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*Date*: JUL 3 1 2018
*Refer To*: N3B-18-0144

John Kieling, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

**Subject: Submittal of the Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1**

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of the Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1. Also enclosed is an electronic copy of a redline strikeout version of the report that includes all changes made in response to the New Mexico Environment Department's (NMED's) comments, dated January 30, 2018. Responses to NMED's comments were submitted on February 28, 2018, and approved by NMED on March 5, 2018.

If you have any questions, please contact Kent Rich at (505) 660-6570 (kent.rich@em-la.doe.gov) or Cheryl Rodriguez at (505) 665-5330 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Joseph A. Legare
Program Manager
Environmental Remediation Program

Sincerely,

for

David S. Rhodes, Director
Office of Quality and Regulatory Compliance
Environmental Management
Los Alamos Field Office

JL/DR/KR/CR

Enclosure(s): 1. Two hard copies with electronic files (including a redline strikeout version) – Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1 (EM2018-0011)

Cy: (letter with enclosure[s])
Kent Rich, N3B, ER Program
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July 2018
EM2018-0011

# Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1

N3B Los Alamos

EM2018-0011

# Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1

July 2018

Responsible program director:

| Printed Name | Signature | Title | Organization | Date |
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## EXECUTIVE SUMMARY

This supplemental investigation report evaluates the nature and extent of contamination and potential human health and ecological risks for 25 solid waste management units (SWMUs) and areas of concern (AOCs) in the Threemile Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The SWMUs and AOCs addressed in this report are located in Technical Area 14 (TA-14), TA-15, TA-36, and former TA-12. Twenty-six sites within the Threemile Canyon Aggregate Area were investigated in 2009–2010, and the investigation results were documented in the Threemile Canyon Aggregate Area investigation report, submitted by the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) to the New Mexico Environment Department (NMED) in November 2010. The approved investigation report concluded that additional sampling to define the extent of contamination was needed for 26 SWMUs and AOCs. Additional sampling requirements for 25 of these sites were documented in the approved Phase II investigation work plan for Threemile Canyon Aggregate Area, submitted by DOE and LANS to NMED in October 2011. Investigation of the remaining site is delayed because it is within an area affected by firing site activities. This revised supplemental investigation report, prepared by Newport News Nuclear BWXT – Los Alamos, LLC (N3B), addresses NMED's comments concerning the original submission of the supplemental investigation report.

After the investigation report and Phase II investigation work plan had been approved, NMED and DOE entered into a framework agreement for the realignment of environmental priorities at the Laboratory. Under the framework agreement, NMED and DOE agreed to review characterization efforts undertaken to date pursuant to the Compliance Order on Consent (Consent Order) to identify those sites where the nature and extent of contamination have been adequately characterized. Pursuant to the framework agreement, the Laboratory reviewed its data evaluation process with respect to U.S. Environmental Protection Agency (EPA) guidance and the framework agreement principles and concluded that this process could be revised to more efficiently complete site characterization, while providing full protection of human health and the environment. Specifically, the process for evaluating data to define extent of contamination was revised to provide a greater emphasis on risk reduction, consistent with EPA guidance.

The revised process was used to evaluate the 2009–2010 data and previous decision-level investigation data for the 25 sites identified in the Phase II investigation work plan as requiring additional sampling to define extent. The revised process does not affect the status of the 15 other sites within the aggregate area approved for completion of corrective action or deferred or delayed investigation. Based on the evaluation of investigation results using the revised process, the extent of contamination has been defined (or a determination has been made that no further sampling for extent is warranted) at 20 sites, and additional sampling for extent is required at 5 sites, of which 2 sites also require remediation. Human health and ecological risk assessments were performed for all sites.

Based on the results of data evaluations presented in this supplemental investigation report, N3B recommends the following:

- Corrective action complete without controls is recommended for 20 sites for which extent is defined and which pose no potential unacceptable human health risk under the residential scenario and no unacceptable ecological risk.
- Additional sampling and analyses are recommended for 5 sites for which extent is not defined.
- Soil removal is recommended for 2 sites (includes 2 of the sites requiring additional sampling and analysis for extent above), which pose a potential unacceptable risk under the industrial scenario, and one of which may pose an unacceptable ecological risk.

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## 1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by Los Alamos National Security, LLC (LANS). The Laboratory is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers approximately 39 $mi^2$ of the Pajarito Plateau, which consists of a series of fingerlike mesas separated by deep canyons that contain perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 ft to 7800 ft above mean sea level.

The Laboratory has been a participant in a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of this effort is to ensure past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, the Laboratory has investigated sites potentially contaminated by past Laboratory operations.

This supplemental investigation report addresses potentially contaminated sites, designated as solid waste management units (SWMUs) or areas of concern (AOCs), within the Threemile Canyon Aggregate Area at the Laboratory. These sites are potentially contaminated with hazardous chemicals and radionuclides. The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act, regulates cleanup of hazardous wastes and hazardous constituents. DOE regulates cleanup of radioactive contamination, pursuant to DOE Order 458.1, Administrative Change 3, Radiation Protection of the Public and the Environment, and DOE Order 435.1, Radioactive Waste Management. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

Corrective actions at the Laboratory are subject to a Compliance Order on Consent (the Consent Order). This supplemental investigation report describes work activities that were completed in accordance with the Consent Order.

### 1.1 General Site Information

The Threemile Canyon Aggregate Area is located in Technical Area 14 (TA-14), TA-15, TA-36, and former TA-12 (most of which is within the boundary of TA-67, with the remainder in TA-15) at the Laboratory (Figure 1.1-1) and consists of 40 SWMUs and AOCs, 10 of which were investigated and/or remediated before the March 2005 effective date of the Consent Order and have been approved for no further action. The remaining 30 SWMUs and AOCs were addressed in the approved investigation work plan for Threemile Canyon Aggregate Area (LANL 2008, 105673; NMED 2008, 104256). These sites were investigated in 2009–2010 and the results documented in the approved investigation report for Threemile Canyon Aggregate Area (LANL 2010, 111324.14; NMED 2010, 111458). Investigation of four sites is deferred under Table IV-2 of the Consent Order. These four deferred sites were discussed in the investigation report but were not sampled. The approved investigation report documented that additional sampling to define the nature and extent of contamination was needed for all 26 of the remaining SWMUs and AOCs. Additional sampling requirements for 25 of these sites were documented in the approved Phase II investigation work plan for Threemile Canyon Aggregate Area (LANL 2011, 207405; NMED 2011, 208344). Because the other site needing additional sampling is within the footprint of a site deferred under Table IV-2 of the Consent Order, additional sampling for this site is delayed. Table 1.1-1 lists the 30 sites, with a brief description, summary of previous investigations, and the current status for each site.

### 1.2 Purpose of the Supplemental Investigation Report

Twenty-six SWMUs and AOCs within the Threemile Canyon Aggregate Area were addressed by the 2009–2010 investigation because these sites are potentially contaminated with hazardous chemicals and radionuclides, and final assessments of site contamination, associated risks, and recommendations for additional corrective actions remained incomplete. For each site, the objectives of the 2009–2010 investigation were to (1) establish the nature and extent of contamination; (2) determine whether current site conditions pose a potential unacceptable risk/dose to human health or the environment; and (3) assess whether any additional sampling and/or corrective actions are required.

Based on the data evaluation guidelines the Laboratory used at the time the investigation report was prepared, the Laboratory concluded that the extent of contamination was not defined for all 26 SWMUs and AOCs, and recommendations for additional sampling at 25 of these sites to define extent were incorporated into the approved Phase II investigation work plan (LANL 2011, 207405; NMED 2011, 208344). (Additional sampling for one site is delayed since it is within the footprint of a deferred site.) In January 2012, after the investigation report and Phase II investigation work plan were approved, NMED and DOE entered into a framework agreement for realignment of environmental priorities at the Laboratory. Under the framework agreement, NMED and DOE agreed to review characterization efforts undertaken to date pursuant to the Consent Order to identify those sites where the nature and extent of contamination have been adequately characterized. The framework agreement also stipulated the use of U.S. Environmental Protection Agency (EPA) guidance in this process, except in cases where EPA guidance was not supported by sound science. Pursuant to the framework agreement, the Laboratory reviewed its data evaluation process with respect to EPA guidance and the framework agreement principles and concluded that this process could be revised to complete site characterization more efficiently, while providing full protection of human health and the environment. Specifically, the process for evaluating data to define extent of contamination was revised to provide a greater emphasis on risk/dose reduction, consistent with EPA guidance. Key changes to the data evaluation process are as follows:

- Initially identify chemicals of potential concern (COPCs) to focus efforts on the constituents of most concern.
- Screen COPCs against soil screening levels (SSLs) and screening action levels (SALs) during determination of extent to focus efforts on characterizing contamination potentially posing a risk/dose and requiring corrective action.
- Perform screening level risk/dose evaluations on all sites, even if extent is not defined, to incorporate risk/dose reduction into recommendations for further actions.

The 2009–2010 investigation data for the 25 sites proposed for Phase II investigation were reevaluated using this revised process, and the results are presented in this supplemental investigation report.

All analytical data collected from the 2009–2010 investigation activities are presented and evaluated in this report, along with decision-level data from previous investigations.

### 1.3 Document Organization

This report is organized in 12 sections, including this introduction, with multiple supporting appendixes. Section 2 provides details on the aggregate area site conditions (surface and subsurface). Section 3 provides an overview of the scope of the activities performed during implementation of the work plan. Section 4 describes the regulatory criteria used to evaluate potential risk/dose to ecological and human health receptors. Section 5 describes the data review methods. Sections 6 through 9 present an overview of the operational history of each site, historical releases, summaries of previous investigations, results of the field activities performed during the 2009–2010 investigation, site contamination, evaluation of the nature and extent of contamination, and summaries of the results of the human health and ecological risk-screening assessments for former TA-12, TA-14, TA-15, and TA-36, respectively. Section 10 presents the conclusions of the nature and extent of contamination investigation and risk-screening assessments. Section 11 discusses recommendations based on applicable data and the risk-screening assessments. Section 12 includes a list of references cited and the map data sources used in all the figures and plates.

The appendixes include acronyms, a metric conversion table, and definitions of data qualifiers used in this report (Appendix A); field methods (Appendix B); borehole logs (Appendix C); analytical program descriptions and summaries of data quality (Appendix D); analytical suites and results and analytical reports (Appendix E); investigation-derived waste management (Appendix F); box plots and statistical results (Appendix G); risk-screening assessments (Appendix H); and site photographs (Appendix I).

# 2.0 SITE CONDITIONS

## 2.1 Surface Conditions

### 2.1.1 Soil

Soil on the Pajarito Plateau was initially mapped and described by Nyhan et al. (1978, 005702). The soil on the slopes between the mesa tops and canyon floors was mapped as mostly steep rock outcrops consisting of approximately 90% bedrock outcrop and patches of shallow, weakly developed colluvial soil. South-facing canyon walls generally are steep and usually have shallow soil in limited, isolated patches between rock outcrops. In contrast, the north-facing canyon walls generally have more extensive areas of shallow, dark-colored soil under thicker forest vegetation. The canyon floors generally contain poorly developed, deep, well-drained soil on floodplain terraces or small alluvial fans (Nyhan et al. 1978, 005702).

The soil in the Threemile Canyon Aggregate Area belongs to the Carjo, Frijoles, Hackroy, Nyjack, Pogna, Seaby, Tocal, Totavi, and the fine Typic Eutoboralfs series, and the Sanjue-Arriba complex (LANL 1993, 015313, pp. 3-17–3-21; LANL 1993, 020946). Soil descriptions are summarized below (Nyhan et al. 1978, 005702).

- The Carjo series is typical of mesa tops and consists of moderately deep, well-drained, and moderately developed soil with an A-B-C horizon sequence. The parent material of the soil may range from Bandelier Tuff to sequences of alluvium/colluvium interstratified with moderately developed to well-developed buried soil. The soil textures of the Carjo series can be very fine sandy loams.
- The Frijoles series is characteristic of deep, well-drained soil formed from pumice on level to moderately sloping mesa tops. The soil is developed with an A-B-C horizon sequence, with textures grading from a brown sandy loam through a clay layer, to a gravelly clay loam.
- Hackroy soil consists of very shallow to shallow, well-drained, and moderately developed soil with an A-B horizon sequence. Soil textures can range from sandy loams to clay loams derived from tuff.
- Nyjack soil consists of moderately deep, well-drained, and moderately developed soil with an A-B-C horizon sequence. Soil textures can range from fine sandy loams to clay loams. The parent material of the soil may range from Bandelier Tuff to sequences of alluvium/colluvium interstratified with moderately developed to well-developed buried soil.

