	0.97	1.18	1.28	—	—
MDA AB-1	RAD	Thorium-232	pCi/g	2.33	—	0.982	1.3	1.51	1.41	—	—
MDA AB-1	RAD	Tritium	pCi/g	na	—	—	—	—	0.0084	—	—
MDA AB-1	RAD	Tritium	pCi/L	na	—	468	—	—	—	—	—
MDA AB-1	RAD	Uranium-234	pCi/g	2.59	0.392	0.605	0.834	1.02	0.903	—	—
MDA AB-1	RAD	Uranium-238	pCi/g	2.29	0.463	0.605	1.05	1.27	1.15	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-10	GENINORG	Calcium	mg/kg	4420	—	—	—	—	—	—	2360
MDA AB-10	GENINORG	Cyanide (Total)	mg/kg	0.82	—	—	—	—	—	—	0.367
MDA AB-10	GENINORG	Magnesium	mg/kg	2370	—	—	—	—	—	—	1910
MDA AB-10	GENINORG	Potassium	mg/kg	2690	—	—	—	—	—	—	2100
MDA AB-10	GENINORG	Sodium	mg/kg	1470	—	—	—	—	—	—	115
MDA AB-10	METALS	Aluminum	mg/kg	15400	5700	7190	—	—	13500	9780	12000
MDA AB-10	METALS	Arsenic	mg/kg	3.98	1.5	2.23	—	—	3.34	3.29	2.7
MDA AB-10	METALS	Barium	mg/kg	127	67	120	—	—	120	88.5	111
MDA AB-10	METALS	Beryllium	mg/kg	1.31	0.513	0.602	—	—	0.836	0.706	0.747
MDA AB-10	METALS	Boron	mg/kg	na	—	2.01	—	—	5.18	2.99	4.61
MDA AB-10	METALS	Cadmium	mg/kg	0.4	—	—	—	—	0.517	0.238	0.412
MDA AB-10	METALS	Chromium	mg/kg	10.5	4.2	5.71	—	—	8.96	7.64	8.29
MDA AB-10	METALS	Cobalt	mg/kg	4.73	2.96	3.87	—	—	4.09	3.49	4.41
MDA AB-10	METALS	Copper	mg/kg	11.2	4.07	5.77	—	—	7.56	6.42	6.73
MDA AB-10	METALS	Iron	mg/kg	13800	6290	8720	—	—	11400	11800	9800
MDA AB-10	METALS	Lead	mg/kg	19.7	8.1	8.73	—	—	14.5	12.3	15
MDA AB-10	METALS	Manganese	mg/kg	543	218	383	—	—	363	296	384
MDA AB-10	METALS	Mercury	mg/kg	0.1	—	—	—	—	0.0209	0.0115	0.0093
MDA AB-10	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.54	0.653	—
MDA AB-10	METALS	Nickel	mg/kg	9.38	—	5.09	—	—	6.7	5.74	5.8
MDA AB-10	METALS	Selenium	mg/kg	0.3	—	0.342	—	—	—	—	—
MDA AB-10	METALS	Silver	mg/kg	1	—	—	—	—	—	—	0.0892
MDA AB-10	METALS	Thallium	mg/kg	0.73	—	0.083	—	—	0.169	0.116	0.216
MDA AB-10	METALS	Vanadium	mg/kg	19.7	8.01	15.9	—	—	18	17.7	19.2
MDA AB-10	METALS	Zinc	mg/kg	60.2	18.9	32.7	—	—	36.7	35.3	37.7
MDA AB-10	RAD	Americium-241	pCi/g	0.04	0.0046	—	—	—	—	—	—
MDA AB-10	RAD	Cesium-137	pCi/g	0.9	0.235	0.214	0.0878	0.694	0.724	0.328	0.629
MDA AB-10	RAD	Gross alpha	pCi/g	na	6.51	7.6	8.81	8.04	15.4	16.1	14.7
MDA AB-10	RAD	Gross beta	pCi/g	na	4.67	37.8	30.9	26.3	34.7	35	29.5
MDA AB-10	RAD	Gross gamma	pCi/g	na	2.7	—	6.14	—	—	—	10.5
MDA AB-10	RAD	Plutonium-239/240	pCi/g	0.068	0.0151	0.017	—	—	0.0504	—	0.0294
MDA AB-10	RAD	Potassium-40	pCi/g	0	21.3	26.6	28.4	24.2	24.9	26.7	29.8
MDA AB-10	RAD	Strontium-90	pCi/g	1.04	—	—	—	0.166	0.375	—	—
MDA AB-10	RAD	Thorium-228	pCi/g	2.28	—	0.972	0.622	1.47	1.45	1.28	1.23
MDA AB-10	RAD	Thorium-230	pCi/g	2.29	—	0.482	0.504	0.875	1.23	1.05	1.14
MDA AB-10	RAD	Thorium-232	pCi/g	2.33	—	0.677	0.558	1.21	1.25	1.1	1.24
MDA AB-10	RAD	Tritium	pCi/L	na	—	525	—	—	—	—	—
MDA AB-10	RAD	Uranium-234	pCi/g	2.59	—	0.48	0.459	0.712	0.836	0.86	0.726

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-10	RAD	Uranium-238	pCi/g	2.29	—	0.493	0.318	0.918	1.05	0.972	0.808
MDA AB-11	GENINORG	Calcium	mg/kg	4420	—	—	—	—	—	—	1420
MDA AB-11	GENINORG	Magnesium	mg/kg	2370	—	—	—	—	—	—	1300
MDA AB-11	GENINORG	Potassium	mg/kg	2690	—	—	—	—	—	—	1320
MDA AB-11	GENINORG	Sodium	mg/kg	1470	—	—	—	—	—	—	110
MDA AB-11	METALS	Aluminum	mg/kg	15400	3260	17400	—	—	3480	5340	9110
MDA AB-11	METALS	Arsenic	mg/kg	3.98	0.7	3.4	—	—	—	1.22	1.9
MDA AB-11	METALS	Barium	mg/kg	127	45.3	186	—	—	22.1	37	64.3
MDA AB-11	METALS	Beryllium	mg/kg	1.31	0.435	1.32	—	—	0.225	0.35	0.554
MDA AB-11	METALS	Boron	mg/kg	na	—	1.77	—	—	0.671	1.31	2.89
MDA AB-11	METALS	Cadmium	mg/kg	0.4	—	0.401	—	—	0.185	0.142	0.307
MDA AB-11	METALS	Chromium	mg/kg	10.5	2.29	9.57	—	—	2.34	3.13	5.45
MDA AB-11	METALS	Cobalt	mg/kg	4.73	1.54	5.53	—	—	0.848	1.5	2.15
MDA AB-11	METALS	Copper	mg/kg	11.2	2.67	10	—	—	1.42	2.51	3.66
MDA AB-11	METALS	Iron	mg/kg	13800	2960	11800	—	—	4620	5860	7830
MDA AB-11	METALS	Lead	mg/kg	19.7	4.6	12.5	—	—	4.24	6.27	9.91
MDA AB-11	METALS	Manganese	mg/kg	543	111	292	—	—	104	164	251
MDA AB-11	METALS	Mercury	mg/kg	0.1	0.0135	0.017	—	—	—	0.0046	0.0075
MDA AB-11	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.379	0.372	—
MDA AB-11	METALS	Nickel	mg/kg	9.38	—	9.36	—	—	1.62	2.43	4.2
MDA AB-11	METALS	Silver	mg/kg	1	—	—	—	—	—	—	0.0746
MDA AB-11	METALS	Thallium	mg/kg	0.73	—	0.226	—	—	0.0688	—	0.155
MDA AB-11	METALS	Vanadium	mg/kg	19.7	3.16	21.3	—	—	4.62	6.47	12.2
MDA AB-11	METALS	Zinc	mg/kg	60.2	14.5	34	—	—	18.8	20.8	36.3
MDA AB-11	RAD	Americium-241	pCi/g	0.04	0.0151	0.0162	—	—	—	—	—
MDA AB-11	RAD	Cesium-137	pCi/g	0.9	0.2	0.339	0.218	0.234	0.0913	0.0815	0.324
MDA AB-11	RAD	Gross alpha	pCi/g	na	7.08	21.2	17.7	2.91	17.8	14.1	5.75
MDA AB-11	RAD	Gross beta	pCi/g	na	4.92	36.8	32	21.6	42	38.7	30.6
MDA AB-11	RAD	Gross gamma	pCi/g	na	3.3	—	8.98	—	7.04	6.65	10.1
MDA AB-11	RAD	Plutonium-238	pCi/g	0.006	0.0072	—	—	—	—	—	—
MDA AB-11	RAD	Plutonium-239/240	pCi/g	0.068	0.0287	0.0157	—	—	—	—	0.025
MDA AB-11	RAD	Potassium-40	pCi/g	na	25.1	27.6	28.5	26.1	28.6	30.9	—
MDA AB-11	RAD	Strontium-90	pCi/g	1.04	—	0.151	—	—	—	—	—
MDA AB-11	RAD	Thorium-228	pCi/g	2.28	—	1.7	1.36	1	1.42	1.38	0.87
MDA AB-11	RAD	Thorium-230	pCi/g	2.29	—	1.3	1.18	0.843	1.16	0.846	0.595
MDA AB-11	RAD	Thorium-232	pCi/g	2.33	—	1.68	1.4	0.827	1.08	1.14	0.927
MDA AB-11	RAD	Tritium	pCi/L	na	—	209	—	—	—	—	—
MDA AB-11	RAD	Uranium-234	pCi/g	2.59	—	0.745	0.75	0.564	0.637	0.763	0.489
MDA AB-11	RAD	Uranium-238	pCi/g	2.29	—	0.771	0.879	0.604	0.709	0.795	0.538

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-2	GENINORG	Cyanide (Total)	mg/kg	0.82	—	—	—	—	0.19	—	—
MDA AB-2	METALS	Aluminum	mg/kg	15400	4880	14800	—	—	21900	—	—
MDA AB-2	METALS	Arsenic	mg/kg	3.98	1.5	3.49	—	—	4.29	—	—
MDA AB-2	METALS	Barium	mg/kg	127	88.4	196	—	—	204	—	—
MDA AB-2	METALS	Beryllium	mg/kg	1.31	0.633	0.979	—	—	1.18	—	—
MDA AB-2	METALS	Boron	mg/kg	na	—	1.55	—	—	3.73	—	—
MDA AB-2	METALS	Cadmium	mg/kg	0.4	—	0.392	—	—	0.541	—	—
MDA AB-2	METALS	Chromium	mg/kg	10.5	3.63	10.9	—	—	13.7	—	—
MDA AB-2	METALS	Cobalt	mg/kg	4.73	3.55	6.54	—	—	7.66	—	—
MDA AB-2	METALS	Copper	mg/kg	11.2	4.03	8.52	—	—	8.72	—	—
MDA AB-2	METALS	Iron	mg/kg	13800	6070	12600	—	—	16700	—	—
MDA AB-2	METALS	Lead	mg/kg	19.7	14.2	14.6	—	—	16.4	—	—
MDA AB-2	METALS	Manganese	mg/kg	543	279	423	—	—	545	—	—
MDA AB-2	METALS	Mercury	mg/kg	0.1	0.0233	0.02	—	—	0.0241	—	—
MDA AB-2	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.346	—	—
MDA AB-2	METALS	Nickel	mg/kg	9.38	4.43	9.54	—	—	10.9	—	—
MDA AB-2	METALS	Selenium	mg/kg	0.3	0.6	—	—	—	—	—	—
MDA AB-2	METALS	Silver	mg/kg	1	1.91	—	—	—	—	—	—
MDA AB-2	METALS	Thallium	mg/kg	0.73	—	0.242	—	—	0.247	—	—
MDA AB-2	METALS	Vanadium	mg/kg	19.7	6.44	27.2	—	—	29.7	—	—
MDA AB-2	METALS	Zinc	mg/kg	60.2	344	46	—	—	45.1	—	—
MDA AB-2	RAD	Americium-241	pCi/g	0.04	0.0128	—	—	—	0.0772	—	—
MDA AB-2	RAD	Cesium-137	pCi/g	0.9	0.144	0.2	0.13	0.154	0.189	—	—
MDA AB-2	RAD	Gross alpha	pCi/g	na	10.2	22.7	13.3	15.6	14.1	—	—
MDA AB-2	RAD	Gross beta	pCi/g	na	5.68	33.2	8.22	25.8	24.4	—	—
MDA AB-2	RAD	Gross gamma	pCi/g	na	3.4	—	10.2	9.6	8.54	—	—
MDA AB-2	RAD	Plutonium-239/240	pCi/g	0.068	0.046	0.0593	0.114	0.0681	0.0503	—	—
MDA AB-2	RAD	Potassium-40	pCi/g	na	15.6	18.7	20.7	19	18.1	—	—
MDA AB-2	RAD	Thorium-228	pCi/g	2.28	—	1.48	1.18	1.58	1.4	—	—
MDA AB-2	RAD	Thorium-230	pCi/g	2.29	—	1.05	1.05	1.4	1.37	—	—
MDA AB-2	RAD	Thorium-232	pCi/g	2.33	—	1.28	1.42	1.49	1.37	—	—
MDA AB-2	RAD	Tritium	pCi/L	na	—	189	—	—	—	—	—
MDA AB-2	RAD	Uranium-234	pCi/g	2.59	0.871	0.84	0.956	0.89	1	—	—
MDA AB-2	RAD	Uranium-238	pCi/g	2.29	0.89	0.976	0.907	1.04	1.12	—	—
MDA AB-3	GENINORG	Cyanide (Total)	mg/kg	0.82	—	0.315	—	—	0.948	—	—
MDA AB-3	METALS	Aluminum	mg/kg	15400	12200	4550	—	—	13500	—	—
MDA AB-3	METALS	Arsenic	mg/kg	3.98	1.8	1.53	—	—	2.64	—	—
MDA AB-3	METALS	Barium	mg/kg	127	81.8	69.4	—	—	143	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-3	METALS	Beryllium	mg/kg	1.31	0.76	0.382	—	—	0.811	—	—
MDA AB-3	METALS	Boron	mg/kg	na	—	0.788	—	—	3.86	—	—
MDA AB-3	METALS	Cadmium	mg/kg	0.4	—	0.212	—	—	0.38	—	—
MDA AB-3	METALS	Chromium	mg/kg	10.5	8.09	3.96	—	—	9.16	—	—
MDA AB-3	METALS	Cobalt	mg/kg	4.73	3.05	2.44	—	—	3.62	—	—
MDA AB-3	METALS	Copper	mg/kg	11.2	4.81	4.54	—	—	5.84	—	—
MDA AB-3	METALS	Iron	mg/kg	13800	8090	6290	—	—	11200	—	—
MDA AB-3	METALS	Lead	mg/kg	19.7	8.6	6.48	—	—	11.8	—	—
MDA AB-3	METALS	Manganese	mg/kg	543	177	213	—	—	264	—	—
MDA AB-3	METALS	Mercury	mg/kg	0.1	0.0119	—	—	—	0.0116	—	—
MDA AB-3	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.294	—	—
MDA AB-3	METALS	Nickel	mg/kg	9.38	5.16	4.55	—	—	5.92	—	—
MDA AB-3	METALS	Selenium	mg/kg	0.3	0.3	—	—	—	—	—	—
MDA AB-3	METALS	Thallium	mg/kg	0.73	—	0.07	—	—	0.132	—	—
MDA AB-3	METALS	Vanadium	mg/kg	19.7	12.5	10.6	—	—	18	—	—
MDA AB-3	METALS	Zinc	mg/kg	60.2	35.8	51.3	—	—	29.9	—	—
MDA AB-3	RAD	Americium-241	pCi/g	0.04	0.19	0.113	0.112	0.127	0.234	—	—
MDA AB-3	RAD	Cesium-137	pCi/g	0.9	0.265	—	0.357	0.53	0.509	—	—
MDA AB-3	RAD	Gross alpha	pCi/g	na	9.31	15.8	26.9	16.1	17	—	—
MDA AB-3	RAD	Gross beta	pCi/g	na	5.22	33	11.9	31.8	31.1	—	—
MDA AB-3	RAD	Gross gamma	pCi/g	na	6.4	—	10.6	—	—	—	—
MDA AB-3	RAD	Plutonium-238	pCi/g	0.006	0.0232	—	—	—	—	—	—
MDA AB-3	RAD	Plutonium-239/240	pCi/g	0.068	0.761	0.402	0.658	0.432	—	—	—
MDA AB-3	RAD	Potassium-40	pCi/g	na	25.2	27.2	24.7	18.3	24.5	—	—
MDA AB-3	RAD	Strontium-90	pCi/g	1.04	—	—	—	0.193	0.117	—	—
MDA AB-3	RAD	Thorium-228	pCi/g	2.28	—	0.986	1.67	1.39	1.41	—	—
MDA AB-3	RAD	Thorium-230	pCi/g	2.29	—	0.591	1.51	1.31	1.45	—	—
MDA AB-3	RAD	Thorium-232	pCi/g	2.33	—	0.753	1.39	1.36	1.43	—	—
MDA AB-3	RAD	Tritium	pCi/L	na	—	541	—	—	—	—	—
MDA AB-3	RAD	Uranium-234	pCi/g	2.59	—	0.565	1.22	1.34	1.59	—	—
MDA AB-3	RAD	Uranium-238	pCi/g	2.29	—	0.527	1.21	1.64	2.01	—	—
MDA AB-3N	GENINORG	Cyanide (Total)	mg/kg	0.82	—	0.613	—	—	—	—	—
MDA AB-3N	METALS	Aluminum	mg/kg	15400	—	8560	—	—	—	—	—
MDA AB-3N	METALS	Antimony	mg/kg	0.83	—	0.043	—	—	—	—	—
MDA AB-3N	METALS	Arsenic	mg/kg	3.98	—	2.21	—	—	—	—	—
MDA AB-3N	METALS	Barium	mg/kg	127	—	107	—	—	—	—	—
MDA AB-3N	METALS	Beryllium	mg/kg	1.31	—	0.541	—	—	—	—	—
MDA AB-3N	METALS	Boron	mg/kg	na	—	1.54	—	—	—	—	—
MDA AB-3N	METALS	Cadmium	mg/kg	0.4	—	0.377	—	—	—	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-3N	METALS	Chromium	mg/kg	10.5	—	5.4	—	—	—	—	—
MDA AB-3N	METALS	Cobalt	mg/kg	4.73	—	2.8	—	—	—	—	—
MDA AB-3N	METALS	Copper	mg/kg	11.2	—	5.59	—	—	—	—	—
MDA AB-3N	METALS	Iron	mg/kg	13800	—	7070	—	—	—	—	—
MDA AB-3N	METALS	Lead	mg/kg	19.7	—	13	—	—	—	—	—
MDA AB-3N	METALS	Manganese	mg/kg	543	—	245	—	—	—	—	—
MDA AB-3N	METALS	Mercury	mg/kg	0.1	—	0.01	—	—	—	—	—
MDA AB-3N	METALS	Nickel	mg/kg	9.38	—	4.7	—	—	—	—	—
MDA AB-3N	METALS	Thallium	mg/kg	0.73	—	0.118	—	—	—	—	—
MDA AB-3N	METALS	Vanadium	mg/kg	19.7	—	11.1	—	—	—	—	—
MDA AB-3N	METALS	Zinc	mg/kg	60.2	—	30.4	—	—	—	—	—
MDA AB-3N	RAD	Americium-241	pCi/g	0.04	—	0.155	—	—	—	—	—
MDA AB-3N	RAD	Cesium-137	pCi/g	0.9	—	0.367	—	—	—	—	—
MDA AB-3N	RAD	Gross alpha	pCi/g	na	—	25.2	—	—	—	—	—
MDA AB-3N	RAD	Gross beta	pCi/g	na	—	38.6	—	—	—	—	—
MDA AB-3N	RAD	Plutonium-238	pCi/g	0.006	—	0.0141	—	—	—	—	—
MDA AB-3N	RAD	Plutonium-239/240	pCi/g	0.068	—	0.721	—	—	—	—	—
MDA AB-3N	RAD	Potassium-40	pCi/g	na	—	25.7	—	—	—	—	—
MDA AB-3N	RAD	Strontium-90	pCi/g	1.04	—	0.178	—	—	—	—	—
MDA AB-3N	RAD	Thorium-228	pCi/g	2.28	—	1.62	—	—	—	—	—
MDA AB-3N	RAD	Thorium-230	pCi/g	2.29	—	1.48	—	—	—	—	—
MDA AB-3N	RAD	Thorium-232	pCi/g	2.33	—	1.4	—	—	—	—	—
MDA AB-3N	RAD	Tritium	pCi/L	na	—	420	—	—	—	—	—
MDA AB-3N	RAD	Uranium-234	pCi/g	2.59	—	1.31	—	—	—	—	—
MDA AB-3N	RAD	Uranium-238	pCi/g	2.29	—	1.74	—	—	—	—	—
MDA AB-4	GENINORG	Cyanide (Total)	mg/kg	0.82	—	0.354	—	—	0.499	—	—
MDA AB-4	METALS	Aluminum	mg/kg	15400	15100	10400	—	—	15300	—	—
MDA AB-4	METALS	Arsenic	mg/kg	3.98	2.6	2.64	—	—	3.09	—	—
MDA AB-4	METALS	Barium	mg/kg	127	157	160	—	—	158	—	—
MDA AB-4	METALS	Beryllium	mg/kg	1.31	1.06	0.786	—	—	0.877	—	—
MDA AB-4	METALS	Boron	mg/kg	na	—	1.64	—	—	3.81	—	—
MDA AB-4	METALS	Cadmium	mg/kg	0.4	—	0.324	—	—	0.421	—	—
MDA AB-4	METALS	Chromium	mg/kg	10.5	7.61	7.2	—	—	9.98	—	—
MDA AB-4	METALS	Cobalt	mg/kg	4.73	4.58	4.66	—	—	5.49	—	—
MDA AB-4	METALS	Copper	mg/kg	11.2	4.61	6.19	—	—	6.17	—	—
MDA AB-4	METALS	Iron	mg/kg	13800	9890	8770	—	—	12700	—	—
MDA AB-4	METALS	Lead	mg/kg	19.7	15	11.9	—	—	11.7	—	—
MDA AB-4	METALS	Manganese	mg/kg	543	393	344	—	—	386	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-4	METALS	Mercury	mg/kg	0.1	0.0154	0.008	—	—	0.0124	—	—
MDA AB-4	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.434	—	—
MDA AB-4	METALS	Nickel	mg/kg	9.38	5.54	6.29	—	—	7.05	—	—
MDA AB-4	METALS	Selenium	mg/kg	0.3	0.5	—	—	—	—	—	—
MDA AB-4	METALS	Thallium	mg/kg	0.73	—	0.173	—	—	0.182	—	—
MDA AB-4	METALS	Vanadium	mg/kg	19.7	10.8	17.7	—	—	23.3	—	—
MDA AB-4	METALS	Zinc	mg/kg	60.2	25.1	24.3	—	—	27.9	—	—
MDA AB-4	RAD	Cesium-137	pCi/g	0.9	0.221	0.207	0.104	0.443	0.188	—	—
MDA AB-4	RAD	Gross alpha	pCi/g	na	9.24	19.6	18	13.4	19.2	—	—
MDA AB-4	RAD	Gross beta	pCi/g	na	5.29	32.1	28.6	28.3	29.6	—	—
MDA AB-4	RAD	Gross gamma	pCi/g	na	3.9	—	9.15	8.57	—	—	—
MDA AB-4	RAD	Potassium-40	pCi/g	na	17.9	21.9	21.2	19.3	22.6	—	—
MDA AB-4	RAD	Strontium-90	pCi/g	1.04	—	0.0879	—	—	—	—	—
MDA AB-4	RAD	Thorium-228	pCi/g	2.28	—	1.6	2.15	1.61	1.5	—	—
MDA AB-4	RAD	Thorium-230	pCi/g	2.29	—	1.27	1.74	1.28	1.18	—	—
MDA AB-4	RAD	Thorium-232	pCi/g	2.33	—	1.29	1.83	1.59	1.51	—	—
MDA AB-4	RAD	Tritium	pCi/g	na	—	—	—	3.33	—	—	—
MDA AB-4	RAD	Tritium	pCi/L	na	—	314	—	—	—	—	—
MDA AB-4	RAD	Uranium-234	pCi/g	2.59	—	0.931	1.02	0.997	0.968	—	—
MDA AB-4	RAD	Uranium-238	pCi/g	2.29	—	0.94	0.91	1.06	1.06	—	—
MDA AB-4A	GENINORG	Cyanide (Total)	mg/kg	0.82	—	—	—	—	0.774	—	—
MDA AB-4A	METALS	Aluminum	mg/kg	15400	5290	13400	—	—	16100	—	—
MDA AB-4A	METALS	Arsenic	mg/kg	3.98	1	2.45	—	—	3.31	—	—
MDA AB-4A	METALS	Barium	mg/kg	127	71.9	199	—	—	178	—	—
MDA AB-4A	METALS	Beryllium	mg/kg	1.31	0.477	0.868	—	—	0.946	—	—
MDA AB-4A	METALS	Boron	mg/kg	na	—	2.82	—	—	4.35	—	—
MDA AB-4A	METALS	Cadmium	mg/kg	0.4	—	0.39	—	—	0.499	—	—
MDA AB-4A	METALS	Chromium	mg/kg	10.5	3.5	7.2	—	—	10.6	—	—
MDA AB-4A	METALS	Cobalt	mg/kg	4.73	2.07	3.98	—	—	5.55	—	—
MDA AB-4A	METALS	Copper	mg/kg	11.2	3.12	6.57	—	—	7.74	—	—
MDA AB-4A	METALS	Iron	mg/kg	13800	4580	8810	—	—	14100	—	—
MDA AB-4A	METALS	Lead	mg/kg	19.7	7.8	12.1	—	—	13.7	—	—
MDA AB-4A	METALS	Manganese	mg/kg	543	153	222	—	—	380	—	—
MDA AB-4A	METALS	Mercury	mg/kg	0.1	0.0113	0.018	—	—	0.017	—	—
MDA AB-4A	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.583	—	—
MDA AB-4A	METALS	Nickel	mg/kg	9.38	—	6.56	—	—	7.5	—	—
MDA AB-4A	METALS	Silver	mg/kg	1	—	—	—	—	0.219	—	—
MDA AB-4A	METALS	Thallium	mg/kg	0.73	—	0.178	—	—	0.178	—	—
MDA AB-4A	METALS	Vanadium	mg/kg	19.7	5.83	16.9	—	—	25.7	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-4A	METALS	Zinc	mg/kg	60.2	15.6	24.5	—	—	31.1	—	—
MDA AB-4A	RAD	Americium-241	pCi/g	0.04	0.0031	0.0153	—	—	—	—	—
MDA AB-4A	RAD	Cesium-137	pCi/g	0.9	0.686	0.337	0.322	0.367	0.165	—	—
MDA AB-4A	RAD	Gross alpha	pCi/g	na	8.26	22.5	24.5	8.2	19.6	—	—
MDA AB-4A	RAD	Gross beta	pCi/g	na	5.95	31.6	36.9	23.3	32.8	—	—
MDA AB-4A	RAD	Gross gamma	pCi/g	na	3.8	—	9.77	—	9.1	—	—
MDA AB-4A	RAD	Plutonium-238	pCi/g	0.006	0.0043	—	—	—	—	—	—
MDA AB-4A	RAD	Plutonium-239/240	pCi/g	0.068	0.0247	0.0156	—	—	—	—	—
MDA AB-4A	RAD	Potassium-40	pCi/g	na	21.9	20.8	22.9	22	24.2	—	—
MDA AB-4A	RAD	Strontium-90	pCi/g	1.04	—	0.148	—	—	0.114	—	—
MDA AB-4A	RAD	Thorium-228	pCi/g	2.28	—	1.67	1.73	1.58	1.43	—	—
MDA AB-4A	RAD	Thorium-230	pCi/g	2.29	—	1.17	1.51	1.54	1.3	—	—
MDA AB-4A	RAD	Thorium-232	pCi/g	2.33	—	1.43	1.63	1.32	1.34	—	—
MDA AB-4A	RAD	Tritium	pCi/L	na	—	268	—	—	—	—	—
MDA AB-4A	RAD	Uranium-234	pCi/g	2.59	—	0.822	0.954	0.809	0.831	—	—
MDA AB-4A	RAD	Uranium-238	pCi/g	2.29	—	0.942	1.43	0.912	1.04	—	—
MDA AB-5	GENINORG	Cyanide (Total)	mg/kg	0.82	—	0.391	—	—	0.573	—	—
MDA AB-5	METALS	Aluminum	mg/kg	15400	685	10500	—	—	11300	—	—
MDA AB-5	METALS	Antimony	mg/kg	0.83	—	0.049	—	—	—	—	—
MDA AB-5	METALS	Arsenic	mg/kg	3.98	1.6	2.9	—	—	2.85	—	—
MDA AB-5	METALS	Barium	mg/kg	127	5.49	110	—	—	87.5	—	—
MDA AB-5	METALS	Beryllium	mg/kg	1.31	—	0.735	—	—	0.683	—	—
MDA AB-5	METALS	Boron	mg/kg	na	—	1.99	—	—	3.64	—	—
MDA AB-5	METALS	Cadmium	mg/kg	0.4	—	0.592	—	—	0.412	—	—
MDA AB-5	METALS	Chromium	mg/kg	10.5	0.566	7.07	—	—	9.17	—	—
MDA AB-5	METALS	Cobalt	mg/kg	4.73	—	3.97	—	—	3.46	—	—
MDA AB-5	METALS	Copper	mg/kg	11.2	0.358	7.22	—	—	5.63	—	—
MDA AB-5	METALS	Iron	mg/kg	13800	869	8900	—	—	11800	—	—
MDA AB-5	METALS	Lead	mg/kg	19.7	11.1	17.1	—	—	11.3	—	—
MDA AB-5	METALS	Manganese	mg/kg	543	23	326	—	—	288	—	—
MDA AB-5	METALS	Mercury	mg/kg	0.1	0.0164	0.013	—	—	0.011	—	—
MDA AB-5	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.367	—	—
MDA AB-5	METALS	Nickel	mg/kg	9.38	—	6.17	—	—	5.52	—	—
MDA AB-5	METALS	Thallium	mg/kg	0.73	—	0.167	—	—	0.164	—	—
MDA AB-5	METALS	Vanadium	mg/kg	19.7	1.06	15.7	—	—	18.2	—	—
MDA AB-5	METALS	Zinc	mg/kg	60.2	3.32	700	—	—	34.1	—	—
MDA AB-5	RAD	Americium-241	pCi/g	0.04	—	0.0196	—	—	—	—	—
MDA AB-5	RAD	Cesium-137	pCi/g	0.9	0.735	0.408	0.282	0.318	0.332	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-5	RAD	Gross alpha	pCi/g	na	7.57	19.2	14.5	10.4	12.8	—	—
MDA AB-5	RAD	Gross beta	pCi/g	na	6.42	39.3	35.9	30.9	29.9	—	—
MDA AB-5	RAD	Gross gamma	pCi/g	na	4	—	8.27	8.7	8.54	—	—
MDA AB-5	RAD	Plutonium-239/240	pCi/g	0.068	0.0332	0.0187	—	—	0.0215	—	—
MDA AB-5	RAD	Potassium-40	pCi/g	0	23.9	25.4	27.6	24.4	25.9	—	—
MDA AB-5	RAD	Strontium-90	pCi/g	1.04	—	—	—	—	0.175	—	—
MDA AB-5	RAD	Thorium-228	pCi/g	2.28	—	1.44	1.09	1.38	1.16	—	—
MDA AB-5	RAD	Thorium-230	pCi/g	2.29	—	0.91	1.03	1.23	0.859	—	—
MDA AB-5	RAD	Thorium-232	pCi/g	2.33	—	1.21	1.21	1.35	1.15	—	—
MDA AB-5	RAD	Tritium	pCi/g	na	—	—	—	3.96	—	—	—
MDA AB-5	RAD	Tritium	pCi/L	na	—	324	—	—	—	—	—
MDA AB-5	RAD	Uranium-234	pCi/g	2.59	—	0.977	0.806	0.724	0.88	—	—
MDA AB-5	RAD	Uranium-238	pCi/g	2.29	—	1.29	0.582	0.869	0.993	—	—
MDA AB-6	GENINORG	Cyanide (Total)	mg/kg	0.82	—	—	—	—	0.137	—	—
MDA AB-6	METALS	Aluminum	mg/kg	15400	3730	7460	—	—	12000	—	—
MDA AB-6	METALS	Antimony	mg/kg	0.83	—	0.037	—	—	—	—	—
MDA AB-6	METALS	Arsenic	mg/kg	3.98	1.3	2.55	—	—	2.93	—	—
MDA AB-6	METALS	Barium	mg/kg	127	54.7	91	—	—	113	—	—
MDA AB-6	METALS	Beryllium	mg/kg	1.31	0.404	0.527	—	—	0.667	—	—
MDA AB-6	METALS	Boron	mg/kg	na	—	1.1	—	—	3.02	—	—
MDA AB-6	METALS	Cadmium	mg/kg	0.4	—	0.264	—	—	0.385	—	—
MDA AB-6	METALS	Chromium	mg/kg	10.5	4.41	6.85	—	—	9.94	—	—
MDA AB-6	METALS	Cobalt	mg/kg	4.73	2.92	4.36	—	—	4.3	—	—
MDA AB-6	METALS	Copper	mg/kg	11.2	2.43	3.73	—	—	5.55	—	—
MDA AB-6	METALS	Iron	mg/kg	13800	5590	8590	—	—	11600	—	—
MDA AB-6	METALS	Lead	mg/kg	19.7	7.6	9.89	—	—	11.4	—	—
MDA AB-6	METALS	Manganese	mg/kg	543	210	322	—	—	306	—	—
MDA AB-6	METALS	Mercury	mg/kg	0.1	—	—	—	—	0.00684	—	—
MDA AB-6	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.262	—	—
MDA AB-6	METALS	Nickel	mg/kg	9.38	—	4.97	—	—	6.27	—	—
MDA AB-6	METALS	Thallium	mg/kg	0.73	—	0.145	—	—	0.214	—	—
MDA AB-6	METALS	Vanadium	mg/kg	19.7	9.12	18.2	—	—	20.9	—	—
MDA AB-6	METALS	Zinc	mg/kg	60.2	15	21.7	—	—	25.9	—	—
MDA AB-6	RAD	Cesium-137	pCi/g	0.9	0.099	0.122	0.114	0.214	0.143	—	—
MDA AB-6	RAD	Gross alpha	pCi/g	na	5.26	9.31	10.5	4.62	9.89	—	—
MDA AB-6	RAD	Gross beta	pCi/g	na	3.8	30.4	27.3	24.3	24.7	—	—
MDA AB-6	RAD	Gross gamma	pCi/g	na	3.8	—	11.1	9.13	7.24	—	—
MDA AB-6	RAD	Plutonium-239/240	pCi/g	0.068	0.0047	—	—	—	—	—	—
MDA AB-6	RAD	Potassium-40	pCi/g	na	17.8	23.8	23.5	20.5	23.6	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-6	RAD	Thorium-228	pCi/g	2.28	—	1.32	1.16	1.58	1.02	—	—
MDA AB-6	RAD	Thorium-230	pCi/g	2.29	—	0.743	1.19	1.6	0.9	—	—
MDA AB-6	RAD	Thorium-232	pCi/g	2.33	—	1.17	1.35	1.4	0.961	—	—
MDA AB-6	RAD	Tritium	pCi/g	na	—	—	—	2.2	—	—	—
MDA AB-6	RAD	Tritium	pCi/L	na	—	302	—	—	—	—	—
MDA AB-6	RAD	Uranium-234	pCi/g	2.59	—	0.664	0.679	0.842	0.748	—	—
MDA AB-6	RAD	Uranium-238	pCi/g	2.29	—	0.652	0.655	0.988	0.811	—	—
MDA AB-7	GENINORG	Cyanide (Total)	mg/kg	0.82	—	0.204	—	—	0.229	—	—
MDA AB-7	METALS	Aluminum	mg/kg	15400	4740	7250	—	—	6980	—	—
MDA AB-7	METALS	Antimony	mg/kg	0.83	—	0.036	—	—	—	—	—
MDA AB-7	METALS	Arsenic	mg/kg	3.98	1.8	2.43	—	—	2.74	—	—
MDA AB-7	METALS	Barium	mg/kg	127	44.6	62.4	—	—	45.1	—	—
MDA AB-7	METALS	Beryllium	mg/kg	1.31	0.51	0.543	—	—	0.482	—	—
MDA AB-7	METALS	Boron	mg/kg	na	—	1.23	—	—	1.82	—	—
MDA AB-7	METALS	Cadmium	mg/kg	0.4	—	0.273	—	—	0.375	—	—
MDA AB-7	METALS	Chromium	mg/kg	10.5	4.44	6.08	—	—	5.6	—	—
MDA AB-7	METALS	Cobalt	mg/kg	4.73	1.94	2.24	—	—	1.74	—	—
MDA AB-7	METALS	Copper	mg/kg	11.2	2.13	3.47	—	—	3.11	—	—
MDA AB-7	METALS	Iron	mg/kg	13800	8460	9300	—	—	9860	—	—
MDA AB-7	METALS	Lead	mg/kg	19.7	12	9.8	—	—	12.7	—	—
MDA AB-7	METALS	Manganese	mg/kg	543	178	197	—	—	180	—	—
MDA AB-7	METALS	Mercury	mg/kg	0.1	—	0.005	—	—	0.00849	—	—
MDA AB-7	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.596	—	—
MDA AB-7	METALS	Nickel	mg/kg	9.38	2.72	4.48	—	—	3.63	—	—
MDA AB-7	METALS	Thallium	mg/kg	0.73	—	0.129	—	—	0.171	—	—
MDA AB-7	METALS	Vanadium	mg/kg	19.7	6.84	11.7	—	—	9.49	—	—
MDA AB-7	METALS	Zinc	mg/kg	60.2	35.5	29.8	—	—	35.4	—	—
MDA AB-7	RAD	Cesium-137	pCi/g	0.9	0.359	0.414	0.399	0.354	0.288	—	—
MDA AB-7	RAD	Gross alpha	pCi/g	na	6.75	9.09	10.8	6.45	11.2	—	—
MDA AB-7	RAD	Gross beta	pCi/g	na	5.14	33.5	39.9	30.9	33.4	—	—
MDA AB-7	RAD	Gross gamma	pCi/g	na	3.2	—	8.22	9.81	8.39	—	—
MDA AB-7	RAD	Plutonium-239/240	pCi/g	0.068	0.0158	—	—	—	—	—	—
MDA AB-7	RAD	Potassium-40	pCi/g	na	24.5	30.2	31.8	26.5	30.4	—	—
MDA AB-7	RAD	Thorium-228	pCi/g	2.28	—	0.757	0.898	1.54	1.3	—	—
MDA AB-7	RAD	Thorium-230	pCi/g	2.29	—	0.519	0.506	1.48	0.968	—	—
MDA AB-7	RAD	Thorium-232	pCi/g	2.33	—	0.696	0.775	1.32	1.13	—	—
MDA AB-7	RAD	Tritium	pCi/L	na	—	529	—	—	—	—	—
MDA AB-7	RAD	Uranium-234	pCi/g	2.59	—	0.372	0.584	0.67	0.639	—	—