- The Pogna series is a shallow well-drained soil with an A-C horizon sequence. Typically, the soil is a fine sandy loam or sandy loam formed over tuff bedrock on gently to strongly sloping mesa tops.
- The Seaby series consists of shallow to moderately deep, well-drained soil with an A-B-C horizon sequence formed on weathered tuff on gently to moderately sloping mesas. The soil texture grades from a sandy loam to a strong brown gravelly clay loam.
- The Tocal series consists of very shallow to shallow, well-drained soil formed in material weathered from tuff on gently to moderately sloping mesa tops. The soil is developed with an A-B-C horizon sequence and grades from a very fine sandy loam through a clay loam to a silt loam.
- The Totavi series consists of deep, well-drained soil with an A horizon sequence that formed in alluvium in canyon bottoms. Soil textures are a gravelly loamy sand or sandy loam.
- The fine Typic Eutoboralfs consist of moderately deep, well-drained soil that formed in colluvium and material weathered from tuff. Textures include very fine sandy loam, or sandy loam, developed with an A-B horizon sequence, on gentle to moderate slopes and are usually located downgradient of fault zones.
- The Sanjue-Arriba complex includes deep, well-drained soil with an A-C horizon sequence that weathered in materials derived from pumice and that are found on moderately steep to very steep slopes. Soil textures range from a gravelly sandy loam to a loamy sand.

### 2.1.2 Surface Water

Most surface water in the Los Alamos area occurs as ephemeral, intermittent, or interrupted streams in canyons cut into the Pajarito Plateau. Springs on the flanks of the Jemez Mountains, west of the Laboratory’s western boundary, supply flow to the upper reaches of Cañon de Valle and to Guaje, Los Alamos, Pajarito, and Water Canyons (Purtymun 1975, 011787; Stoker 1993, 056021). These springs discharge water perched in the Bandelier Tuff and Tschicoma Formation at rates from 2 to 135 gal./min (Abeele et al. 1981, 006273). The volume of flow from the springs maintains natural perennial reaches of varying lengths in each of the canyons.

The hydrogeology of the canyon systems is thoroughly discussed in section 2.1.3 of the Laboratory’s hydrogeologic work plan (LANL 1998, 059599). The surface water infiltration pathways within the aggregate area include native or disturbed soil, unconsolidated alluvium, Bandelier Tuff, Puye Formation, and basalt, faults and fracture systems, and cooling joints (LANL 1999, 064617, p. 3-25).

Threemile Canyon is the second largest tributary to Pajarito Canyon. Threemile Canyon joins Pajarito Canyon at TA-18 and parallels Pajarito Canyon on the south and extends for a distance of approximately 3.3 mi. Threemile Canyon has several unnamed tributaries; the largest is referred to informally as the south fork of Threemile Canyon, which has a total drainage area of approximately 1.67 $mi^2$. Other tributaries to Threemile Canyon are informally referred to as the middle fork of Threemile Canyon and the west fork of Threemile Canyon (LANL 1998, 059577, p. 3-5).

Springs discharging to Threemile Canyon include Threemile Spring and TA-18 Spring (Plate 1). These springs are perennial and support short reaches of perennial flow in Threemile Canyon (LANL 1998, 059577, pp. 3-4–3-5).

## 2.2 Subsurface Conditions

### 2.2.1 Stratigraphic Units

This section summarizes the stratigraphy of the Threemile Canyon Aggregate Area. Additional information on the geologic setting of the area and information on the Pajarito Plateau can be found in the hydrogeologic work plan (LANL 1998, 059599).

The bedrock at or near the surface of the mesa top is the Bandelier Tuff. There are approximately 1250 ft of volcanic and sedimentary materials between any potential contaminant-bearing units at the mesa surface and the regional aquifer. The stratigraphic units that may be encountered during investigation of the Threemile Canyon Aggregate Area are described briefly in the following sections. The descriptions begin with the oldest (deepest) and proceed to the youngest (topmost). The stratigraphic units that may be encountered during investigation of the Threemile Canyon Aggregate Area are limited to the upper units (Qbt 3, Qbt 2, Qbt 1v, and Qbt 1g) of the Tshirege Member of the Bandelier Tuff, described below (LANL 1998, 059577, p. 13; LANL 2006, 093196). Stratigraphic units comprising the Bandelier Tuff are described briefly in the following sections and are shown in Figure 2.2-1.

The Bandelier Tuff consists of the Otowi and Tshirege Members, which are stratigraphically separated in many places by the tephras and volcaniclastic sediment of the Cerro Toledo interval. The Bandelier Tuff was emplaced during cataclysmic eruptions of the Valles Caldera between 1.61 and 1.22 million years ago. The tuff is composed of pumice, minor rock fragments, and crystals supported in an ashy matrix. It is a prominent cliff-forming unit because of its generally strong consolidation (Broxton and Reneau 1995, 049726).

#### 2.2.1.1 Otowi Member

Griggs and Hem (1964, 092516), Smith and Bailey (1966, 021584), Bailey et al. (1969, 021498), and Smith et al. (1970, 009752) describe the Otowi Member. The Otowi Member consists of moderately consolidated (indurated), porous, and nonwelded vitric tuff (ignimbrite) that forms gentle colluvium-covered slopes along the base of canyon walls. The Otowi ignimbrites contain light gray to orange pumice supported in a white-to-tan ash matrix (Broxton et al. 1995, 050121; Broxton et al. 1995, 050119; Goff 1995, 049682). The ash matrix consists of glass shards, broken pumice, crystal fragments, and fragments of perlite.

#### 2.2.1.2 The Guaje Pumice Bed

The Guaje Pumice Bed occurs at the base of the Otowi Member, making a significant and extensive marker horizon. The Guaje Pumice Bed (Bailey et al. 1969, 021498; Self et al. 1986, 021579) contains well-sorted pumice fragments whose mean size varies between 0.8 and 1.6 in. Its thickness averages approximately 28 ft below most of the Pajarito Plateau, with local areas of thickening and thinning. Its distinctive white color and texture make it easily identifiable in cuttings and core, and it is an important marker bed for the base of the Bandelier Tuff.

#### 2.2.1.3 Tephras and Volcaniclastic Sediment of the Cerro Toledo Interval

The Cerro Toledo interval is an informal name given to a sequence of volcaniclastic sediment and tephra of mixed provenance that separates the Otowi and Tshirege Members of the Bandelier Tuff (Broxton et al. 1995, 050121; Goff 1995, 049682; Broxton and Reneau 1995, 049726). Although it is located between the two members of the Bandelier Tuff, it is not considered part of that formation (Bailey et al. 1969, 021498). Outcrops of the Cerro Toledo interval generally occur wherever the top of the Otowi Member appears in Pajarito Canyon and in canyons to the north. The unit contains primary volcanic deposits described by Smith et al. (1970, 009752) as well as reworked volcaniclastic sediment. The occurrence of the Cerro Toledo interval is widespread; however, its thickness is variable, ranging between several feet and more than 100 ft.

The predominant rock types in the Cerro Toledo interval are rhyolitic tuffaceous sediment and tephra (Heiken et al. 1986, 048638; Stix et al. 1988, 049680; Broxton et al. 1995, 050121; Goff 1995, 049682). The tuffaceous sediment is the reworked equivalents of Cerro Toledo rhyolite tephra. Oxidation and clay-rich horizons indicate at least two periods of soil development occurred within the Cerro Toledo deposits. Because the soil is rich in clay, it may act as a barrier to the movement of vadose zone moisture. Some of the deposits contain both crystal-poor and crystal-rich varieties of pumice. The pumice deposits tend to form porous and permeable horizons within the Cerro Toledo interval and locally may provide important pathways for moisture transport in the vadose zone. A subordinate lithology within the Cerro Toledo interval includes clast-supported gravel, cobble, and boulder deposits derived from the Tschicoma Formation (Broxton et al. 1995, 050121; Goff 1995, 049682; Broxton and Reneau 1996, 055429).

#### 2.2.1.4 Tshirege Member

The Tshirege Member is the upper member of the Bandelier Tuff and is the most widely exposed bedrock unit of the Pajarito Plateau (Griggs and Hem 1964, 092516; Smith and Bailey 1966, 021584; Bailey et al. 1969, 021498; Smith et al. 1970, 009752). Emplacement of this unit occurred during eruptions of the Valles Caldera approximately 1.2 million years ago (Izett and Obradovich 1994, 048817; Spell et al. 1996, 055542). The Tshirege Member is a multiple-flow, ash-and-pumice sheet that forms the prominent cliffs in most of the canyons on the Pajarito Plateau. It is a cooling unit whose physical properties vary vertically and laterally. The consolidation in this member is largely from compaction and welding at high temperatures after the tuff was emplaced. Its light brown, orange-brown, purplish, and white cliffs have numerous, mostly vertical fractures that may extend from several feet up to several tens of feet. The Tshirege Member includes thin but distinctive layers of bedded, sand-sized particles called surge deposits that demark separate flow units within the tuff. The Tshirege Member is generally over 200 ft thick.

The Tshirege Member differs from the Otowi Member most notably in its generally greater degree of welding and compaction. Time breaks between the successive emplacement of flow units caused the tuff to cool as several distinct cooling units. For this reason, the Tshirege Member consists of at least four cooling subunits that display variable physical properties vertically and horizontally (Smith and Bailey 1966, 021584; Crowe et al. 1978, 005720; Broxton et al. 1995, 050121). The welding and crystallization variability in the Tshirege Member produces recognizable vertical variations in its properties, such as density, porosity, hardness, composition, color, and surface-weathering patterns. The subunits are mappable based on a combination of hydrologic properties and lithologic characteristics.

Broxton et al. (1995, 050121) provide extensive descriptions of the Tshirege Member cooling units. The following paragraphs describe, in ascending order, subunits of the Tshirege Member.

The Tsankawi Pumice Bed forms the base of the Tshirege Member. Where exposed, it is commonly 20 to 30 in. thick. This pumice-fall deposit contains moderately well-sorted pumice lapilli (diameters reaching about 2.5 in.) in a crystal-rich matrix. Several thin ash beds are interbedded with the pumice-fall deposits.

Subunit Qbt 1g is the lowermost tuff subunit of the Tshirege Member. It consists of porous, nonwelded, and poorly sorted ash-flow tuff. This unit is poorly indurated but nonetheless forms steep cliffs because of a resistant bench near the top of the unit; the bench forms a harder, protective cap over the softer underlying tuff. A thin (4 to 10 in.) pumice-poor surge deposit commonly occurs at the base of this unit.

Subunit Qbt 1v forms alternating cliff-like and sloping outcrops composed of porous, nonwelded, crystallized tuff. The base of this unit is a thin, horizontal zone of preferential weathering that marks the abrupt transition from glassy tuff below (in unit Qbt 1g) to the crystallized tuff above. This feature forms a widespread marker horizon (locally termed the vapor-phase notch) throughout the Pajarito Plateau that is readily visible in canyon walls in parts of Pajarito Canyon. The lower part of Qbt 1v is orange-brown, resistant to weathering, and has distinctive columnar (vertical) joints; hence, the term “colonnade tuff” is appropriate for its description. A distinctive white band of alternating cliff- and slope-forming tuffs overlies the colonnade tuff. The tuff of Qbt 1v is commonly nonwelded (pumices and shards retain their initial equant shapes) and have an open, porous structure.

Subunit Qbt 2 forms a distinctive, medium-brown, vertical cliff that stands out in marked contrast to the slope-forming, lighter-colored tuff above and below. It displays the greatest degree of welding in the Tshirege Member. A series of surge beds commonly mark its base. It typically has low porosity and permeability relative to the other units of the Tshirege Member.

Subunit Qbt 3 is a nonwelded to partially welded, vapor-phase altered tuff that forms the upper cliffs in Pajarito Canyon. Its base consists of a purple-gray, unconsolidated, porous, and crystal-rich nonwelded tuff that forms a broad, gently sloping bench developed on top of Qbt 2. Abundant fractures extend through the upper units of the Bandelier Tuff, including the ignimbrite of Qbt 3 of the Tshirege. The origin of the fractures has not been fully determined, but the most probable cause is brittle failure of the tuff caused by cooling contraction soon after initial emplacement (Vaniman 1991, 009995.1; Wohletz 1995, 054404).