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-7	RAD	Uranium-238	pCi/g	2.29	—	0.406	0.61	—	0.589	—	—
MDA AB-8	GENINORG	Cyanide (Total)	mg/kg	0.82	—	—	—	—	0.217	—	—
MDA AB-8	METALS	Aluminum	mg/kg	15400	2660	5790	—	—	7760	—	—
MDA AB-8	METALS	Arsenic	mg/kg	3.98	1.4	2.36	—	—	2.63	—	—
MDA AB-8	METALS	Barium	mg/kg	127	55.2	58.1	—	—	63	—	—
MDA AB-8	METALS	Beryllium	mg/kg	1.31	0.429	0.476	—	—	0.535	—	—
MDA AB-8	METALS	Boron	mg/kg	na	—	0.857	—	—	1.38	—	—
MDA AB-8	METALS	Cadmium	mg/kg	0.4	—	0.24	—	—	0.334	—	—
MDA AB-8	METALS	Chromium	mg/kg	10.5	3.29	4.8	—	—	6.92	—	—
MDA AB-8	METALS	Cobalt	mg/kg	4.73	2.65	2.23	—	—	2.88	—	—
MDA AB-8	METALS	Copper	mg/kg	11.2	2.36	3.36	—	—	3.73	—	—
MDA AB-8	METALS	Iron	mg/kg	13800	4340	7460	—	—	12600	—	—
MDA AB-8	METALS	Lead	mg/kg	19.7	10.5	9.53	—	—	11.9	—	—
MDA AB-8	METALS	Manganese	mg/kg	543	228	232	—	—	292	—	—
MDA AB-8	METALS	Mercury	mg/kg	0.1	0.0111	0.006	—	—	0.00781	—	—
MDA AB-8	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.793	—	—
MDA AB-8	METALS	Nickel	mg/kg	9.38	—	3.91	—	—	4.79	—	—
MDA AB-8	METALS	Thallium	mg/kg	0.73	—	0.262	—	—	0.309	—	—
MDA AB-8	METALS	Vanadium	mg/kg	19.7	4.89	11.2	—	—	18.4	—	—
MDA AB-8	METALS	Zinc	mg/kg	60.2	19.2	29.8	—	—	36.5	—	—
MDA AB-8	RAD	Americium-241	pCi/g	0.04	—	0.0125	—	—	0.025	—	—
MDA AB-8	RAD	Cesium-137	pCi/g	0.9	—	0.0933	0.0961	0.119	0.0771	—	—
MDA AB-8	RAD	Gross alpha	pCi/g	na	14.7	8.9	14.6	6.41	7.42	—	—
MDA AB-8	RAD	Gross beta	pCi/g	na	3.12	35.1	38.6	31.7	31.7	—	—
MDA AB-8	RAD	Gross gamma	pCi/g	na	3	—	9.32	8.63	8.53	—	—
MDA AB-8	RAD	Plutonium-238	pCi/g	0.006	—	—	0.166	—	—	—	—
MDA AB-8	RAD	Plutonium-239/240	pCi/g	0.068	0.0079	—	—	—	—	—	—
MDA AB-8	RAD	Potassium-40	pCi/g	na	28.1	25.8	28.9	25.6	28.5	—	—
MDA AB-8	RAD	Thorium-228	pCi/g	2.28	—	0.775	1.19	1.56	1.08	—	—
MDA AB-8	RAD	Thorium-230	pCi/g	2.29	—	0.669	0.865	1.46	1.14	—	—
MDA AB-8	RAD	Thorium-232	pCi/g	2.33	—	0.621	1.18	1.25	0.848	—	—
MDA AB-8	RAD	Tritium	pCi/L	na	—	478	—	—	—	—	—
MDA AB-8	RAD	Uranium-234	pCi/g	2.59	—	0.519	0.606	0.705	0.596	—	—
MDA AB-8	RAD	Uranium-238	pCi/g	2.29	—	0.547	0.995	0.857	0.751	—	—
MDA AB-9	GENINORG	Calcium	mg/kg	4420	—	—	—	—	—	—	1240
MDA AB-9	GENINORG	Cyanide (Total)	mg/kg	0.82	—	1.25	—	—	—	—	—
MDA AB-9	GENINORG	Magnesium	mg/kg	2370	—	—	—	—	—	—	1530
MDA AB-9	GENINORG	Potassium	mg/kg	2690	—	—	—	—	—	—	1290
MDA AB-9	GENINORG	Sodium	mg/kg	1470	—	—	—	—	—	—	107