### 2.2.2 Hydrogeology

The hydrogeology of the Pajarito Plateau is separable in terms of mesas and canyons forming the plateau. Mesas are generally devoid of water, both on the surface and within the rock forming the mesa. Canyons range from wet to relatively dry; the wettest canyons contain continuous streams and contain perennial groundwater in the canyon-bottom alluvium. Dry canyons have only occasional stream flow and may lack alluvial groundwater. Intermediate perched groundwater has been found at certain locations on the plateau at depths ranging between 100 and 700 ft below ground surface (bgs). The regional aquifer is found at depths of about 600 to 1200 ft bgs (Figure 2.2-2).

Hydrogeologic conceptual site models for each watershed at the Laboratory are presented in watershed investigation reports (e.g., LANL 2009, 106939). These conceptual models show that, under natural conditions, relatively small volumes of water move beneath mesa tops because of low rainfall, high evaporation, and efficient water use by vegetation. Atmospheric evaporation may extend into mesas, further inhibiting downward flow.

#### 2.2.2.1 Groundwater

In the Los Alamos area, groundwater occurs as (1) water in shallow alluvium in some of the larger canyons, (2) intermediate perched groundwater (a perched groundwater body lies above a less permeable layer and is separated from the underlying aquifer by an unsaturated zone), and (3) the regional aquifer. Numerous wells have been installed at the Laboratory and in the surrounding area to investigate the presence of groundwater in these zones and to monitor groundwater quality. The locations of the existing wells within the vicinity of the Threemile Canyon Aggregate Area are shown on Plate 1.

The Laboratory formulated a comprehensive groundwater protection plan (LANL 1995, 050124) for an enhanced set of characterization and monitoring activities. The approved hydrogeologic work plan (LANL 1998, 059599) details the implementation of extensive groundwater characterization across the Pajarito Plateau within an area potentially affected by past and present Laboratory operations. Following implementation of the hydrogeologic work plan, watershed-scale groundwater investigations were implemented for each major watershed at the Laboratory (e.g., LANL 2009, 106939).

**Alluvial Groundwater**

Intermittent and ephemeral stream flows in the canyons of the Pajarito Plateau have deposited alluvium that is as much as 100 ft thick. The alluvium in canyons that head on the Jemez Mountains is generally composed of sands, gravels, pebbles, cobbles, and boulders derived from the Tschicoma Formation and Bandelier Tuff on the flank of the mountains. The alluvium in canyons that head on the plateau is comparatively more finely grained, consisting of clays, silts, sands, and gravels derived from the Bandelier Tuff (LANL 1998, 059599, p. 2-17).

In contrast to the underlying volcanic tuff and sediment, alluvium is relatively permeable. Ephemeral runoff in some canyons infiltrates the alluvium until downward movement is impeded by the less permeable tuff and sediment, which results in the buildup of a shallow alluvial groundwater body. Depletion by evapotranspiration and movement into the underlying rock limit the horizontal and vertical extent of the alluvial water (Purtymun et al. 1977, 011846). The limited saturated thickness and extent of the alluvial groundwater preclude its use as a viable source of water for municipal and industrial needs. Lateral flow of the alluvial perched groundwater is in an easterly, downcanyon direction (Purtymun et al. 1977, 011846).

**Intermediate Groundwater**

Identification of perched groundwater systems beneath the Pajarito Plateau comes mostly from direct observation of saturation in boreholes, wells, or piezometers or from borehole geophysics. In boreholes across the Pajarito Plateau, 33 occurrences of perched groundwater have been detected. Perched groundwater is widely distributed across the northern and central part of the Pajarito Plateau with depth to water ranging from 118 to 894 ft bgs. The principal occurrences of perched groundwater occur in (1) the relatively wet Los Alamos and Pueblo Canyon watersheds, (2) the smaller watersheds of Sandia and Mortandad Canyons that receive significant volumes of treated effluent from Laboratory operations, and (3) in the Cañon de Valle area in the southwestern part of the Laboratory. Perched water is most often found in Puye fanglomerates, Cerros del Rio basalt, and in units of Bandelier Tuff. There are few reported occurrences in the southern part of the Laboratory, but few deep boreholes are located in that area. Additional perched zones probably occur beneath the adjacent wet watersheds of Pajarito and Water Canyons (Collins et al. 2005, 092028, pp. 2-96–2-97).

**Regional Aquifer**

The regional aquifer is the only aquifer capable of large-scale municipal water supply in the Los Alamos area (Purtymun 1984, 006513). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western part of the Pajarito Plateau. The depths to groundwater below the mesa top range between about 1200 ft along the western margin of the plateau and about 600 ft at the eastern margin. The location of wells and generalized water-level contours on top of the regional aquifer are described in the 2011 General Facility Information report (LANL 2011, 201568). The regional aquifer is typically separated from the alluvial groundwater and intermediate perched zone groundwater by 350 to 620 ft of tuff, basalt, and sediment (LANL 1993, 023249).

Groundwater in the regional aquifer flows east-southeast toward the Rio Grande. The velocity of groundwater flow ranges from about 20 ft/yr to 250 ft/yr (LANL 1998, 058841, p. 2-7). Details of depths to the regional aquifer, flow directions and rates, and well locations are presented in various Laboratory documents (Purtymun 1995, 045344; LANL 1997, 055622; LANL 2000, 066802).

#### 2.2.2.2 Vadose Zone

The unsaturated zone from the mesa surface to the top of the regional aquifer is referred to as the vadose zone. The source of moisture for the vadose zone is precipitation, but much of it runs off, evaporates, or is absorbed by plants. The subsurface vertical movement of water is influenced by properties and conditions of the materials that make up the vadose zone.

Although water moves slowly through the unsaturated tuff matrix, it can move rapidly through fractures if saturated conditions exist (Hollis et al. 1997, 063131). Fractures may provide conduits for fluid flow but probably only in discrete, disconnected intervals of the subsurface. Because they are open to the passage of both air and water, fractures can have both wetting and drying effects, depending on the relative abundance of water in the fractures and the tuff matrix.

The Bandelier Tuff is very dry and does not readily transmit moisture. Most of the pore spaces in the tuff are of capillary size and have a strong tendency to hold water against gravity by surface-tension forces. Vegetation is very effective at removing moisture near the surface. During the summer rainy season, when rainfall is highest, near-surface moisture content is variable because of higher rates of evaporation and of transpiration by vegetation, which flourishes during this time.

The various units of the Bandelier Tuff tend to have relatively high porosities. Porosity ranges between 30% and 60% by volume, generally decreasing for more highly welded tuff. Permeability varies for each cooling unit of the Bandelier Tuff. The moisture content of native tuff is low, generally less than 5% by volume throughout the profile (Kearl et al. 1986, 015368; Purtymun and Stoker 1990, 007508).

## 3.0 SCOPE OF ACTIVITIES

This section presents an overview of field activities performed during the implementation of the Threemile Canyon Aggregate Area approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256); the field investigation results and observations are presented in detail in sections 6 through 9 and in the appendixes. The scope of activities for the 2009–2010 Threemile Canyon Aggregate Area investigation included site access and premobilization activities; geodetic surveys; surface and shallow-subsurface sampling; borehole drilling, sampling, and abandonment; tank excavation; health and safety monitoring; and waste management activities.

### 3.1 Site Access and Premobilization Activities

The Threemile Canyon Aggregate Area is closed to the public and is accessible only to Laboratory employees with a clearance or under supervision of an escort. Before field mobilization, the issue of public access was reviewed, and efforts were made to provide a secure and safe work area.

Premobilization activities included completing the permit requirements identification form, completing excavation permits, requesting sampling paperwork from the Laboratory’s Sample Management Office (SMO), and conducting the readiness review. Additional premobilization activities included constructing the less-than-90-day waste storage areas and staging waste drums.

### 3.2 Field Activities

This section describes the field activities conducted during the 2009–2010 investigation. Additional details regarding the field methods and procedures used to perform these field activities are presented in Appendix B.

#### 3.2.1 Geodetic Surveys

Geodetic surveys were conducted during the Threemile Canyon Aggregate Area investigation to identify surface and subsurface sampling locations. The planned sampling locations for the 2009–2010 investigation are described in the approved work plan (LANL 2008, 105673; NMED 2008, 104256). An initial geodetic survey was performed to establish and mark the planned locations in the field.

Geodetic surveys were conducted in accordance with LANL standard operating procedure (SOP) 5028, Coordinating and Evaluating Geodetic Surveys, using a Trimble 5700 differential global positioning system (GPS) unit. Horizontal accuracy of the Trimble GPS 5700 is within 0.1 ft. During sampling, if the planned location could not be sampled because of surface or subsurface obstruction or other unanticipated field conditions, the relocated sampling location was resurveyed.

The surveyed coordinates for all sampling locations are presented in Table 3.2-1. All coordinates are expressed as State Plane Coordinate System 83, New Mexico Central, U.S. All surveyed coordinates for sampling locations were uploaded to the Environmental Information Management database.

#### 3.2.2 Field Screening

Core samples, cuttings, and excavated material were screened for gross-alpha and beta radioactivity by a Laboratory radiological control technician (RCT). Screening was performed using an Eberline E600 with either a 380AB or SHP360 probe (or equivalent) and an ESP-1 rate meter with a 210 probe (or equivalent) in accordance with LANL SOP 10.07, Field Monitoring for Surface and Volume Radioactivity Levels. The probe was held less than 1 in. away from the medium. Measurements were made by conducting a quick scan to find the location with the highest initial reading and then collecting a 1–min reading at that location to determine levels of gross-alpha and -beta radioactivity.

After field-screening measurements were established, appropriate precautions were taken before samples were collected. Samples from the soil and core material were collected and logged. The RCT collected and recorded background level measurements for gross-alpha and -beta radioactivity on a daily basis.

Before samples were collected, all surface sampling locations were screened for high explosives (HE) with a spot test for explosives developed by the Laboratory Dynamic Experimentation Division's High Explosives and Technology group (DE-1). A small amount of soil was placed on a piece of filter paper, followed by a few drops of reagent 1 (sodium methoxide and dimethyl sulfoxide), a few drops of reagent 2 (hydrochloric acid and sulfanilamide), and a few drops of reagent 3 [1-N-(naphthyl)-ethylene diamine hydrochloride in water]. The detection limit (DL) of the test is approximately 100 to 200 parts per million. The test was used only qualitatively to determine 1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); nitrocellulose; nitroglycerine; pentaerythritol tetranitrate (PETN); hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX); tetryl; triaminotrinitrobenzene (TATB); or 2,4,6-trinitrotoluene (TNT) contamination.

All samples were submitted to American Radiation Services, Inc. in White Rock, NM for gross-alpha, -beta, and -gamma analyses before shipment by the SMO to ensure compliance with U.S. Department of Transportation requirements.

Field-screening results were recorded on borehole logs and/or corresponding sample collection logs (SCLs). Borehole logs are presented in Appendix C, and SCLs / chain of custody (COC) forms are included in Appendix E. Radiation screening results are presented in Table 3.2-2.

### 3.2.3 Surface and Shallow-Subsurface Soil Investigation

Samples were collected according to the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256). Surface samples were collected using the spade-and-scoop method in accordance with LANL SOP-06.09, Spade and Scoop Method for Collection of Soil Samples, or with a hand auger in accordance with LANL SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. Shallow-subsurface samples were collected using the hand auger method in accordance with SOP-06.10. Before any other samples were collected and before core material was broken into smaller pieces for containerization, samples were collected for volatile organic compound (VOC) analysis. Samples were collected using stainless-steel shovels or spoons and placed in stainless-steel bowls and transferred to sterile sample collection jars or bags for transport to the SMO.

Quality assurance / quality control samples (field duplicates, field trip blanks, and rinsate blanks) were collected in accordance with LANL SOP-5059, Field Quality Control Samples. Field duplicate samples were collected at a minimum rate of 1 per 10 investigation samples. Rinsate blanks were also collected at a minimum rate of 1 per 10 investigation samples to confirm decontamination of the sampling equipment. When VOC samples were collected, field trip blank samples were collected in conjunction with investigation samples at a minimum rate of 1 per day.

All sample collection activities were coordinated with the SMO. Upon collection, samples remained at all times in the controlled custody of the field team until they were delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to a preapproved off-site contract analytical laboratory for the analyses specified by the approved work plan (LANL 2008, 105673; NMED 2008, 104256). The SCLs / COC forms for all samples are provided in Appendix E.

### 3.2.4 Subsurface Investigation

#### 3.2.4.1 Borehole Drilling and Subsurface Sampling

At locations where the required sample depths could not be reached by hand augers, a drill rig with a hollow-stem auger was used to collect subsurface samples. Samples were collected using stainless-steel core barrel samplers in accordance with LANL SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials, at depth intervals based on criteria established in the approved work plan (LANL 2008, 105673; NMED, 2008, 104256).

For the 2009–2010 investigation, nine boreholes were drilled to depths ranging from 10.0–182.5 ft bgs, and samples were collected to characterize the sites. The samples were extracted from the core barrels, placed in stainless-steel bowls, and handled the same way as the surface and shallow-subsurface samples were handled, as described in section 3.2.3. Samples were then submitted to the SMO under COC for laboratory analyses as specified by the approved work plan (LANL 2008, 105673; NMED, 2008, 104256).

#### 3.2.4.2 Borehole Abandonment

Boreholes were abandoned in accordance with LANL SOP-5034, Monitoring Well and Borehole Abandonment. Borehole abandonment is described in detail in Appendix B, Field Methods.

#### 3.2.4.3 Excavation

Excavation was performed at two sites during the 2009–2010 investigation. The septic tanks at SWMUs 15-009(b) and 15-009(c) were removed.

Fill material was removed to the tops of the two tanks, approximately 3 ft bgs at SWMU 15-009(c) and approximately 6 ft bgs at SWMU 15-009(b). The septic tanks were removed and samples were collected beneath each tank's inlet pipe, the inlet to the tank, the tank, and the outlet pipe from the tank. The inlet and outlet drainlines to each tank were plugged and left in place. Excavated tank material was placed in rolloff containers; the volume of excavated material was approximately 30 $yd^3$.

Because sample analysis results of the material removed from the SWMU 15-009(b) excavation indicated the material was nonhazardous and met residential SSLs and SALs, the excavation was backfilled with soil removed from the excavation. In addition, clean fill material from an off-site source was placed above the fill material to restore the area to its approximate original grade and condition.

Because sample results of the material from SWMU 15-009(c) indicated the material was nonhazardous and the radioactivity was below the residential SALs, the excavation was backfilled with soil removed from the excavation. In addition, clean fill material from an off-site source was placed above the fill material to restore the area to its approximate original grade and condition.

#### 3.2.4.4 Equipment Decontamination

Between collection of each sample and between sampling locations, all field equipment with the potential to contact sample material (e.g., hand augers, sampling scoops, bowls, and core barrel sections) was decontaminated to prevent cross-contamination of samples and locations. Dry decontamination was performed in accordance with LANL SOP-5061, Field Decontamination of Equipment. The dry decontamination methods used are described in Appendix B. Rinsate blanks were used to check the effectiveness of decontamination.

At sites where a drill rig was used, an RCT field screened the drilling equipment for gross-alpha and -beta radioactivity after each borehole was drilled. An RCT also surveyed the drill rig before it was brought on site and before it was released back to the drilling contractor.

### 3.2.5 Health and Safety Measures

All 2009–2010 investigation activities were conducted in accordance with a site-specific health and safety plan, an integrated work document, and two radiological work permits that detailed work steps, potential hazards, hazard controls, and required training to conduct work. These health and safety measures included the use of modified level-D personal protective equipment (PPE) and field monitoring for organic vapors and for gross-alpha and -beta radioactivity using portable air monitoring systems. Organic vapor monitoring was performed for health and safety purposes only and was not part of field screening (section 3.2.2).

### 3.2.6 Waste Management

All investigation-derived waste (IDW) generated during the Threemile Canyon Aggregate Area investigation was managed in accordance with the IDW management plan in the approved work plan (LANL 2008, 105673; NMED 2008, 104256) and the Laboratory-approved project waste characterization strategy form (WCSF) (Appendix F). These documents incorporate the requirements of all applicable EPA and NMED regulations and DOE orders. Characterization and management of IDW was performed in accordance with LANL SOP-5238, Characterization and Management of Environmental Program Waste.

The waste streams associated with the investigation included drill cuttings, septic tank debris, HE spot-test waste, metal pipe, returned radiological screening laboratory samples, water, asphalt, lead shot, and contact IDW.

Drill cuttings and discarded core from boreholes were collected and containerized in rolloff bins or 55-gal. drums in a fenced and locked less-than-90-day waste storage area pending characterization. This waste stream was characterized in accordance with the Laboratory-approved WCSF (Appendix F). The drill cuttings and discarded core waste stream were initially classified as hazardous waste pending characterization results. The waste from the drilling at SWMUs 15-007(c) and 15-007(d) was determined to be low-level radioactive waste (LLW). The waste from the drilling at SWMUs 36-002 and 36-003(a) was determined to be nonhazardous.

Contact IDW included PPE such as gloves, disposable sampling supplies, decontamination towels, and other solid waste that may have come in contact with potentially contaminated environmental media. Contact IDW was stored in 55-gal. drums placed on pallets in the fenced and locked less-than-90-day waste storage area pending characterization results. As described in the WCSF, the contact IDW was characterized using samples collected during the investigation. This waste was determined to be nonhazardous.

HE spot-test waste included filter paper, a small amount of soil, and chemicals from the HE spot-test kit. This waste was stored in a 5-gal. drum placed on a pallet in the fenced and locked less-than-90-day waste storage area pending characterization. As described in the WCSF, the HE spot-test waste was characterized using samples collected during the investigation and using the Laboratory waste profile form. This waste was determined to be nonhazardous.

Tank debris was collected and containerized in locked rolloff bins in a less-than-90-day waste storage area pending characterization. This waste stream was characterized by collecting chip samples in accordance with the approved WCSF, which is included in Appendix F. The tank debris was initially classified as hazardous waste pending characterization results. This waste was determined to be nonhazardous.

The metal pipe from AOC 12-004(b) was collected and stored in an 85-gal. drum placed on pallets in the fenced and locked less-than-90-day waste storage area pending characterization. This waste stream was characterized by collecting smear samples in accordance with the approved WCSF, which is included in Appendix F. The pipe was initially classified as hazardous waste pending characterization results. This waste was determined to be nonhazardous.

Returned radiological screening laboratory samples were collected and containerized in a 55-gal. drum in a fenced and locked less-than-90-day waste storage area pending characterization. This waste stream was characterized in accordance with the approved WCSF, which is included in Appendix F. The radiological screening laboratory samples were initially classified as hazardous waste pending characterization results. This waste was determined to be mixed LLW.

Water from the inside of the HE settling tank at SWMU 15-010(b) was collected and containerized in 300-gal. drums in a fenced and locked less-than-90-day waste storage area pending characterization. This waste stream was characterized in accordance with the approved WCSF, which is included in Appendix F. The water was initially classified as hazardous waste pending characterization results. This waste was determined to be nonhazardous.

Asphalt from SWMU 15-009(h) was stored in 55-gal. drums placed on pallets in the fenced and locked less-than-90-day waste storage area pending characterization results. As described in the WCSF, the asphalt was characterized by collecting a sample. The asphalt was determined to be LLW.

The lead shot from SWMUs 15-007(c) and 15-007(d) was collected and containerized in two 5-gal. drums placed on a pallet in the fenced and locked less-than-90-day waste storage area pending characterization results. The lead shot was determined to be mixed LLW.

Each waste stream was containerized and managed in storage areas appropriate to the type of waste. The management of IDW is described in greater detail in Appendix F. All available waste documentation, including WCSFs, WCSF amendments, and waste profile forms is provided in Appendix F.

### 3.3 Sample Analyses

The SMO shipped all investigation samples to off-site contract analytical laboratories for the requested analyses. The analyses requested were specified in the approved work plan (LANL 2008, 105673; NMED 2008, 104256) and were analyzed for all or a subset of the following: target analyte list (TAL) metals, total cyanide, nitrate, perchlorate, total uranium, explosive compounds, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

Field duplicates of investigation samples were analyzed for the same analytical suites as the corresponding investigation samples. Equipment rinsate blanks were analyzed for the same inorganic suites as the related investigation samples. Field trip blanks were analyzed only for VOCs.

### 3.4 Deviations

Deviations from the scope of activities defined in the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256) occurred during the implementation of the Threemile Canyon Aggregate Area investigation. Specific deviations are described in greater detail in section B-8.0 of Appendix B.

Additional samples were collected for analysis of PCBs at each SWMU and AOC to aid in defining the nature and extent of PCBs.

Eighteen planned sampling locations in the investigation work plan were adjusted because of their proximity to active utilities or were moved to place them in a drainage channel, as was intended. An additional five locations at AOC C-12-003 were moved because ground-truthing of the planned locations determined they were not located within the AOC.

Auger refusal occurred at 12 locations because of subsurface obstructions. Samples were not collected from the second planned depth at those locations.

The septic tank associated with SWMU 15-009(h) was not removed because it was determined to be immediately adjacent to active utilities. As a consequence of not removing the tank, the proposed samples from below the tank could not be collected.

The SWMU 15-010(b) HE settling tank associated with former shop building 15-8 was not removed. The contents of the tank were removed on February 25 and 26, 2010. The tank could not be removed because of facility safety concerns until the analytical results were received and an HE expert verified no HE was present in the tank. In the interim, the tank refilled with water from snowmelt. At the time of the original report, the facility had not approved the removal of the tank until the appropriate safety procedures are in place. The planned samples from under the inlet pipe, the tank inlet, the tank, and the tank outlet were not collected.

An additional five locations were not sampled because of refusal and/or active utilities.

# 4.0 REGULATORY CRITERIA

This section describes the criteria used for evaluating potential risk to ecological and human receptors. Regulatory criteria identified by medium in the Consent Order include cleanup standards, risk-based screening levels, and risk-based cleanup goals.

Human health risk-screening evaluations were conducted for the Threemile Canyon Aggregate Area using NMED guidance (NMED 2015, 600915). Ecological risk-screening assessments were performed using Laboratory guidance (LANL 2015, 600921).

## 4.1 Current and Future Land Use

The specific screening levels used in the risk evaluation and corrective-action decision process at a site depend on the current and reasonably foreseeable future land use(s). The current and reasonably foreseeable future land use(s) for a site determines the receptors and exposure scenarios used to select screening and cleanup levels. The land use within and surrounding the Threemile Canyon Aggregate Area is currently industrial and is expected to remain industrial for the reasonably foreseeable future. The recreational scenario was evaluated for several sites within former TA-12 where trail users might be exposed. The residential scenario is evaluated for comparison purposes per the Consent Order and is the decision scenario for sites that do not require future controls. For sites to be recommended for corrective action complete without controls, the residential scenario was evaluated to determine whether it was also protective of construction workers. If not, the construction worker scenario was also evaluated for these sites.

## 4.2 Screening Levels

Human health and ecological risk-screening evaluations were conducted for the COPCs detected in solid media at sites within the Threemile Canyon Aggregate Area. The human health risk-screening assessments (Appendix H) were performed on inorganic and organic COPCs using NMED SSLs for the industrial and residential scenarios (NMED 2015, 600915) and Laboratory SSLs for the recreational scenario (LANL 2015, 600336). When an NMED SSL was not available for a COPC, SSLs were obtained from EPA regional tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables) (adjusted to a risk level of $1 \times 10^{-5}$ for carcinogens). Radionuclides were assessed using the Laboratory SALs for the same scenarios (LANL 2015, 600929). Surrogate SSLs were used for some COPCs for which no SSLs were available based on structural similarity or breakdown products.

NMED guidance includes total chromium SSLs for the residential and industrial scenarios (NMED 2015, 600915). Because the toxicity of chromium strongly depends on its oxidation state, NMED and EPA have SSLs for trivalent chromium and hexavalent chromium. For screening purposes, the NMED SSLs for total chromium are typically used for comparison with total chromium results unless there is a known or suspected source of hexavalent chromium at the SWMU or AOC or site conditions could alter the speciation of chromium in the environment. Total chromium screening levels are appropriate for low-level releases to soil from sources not associated with hexavalent chromium. However, NMED and EPA recommend collecting valence-specific data for chromium when chromium is likely to be an important contaminant at a site and when hexavalent chromium may exist.

There are no known sources of hexavalent chromium use (e.g., cooling towers, electroplating) at SWMUs and AOCs in the Threemile Canyon Aggregate Area. Total chromium results for all sites are screened using the NMED SSLs for total chromium.

### 4.3 Ecological Screening Levels

The ecological risk-screening assessments (Appendix H) were conducted using ecological screening levels (ESLs) obtained from the ECORISK Database, Version 3.3 (LANL 2015, 600921). The ESLs are based on similar species and are derived from experimentally determined no observed adverse effect levels (NOAELs), lowest observed adverse effect levels (LOAELs), or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Version 3.3 (LANL 2015, 600921).