Table 3.4-3 (continued)

Location Name	Analytical Suite	Analyte	Units	BV/FV[a]	2000	2001	2002	2003	2004	2005	2006
MDA AB-9	METALS	Aluminum	mg/kg	15400	5520	5210	—	—	11400	4010	8830
MDA AB-9	METALS	Antimony	mg/kg	0.83	—	0.037	—	—	—	—	—
MDA AB-9	METALS	Arsenic	mg/kg	3.98	0.7	2.02	—	—	2.96	1.92	2.81
MDA AB-9	METALS	Barium	mg/kg	127	65.2	70.7	—	—	131	62.3	79.2
MDA AB-9	METALS	Beryllium	mg/kg	1.31	0.469	0.481	—	—	0.744	0.35	0.566
MDA AB-9	METALS	Boron	mg/kg	na	—	0.734	—	—	3.68	—	2.25
MDA AB-9	METALS	Cadmium	mg/kg	0.4	—	0.345	—	—	0.552	0.116	0.249
MDA AB-9	METALS	Chromium	mg/kg	10.5	3.06	4.12	—	—	8.45	2.95	6.06
MDA AB-9	METALS	Cobalt	mg/kg	4.73	1.76	3.31	—	—	6.4	4.9	4.27
MDA AB-9	METALS	Copper	mg/kg	11.2	2.41	3.63	—	—	6.11	2.19	2.98
MDA AB-9	METALS	Iron	mg/kg	13800	4520	7390	—	—	11300	6050	8780
MDA AB-9	METALS	Lead	mg/kg	19.7	6.2	11.9	—	—	15.9	8.83	11.3
MDA AB-9	METALS	Manganese	mg/kg	543	147	275	—	—	492	515	398
MDA AB-9	METALS	Mercury	mg/kg	0.1	—	0.008	—	—	0.0185	—	0.0051
MDA AB-9	METALS	Molybdenum	mg/kg	na	—	—	—	—	0.467	0.507	—
MDA AB-9	METALS	Nickel	mg/kg	9.38	—	3.94	—	—	6.61	5.86	4
MDA AB-9	METALS	Selenium	mg/kg	0.3	—	—	—	—	0.319	—	—
MDA AB-9	METALS	Silver	mg/kg	1	—	—	—	—	—	—	0.0583
MDA AB-9	METALS	Thallium	mg/kg	0.73	—	0.131	—	—	0.17	0.0864	0.14
MDA AB-9	METALS	Vanadium	mg/kg	19.7	4.12	11.3	—	—	20.3	10.7	24.2
MDA AB-9	METALS	Zinc	mg/kg	60.2	17.8	26.8	—	—	29.2	15.9	26.4
MDA AB-9	RAD	Americium-241	pCi/g	0.04	—	0.0223	—	—	—	—	—
MDA AB-9	RAD	Cesium-137	pCi/g	0.9	—	0.454	0.24	0.696	0.332	0.0612	0.155
MDA AB-9	RAD	Gross alpha	pCi/g	na	6.1	22.6	20.3	13.3	22.5	14.6	8.32
MDA AB-9	RAD	Gross beta	pCi/g	na	3.93	44.3	10.4	27.5	35.9	36.1	31.7
MDA AB-9	RAD	Gross gamma	pCi/g	na	2.9	—	8.99	9.59	10.4	5.65	—
MDA AB-9	RAD	Plutonium-239/240	pCi/g	0.068	0.0076	0.0412	—	0.0358	—	—	0.0293
MDA AB-9	RAD	Potassium-40	pCi/g	na	27.5	26.4	26.4	20.9	25.3	25.4	28.1
MDA AB-9	RAD	Strontium-90	pCi/g	1.04	—	0.163	—	—	—	—	—
MDA AB-9	RAD	Thorium-228	pCi/g	2.28	—	1.53	1.43	1.47	1.29	1.38	0.888
MDA AB-9	RAD	Thorium-230	pCi/g	2.29	—	1.16	1.28	1.16	1.31	0.961	0.64
MDA AB-9	RAD	Thorium-232	pCi/g	2.33	—	1.33	1.39	1.28	1.11	1.1	0.841
MDA AB-9	RAD	Tritium	pCi/L	na	—	400	—	—	—	—	—
MDA AB-9	RAD	Uranium-234	pCi/g	2.59	—	1.31	0.784	1.12	1.17	1.04	0.435
MDA AB-9	RAD	Uranium-238	pCi/g	2.29	—	1.61	0.929	1.41	1.43	0.798	0.57

Note: Results shaded in gray are above BV/FV.

[a] BVs/FVs are from LANL (1998, 059730).

[b] — = Analysis was not requested, analysis was not detected, or analysis was rejected.

[c] na = Not available.

Table 3.4-4
Surface Water Results at the Surface Water Sampling Station Water below MDA AB

Analytical Suite	Analyte	Field Prep	Unit	8/3/2001	7/26/2001	8/8/2001	6/21/2002	7/14/2002	4/27/2004	8/19/2004	10/5/2004	3/30/2005	8/4/2005	8/12/2005	8/24/2005	8/14/2006	8/25/2006	9/1/2006	10/9/2006	3/30/2007
GENINORG	Alkalinity-CO_3	Filtered	mg/L	<0.725[a]	—[b]	—	—	—	—	—	—	—	—	—	—	<0.725	<0.725	—	<0.725	—
GENINORG	Alkalinity-CO3+HCO_3	Filtered	mg/L	10.5	—	—	—	—	—	—	—	—	14	22.5	19.2	36.6	33.5	—	56.3	—
GENINORG	Alkalinity-HCO_3	Filtered	mg/L	10.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Calcium	Filtered	mg/L	—	—	—	—	—	15.7	5.33	3.1	—	6.48	7.07	4.94	14.5	9.65	9.53	12.8	12.2
GENINORG	Chloride	Filtered	mg/L	2.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Dissolved Organic Carbon	Filtered	mg/L	—	—	—	—	—	—	—	—	—	28	13.6	7.12	13.8	17.1	—	7.02	—
GENINORG	Hardness	Filtered	mg/L	—	—	—	—	—	59.7	19.9	11.3	—	23.8	24.6	16.7	50.5	33.6	35.7	48.5	47.1
GENINORG	Magnesium	Filtered	mg/L	2.81	6.78	4.74	—	—	4.96	1.39	0.857	—	1.84	1.68	1.05	3.5	2.32	2.88	4.05	4.04
GENINORG	pH	Filtered	SU	6.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Potassium	Filtered	mg/L	—	—	—	—	—	4.45	4.94	3.81	—	5.6	5	3.23		—	—	—	3.43
GENINORG	Silicon Dioxide	Filtered	mg/L	—	—	—	—	—	38.2	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Sodium	Filtered	mg/L	—	—	—	—	—	15.4	1.29	0.956	—	4.75	6.17	1.3		—	—	—	11.2
GENINORG	Sulfate	Filtered	mg/L	3.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Total dissolved solids	Filtered	mg/L	160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Total organic carbon	Filtered	mg/L	—	—	—	—	—	—	—	—	7.62	—	—	—	—	—	—	—	—
GENINORG	Alkalinity-CO_3	Unfiltered	mg/L	—	—	—	—	—	—	—	—	<1.45	—	—	—	—	—	—	—	—
GENINORG	Alkalinity-CO_3+HCO_3	Unfiltered	mg/L	—	—	—	—	—	—	—	—	38	—	—	—	—	—	—	—	—
GENINORG	Alkalinity-HCO_3	Unfiltered	mg/L	—	—	—	—	—	—	—	—	37.8	—	—	—	—	—	—	—	—
GENINORG	Ammonia as nitrogen	Unfiltered	mg/L	0.45	—	0.87	—	0.53	—	0.437	0.335	—	—	—	—	0.234	0.828	1.09	0.056	—
GENINORG	Calcium	Unfiltered	mg/L	—	—	—	—	—	15.2	27.1	33.9	15.4	23.2	19.7	34.9	42.9	88	44.8	18.9	14.2
GENINORG	Chemical oxygen demand	Unfiltered	mg/L	40.5	—	116		309	—	944	288	—	—	—	—	827	1370	427	164	—
GENINORG	Cyanide (total)	Unfiltered	mg/L	0.00738	—	0.011	0.0205	0.00607	—	—	<0.00241	—	—	—	—	0.0025	0.0053	0.00158	<0.0015	<0.0015
GENINORG	Cyanide, amenable to chlorination	Unfiltered	mg/L	<0.00289	—	<0.00289	—	—	—	—	<0.00227	—	—	—	—	<0.0015	—	—	<0.0015	<0.0015
GENINORG	Hardness	Unfiltered	mg/L	—	—	—	—	—	58.1	118	110	58.6	118	89.8	169	217	356	195	70.8	55.4
GENINORG	Loss on Ignition	Unfiltered	mg/L	764	10900	1280	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Magnesium	Unfiltered	mg/L	27.2	172	72.1	30.1	34.4	4.86	18.2	6.12	4.91	14.5	9.84	19.8	26.8	33.2	20.3	5.75	4.85
GENINORG	Max total dissolved solids	Unfiltered	mg/L	33400	107000	21400	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Nitrate–nitrite as N	Unfiltered	mg/L	0.56	—	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Perchlorate	Unfiltered	µg/L	—	—	<3.83	—	—	—	—	—	0.404	—	—	—	—	—	—	—	—

Table 3.4-4 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/3/2001	7/26/2001	8/8/2001	6/21/2002	7/14/2002	4/27/2004	8/19/2004	10/5/2004	3/30/2005	8/4/2005	8/12/2005	8/24/2005	8/14/2006	8/25/2006	9/1/2006	10/9/2006	3/30/2007
GENINORG	pH	Unfiltered	SU	6.77	7.29	6.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Potassium	Unfiltered	mg/L	—	—	—	—	—	4.35	24.1	9.04	4.12	19.4	16.1	25.8	—	—	—	—	4.77
GENINORG	Silicon dioxide	Unfiltered	mg/L	—	—	—	—	—	36.9	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Sodium	unfiltered	mg/L	—	—	—	—	—	15.1	3.22	1.2	13.5	6.59	11.1	5.38	—	—	—	—	11.8
GENINORG	Specific conductance	Unfiltered	uS/cm	93.6	362	185	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Specific gravity	Unfiltered	Unitless	1.01	1.03	1.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Suspended sediment	Unfiltered	mg/L	—	—	—	—	—	4.5	3510	4360	10	2380	2390	2760	6170	13500	3720	1870	610
GENINORG	Total Kjeldahl Nitrogen	Unfiltered	mg/L	1.4	—	2.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Total phosphate as phosphorus	Unfiltered	mg/L	2.17	—	4.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GENINORG	Total suspended solids	Unfiltered	mg/L	7260	81100	17300	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	4-amino-2,6-dinitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.48	<0.48	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	2-amino-4,6-dinitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	1,3-dinitrobenzene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	2,4-dinitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	2,6-dinitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.54	<0.54	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	HMX	Unfiltered	µg/L	—	—	—	—	—	1.3	<0.48	—	1.4	<0.65	<0.65	<0.68	—	0.563	—	1.38	—
HEXP	Nitrobenzene	Unfiltered	µg/L	—	—	—	—	—	<0.48	<0.48	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	2-nitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.48	<0.48	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	3-nitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	4-nitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	RDX	Unfiltered	µg/L	—	—	—	—	—	<0.48	<0.48	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	Tetryl	Unfiltered	µg/L	—	—	—	—	—	<1.5	<1.5	—	—	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	1,3,5-trinitrobenzene	Unfiltered	µg/L	—	—	—	—	—	<0.97	<0.97	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
HEXP	2,4,6-trinitrotoluene	Unfiltered	µg/L	—	—	—	—	—	<0.48	<0.48	—	<0.65	<0.65	<0.65	<0.68	—	—	—	<0.649	—
METALS	Aluminum	Filtered	µg/L	546	627	2390	—	—	100	1420	680	—	493	747	<116	1100	1190	2330	<378	1480
METALS	Antimony	Filtered	µg/L	<0.29	0.424	<0.15	—	—	<0.2	<0.24	<0.2	—	<0.5	<0.5	<0.5	—	—	—	—	<0.5
METALS	Arsenic	Filtered	µg/L	<3.07	3.12	<2.57	—	—	<1.67	<1.67	<1.67	—	<6	<6	<6	<6	<6	<6	<6	<6
METALS	Barium	Filtered	µg/L	305	133	236	—	—	204	47.3	32.5	—	49.8	60.6	36.4	—	—	—	—	107
METALS	Beryllium	Filtered	µg/L	0.785	<0.253	<0.253	—	—	<0.172	<0.172	<0.172	—	<1	<1	<1	—	—	—	—	<1
METALS	Boron	Filtered	µg/L	29.9	25.4	<18.7	—	—	15.4	20.9	<15.4	—	—	—	—	—	—	—	—	—
METALS	Cadmium	Filtered	µg/L	<0.595	<0.05	<0.094	—	—	<0.07	0.073	0.072	—	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
METALS	Chromium	Filtered	µg/L	<1.47	<1.47	<0.732	—	—	<1.43	<1.43	<1.43	—	1	<1	<1	<1	<1	2	<1	<1

Table 3.4-4 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/3/2001	7/26/2001	8/8/2001	6/21/2002	7/14/2002	4/27/2004	8/19/2004	10/5/2004	3/30/2005	8/4/2005	8/12/2005	8/24/2005	8/14/2006	8/25/2006	9/1/2006	10/9/2006	3/30/2007
METALS	Cobalt	Filtered	µg/L	2.96	<0.901	<0.968	—	—	<0.762	3.7	<0.762	—	<1	<1	<1	—	—	—	—	<2.6
METALS	Copper	Filtered	µg/L	2.21	3.51	<4.97	—	—	<1.8	2	2.3	—	<3	<3	<3	<3	—	<3	<3	<3
METALS	Iron	Filtered	µg/L	262	301	1120	—	—	52.3	755	347	—	270	381	<67.2	1350	1060	1280	<209	687
METALS	Lead	Filtered	µg/L	1.16	<0.261	0.93	—	—	0.098	0.53	0.44	—	<0.5	<0.5	<0.5	0.82	0.9	0.89	<0.5	0.51
METALS	Manganese	Filtered	µg/L	1060	593	46.4	—	—	2.27	275	46.8	—	29.1	69.2	318	—	—	—	—	8.9
METALS	Mercury	Filtered	µg/L	<0.073	<0.073	<0.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—
METALS	Molybdenum	Filtered	µg/L	<1.66	4.16	<2.08	—	—	2.1	2.1	<1.3	—	<2	<2	<2	—	—	—	—	2.3
METALS	Nickel	Filtered	µg/L	1.41	<1.2	<1.2	—	—	<3.6	<3.6	<3.6	—	1.1	0.99	0.83	—	—	—	—	1.2
METALS	Selenium	Filtered	µg/L	<2.38	3.81	3.56	—	—	<2.29	<7.5	<2.29	—	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
METALS	Silver	Filtered	µg/L	<0.276	<0.276	0.739	—	—	<0.819	<0.819	<0.819	—	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
METALS	Strontium	Filtered	µg/L	111	256	150	—	—	111	32.6	19.4	—	—	—	—	—	—	—	—	—
METALS	Thallium	Filtered	µg/L	<0.054	<0.014	<0.014	—	—	<0.02	<0.02	<0.08	—	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.76
METALS	Tin	Filtered	µg/L	<3.5	<3.5	<3.5	—	—	<1.55	<1.55	<1.55	—	—	—	—	—	—	—	—	—
METALS	Uranium	Filtered	µg/L	0.279	<0.754	<0.248	—	—	0.099	0.44	<0.29	—	—	—	—	—	—	—	—	—
METALS	Vanadium	Filtered	µg/L	3.1	2.65	4.4	—	—	1.32	1.8	<2.9	—	3.1	2.1	<1.1	3.2	2.6	3	1.4	<3.3
METALS	Zinc	Filtered	µg/L	22.6	<7.18	9.14	—	—	<0.809	3.2	<2.1	—	3	<4.5	<3.7	2.5	6.5	8.5	3	4.8
METALS	Aluminum	Unfiltered	µg/L	192000	1030000	430000	—	—	196	114000	7600	1300	94500	54100	129000	169000	162000	95700	6320	6320
METALS	Antimony	Unfiltered	µg/L	—	—	—	—	—	<0.2	<0.35	<0.2	<0.5	1.2	<0.54	0.57	—	—	—	—	<0.5
METALS	Arsenic	Unfiltered	µg/L	37.3	67.4	82.2	23.3	20	<1.67	23.9	<1.67	<6	19	14	20.8	<25.1	40.5	21.4	<6	<6
METALS	Barium	Unfiltered	µg/L	3040	22700	13700	—	—	205	1460	1490	148	1130	799	1920	—	—	—	—	241
METALS	Beryllium	Unfiltered	µg/L	15.8	61.6	34.8	—	—	<0.172	7.9	6.9	<1	5.9	4.5	<13.6	—	—	—	—	<1
METALS	Boron	Unfiltered	µg/L	48	45.9	108	—	—	15.7	54.3	22.8	—	—	—	—	—	—	—	—	—
METALS	Cadmium	Unfiltered	µg/L	3.7	25.9	10.9	5.62	6.24	<0.07	2.3	2.7	<0.1	1.7	1.2	<3.2	2.5	5.4	2.2	0.48	0.22
METALS	Chromium	Unfiltered	µg/L	93.6	302	245	—	—	<1.43	59.2	<1.43	<1	50.9	29.9	68.7	64	64.3	34.3	3.1	4.1
METALS	Cobalt	Unfiltered	µg/L	54	382	167	—	—	<0.762	39.2	30.8	<1	21.9	14.5	42.5	—	—	—	—	<3
METALS	Copper	Unfiltered	µg/L	113	436	348	—	—	<1.8	76.1	22.3	<3	58.4	35.3	84.8	103	203	72.8	9	3.2
METALS	Iron	Unfiltered	µg/L	127000	353000	315000	—	—	112	76300	1700	618	75300	41200	97900	114000	139000	66400	4800	3580
METALS	Lead	Unfiltered	µg/L	121	1110	687	145	149	0.177	78.2	43.6	0.51	93.2	51.7	129	149	277	135	20.9	8.2
METALS	Manganese	Unfiltered	µg/L	8350	71500	26400	—	—	4.42	3310	3260	10.7	2590	1760	5850	—	—	—	—	264
METALS	Mercury	Unfiltered	µg/L	<0.073	<0.073	<0.073	<0.273	<0.0472	<0.047	0.22	0.17	<0.05	0.27	<0.05	0.28	<0.6	<0.06	<0.6	<0.06	<0.089
METALS	Molybdenum	Unfiltered	µg/L	<4.97	<1.66	<3.25	—	—	1.76	1.7	<0.948	<2	4.3	2.1	<4	—	—	—	—	<2
METALS	Nickel	Unfiltered	µg/L	86.8	530	261	—	—	<3.6	56.8	25.7	0.98	34.2	20.4	51.1	—	—	—	—	53.7
METALS	Selenium	Unfiltered	µg/L	8.43	8.52	27.1	4.78	5.87	<2.29	<2.29	<7	<2.5	<2.5	<2.5	<2.5	<2.5	3	<2.5	<2.5	<2.5
METALS	Silver	Unfiltered	µg/L	2.38	1.47	267	1.58	2.01	<0.819	<0.819	<0.819	<0.2	<0.78	0.62	1.4	2.4	21.6	4.3	<0.2	<0.2
METALS	Strontium	Unfiltered	µg/L	561	6040	1650	—	—	108	244	240	—	—	—	—	—	—	—	—	—

Table 3.4-4 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/3/2001	7/26/2001	8/8/2001	6/21/2002	7/14/2002	4/27/2004	8/19/2004	10/5/2004	3/30/2005	8/4/2005	8/12/2005	8/24/2005	8/14/2006	8/25/2006	9/1/2006	10/9/2006	3/30/2007
METALS	Thallium	Unfiltered	µg/L	1.29	8.98	5.49	—	—	<0.087	0.5	<0.11	<0.4	1.4	0.76	1.8	1.7	2.4	<1.2	<0.4	<0.4
METALS	Tin	Unfiltered	µg/L	5.76	5.83	8.11	—	—	<1.55	2.9	<1.6	—	—	—	—	—	—	—	—	—
METALS	Uranium	Unfiltered	µg/L	11.3	104	43.9	—	—	0.102	19	23.2	—	—	—	—	—	—	—	—	—
METALS	Vanadium	Unfiltered	µg/L	197	253	405	—	—	2.44	125	35.8	<2.9	98.1	55.8	123	177	200	115	12.2	8.4
METALS	Zinc	Unfiltered	µg/L	608	3370	1470	—	—	<1.03	253	61.1	3.5	250	156	389	532	673	333	35.3	17.8
RAD	Americium-241	Filtered	pCi/L	<0.00854	0.039	<0.0138	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Cesium-137	Filtered	pCi/L	<-0.648	<4.36	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Cobalt-60	Filtered	pCi/L	<-0.456	<0.117	<-1.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Gross alpha	Filtered	pCi/L	2.04	9.62	<0.926	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Gross beta	Filtered	pCi/L	7.41	23.5	8.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Lead-210	Filtered	pCi/L	0.868	1.37	<0.611	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Neptunium-237	Filtered	pCi/L	<-11.3	<1.42	<2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Plutonium-238	Filtered	pCi/L	<0	<-0.0019	<0.00619	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Plutonium-239/240	Filtered	pCi/L	<0.00534	0.0228	0.111	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Polonium-210	Filtered	pCi/L	1.08	1.46	0.332	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Potassium-40	Filtered	pCi/L	<3.32	<25.3	<12.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Radium-226	Filtered	pCi/L	<0.141	0.781	<0.141	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Radium-228	Filtered	pCi/L	<0.323	<0.611	<0.104	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Sodium-22	Filtered	pCi/L	<0.406	<0.95	<-0.915	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Strontium-90	Filtered	pCi/L	0.681	1.18	0.954	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Thorium-228	Filtered	pCi/L	0.126	0.942	0.107	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Thorium-230	Filtered	pCi/L	0.13	0.746	0.0642	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Thorium-232	Filtered	pCi/L	0.1	0.862	0.0638	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Uranium-234	Filtered	pCi/L	0.101	0.8	0.152	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Uranium-235/236	Filtered	pCi/L	<0.00877	0.0664	<0.0123	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Uranium-238	Filtered	pCi/L	0.109	0.757	0.103	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RAD	Americium-241	Unfiltered	pCi/L	0.233	0.776	0.501	—	—	<0.00838	—	<0.0326	<-0.00375	<0.0403	0.0538	—	0.0333	0.0622	0.106	<0.0262	<0.0125
RAD	Cesium-137	Unfiltered	pCi/L	—	<3.25	12.4	—	—	—	—	<-1.09	<-1.64	—	<1.17	—	<4.13	19.2	6.99	<2.31	<-0.198
RAD	Cobalt-60	Unfiltered	pCi/L	<1.29	<2.32	<-1.44	—	—	<1.98	—	<0.561	<-0.409	<1.72	<2.51	—	<-1.7	<-0.128	<1.8	<4.7	<0.303
RAD	Gross alpha	Unfiltered	pCi/L	238	1660	948	—	—	<0.537	—	188	<0.397	60	37.7	—	171	99.3	89.3	14.3	<1.4
RAD	Gross beta	Unfiltered	pCi/L	297	2990	2260	—	—	2.34	—	368	6.06	122	55.3	—	197	201	197	18.9	5.9
RAD	Gross gamma	Unfiltered	pCi/L	—	—	—	—	—	<58.3	—	—	—	—	—	—	—	—	—	—	—
RAD	Lead-210	Unfiltered	pCi/L	46.9	3.68	32.8	—	—	<0.463	—	—	—	—	—	—	—	—	—	—	—
RAD	Neptunium-237	Unfiltered	pCi/L	<1.06	<-2.99	<7.67	—	—	<-0.213	—	<-1.68	<15.9	<-2.13	<13.2	—	<28.9	<3.1	<9.81	<10.3	<-7.44
RAD	Plutonium-238	Unfiltered	pCi/L	0.042	0.304	<0.0661	—	—	<0.00365	—	<0.00232	<0.00225	<-0.00756	<0.0207	—	<0.0247	<-0.00879	<0.03	<0.0115	<-4.4E-10