### 4.4 Cleanup Standards

As specified in the Consent Order, SSLs for inorganic and organic chemicals (NMED 2015, 600915) are used as soil cleanup levels unless they are determined to be impracticable or values do not exist for the current and reasonably foreseeable future land uses. SALs are used as soil cleanup levels for radionuclides (LANL 2015, 600929). Screening assessments compare COPC concentrations for each site with industrial and residential SSLs and SALs and with recreational SSLs and SALs, when appropriate.

The cleanup goals specified in Section VIII of the Consent Order are a target risk of $1 \times 10^{-5}$ for carcinogens or a hazard index (HI) of 1 for noncarcinogens. For radionuclides, the target dose is 25 mrem/yr as authorized by DOE Order 458.1. The SSLs/SALs used for the risk-screening assessments in Appendix H are based on these cleanup goals.

## 5.0 DATA REVIEW METHODOLOGY

The purpose of the data review is to define the nature and extent of contaminant releases for each SWMU or AOC in the Threemile Canyon Aggregate Area. The nature of a contaminant release refers to the specific contaminants that are present, the affected media, and associated concentrations. The nature of contamination is defined through identification of COPCs, which is discussed in section 5.1. The identification of a chemical or radionuclide as a COPC does not mean the constituent(s) is related to the site and a result of site operations. A COPC is identified because it is present at a site based on the criteria discussed below, but it might be present because of adjacent and/or upgradient operations and/or infrastructure typical of industrial and metropolitan development. If such origins are evident, the constituents might be excluded from the data analyses and risk assessments. The extent of contamination refers to the spatial distribution of COPCs, with an emphasis on the distribution of COPCs potentially posing a risk or requiring corrective action. The process for determining the extent of contamination and for concluding no further sampling for extent is warranted is discussed in section 5.2.

### 5.1 Identification of COPCs

COPCs are chemicals and radionuclides that may be present as a result of releases from SWMUs or AOCs. Inorganic chemicals and some radionuclides occur naturally, and inorganic chemicals and radionuclides detected because of natural background are not considered COPCs. Similarly, some radionuclides may be present as a result of fallout from historic nuclear weapons testing, and these radionuclides are also not considered COPCs. The Laboratory has collected data on background concentrations of many inorganic chemicals, naturally occurring radionuclides and fallout radionuclides. These data have been used to develop media-specific background values (BVs) and fallout values (FVs) (LANL 1998, 059730). For inorganic chemicals and radionuclides for which BVs or FVs exist, identification of COPCs involves background comparisons, which are described in sections 5.1.1 and 5.1.2. If no BVs or FVs are available or if samples are collected where FVs are not appropriate (i.e., greater than 1-ft depth or in rock), COPCs are identified based on detection status (i.e., if the inorganic chemical or radionuclide is detected, it is identified as a COPC unless there is information indicating it is not present as a result of a release from the SWMU or AOC).

Organic chemicals may also be present as a result of anthropogenic activities unrelated to the SWMU or AOC or, to a lesser extent, from natural sources. Because there are no background data for organic chemicals, background comparisons cannot be performed in the same manner as for inorganic chemicals or radionuclides. Therefore, organic COPCs are identified on the basis of detection status (i.e., the organic chemical is detected). When the nature of contamination is assessed, the history of site operations may be evaluated to determine whether an organic COPC is present because of a release from a SWMU or AOC or is present from a non-site-related source. Organic chemicals that are clearly present from sources other than releases from a SWMU or AOC may be eliminated as COPCs and not evaluated further.

### 5.1.1 Inorganic Chemical and Radionuclide Background Comparisons

The COPCs are identified for inorganic chemicals and radionuclides following EP-SOP-10071, Background Comparisons for Inorganic Chemicals, and EP-SOP-10073, Background Comparisons for Radionuclides. Inorganic COPCs are identified by comparing site data with BVs, statistical comparisons, and other lines of evidence, as applicable (LANL 1998, 059730). The upper end of the background data set may be used for comparison if one or more of the following conditions exist:

- Statistically determined BV is significantly greater than the maximum background concentration.
- Statistical tests cannot be performed because of insufficient data (fewer than eight samples and/or five detections per medium) or a high percentage of nondetections.
- Sufficient numbers of samples have been collected to determine nature and extent but results are predominately nondetections.
- Site history does not indicate the constituent is directly related to site activities or to a dominant waste stream.
- Spatial analyses do not show a pattern or trend indicating contamination.
- The maximum detected concentration is statistically determined to be an outlier. (Note: A sufficient number of samples must be collected to show a point is an outlier and is not indicative of a hot spot.)

Radionuclides are identified as COPCs based on background comparisons and statistical methods if BVs or FVs are available, based on detection status if BVs or FVs have not been established, or based on other lines of evidence, as applicable.

Background data are generally available for inorganic chemicals in soil, sediment, and tuff (LANL 1998, 059730). However, some analytes (e.g., nitrate, perchlorate, and hexavalent chromium) have no BVs. A BV may be either a calculated value from the background data set (upper tolerance limit [UTL] or the 95% upper confidence bound on the 95th quantile) or a DL. When a BV is based on a DL, there is no corresponding background data set for that analyte/media combination.

For inorganic chemicals, data are evaluated by sample media to facilitate the comparison with media-specific background data. To identify inorganic COPCs, the first step is to compare the sampling result with BVs. If sampling results are above the BV and sufficient data are available (eight or more sampling results and five or more detections), statistical tests are used to compare the site sample data with the background data set for the appropriate media. If statistical tests cannot be performed because of insufficient data or a high percentage of nondetections, the sampling results are compared with the BV and the upper end of background concentration for the appropriate media. If concentrations are above the BV but no results are greater than the upper end of the background data set, lines of evidence are presented to determine whether the inorganic chemical is or is not a COPC. If at least one sampling result is above the BV and the upper end of the background data set, the inorganic chemical is identified as a COPC. The same evaluation is performed using DLs when an inorganic chemical is not detected but has a DL above the BV. If no BV is available, detected inorganic chemicals are identified as COPCs.

Radionuclides are identified as COPCs based on comparisons with BVs for naturally occurring radionuclides or with FVs for fallout radionuclides. Thorium-228, thorium-230, thorium-232, uranium-234, uranium-235/236, and uranium-238 are naturally occurring radionuclides. Americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, and tritium are fallout radionuclides.

Naturally occurring radionuclides detected at activities above their respective BVs are identified as COPCs unless lines of evidence can be presented to establish the radionuclide is not a COPC. If there is no associated BV or FV and the radionuclide is detected, it is retained as a COPC.

The FVs for the fallout radionuclides apply to the top 0.0 to 1.0 ft of soil and fill and to sediment regardless of depth. If a fallout radionuclide is detected in soil or fill samples collected below 1.0 ft or in tuff samples, the radionuclide is identified as a COPC. For soil and fill samples from 1.0 ft bgs or less, if the activity of a fallout radionuclide is greater than the FV, comparisons of the top 0.0 to 1.0 ft sample data are made with the fallout data set. The radionuclide is eliminated as a COPC if activities are similar to fallout activities or lines of evidence can be presented to establish the radionuclide is not a COPC. Sediment results are evaluated in the same manner, although all data are included, not just the data from 0.0–1.0 ft bgs.

The FV for tritium in surface soil (LANL 1998, 059730) is in units of pCi/mL. This FV requires using sample percent moisture to convert sample tritium data from pCi/g (as provided by analytical laboratories) to the corresponding values in units of pCi/mL. Because sample percent moisture historically has been determined using a variety of methods, often undocumented, the Laboratory has adopted the conservative approach of identifying tritium in soil as a COPC based on detection status.

Sample media encountered during investigations at Threemile Canyon Aggregate Area include soil (all soil horizons, designated by the media code ALLH or SOIL), fill material (media code FILL), alluvial sediment (media code SED), and Bandelier Tuff (media codes Qbt 1v, Qbt 1g, Qbt 2, Qbt 3, and Qbt 4). Because no separate BVs are available for fill material, fill samples are evaluated by comparison with soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples along with soil samples in sample counts and comparisons with background. Fill samples are not discussed separately from soil. The units of the Upper Bandelier Tuff (Qbt 2, Qbt 3, and Qbt 4) are likewise evaluated together with respect to background, as are the units of the Lower Bandelier Tuff (Qbo, Qct, and Qbt 1g) (LANL 1998, 059730).

### 5.1.2 Statistical Methods Overview

A variety of statistical methods may be applied to each of the data sets. The use of any of these methods depends on how appropriate the method is for the available data. The results of the statistical tests are presented in Appendix G tables.

#### 5.1.2.1 Distributional Comparisons

Comparisons between site-specific data and Laboratory background data are performed using a variety of statistical methods. These methods begin with a simple comparison of site data with a UTL estimated from the background data (UTL or the 95% upper confidence bound on the 95th quantile). The UTLs are used to represent the upper end of the concentration distribution and are referred to as BVs. The UTL comparisons are then followed, when appropriate, by statistical tests that evaluate potential differences between the distributions. These tests are used for testing hypotheses about data from two potentially different distributions (e.g., a test of the hypothesis that site concentrations are elevated above background levels). Nonparametric tests most commonly performed include the Gehan test (modification of the Wilcoxon Rank Sum test) and the quantile test (Gehan 1965, 055611; Gilbert and Simpson 1990, 055612).

The Gehan test is recommended when between 10% and 50% of the data sets are nondetections. It handles data sets with nondetections reported at multiple DLs in a statistically robust manner (Gehan 1965, 055611; Millard and Deverel 1988, 054953). The Gehan test is not recommended if either of the two data sets has more than 50% nondetections. If there are no nondetected concentrations in the data, the Gehan test is equivalent to the Wilcoxon Rank Sum test. The Gehan test is the preferred test because of its applicability to a majority of environmental data sets and its recognition and recommendation in EPA-sponsored workshops and publications.

The quantile test is better suited to assessing shifts in a subset of the data. The quantile test determines whether more of the observations in the top chosen quantile of the combined data set come from the site data set than would be expected by chance, given the relative sizes of the site and background data sets. If the relative proportion of the two populations being tested is different in the top chosen quantile of the data from that of the remainder of the data, the distributions may be partially shifted because of a subset of site data. This test is capable of detecting a statistical difference when only a small number of concentrations are elevated (Gilbert and Simpson 1992, 054952). The quantile test is the most useful distribution shift test where samples from a release represent a small fraction of the overall data collected. The quantile test is applied at a prespecified quantile or threshold, usually the 80th percentile. The test cannot be performed if more than 80% (or, in general, more than the chosen percentile) of the combined data are nondetected values. It can be used when the frequency of nondetections is approximately the same as the quantile being tested. For example, in a case with 75% nondetections in the combined background and site data set, application of a quantile test comparing 80th percentiles is appropriate. However, the test cannot be performed if nondetections occur in the top chosen quantile. The threshold percentage can be adjusted to accommodate the detection rate of an analyte or to look for differences further into the distribution tails. The quantile test is more powerful than the Gehan test for detecting differences when only a small percentage of the site concentrations are elevated.

If the differences between two distributions appear to occur far into the tails, the slippage test might be performed. This test evaluates the potential for some of the site data to be greater than the maximum concentration in the background data set if, in fact, the site data and background data came from the same distribution. This test is based on the maximum concentration in the background data set and the number (“n”) of site concentrations that exceed the maximum concentration in the background set (Gilbert and Simpson 1990, 055612, pp. 5–8). The result (p-value) of the slippage test is the probability that “n” site samples (or more) exceed the maximum background concentration by chance alone. The test accounts for the number of samples in each data set (number of samples from the site and number of samples from background) and determines the probability of “n” (or more) exceedances if the two data sets came from identical distributions. This test is similar to the BV comparison in that it evaluates the largest site measurements but is more useful than the BV comparison because it is based on a statistical hypothesis test, not simply on a statistic calculated from the background distribution.

Statistical tests for radionuclides are performed only in limited cases. There are no background data sets for naturally occurring radionuclides in soil or tuff, so statistics were not performed if there were any detections of uranium isotopes above BV in soil or tuff. Although there are background data sets for fallout radionuclides in soil, the background data are limited to the depth range of 0.0–1.0 ft bgs for evaluation of fallout radionuclides. Therefore, statistical tests were not performed for fallout radionuclides in soil. Fallout values are not applicable for tuff, so statistical tests cannot be performed. Background data sets are available for naturally occurring and fallout radionuclides in sediment, and background evaluations for sediment are not limited to the depth range of 0.0–1.0 ft bgs. Therefore, statistical tests can be performed for radionuclides in sediment. However, statistical tests for radionuclides in sediment were not performed for a site if there were also detections of naturally occurring radionuclides above BV in soil, detections of fallout radionuclides above FV in soil in the 0.0–1.0 ft bgs depth range, detections of fallout radionuclides in soil below 1.0 ft bgs, and/or detections of fallout radionuclides in tuff.

For all statistical tests, a p-value less than 0.05 was the criterion for accepting the null hypothesis that site sampling results are different from background.

#### 5.1.2.2 Graphical Presentation

Box plots are provided in Appendix G for a visual representation of the data and to help illustrate the presence of outliers or other anomalous data that might affect statistical results and interpretations. The plots allow a visual comparison among data distributions. The differences of interest may include an overall shift in concentration (shift of central location) or, when the centers are nearly equal, a difference between the upper tails of the two distributions (elevated concentrations in a small fraction of one distribution). The plots may be used in conjunction with the statistical tests (distributional comparisons) described above. Unless otherwise noted, the nondetected concentrations are included in the plots at their reported DL.

The box plots produced in Appendix G of this report consist of a box, a line across the box, whiskers (lines extended beyond the box and terminated with a short perpendicular line), and points outside the whiskers. The box area of the plot is the region between the 25th percentile and the 75th percentile of the data, the interquartile range or middle half of the data. The horizontal line within the box represents the median (50th percentile) of the data. The whiskers extend to the most extreme point that is not considered an outlier, with a maximum whisker length of 1.5 times the interquartile range, outside of which data may be evaluated for their potential to be outliers. The concentrations are plotted as points overlying the box plot. When a data set contains both detected concentrations and nondetected concentrations reported as DLs, the detected concentrations are plotted as Xs and the nondetected concentrations are plotted as Os.

## 5.2 Extent of Contamination

Spatial concentration trends are initially used to determine whether the extent of contamination is defined. Evaluation of spatial concentration data considers the conceptual site model of the release and subsequent migration. Specifically, the conceptual site model should define where the highest concentrations would be expected if a release had occurred and how these concentrations should vary with distance and depth. If the results are different from the conceptual site model, it could indicate that no release has occurred or there are other sources of contamination.

In general, both laterally and vertically decreasing concentrations are used to define extent. If concentrations are increasing or not changing, other factors are considered to determine whether extent is defined or if additional extent sampling is warranted. These factors include

- the magnitude of concentrations and rate of increase compared with SSLs/SALs,
- the magnitude of concentrations of inorganic chemicals or radionuclides compared with the maximum background concentrations for the medium,
- concentrations of organic chemicals compared with estimated quantitation limits (EQLs), and
- results from nearby sampling locations.

The primary focus for defining the extent of contamination is characterizing contamination that potentially poses a potential unacceptable risk and might require additional corrective actions. As such, comparison with SSLs/SALs is used as an additional step following a determination of whether extent is defined by decreasing concentrations with depth and distance and whether concentrations are below EQLs or DLs. The initial SSL/SAL comparison uses the residential SSL/SAL (regardless of whether the current and reasonably foreseeable future land use is residential) because this value is typically the most protective. If the current and reasonably foreseeable future land use is not residential, and if the residential SSL/SAL is exceeded or otherwise similar to COPC concentrations, comparison with the relevant SSL/SAL may also be conducted. For all SWMUs and AOCs in the Threemile Canyon Aggregate Area, the current and reasonably foreseeable future land use is industrial (section 4.1).

The SSL/SAL comparison is not necessary if all COPC concentrations are decreasing with depth and distance. If, however, concentrations increase with depth and distance or do not display any obvious trends, the SSLs/SALs are used to determine whether additional sampling for extent is warranted. If the COPC concentrations are sufficiently below the SSL/SAL (e.g., the residential and/or industrial SSL/SAL is 10 times [an order of magnitude]) or more than all concentrations), the COPC does not pose a potential unacceptable risk and no further sampling for extent is warranted. The validity of the assumption that the COPC does not pose a risk is confirmed with the results of the risk-screening assessment. The calculation of risk also assists in determining whether additional sampling is warranted to define the extent of contamination needing additional corrective actions.

Calcium, magnesium, potassium, and sodium may be COPCs for some sites. These constituents are essential nutrients, and their maximum concentrations are compared with NMED's essential nutrient screening levels (NMED 2015, 600915). If the maximum concentration is less than the screening level(s), no additional sampling for extent is warranted and the inorganic chemical is eliminated from further evaluation in the risk assessment.

## 6.0 FORMER TA-12 BACKGROUND AND FIELD INVESTIGATION RESULTS

### 6.1 Background of Former TA-12

#### 6.1.1 Operational History

Former TA-12, also known as L-Site, was constructed during World War II and used as an explosives testing facility. An open area was used as the firing site where a number of shots were detonated, including one 70-kg charge (LANL 1996, 054086, p. 1-1). Figure 6.1-1 shows the site features of former TA-12.

In 1950, a radiation test bunker was constructed at former TA-12 to conduct radiation experiments on animals using a radioactive lanthanum-140 source. Because of these radiation experiments, a section of the perimeter became contaminated. In 1951, Group DE-1 began using the area, firing several shots per month (LANL 1994, 034755). By 1953, the entire site was vacated. Activities at former TA-12 ceased in the early 1950s. In 1960, the structures were decontaminated, decommissioned, and intentionally burned (LANL 1996, 054086, p. 1-1). A Laboratory group used part of the site during the Vietnam War for "Mortar Locator" experiments, which involved using an acetylene gas gun. Former TA-12 is no longer used for Laboratory operations (LANL 1994, 034755, p. 1-8).

In 1989 the Laboratory redefined TA boundaries. Most of former TA-12 is within the boundary of TA-67, and the remaining area is within the boundary of TA-15. Two former TA-12 sites in this investigation [AOCs 12-004(a) and 12-004(b)] are located in the northeast corner of TA-15. The other eight former TA-12 sites are located in the western portion of TA-67 (Figure 6.1-1). In 2000, the Cerro Grande fire moved through former TA-12, damaging or destroying vegetation and remaining surface debris (LANL 1994, 034755, p. 1-8).

The following three SWMUs and seven AOCs within the Threemile Canyon Aggregate Area are located at former TA-12 and are addressed in this supplemental investigation report:

- SWMU 12-001(a) is a belowground, steel-lined firing pit with an aboveground steel cover (structure 12-4).
- SWMU 12-001(b) is a firing pit located approximately 175 ft east of SWMU 12-001(a).
- SWMU 12-002 is an area approximately 3 $ft^2$ used on one occasion to burn scrap explosives.
- AOC 12-004(a) is the location of a lanthanum radiation experiment and its surrounding area, including a drainage.
- AOC 12-004(b) is a belowground aluminum pipe about 78 ft north of a former radiation shelter (structure 12-8).
- AOC C-12-001 is an area of potential soil contamination associated with the former trim building 12-1.
- AOC C-12-002 is an area of potential soil contamination associated with the former control building 12-2.
- AOC C-12-003 is an area of potential soil contamination associated with a former HE-storage magazine (building 12-3).
- AOC C-12-004 is an area of potential soil contamination associated with a former generator (building 12-5).
- AOC C-12-005 is the location of a former junction box (structure 12-6).

### 6.1.2 Summary of Releases

Potential contaminants at former TA-12 may have been released into the environment through operational releases at the firing sites, radiation experiment area, and associated facilities.

### 6.1.3 Current Site Usage and Status

Former TA-12 is located within TA-15 and TA-67 and is no longer used for Laboratory operations.

## 6.2 SWMU 12-001(a)—Firing Site Steel-Lined Pit

### 6.2.1 Site Description and Operational History

SWMU 12-001(a) is a decommissioned belowground steel-lined firing pit and steel cover (structure 12-4) located on the north side of Redondo Road at former TA-12 (Plate 2). The firing pit is hexagonal and measures 10.5 ft on each side × 11 ft deep. A steel cover that measures 20 ft long × 22 ft wide × 5 ft high overlays the pit. The steel cover has a 5-ft-diameter opening in its center through which explosives were lowered into the pit. The firing pit began operation in 1944 (LANL 1994, 034755, p. 5-1-1) and was used to conduct recovery shots involving uranium until the pit was decommissioned in 1953. In 1996, a voluntary corrective action removed approximately 10.5 $ft^3$ of noncontaminated soil that had blown into the bottom of the pit; the pit remains in place (LANL 1996, 055073, p. 1).

### 6.2.2 Relationship to Other SWMUs and AOCs

SWMU 12-001(a) is a component of Consolidated Unit 12-001(a)-99, along with SWMUs 12-001(b) and 12-002, and AOC C-12-005. SWMU 12-001(a) is located approximately 175–200 ft west of SWMUs 12-001(b) and 12-002 and 50 ft northeast of AOC C-12-005 (Plate 2).

### 6.2.3 Summary of Previous Investigations

In 1993, a radiation survey was conducted outside the firing pit with a Geiger-Muller thin-window probe; no radionuclides were detected above background levels (Harris 1993, 055658, pp. 3–6; LANL 1994, 034755, p. 5-1-6). An internal survey of the firing pit was conducted in 1993; beta- and gamma-emitting radionuclides were detected above background levels. Small pieces of uranium and HE were observed in the firing pit (LANL 1994, 034755, pp. 5-1-6–5-1-7).

In 1995, Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) activities were performed at SWMU 12-001(a) (LANL 1996, 054086, p. 5-1). One sample from each of two locations was collected at the bottom of the firing pit, and one sample from each of two locations was collected from the surrounding area. All samples were analyzed for inorganic chemicals, HE, and radionuclides (LANL 1996, 055073, pp. 5-2–5-4).

In 1996, a voluntary corrective action (VCA) was conducted. During the VCA, all soil within the firing pit was removed. No additional confirmatory samples were collected after soil removal (LANL 1996, 055073, pp.1–8; LANL 1996, 059535).

The locations of the two samples collected at the pit bottom during the 1995 RFI were removed during soil removal activities conducted as part of the 1996 VCA. Data from two samples collected in the surrounding area during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

#### 6.2.4 Site Contamination

##### 6.2.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 12-001(a). As a result, the following activities were completed as part of the 2009–2010 investigation.

- Forty-six samples were collected in 2009–2010 from 24 locations adjacent to and around the firing site and in the drainage below the firing site. At each location, samples were collected at the surface (0.0–0.1 ft bgs to 0.0–1.0 ft bgs), and at all but two locations, a subsurface sample (1.0−1.5 ft bgs to 2.0–3.0 ft bgs) was also collected. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Ten samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 12-001(a) are shown on Plate 2. Table 6.2-1 presents the samples collected and analyses requested for SWMU 12-001(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

##### 6.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

##### 6.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 12-001(a) consist of results from 46 samples (35 soil, 8 tuff, and 3 sediment) collected from 24 locations. In addition, there are decision-level data for 34 samples (32 soil and 2 tuff) collected from 17 locations at SWMU 12-001(b) (see section 6.3.4). Because of the proximity of SWMUs 12-001(a) and 12-001(b), the combined data set for SWMUs 12-001(a) and 12-001(b) are evaluated below.

**Inorganic Chemicals**

A total of 80 samples (67 soil, 10 tuff, and 3 sediment) were collected at SWMUs 12-001(a) and 12-001(b) and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.2-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 3 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in four samples with a maximum concentration of 11,700 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-1 and Table G-1). Aluminum is retained as a COPC.

Antimony was detected above the soil BV (0.83 mg/kg) in 1 sample at a concentration of 1.15 mg/kg and was not detected above the soil BV or the sediment and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.886 mg/kg to 1.3 mg/kg) above BVs in 61 soil samples, 3 sediment samples, and 8 tuff samples. Antimony is retained as a COPC.

Barium was detected above the soil and Qbt 2,3,4 BVs (295 mg/kg and 46 mg/kg) in four soil samples and six tuff samples with a maximum concentration of 503 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are statistically different from background (Figure G-2 and Table G-2). The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-3 and Table G-1). Barium is retained as a COPC.