Table 3.4-4 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/3/2001	7/26/2001	8/8/2001	6/21/2002	7/14/2002	4/27/2004	8/19/2004	10/5/2004	3/30/2005	8/4/2005	8/12/2005	8/24/2005	8/14/2006	8/25/2006	9/1/2006	10/9/2006	3/30/2007
RAD	Plutonium-239/240	Unfiltered	pCi/L	0.626	2.18	1.07	—	—	<-0.00183	—	0.107	<0.00676	0.31	<-0.00919	—	<0.222	0.129	0.449	0.0553	<0.0111
RAD	Polonium-210	Unfiltered	pCi/L	53.9	<92.1	204	—	—	<0	—	—	—	—	—	—	—	—	—	—	—
RAD	Potassium-40	Unfiltered	pCi/L	<70.7	<73.6	<43.8	—	—	<1.26	—	—	<18.2	118	—	—	106	291	193	<8.58	<-30
RAD	Radium-226	Unfiltered	pCi/L	5.1	20.2	11.5	—	—	<0.245	—	—	—	—	—	—	7.29	25.8	8.18	1.84	—
RAD	Radium-228	Unfiltered	pCi/L	4.36	2.02	10.6	—	—	1.06	—	—	—	—	—	—	—	—	—	—	—
RAD	Sodium-22	Unfiltered	pCi/L	<2.85	<-0.631	<3.44	—	—	<0.264	—	<0.452	<-0.0263	<-2.3	<-0.27	—	<3.24	<-0.245	<-2.29	<0.0944	<-0.217
RAD	Strontium-90	Unfiltered	pCi/L	3.54	16.9	8.13	—	—	<0.281	—	0.506	<0.223	0.918	0.411	—	1.09	2.33	0.734	—	<0.118
RAD	Thorium-228	Unfiltered	pCi/L	15.4	<47.7	71.6	—	—	<0.0144	—	—	—	—	—	—	9.28	22.1	22.2	2.76	<0.128
RAD	Thorium-230	Unfiltered	pCi/L	10.6	<42.9	40	—	—	<0.0457	—	—	—	—	—	—	5.96	18.5	<16.8	1.83	<0.017
RAD	Thorium-232	Unfiltered	pCi/L	12.3	<44.8	56.5	—	—	<0.00989	—	—	—	—	—	—	7.09	26.8	19.6	1.76	<0.0565
RAD	Tritium	Unfiltered	pCi/L	<-80.4	—	<54.1	—	—	189	—	<0	<61.3	<-122	<-114	<118	—	—	—	—	—
RAD	Uranium-234	Unfiltered	pCi/L	12	<33.9	47.8	—	—	<0.01	—	8.21	<0.022	3.73	8.65	—	4.53	13.5	9.45	2.42	0.89
RAD	Uranium-235/236	Unfiltered	pCi/L	0.763	<4.86	4.81	—	—	<0.0201	—	0.606	<-0.0221	0.231	0.561	—	0.474	<1.15	<1.04	<0.212	<0.0227
RAD	Uranium-238	Unfiltered	pCi/L	14	<30.6	46.6	—	—	<0.0226	—	13.5	<-0.00733	4.55	13.2	—	5.3	20.9	13.2	2.42	1.14

[a] — = Analysis was not requested or analysis was rejected.

[b] < = Result is not detected at the concentration reported.

Table 3.4-5
Surface Water Screening-Level Results at the Sampling Station Water at Beta (2000 and 2001)

Analytical Suite	Analyte	Field Prep	Unit	8/17/2000	4/17/2001
GENINORG	Alkalinity-CO_3	Filtered	mg/L	<5[a]	<1.45
GENINORG	Alkalinity-CO_3+HCO_3	Filtered	mg/L	131	93.5
GENINORG	Alkalinity-HCO_3	Filtered	mg/L	—[b]	93.1
GENINORG	Calcium	Filtered	mg/L	26.24	16.9
GENINORG	Chloride	Filtered	mg/L	7.73	23.1
GENINORG	Cyanide (total)	Unfiltered	mg/L	3.00	<0.00276
GENINORG	Fluoride	Filtered	mg/L	0.12	<0.129
GENINORG	Hardness	Filtered	mg/L	94.7	64.3
GENINORG	Magnesium	Filtered	mg/L	7.09	5.39
GENINORG	Nitrate as nitrogen	Filtered	mg/L	0.13	—
GENINORG	Nitrate–nitrite as N	Filtered	mg/L	0.13	0.85
GENINORG	Perchlorate	Unfiltered	µg/L	<1	<0.801
GENINORG	pH	Filtered	SU	1.70	7.42
GENINORG	Potassium	Filtered	mg/L	5.631	4.19
GENINORG	Silicon dioxide	Filtered	mg/L	47	33.5
GENINORG	Sodium	Filtered	mg/L	17.396	11.8
GENINORG	Specific conductance	Filtered	µS/cm	273	135
GENINORG	Sulfate	Filtered	mg/L	4.94	15.5
GENINORG	Total dissolved solids	Filtered	mg/L	286	151
GENINORG	Total phosphate as phosphorus	Filtered	mg/L	0.17	<0.08
GENINORG	Total suspended solids	Unfiltered	mg/L	18	3.2
HEXP	Amino-2,6-dinitrotoluene[4-]	Unfiltered	µg/L	—	<0.1
HEXP	Amino-4,6-dinitrotoluene[2-]	Unfiltered	µg/L	—	<0.1
HEXP	Dinitrobenzene[1,3-]	Unfiltered	µg/L	—	<0.1
HEXP	Dinitrotoluene[2,4-]	Unfiltered	µg/L	—	<0.1
HEXP	Dinitrotoluene[2,6-]	Unfiltered	µg/L	—	<0.1
HEXP	HMX	Unfiltered	µg/L	—	1.9
HEXP	Nitrobenzene	Unfiltered	µg/L	—	<0.1
HEXP	Nitrotoluene[2-]	Unfiltered	µg/L	—	<0.1
HEXP	Nitrotoluene[3-]	Unfiltered	µg/L	—	<0.1
HEXP	Nitrotoluene[4-]	Unfiltered	µg/L	—	<0.1
HEXP	RDX	Unfiltered	µg/L	—	0.49
HEXP	Tetryl	Unfiltered	µg/L	—	<0.1
HEXP	Trinitrobenzene[1,3,5-]	Unfiltered	µg/L	—	<0.1
HEXP	Trinitrotoluene[2,4,6-]	Unfiltered	µg/L	—	<0.1
METALS	Aluminum	Filtered	µg/L	61.0	132
METALS	Antimony	Filtered	µg/L	<0.3	<0.153

Table 3.4-5 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/17/2000	4/17/2001
METALS	Arsenic	Filtered	µg/L	<0.7	<2.33
METALS	Barium	Filtered	µg/L	211.0	142
METALS	Beryllium	Filtered	µg/L	<1.0	0.035
METALS	Boron	Filtered	µg/L	24.0	24.2
METALS	Cadmium	Filtered	µg/L	<3.0	<0.072
METALS	Chromium	Filtered	µg/L	<5.0	<0.582
METALS	Cobalt	Filtered	µg/L	<6.0	2.42
METALS	Copper	Filtered	µg/L	<2.0	<1.11
METALS	Iron	Filtered	µg/L	41.0	68.6
METALS	Lead	Filtered	µg/L	<0.30	0.101
METALS	Manganese	Filtered	µg/L	43.0	1.42
METALS	Mercury	Filtered	µg/L	—	<0.057
METALS	Mercury	Unfiltered	µg/L	<0	<0.057
METALS	Molybdenum	Filtered	µg/L	<6.0	<1.28
METALS	Nickel	Filtered	µg/L	<10.0	<0.815
METALS	Selenium	Unfiltered	µg/L	3	<2.93
METALS	Silicon	Filtered	µg/L	47000	—
METALS	Silver	Filtered	µg/L	<3.0	<0.871
METALS	Strontium	Filtered	µg/L	172.0	109
METALS	Thallium	Filtered	µg/L	—	0.499
METALS	Tin	Filtered	µg/L	<30.	<2.31
METALS	Titanium	Filtered	µg/L	<10.0	—
METALS	Vanadium	Filtered	µg/L	<5.0	1.67
METALS	Zinc	Filtered	µg/L	<10.0	<0.72
PEST/PCB	Aroclor 1016	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1221	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1232	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1242	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1248	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1254	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1260	Unfiltered	µg/L	—	<0.097
PEST/PCB	Aroclor 1262	Unfiltered	µg/L	—	<0.097
RAD	Americium-241	Unfiltered	pCi/L	<4.6	<0.018
RAD	Cesium-137	Unfiltered	pCi/L	<1.28	<2.83
RAD	Cobalt-60	Unfiltered	pCi/L	<-1.8	<0.679
RAD	Gross alpha	Unfiltered	pCi/L	<2.83	<0.0057
RAD	Gross beta	Unfiltered	pCi/L	<8.53	5.82
RAD	Gross gamma	Unfiltered	pCi/L	<29	—
RAD	Neptunium-237	Unfiltered	pCi/L	—	<2.82

Table 3.4-5 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/17/2000	4/17/2001
RAD	Plutonium-238	Unfiltered	pCi/L	<2.8	<0.0192
RAD	Plutonium-239/plutonium-240	Unfiltered	pCi/L	<2.2	<0.0138
RAD	Potassium-40	Unfiltered	pCi/L	<-21.4	<18.5
RAD	Sodium-22	Unfiltered	pCi/L	<0.44	<0.0844
RAD	Strontium-90	Unfiltered	pCi/L	0.91	0.574
RAD	Tritium	Unfiltered	pCi/L	<-60	<-28
RAD	Uranium-234	Unfiltered	pCi/L	0.1722	<0.0187
RAD	Uranium-235/uranium-236	Unfiltered	pCi/L	<-3.3	<-0.00413
RAD	Uranium-238	Unfiltered	pCi/L	0.1704	<0.0245
SVOA	Acenaphthene	Unfiltered	µg/L	—	<0.97
SVOA	Acenaphthylene	Unfiltered	µg/L	—	<0.97
SVOA	Aniline	Unfiltered	µg/L	—	<9.7
SVOA	Anthracene	Unfiltered	µg/L	—	<0.97
SVOA	Benzidine	Unfiltered	µg/L	—	<48.5
SVOA	Benzo(a)anthracene	Unfiltered	µg/L	—	<0.97
SVOA	Benzo(a)pyrene	Unfiltered	µg/L	—	<0.97
SVOA	Benzo(b)fluoranthene	Unfiltered	µg/L	—	<0.97
SVOA	Benzo(g,h,i)perylene	Unfiltered	µg/L	—	<0.97
SVOA	Benzo(k)fluoranthene	Unfiltered	µg/L	—	<0.97
SVOA	Benzoic acid	Unfiltered	µg/L	—	<19.4
SVOA	Benzyl alcohol	Unfiltered	µg/L	—	<9.7
SVOA	Bis(2-chloroethoxy)methane	Unfiltered	µg/L	—	<9.7
SVOA	Bis(2-chloroethyl)ether	Unfiltered	µg/L	—	<9.7
SVOA	Bis(2-ethylhexyl)phthalate	Unfiltered	µg/L	—	<0.97
SVOA	Bromophenyl-phenylether[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Butylbenzylphthalate	Unfiltered	µg/L	—	<9.7
SVOA	Chloro-3-methylphenol[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Chloroaniline[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Chloronaphthalene[2-]	Unfiltered	µg/L	—	<0.97
SVOA	Chlorophenol[2-]	Unfiltered	µg/L	—	<9.7
SVOA	Chlorophenyl-phenyl[4-] ether	Unfiltered	µg/L	—	<9.7
SVOA	Chrysene	Unfiltered	µg/L	—	<0.97
SVOA	Dibenz(a,h)anthracene	Unfiltered	µg/L	—	<0.97
SVOA	Dibenzofuran	Unfiltered	µg/L	—	<9.7
SVOA	Dichlorobenzene[1,2-]	Unfiltered	µg/L	—	<9.7
SVOA	Dichlorobenzene[1,3-]	Unfiltered	µg/L	—	<9.7
SVOA	Dichlorobenzene[1,4-]	Unfiltered	µg/L	—	<9.7
SVOA	Dichlorobenzidine[3,3'-]	Unfiltered	µg/L	—	<9.7
SVOA	Dichlorophenol[2,4-]	Unfiltered	µg/L	—	<9.7