Cadmium was not detected above the soil and sediment BVs (0.4 mg/kg for both) but had DLs (0.514 mg/kg to 0.609 mg/kg) above BVs in 27 soil samples and 1 sediment sample. The DLs were only 0.114 mg/kg to 0.209 mg/kg above the BVs, below the highest background DL (2 mg/kg), and below or similar to the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or not detected above BVs in the other 52 samples (detected below BVs in 44 samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in three samples with a maximum concentration of 3240 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-4 and Table G-1). Calcium is retained as a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in 18 soil samples and 10 tuff samples with a maximum concentration of 74.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-5 and Table G-2). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-6 and Table G-1). Chromium is retained as a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in four soil samples and four tuff samples with a maximum concentration of 22.8 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-7 and Table G-2). The Gehan and quantile tests indicated site concentrations of cobalt in tuff are statistically different from background (Figure G-8 and Table G-1). Cobalt is retained as a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg) in two soil samples and four tuff samples with a maximum concentration of 29 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure G-9 and Table G-2). The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-10 and Table G-1). Copper is retained as a COPC.

Cyanide was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in one sample at a concentration of 0.502 mg/kg. The concentration was only 0.002 mg/kg above the BV. Cyanide was not detected or was detected below BVs in the other 79 samples (detected below BVs in 9 samples). Cyanide is not a COPC.

Iron was detected above the soil and Qbt 2,3,4 BVs (21,500 mg/kg and 14,500 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 22,100 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are statistically different from background (Figure G-11 and Table G-2). The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-12 and Table G-1). Iron is retained as a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in two soil samples and two tuff samples with a maximum concentration of 41 mg/kg. The Gehan test indicated site concentrations of lead in soil are statistically different from background (Table G-2). However, the quantile and slippage tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-13 and Table G-2). The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-14 and Table G-1). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in four samples with a maximum concentration of 2080 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are statistically different from background (Figure G-15 and Table G-1). Magnesium is retained as a COPC.

Manganese was detected above the soil BV (671 mg/kg) in three samples with a maximum concentration of 2150 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are statistically different from background (Figure G-16 and Table G-2). Manganese is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in three samples with a maximum concentration of 8.43 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-17 and Table G-1). Nickel is retained as a COPC.

Perchlorate was detected in 13 samples with a maximum concentration of 0.00209 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment and Qbt 2,3,4 BV (0.3 mg/kg for both) but had DLs (0.979 mg/kg to 1.29 mg/kg) above the BVs in 13 samples. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.11 mg/kg. The concentration was only 0.11 mg/kg above the BV. Silver was not detected or was detected below BVs in the other 79 samples (detected below BVs in 53 samples). Silver is not a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in 30 samples with a maximum concentration of 19.1 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-18 and Table G-2). Uranium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in four samples with a maximum concentration of 28.8 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-19 and Table G-1). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 85.6mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-20 and Table G-2). Zinc is not a COPC.

**Organic Chemicals**

A total of 80 samples (67 soil, 10 tuff, and 3 sediment) were collected at SWMUs 12-001(a) and 12-001(b) and analyzed for explosive compounds. A total of 22 samples (19 soil, 1 sediment, and 2 tuff) were also analyzed for PCBs. Table 6.2-3 summarizes the analytical results for detected organic chemicals. Plate 4 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMUs 12-001(a) and 12-001(b) include 4-amino-2,6-dinitrotoluene, HMX, PETN, RDX, and tetryl. The detected organic chemicals are retained as COPCs.

**Radionuclides**

A total of 80 samples (67 soil, 10 tuff, and 3 sediment) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 6.2-4 summarizes radionuclides detected or detected above BVs/FVs. Plate 5 shows the spatial distribution of detected radionuclides.

Americium-241 was detected above the soil FV (0.013 pCi/g) in one sample at an activity of 0.0257 pCi/g. The activity was only 0.0127 pCi/g above the FV, and americium-241 was not detected in the other 79 samples. Americium-241 is not a COPC.

Cesium-137 was detected in three soil samples below 1 ft bgs and detected in one tuff sample with a maximum activity of 0.345 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample and detected in one soil sample below 1 ft bgs with a maximum activity of 0.0682 pCi/g. Plutonium-239/240 is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in three samples with a maximum activity of 4.15 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil BV (0.2 pCi/g) in two samples with a maximum activity of 0.22 pCi/g. The activity was only 0.02 pCi/g above the BV, and uranium-235/236 was not detected in the other 78 samples. Uranium-235/236 is not a COPC.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs (2.29 pCi/g, 2.29 pCi/g, and 1.93 pCi/g) in 10 soil samples, 1 sediment sample, and 1 tuff sample with a maximum activity of 4.47 pCi/g. Uranium-238 is retained as a COPC.

#### 6.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMUs 12-001(a) and 12-001(b) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMUs 12-001(a) and 12-001(b) include aluminum, antimony, barium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, perchlorate, selenium, uranium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 11,700 mg/kg. Concentrations increased with depth at locations 12-610670, 12-610671, and 12-610701. Concentrations decreased with depth at location 12-610650 (the concentration in the shallow sample at location 12-610650 was 15,600 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 4.6 times the maximum concentration (the maximum concentration was 66,300 mg/kg below the residential SSL), and the industrial SSL was approximately 108 times the maximum concentration. The lateral extent of aluminum is defined, and further sampling for vertical extent is not warranted.

Antimony was detected above the soil BV in one sample at a concentration of 1.15 mg/kg. Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs but had DLs (0.886 mg/kg to 1.3 mg/kg) above BVs in 61 soil samples, 8 tuff samples, and 3 sediment samples. Concentrations increased with depth at location 12-610694 and decreased downgradient. The residential SSL was approximately 27 times the detected concentration and 24 times the maximum DL. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and six tuff samples with a maximum concentration of 503 mg/kg. Concentrations increased with depth at locations 12-610647, 12-610694, 12-610670, 12-610671, and 12-610701. Concentrations decreased with depth at locations 12-610641, 12-610642, 12-610650, 12-610654, and 12-610667 (the concentration in the shallow sample at location 12-610667 was 101 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 31 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3240 mg/kg. Concentrations increased with depth at all locations and decreased downgradient. The NMED residential essential nutrient SSL was approximately 4100 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 18 soil samples and 10 tuff samples with a maximum concentration of 74.3 mg/kg. Concentrations increased with depth at locations 12-610668, 12-610676, 12-610694, and 12-610697. Concentrations did not change substantially with depth at locations 12-610650 and 12-610673 (0.5 mg/kg and 0.2 mg/kg, respectively); the concentrations in the shallow samples at locations 12-610650 and 12-610673 were 13.7 mg/kg and 11.3 mg/kg, respectively, and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at all other locations (the concentrations in the shallow samples at locations 12-610654, 12-610670, 12-610672, and 12-610701 were 15.4 mg/kg, 19.2 mg/kg, 14.5 mg/kg, and 13.3 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at these sites, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 1570 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in four soil samples and four tuff samples with a maximum concentration of 22.8 mg/kg. Concentrations increased with depth at locations 12-610647, 12-610694, 12-610696, and 12-610671. Concentrations did not change substantially with depth at locations 12-610650, 12-610670, and 12-610701 (0.58 mg/kg, 0.65 mg/kg, and 0.52 mg/kg, respectively); the concentrations in the shallow samples at locations 12-610650, 12-610670, and 12-610701 were 5.88 mg/kg, 3.8 mg/kg, and 6.56 mg/kg, respectively, and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at location 12-610695. Concentrations decreased downgradient. The industrial SSL was approximately 15 times the maximum concentration. The lateral extent of cobalt is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the soil and Qbt 2,3,4 BVs in two soil samples and four tuff samples with a maximum concentration of 29 mg/kg. Concentrations did not change substantially with depth at location 12-610671 (0.38 mg/kg); the concentration in the shallow sample at location 12-610671 was 7.15 mg/kg and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at locations 12-610641, 12-610643, 12-610650, 12-610670, and 12-610701 (the concentrations in the shallow samples at locations 12-610650, 12-610670, and 12-610701 were 7.92 mg/kg, 7.87 mg/kg, and 10.4 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 108 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Iron was detected above the soil and Qbt 2,3,4 BVs in one soil sample and two tuff samples with a maximum concentration of 22,100 mg/kg. Concentrations increased with depth at locations 12-610670 and 12-610675 and decreased with depth at location 12-610650 (the concentration in the shallow sample at location 12-610650 was 15,000 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential and industrial SSLs were approximately 2.5 times and 41 times the maximum concentration, respectively. The lateral extent of iron is defined, and further sampling for vertical extent is not warranted.

Magnesium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 2080 mg/kg. Concentrations increased with depth at locations 12-610670, 12-610671, and 12-610701. Concentrations decreased with depth at location 12-610650 (the concentration in the shallow sample at location 12-610650 was 2190 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The NMED residential essential nutrient SSL was approximately 160 times the maximum concentration. The lateral extent of magnesium is defined, and further sampling for vertical extent is not warranted.

Manganese was detected above the soil BV in three samples with a maximum concentration of 2150 mg/kg. Concentrations increased with depth at locations 12-610647 and 12-610694 and decreased with depth at location 12-610695. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 4.9 times and 74 times the maximum concentration, respectively. The lateral extent of manganese is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 8.43 mg/kg. Concentrations did not change substantially with depth at locations 12-610650, 12-610670, and 12-610701 (0.75 mg/kg, 0.72 mg/kg, and 0.11 mg/kg, respectively); the concentrations in the shallow samples at locations 12-610650, 12-610670, and 12-610701 were 7.94 mg/kg, 6.08 mg/kg, and 8.54 mg/kg, respectively, and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased downgradient. The residential SSL was approximately 185 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 13 samples with a maximum concentration of 0.00209 mg/kg. Concentrations increased with depth at locations 12-610643, 12-610655, 12-610674, and 12-610700 and were below estimated detection limits (EDLs). Concentrations decreased with depth at all other locations and decreased downgradient. The residential SSL was approximately 26,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (0.979 mg/kg to 1.29 mg/kg) above BVs in 13 samples. Because selenium was not detected above the BVs and the residential SSL was approximately 303 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil BV in 30 samples with a maximum concentration of 19.1 mg/kg. Concentrations did not change substantially with depth at location 12-610648 (0.18 mg/kg) and decreased with depth at all other locations. Concentrations decreased downgradient. The lateral and vertical extent of uranium are defined.

Vanadium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 28.8 mg/kg. Concentrations increased with depth at locations 12-610670 and 12-610671. Concentrations decreased with depth at locations 12-610650 and 12-610701 (the concentrations in the shallow samples at locations 12-610650 and 12-610701 were 29.6 mg/kg and 30.7 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential and industrial SSLs were approximately 14 times and 227 times the maximum concentration, respectively. The lateral extent of vanadium is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at SWMUs 12-001(a) and 12-001(b) include 4-amino-2,6-dinitrotoluene, HMX, PETN, RDX, and tetryl.

Amino-2,6-dinitrotoluene[4-] was detected in one sample at a concentration of 0.127 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 4-amino-2,6-dinitrotoluene are defined.

HMX was detected in six samples with a maximum concentration of 11.4 mg/kg. Concentrations increased with depth at locations 12-610640 and 12-610642 and decreased with depth at location 12-610641. Concentrations decreased downgradient. The residential SSL was approximately 337 times the maximum concentration. The lateral extent of HMX is defined, and further sampling for vertical extent is not warranted.

PETN was detected in one sample at a concentration of 5.82 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of PETN are defined.

RDX was detected in eight samples with a maximum concentration of 49.4 mg/kg. Concentrations did not change substantially with depth at locations 12-610640 and 12-610642 (0.038 mg/kg and 0.173 mg/kg). Concentrations decreased with depth at locations 12-610641, 12-610643, and 12-610646 and decreased downgradient. The residential SSL was approximately 220 times the maximum concentration at location 12-610640 and 140 times the maximum concentration at location 12-610642. The lateral extent of RDX is defined, and further sampling for vertical extent is not warranted.

Tetryl was detected in one sample at a concentration of 0.333 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of tetryl are defined.

**Radionuclides**

Radionuclide COPCs at SWMUs 12-001(a) and 12-001(b) include cesium-137, plutonium-239/240, uranium-234, and uranium-238.

Cesium-137 was detected in three soil samples and one tuff sample with a maximum activity of 0.345 pCi/g. Activities increased with depth at location 12-610639, did not change substantially with depth at location12-610680 (0.087 pCi/g), and decreased with depth at locations 12-610676 and 12-610679 (the activities in the shallow samples at locations 12-610676 and 12-610679 were 0.514 pCi/g and 0.15 pCi/g, respectively, and below the soil FV [Appendix E, Pivot Tables]). Activities decreased downgradient from location 12-610639 to location 12-610680 (0.014 pCi/g). The residential SAL was approximately 35 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected in two soil samples with a maximum activity of 0.0682 pCi/g. Activities increased with depth at location 12-610639 and decreased with depth at location 12-610675. Activities decreased downgradient. The residential SAL was approximately 1160 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Uranium-234 was detected above the soil BV in three samples with a maximum activity of 4.15 pCi/g. Activities decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of uranium-234 are defined.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs in 10 soil samples, 1 sediment sample, and 1 tuff sample with a maximum activity of 4.47 pCi/g. Activities increased with depth at location 12-610676 and decreased at all other locations. Activities decreased downgradient. The residential SAL was approximately 33 times the maximum activity. Further sampling for extent of uranium-238 is not warranted.