Table 3.4-5 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/17/2000	4/17/2001
SVOA	Diethylphthalate	Unfiltered	µg/L	—	<9.7
SVOA	Dimethyl Phthalate	Unfiltered	µg/L	—	<9.7
SVOA	Dimethylphenol[2,4-]	Unfiltered	µg/L	—	<9.7
SVOA	Di-n-butylphthalate	Unfiltered	µg/L	—	<9.7
SVOA	Dinitro-2-methylphenol[4,6-]	Unfiltered	µg/L	—	<9.7
SVOA	Dinitrophenol[2,4-]	Unfiltered	µg/L	—	<19.4
SVOA	Dinitrotoluene[2,4-]	Unfiltered	µg/L	—	<9.7
SVOA	Dinitrotoluene[2,6-]	Unfiltered	µg/L	—	<9.7
SVOA	Di-n-octylphthalate	Unfiltered	µg/L	—	<9.7
SVOA	Diphenylamine	Unfiltered	µg/L	—	<9.7
SVOA	Diphenylhydrazine[1,2-]	Unfiltered	µg/L	—	<9.7
SVOA	Fluoranthene	Unfiltered	µg/L	—	<0.97
SVOA	Fluorene	Unfiltered	µg/L	—	<0.97
SVOA	Hexachlorobenzene	Unfiltered	µg/L	—	<9.7
SVOA	Hexachlorobutadiene	Unfiltered	µg/L	—	<9.7
SVOA	Hexachlorocyclopentadiene	Unfiltered	µg/L	—	<9.7
SVOA	Hexachloroethane	Unfiltered	µg/L	—	<9.7
SVOA	Indeno(1,2,3-cd)pyrene	Unfiltered	µg/L	—	<0.97
SVOA	Isophorone	Unfiltered	µg/L	—	<9.7
SVOA	Methylnaphthalene[2-]	Unfiltered	µg/L	—	<0.97
SVOA	Methylphenol[2-]	Unfiltered	µg/L	—	<9.7
SVOA	Methylphenol[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Methylpyridine[2-]	Unfiltered	µg/L	—	<9.7
SVOA	Naphthalene	Unfiltered	µg/L	—	<0.97
SVOA	Nitroaniline[2-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitroaniline[3-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitroaniline[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitrobenzene	Unfiltered	µg/L	—	<9.7
SVOA	Nitrophenol[2-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitrophenol[4-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitrosodimethylamine[N-]	Unfiltered	µg/L	—	<9.7
SVOA	Nitroso-di-n-propylamine[N-]	Unfiltered	µg/L	—	<9.7
SVOA	Oxybis(1-chloropropane)[2,2'-]	Unfiltered	µg/L	—	<9.7
SVOA	Pentachlorophenol	Unfiltered	µg/L	—	<9.7
SVOA	Phenanthrene	Unfiltered	µg/L	—	<0.97
SVOA	Phenol	Unfiltered	µg/L	—	<9.7
SVOA	Pyrene	Unfiltered	µg/L	—	<0.97
SVOA	Pyridine	Unfiltered	µg/L	—	<9.7
SVOA	Trichlorobenzene[1,2,4-]	Unfiltered	µg/L	—	<9.7

Table 3.4-5 (continued)

Analytical Suite	Analyte	Field Prep	Unit	8/17/2000	4/17/2001
SVOA	Trichlorophenol[2,4,5-]	Unfiltered	µg/L	—	<9.7
SVOA	Trichlorophenol[2,4,6-]	Unfiltered	µg/L	—	<9.7
VOA	Benzene	Unfiltered	µg/L	—	<1
VOA	Bromodichloromethane	Unfiltered	µg/L	—	<1
VOA	Bromoform	Unfiltered	µg/L	—	<1
VOA	Bromomethane	Unfiltered	µg/L	—	<1
VOA	Carbon Tetrachloride	Unfiltered	µg/L	—	<1
VOA	Chlorobenzene	Unfiltered	µg/L	—	<1
VOA	Chlorodibromomethane	Unfiltered	µg/L	—	<1
VOA	Chloroethane	Unfiltered	µg/L	—	<1
VOA	Chloroform	Unfiltered	µg/L	—	<1
VOA	Chloromethane	Unfiltered	µg/L	—	<1
VOA	Dichlorobenzene[1,2-]	Unfiltered	µg/L	—	<1
VOA	Dichlorobenzene[1,3-]	Unfiltered	µg/L	—	<1
VOA	Dichlorobenzene[1,4-]	Unfiltered	µg/L	—	<1
VOA	Dichloroethane[1,1-]	Unfiltered	µg/L	—	<1
VOA	Dichloroethane[1,2-]	Unfiltered	µg/L	—	<1
VOA	Dichloroethene[1,1-]	Unfiltered	µg/L	—	<1
VOA	Dichloroethene[trans-1,2-]	Unfiltered	µg/L	—	<1
VOA	Dichloropropane[1,2-]	Unfiltered	µg/L	—	<1
VOA	Dichloropropene[cis-1,3-]	Unfiltered	µg/L	—	<1
VOA	Dichloropropene[trans-1,3-]	Unfiltered	µg/L	—	<1
VOA	Ethylbenzene	Unfiltered	µg/L	—	<1
VOA	Methylene chloride	Unfiltered	µg/L	—	<5
VOA	Tetrachloroethane[1,1,2,2-]	Unfiltered	µg/L	—	<1
VOA	Tetrachloroethene	Unfiltered	µg/L	—	<1
VOA	Toluene	Unfiltered	µg/L	—	<1
VOA	Trichloroethane[1,1,1-]	Unfiltered	µg/L	—	<1
VOA	Trichloroethane[1,1,2-]	Unfiltered	µg/L	—	<1
VOA	Trichloroethene	Unfiltered	µg/L	—	<1
VOA	Trichlorofluoromethane	Unfiltered	µg/L	—	<1
VOA	Vinyl chloride	Unfiltered	µg/L	—	<1

Notes: All values are in pCi/g.

[a] < = Result is not detected at the concentration reported.

[b] — = Analysis was not requested or analysis was rejected.

Appendix A

Acronyms and Abbreviations, Glossary,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
asl	above sea level
bgs	below ground surface
BV	background value
cpm	count(s) per minute
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EQL	estimated quantitation limit
ER-RS	Emergency Response Services Team
ET	evapotranspiration
FFCA	Federal Facilities Compliance Agreement
FIDLER	Field Instrument Detecting Low Energy Radiation
FV	fallout value
FY	fiscal year
GPR	ground-penetrating radar
HC	Hazard Category
HDT	Hazardous Devices Team
HE	high explosive
HIR	historical investigation report
HMX	1,3,5,7-tetranitro-1,3,5,7-tetraocine [also high-melting explosive]
ID	identification
IM	interim measure
LANL	Los Alamos National Laboratory
MDA	material disposal area
NES	nuclear environmental site
NFA	no further action
NMED	New Mexico Environmental Department
NMSA	New Mexico Statutes Annotated
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine [also research department explosive]
RFI	RCRA facility investigation

SU	standard unit
SVOC	semivolatile organic compound
SWA	New Mexico Solid Waste Act
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list (EPA)
TDR	time domain reflectometry
TDS	total dissolved solids
TNT	trinitrotoluene [dynamite]
VCA	voluntary corrective action
VOC	volatile organic compound

A-2.0 GLOSSARY

administrative authority—For Los Alamos National Laboratory, one or more regulatory agencies, such as the New Mexico Environment Department, the U.S. Environmental Protection Agency, or the U.S. Department of Energy, as appropriate.

alpha radiation—A form of particle radiation that is highly ionizing and has low penetration. Alpha radiation consists of two protons and two neutrons bound together into a particle that is identical to a helium nucleus and can be written as He2+.

analysis—A critical evaluation, usually made by breaking a subject (either material or intellectual) down into its constituent parts, then describing the parts and their relationship to the whole. Analyses may include physical analysis, chemical analysis, toxicological analysis, and knowledge-of-process determinations.

analyte—The element, nuclide, or ion a chemical analysis seeks to identify and/or quantify; the chemical constituent of interest.

analytical method—A procedure or technique for systematically performing an activity.

aquifer—An underground geological formation (or group of formations) containing water that is the source of groundwater for wells and springs.

assessment—(1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this glossary, assessment is an all-inclusive term used to denote any one of the following: audit, performance evaluation, management system review, peer review, inspection, or surveillance.

background concentration—Naturally occurring concentrations of an inorganic chemical or radionuclide in soil, sediment, or tuff.

background data—Data that represent naturally occurring concentrations of inorganic and radionuclide constituents in a geologic medium. Los Alamos National Laboratory's (the Laboratory's) background data are derived from samples collected at locations that are either within, or adjacent to, the

Laboratory. These locations (1) are representative of geological media found within Laboratory boundaries, and (2) have not been affected by Laboratory operations.

background level—(1) The concentration of a substance in an environmental medium (air, water, or soil) that occurs naturally or is not the result of human activities. (2) In exposure assessment, the concentration of a substance in a defined control area over a fixed period of time before, during, or after a data-gathering operation.

background radiation—The amount of radioactivity naturally present in the environment, including cosmic rays from space and natural radiation from soils and rock.

Background value (BV). The background concentration of a chemical used to represent the background of statistically derived BV in the upper tolerance limit (UTL) of the distribution. If a UTL cannot be derived, either the detection limit or maximum reported value in the background data set is used.

basalt—A fine-grained, dark volcanic rock comprised chiefly of plagioclase, augite, olivine, and magnetite.

beta radiation—High-energy electrons emitted by certain types of radioactive nuclei, such as potassium-40. The beta particles emitted are a form of ionizing radiation also known as beta rays.

blank—A sample that is expected to have a negligible or unmeasurable amount of an analyte. Results of blank sample analyses indicate whether field samples might have been contaminated during the sample collection, transport, storage, preparation, or analysis processes.

borehole—(1) A hole drilled or bored into the ground, usually for exploratory or economic purposes. (2) A hole into which casing, screen, and other materials may be installed to construct a well.

calibration—A process used to identify the relationship between the true analyte concentration or other variable and the response of a measurement instrument, chemical analysis method, or other measurement system.

canyon—A stream-cut chasm or gorge, the sides of which are composed of cliffs or a series of cliffs rising from the canyon's bed. Canyons are characteristic of arid or semiarid regions where downcutting by streams greatly exceeds weathering.

cap—A modern engineered landfill cover that is designed and constructed to minimize or eliminate the release of constituents into the environment.

casing—A solid piece of pipe, typically steel, stainless steel, or polyvinyl chloride (PVC) plastic, used to keep a well open in either unconsolidated material or unstable rock and as a means to contain zone-isolation materials, such as cement grout or bentonite.

chemical—Any naturally occurring or human-made substance characterized by a definite molecular composition, including molecules that contain radionuclides.

chemical analysis—A process used to measure one or more attributes of a sample in a clearly defined, controlled, and systematic manner. Chemical analysis often requires treating a sample chemically or physically before measurement.

Compliance Order on Consent (Consent Order)—For the Environmental Restoration Project, an enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to

implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the Hazardous Waste Facility Permit.

Consent Order—See Compliance Order on Consent.

contaminant—(1) Any chemical (including radionuclides) present in environmental media or on structural debris above background levels. (2) According to the Compliance Order on Consent, any hazardous waste listed or identified as characteristic in 40 Code of Federal Regulations (CFR) 261 (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]); any hazardous constituent listed in 40 CFR 261 Appendix VIII (incorporated by 20.4.1.200 NMAC) or 40 CFR 264 Appendix IX (incorporated by 20.4.1.500 NMAC); any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.3.3103 NMAC; any toxic pollutant listed in the WQCC Regulations at 20.6.2.7 NMAC; explosive compounds; nitrate; and perchlorate. (Note: Under the Compliance Order on Consent, the term "contaminant" does not include radionuclides or the radioactive portion of mixed waste.)

corrective action—(1) In the Resource Conservation and Recovery Act, an action taken to rectify conditions potentially adverse to human health or the environment. (2) In the quality assurance field, the process of rectifying and preventing nonconformances. (Also see accelerated corrective action.)

Curie—A unit of radioactivity defined as the quantity of any radioactive nuclide that has an activity of 3.7 × 1010 disintegrations per second (dps).

detect (detection)—An analytical result, as reported by an analytical laboratory, that denotes a chemical or radionuclide to be present in a sample at a given concentration.

detection limit—The minimum concentration that can be determined by a single measurement of an instrument. A detection limit implies a specified statistical confidence that the analytical concentration is greater than zero.

disposal—The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into, or on, any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters. (40 Code of Federal Regulations [CFR] 260.10)

document—A written or pictorial compilation of information that describes, defines, specifies, reports, or certifies activities, requirements, procedures, or results (e.g., plan, report, proposal, regulatory response, permit modification request, document addendum or update, or procedure) and that must be submitted to the administrative authority or that has significance to the operations of the Environmental Restoration Project. Document types are shown in Quality Procedure 4.9, Document Development and Approval Process.

Environmental Restoration (ER) Project—A Los Alamos National Laboratory project established in 1989 as part of a U.S. Department of Energy nationwide program. The ER Project's specific purposes are (1) to investigate hazardous and/or radioactive materials that may be present in the environment as a result of past Laboratory operations, (2) to determine if the materials currently pose an unacceptable risk to human health or the environment, and (3) to remediate (clean up, stabilize, or restore) those sites where contamination is still present.

environmental samples—Air, soil, water, or other media samples that have been collected from streams, wells, and soils, or other locations, and that are not expected to exhibit properties classified as hazardous by the U.S. Department of Transportation.

ER identification (ER ID) number—A unique identifier assigned by the Environmental Restoration (ER) Project's Records Processing Facility to each document when it is submitted as a final record. The ER ID number signals the end of the document process.

estimated quantitation limit (EQL)—The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine analytical-laboratory operating conditions. The low point on a calibration curve should reflect this quantitation limit. The EQL is not used to establish detection status. Sample EQLs are highly matrix-dependent and the specified EQLs might not always be achievable.

facility—All contiguous land (and structures, other appurtenances, and improvements on the land) used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. For the purpose of implementing a corrective action, a facility is all the contiguous property that is under the control of the owner or operator seeking a permit under Subtitle C of the Resource Conservation and Recovery Act (40 Code of Federal Regulations 260.10).

fallout radionuclides—Radionuclides that are present at globally elevated levels in the environment as a result of fallout from atomic weapons tests. The Los Alamos National Laboratory (the Laboratory) background data sets consist of environmental surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the Laboratory's vicinity that were (1) representative of geological media found within Laboratory boundaries, and (2) were not impacted by Laboratory operations.

field duplicate (replicate) samples—Two separate, independent samples taken from the same source, which are collected as collocated samples (i.e., equally representative of a sample matrix at a given location and time).

gamma radiation—A form of electromagnetic, high-energy ionizing radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays (though at higher energy) and require heavy shielding, such as concrete or steel, to be blocked.

geohydrology—The science that applies hydrologic methods to the understanding of geologic phenomena.

groundwater—Interstitial water that occurs in saturated earth material and is capable of entering a well in sufficient amounts to be used as a water supply.

hazardous waste—(1) Solid waste (as defined in 40 Code of Federal Regulations [CFR] 261.2) that is a listed hazardous waste (as provided in 40 CFR Subpart D), or a waste that exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR Subpart C). (2) According to Compliance Order on Consent, any solid waste or combination of solid wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, meets the description set forth in New Mexico Statutes Annotated 1978, § 74-4-3(K) and is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR 261 (incorporated by 20.4.1.200 New Mexico Administrative Code).

Hazardous Waste Bureau—The New Mexico Environment Department bureau charged with providing regulatory oversight and technical guidance to New Mexico hazardous waste generators and to treatment, storage, and disposal facilities, as required by the New Mexico Hazardous Waste Act and by regulations promulgated under the Act.

Los Alamos unlimited release (LA-UR) number—A unique identification number required for all documents or presentations prepared for distribution outside Los Alamos National Laboratory (the Laboratory). LA-UR numbers are obtained by filling out a technical information release form (http://enterprise.lanl.gov/alpha.htm) and submitting the form together with 2 copies of the document to the Laboratory's Classification Group (S-7) for review.

matrix—Relatively fine material in which coarser fragments or crystals are embedded; also called "ground mass" in the case of igneous rocks. (Also see sample matrix.)

migration—The movement of inorganic and organic chemical species through unsaturated or saturated materials.

minimum detectable activity (MDA)—For the analysis of radionuclides, the lowest detectable radioactivity for a given analytical technique. The following equation is used to calculate the MDA unless otherwise noted or approved by Los Alamos National Laboratory. (Note: "MDA" here should not to be confused with material disposal area):

$$MDA = \frac{4.65(BKG)^{0.5} + 2.71}{2.22 \times EFF \times V \times T_s \times Y}$$

where BKG = the total background counts,

EFF = the fraction detector efficiency,

V = the volume or unit weight,

T_s = the sample count duration, and

Y = the fractional chemical recovery obtained from the *tracer* recovery.

Depending on the type of analysis, other terms may also be required in the denominator (e.g., gamma abundance).

model—A schematic description of a physical, biological, or social system, theory, or phenomenon that accounts for its known or inferred properties and may be used for the further study of its characteristics.

monitoring well—(1) A well used to obtain water-quality samples or to measure groundwater levels. (2) A well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for the purpose of physical, chemical, or biological analysis and to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site.

operable units (OUs)—At Los Alamos National Laboratory, 24 areas originally established for administering the Environmental Restoration Project. Set up as groups of potential release sites, the OUs were aggregated according to geographic proximity for the purposes of planning and conducting Resource Conservation and Recovery Act (RCRA) facility assessments and RCRA facility investigations. As the project matured, it became apparent that there were too many areas to allow efficient communication and to ensure consistency in approach. In 1994, the 24 OUs were reduced to 6 administrative field units.

polychlorinated biphenyls (PCBs)—Any chemical substance that is limited to the biphenyl molecule which has been chlorinated to varying degrees, or any combination that contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and other animals.

precision—The degree of mutual agreement among a series of individual measurements, values, or results.

radiation—A stream of particles or electromagnetic waves emitted by atoms and molecules of a radioactive substance as a result of nuclear decay. The particles or waves emitted can consist of neutrons, positrons, alpha particles, beta particles, or gamma radiation.

radioactive material—For purposes of complying with U.S. Department of Transportation regulations, any material having a specific activity (activity per unit mass of the material) greater than 2 nanocuries per gram (nCi/g) and in which the radioactivity is evenly distributed.

radioactive tracer—A radionuclide added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of target analytes. The tracer is assumed to behave in the same manner as the target analytes.

radioactive waste—Waste that, by either monitoring and analysis, or acceptable knowledge, or both, has been determined to contain added (or concentrated and naturally occurring) radioactive material or activation products, or that does not meet radiological release criteria.

radioactivity (radioactive decay; radioactive disintegration)—The spontaneous change in an atom by the emission of charged particles and/or gamma rays.

radionuclide—Radioactive particle (human-made or natural) with a distinct atomic weight number; can have as long a life as soil or water pollutants.

RCRA facility investigation (RFI)—A Resource Conservation and Recovery Act (RCRA) investigation that determines if a release has occurred and characterizes the nature and extent of contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

record—Any book, paper, map, photograph, machine-readable material, or other documentary material, regardless of physical form or characteristics.

regional aquifer—Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional water table or potentiometric surface. (Also see aquifer.)

release—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment.

request number—An identifying number assigned by the Environmental Restoration Project to a group of samples submitted for analysis.

Resource Conservation and Recovery Act—The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976. (Public Law [PL] 94-580, as amended by PL 95-609 and PL 96-482, United States Code 6901 et seq.)

risk—A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

risk assessment—See baseline risk assessment.

sample—A portion of a material (e.g., rock, soil, water, or air), which, alone or in combination with other portions, is expected to be representative of the material or area from which it is taken. Samples are typically either sent to a laboratory for analysis or inspection or are analyzed in the field. When referring to samples of environmental media, the term field sample may be used.

sediment—(1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice. (2) A mass that is accumulated by any other natural agent and that forms in layers on the Earth's surface (e.g., sand, gravel, silt, mud, fill, or loess). (3) A solid material that is not in solution and is either distributed through the liquid or has settled out of the liquid.

site—An area or place that falls under the jurisdiction of the U.S. Environmental Protection Agency and/or a state for corrective action.

site characterization—Defining the pathways and methods of migration of hazardous waste or constituents, including the media affected; the extent, direction and speed of the contaminants; complicating factors influencing movement; or concentration profiles. (U.S. Environmental Protection Agency, May 1994. Publication EPA-520/R-94/004)

soil—A sample media group that includes soil and can include artificial fill materials. "Soil" refers to a material that overlies bedrock and has been subject to soil-forming processes. The sample media group of soil includes soils from all soil horizons.

soil moisture—The water contained in the pore space of the unsaturated zone.

solid waste—Any garbage, refuse, or sludge from a waste treatment plant, water-supply treatment plant, or air-pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended; or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended.

solid waste management unit (SWMU)—(1) Any discernible site at which solid wastes have been placed at any time, whether or not the site use was intended to be the management of solid or hazardous waste. SWMUs include any site at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated sites (i.e., landfills, surface impoundments, waste piles, and land treatment sites), but does not include passive leakage or onetime spills from production areas and sites in which wastes have not been managed (e.g., product storage areas). (2) According to the Compliance Order on Consent, any discernible site at which solid waste has been placed at any time, and from which NMED determines there may be a risk of a release of hazardous waste or hazardous waste constituents (hazardous constituents), whether or not the site use was intended to be the management of solid or hazardous waste. Such sites include any area in Los Alamos National Laboratory at which solid wastes have been routinely and systematically released; they do not include one-time spills.

stratigraphy—The study of the formation, composition, and sequence of sediments, whether consolidated or not.

surface sample—A sample taken at a collection depth that is (or was) representative of the medium's surface during the period of investigative interest. A typical depth interval for a surface sample is 0 to 6 in. for mesa-top locations, but may be up to several feet in sediment-deposition areas within canyons.

technical area (TA)—At Los Alamos National Laboratory, an administrative unit of operational organization (e.g., TA-21).

tuff—Consolidated volcanic ash, composed largely of fragments produced by volcanic eruptions.

U.S. Department of Energy—The federal agency that sponsors energy research and regulates nuclear materials for weapons production.

U.S. Environmental Protection Agency (EPA)—The federal agency responsible for enforcing environmental laws. Although state regulatory agencies may be authorized to administer some of this responsibility, EPA retains oversight authority to ensure the protection of human health and the environment.

verification—A test or tests, generally performed before and after logging in lieu of a calibration, to ascertain whether the logging system is operating properly. Verification differs from calibration in that it does not provide updated system-calibration values.

water content—The amount of water in an unsaturated medium, expressed as the ratio of the weight of water in a sample to the weight of the oven-dried sample (often expressed as a percentage). (Also see gravimetric moisture content.)

work plan—A document that specifies the activities to be performed when implementing an investigation or remedy. At a minimum, the work plan should identify the scope of the work to be performed, specify the procedures to be used to perform the work, and present a schedule for performing the work. The work plan may also present the technical basis for performing the work.

A-3.0 METRIC CONVERSION

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-4.0 DATA QUALIFIER DEFINITIONS

Qualifier	Explanation
U	The analyte was analyzed for but not detected. Reported value is the sample-specific EQL or detection limit.
J	The reported value should be regarded as estimated.
J+	The reported value should be regarded as estimated and biased high.
J-	The reported value should be regarded as estimated and biased low.
UJ	The analyte was analyzed for but not detected. Reported value is an estimate of the sample-specific quantitation limit or detection limit.
R	The sample results were rejected because of serious deficiencies in the ability to analyze the sample and meet quality control criteria; presence or absence cannot be verified.

Appendix B

Analytical Suites and Results
(on CD included with this document)

SGS/DRG/GLD/JPM:sm

Enclosures: 1) Two hard copies with electronic files - Investigation Work Plan for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary (EP2007-0569)
2) Two hard copies with electronic files - Historical Investigation Report for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary (EP2007-0570)

Cy: (w/enc.)
Kim T. Birdsall, North Wind
Rich Nevarez, DOE-LASO, MS A316
John McCann, EP-CAP, MS M992
EP-CAP File, MS M992
RPF, MS M707 (with two CDs)
Public Reading Room, MS M992

Cy: (Letter and CD only)
Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-OB, White Rock, NM
Peggy Reneau, EP-ERSS, MS M992

Cy: (w/o enc.)
Tom Skibitski, NMED-OB, Santa Fe, NM
Bonita Eichorst, DOE-LASO (date-stamped letter emailed)
Susan G. Stiger, ADEP, MS M991
Carolyn A. Mangeng, ADEP, MS M991
Alison M. Dorries, ERSS-DO, MS M992
Gordon Dover, EP-CAP, MS M992
Dave McInroy, EP-CAP, MS M992
IRM-RMMSO, MS A150