### 6.2.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $8 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.03, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.09 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Recreational Scenario**

The total excess cancer risk for the recreational scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.07, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.03 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.9 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Construction Worker Scenario**

The residential exposure scenario is protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is 0.9, which is less than the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMUs 12-001(a) and 12-001(b).

### 6.2.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for threatened and endangered (T&E) species), LOAEL analyses, and chemicals of potential ecological concern (COPECs) without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMUs 12-001(a) and 12-001(b).

## 6.3 SWMU 12-001(b)—Former Firing Pit

### 6.3.1 Site Description and Operational History

SWMU 12-001(b) is a decommissioned firing pit located on the north side of Redondo Road at former TA-12 (Plate 2). The pit is 5 ft × 5 ft × 3 ft deep and was used for calorimetric experiments in 1945. Following World War II, the pit was used to fire HE shots involving lead and uranium. Although operations at this site ceased in the 1950s, the pit remains in place.

### 6.3.2 Relationship to Other SWMUs and AOCs

SWMU 12-001(b) is a component of Consolidated Unit 12-001(a)-99, along with SWMUs 12-001(a) and 12-002, and AOC C-12-005. SWMU 12-001(b) is located approximately 175 ft east of SWMU 12-001(a) and 40 ft northwest of SWMU 12-002 (Plate 2).

### 6.3.3 Summary of Previous Investigations

In 1993, a radiological survey detected beta- and gamma-emitting radionuclides at approximately twice background levels in the open firing pit (LANL 1994, 034755, p. 5-1-6; LANL 1997, 055675, p. 1). Small fragments of uranium and pink material were observed in the firing pit. Field HE spot-tests were conducted and fragments of pink material tested positive for RDX (Harris 1993, 055658).

In 1995, RFI activities were performed at SWMU 12-001(b) (LANL 1996, 054086, p. 5-1). Four soil samples were collected from three locations and analyzed for inorganic chemicals, HE, and radionuclides (LANL 1996, 054086, p. 5-1; LANL 1997, 055675, pp. 2–4).

Data from four samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.3.4 Site Contamination

#### 6.3.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 12-001(b). As a result, the following activities were completed as part of the 2009–2010 investigation.

- A total of 34 samples were collected in 2009–2010 from 17 locations adjacent to and around the firing site. At each location, samples were collected at the surface (0.0–0.4 ft bgs to 0.0-1.0 ft bgs) and from the subsurface (1.5–2.5 ft bgs to 2.0–3.6 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Eight samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 12-001(b) are shown on Plate 2. Table 6.2-1 presents the samples collected and analyses requested for SWMU 12-001(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.3.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 12-001(b) consist of results from 34 samples (32 soil and 2 tuff) collected from 17 locations. As described in section 6.2.4, because of the proximity of SWMUs 12-001(a) and 12-001(b), these data were combined with the decision-level data for SWMU 12-001(a) and the combined data sets were evaluated for COPCs. See section 6.2.4.3 for results of the evaluation of COPCs for SWMUs 12-001(a) and 12-001(b).

#### 6.3.4.4 Nature and Extent of Contamination

Section 6.2.4.4 discusses the nature and extent of contamination for SWMUs 12-001(a) and 12-001(b).

### 6.3.5 Summary of Human Health Risk Screening

The human health risk screening for SWMU 12-001(b) was conducted in conjunction with SWMU 12-001(a) and the results are presented in section 6.2.5.

### 6.3.6 Summary of Ecological Risk Screening

The ecological risk screening for SWMU 12-001(b) was conducted in conjunction with SWMU 12-001(a) and the results are presented in section 6.2.6.

## 6.4 SWMU 12-002—Potential Soil Contamination

### 6.4.1 Site Description and Operational History

SWMU 12-002 is an area of potential soil contamination at former TA-12 where a small quantity of scrap HE was burned on one occasion (Plate 2). In 1962, a can containing approximately 0.5 lb of HE was discovered during a property survey and was subsequently burned in a small area (approximately 3 $ft^2$) to destroy the HE (Anderson 1962, 004860; LANL 1994, 034755, p. 6-3). The location of SWMU 12-002 now lies beneath the asphalt pavement of Redondo Road.

### 6.4.2 Relationship to Other SWMUs and AOCs

SWMU 12-002 is a component of Consolidated Unit 12-001(a)-99, along with SWMUs 12-001(a) and 12-001(b), and AOC C-12-005. SWMU 12-002 is located approximately 40 ft southeast of SWMU 12-001(b) (Plate 2).

### 6.4.3 Summary of Previous Investigations

No sampling was conducted at SWMU 12-002 before the 2009–2010 investigation.

### 6.4.4 Site Contamination

#### 6.4.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 12-002. The following activities were completed as part of the 2009−2010 investigation.

- Two samples were collected in 2009–2010 from one location where HE had previously been burned. Samples were collected at intervals of 0.4–0.8 ft bgs and 2.0–3.3 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, PCBs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

The 2009–2010 sampling locations at SWMU 12-002 are shown on Plate 2. Table 6.4-1 presents the samples collected and analyses requested for SWMU 12-002. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.4.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 12-002 consist of two tuff samples collected from one location.

**Inorganic Chemicals**

Two tuff samples were collected at SWMU 12-002 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.4-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 3 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in one sample at a concentration of 14,200 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the Qbt 2,3,4 BV (0.5 mg/kg) but had a DL (1.03 mg/kg) above the BV in one sample. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two samples with a maximum concentration of 191 mg/kg. Barium is retained as a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in one sample at a concentration of 2440 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in one sample at a concentration of 13.5 mg/kg. Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in two samples with a maximum concentration of 14.2 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in two samples with a maximum concentration of 11.1 mg/kg. Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in one sample at a concentration of 18,900 mg/kg. Iron is retained as a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in one sample at a concentration of 13 mg/kg. The concentration was only 1.8 mg/kg above the BV and below the two highest tuff background concentrations (15.5 mg/kg and 14.5 mg/kg). Lead was detected below BV in the other sample. Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in one sample at a concentration of 2220 mg/kg. The concentration was below the two highest tuff background concentrations (2820 mg/kg and 2720 mg/kg). Magnesium was detected below BV in the other sample. Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 9.28 mg/kg. Nickel is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.06 mg/kg and 1.1 mg/kg) above BV in two samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample at a concentration of 27.1 mg/kg. Vanadium is retained as a COPC.

**Organic Chemicals**

Two tuff samples were collected at SWMU 12-002 and analyzed for explosive compounds and PCBs. Organic chemicals were not detected at SWMU 12-002.

**Radionuclides**

Two tuff samples were collected at SWMU 12-002 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at SWMU 12-002.

#### 6.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic COPCs at SWMU 12-002 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 12-002 include aluminum, antimony, barium, calcium, chromium, cobalt, copper, iron, nickel, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in one sample at a concentration of 14,200 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential SSL was approximately 5.5 times the maximum concentration (the maximum concentration was 63,800 mg/kg below the residential SSL), and the industrial SSL was approximately 89 times the maximum concentration. The lateral extent of aluminum is defined, and further sampling for vertical extent is not warranted.

Antimony was not detected above the Qbt 2,3,4 BV but had a DL (1.03 mg/kg) above BV in one sample. The residential SSL was approximately 30 times the DL. Further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 191 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential SSL was approximately 82 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 2440 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The NMED residential essential nutrient SSL was approximately 5300 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 13.5 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 8700 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 14.2 mg/kg. Concentrations did not change substantially with depth (0.8 mg/kg). Concentrations decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The lateral and vertical extent of cobalt are defined.

Copper was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 11.1 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential SSL was approximately 280 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Iron was detected above the Qbt 2,3,4 BV in one sample at a concentration of 18,900 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential and industrial SSLs were approximately 2.9 times and 48 times the maximum concentration, respectively. The lateral extent of iron is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 9.28 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential SSL was approximately 170 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.06 mg/kg and 1.1 mg/kg) above BV in two samples. Because selenium was not detected above BV and the residential SSL was approximately 355 times the maximum DL, further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 27.1 mg/kg. Concentrations increased with depth but decreased laterally at locations 12-610641, 12-610646, 12-610649, and 12-610652 within SWMU 12-001(b) (Plate 3). The residential and industrial SSLs were approximately 14 times and 241 times the maximum concentration, respectively. The lateral extent of vanadium is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

No organic COPCs were identified at SWMU 12-002.

**Radionuclides**

No radionuclide COPCs were identified at SWMU 12-002.

### 6.4.5 Summary of Human Health Risk Screening

**Industrial Scenario**

No carcinogenic COPCs were identified for the industrial scenario. The HI is 0.04, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at SWMU 12-002.

**Recreational Scenario**

No carcinogenic COPCs were identified for the recreational scenario. The HI is 0.08, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at SWMU 12-002.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.9, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at SWMU 12-002. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 12-002.

### 6.4.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 12-002.

## 6.5 AOC 12-004(a)—Radiation Test Site

### 6.5.1 Site Description and Operational History

AOC 12-004(a) is the site of a lanthanum radiation experiment conducted at former TA-12 (Figure 6.5-1). The site originally consisted of a 6-ft × 6-ft × 6-ft soil-bermed radiation shelter (structure 12-8) and three vertical poles. The shelter and poles were constructed in a line parallel to a drainage channel that flows southwest from Redondo Road into Threemile Canyon. The northernmost pole has been removed and was located in a drainage 30 ft south of Redondo Road, the middle pole is located 58 ft south of the first pole location, and the radiation shelter and the third pole are located 40 ft south of the second pole (LANL 1996, 054086, pp. 5-18–5-24).

The site was constructed in March 1950, and experiments were conducted over a 3-wk period in the same year. Operations at the site consisted of deploying a lanthanum source from the radiation shelter by raising it with a wire strung over the three poles. The radiation source was stored in a lead container at the base of the first pole and could be deployed at various heights by raising it inside a guide tube attached to the pole. At an unspecified date between 1962 and 1966, the lead container and the plastic guide tube were removed (Blackwell 1962, 005011). The northernmost pole was removed in 1966 (Blackwell 1966, 005012). The shelter and two poles remain in place.

### 6.5.2 Relationship to Other SWMUs and AOCs

AOC 12-004(a) is located adjacent to AOC 12-004(b) and is approximately 1.1 miles east of the other former TA-12 SWMUs and AOCs (Plate 2).

### 6.5.3 Summary of Previous Investigations

A 1959 survey reported the shelter and pole closest to the road were contaminated with HE and strontium-90 (Blackwell 1959, 005773; LANL 1994, 034755, pp. 5-2-1–5-2-2).

A 1966 survey showed all structures were contaminated with beta- and gamma-emitting radionuclides (Blackwell 1966, 005012; LANL 1994, 034755, pp. 5-2-1–5-2-2). The structures were subsequently decontaminated and one pole was removed.

A 1993 radiation screening survey inside the shelter showed a cardboard box with beta- and gamma-emitting radionuclides at 10 times background levels. No other readings above instrument background levels were observed (LANL 1994, 034755, pp. 5-2-1–5-2-2).

In 1995, RFI activities were performed at AOC 12-004(a). Six surface soil samples were collected from six locations and analyzed for inorganic chemicals, HE, and radionuclides (LANL 1996, 054086, p. 5-20).

Data from six samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.5.4 Site Contamination

#### 6.5.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 12-004(a). As a result, the following activities were completed as part of the 2009–2010 investigation.

- A total of 31 samples were collected in 2009–2010 from 16 locations around former structure 12-8 and the experimental area and in the drainage to the south of the site. At each location, samples were collected at the surface (0.0–0.3 ft bgs to 0.0–1.0 ft bgs), and at all but one location, a subsurface sample (1.0–1.3 ft bgs to 1.0–3.0 ft bgs) was also collected. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Eight samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC 12-004(a) are shown on Figure 6.5-1. Table 6.5-1 presents the samples collected and analyses requested for AOC 12-004(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.5.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 12-004(a) consist of 31 samples (10 soil, 18 tuff, and 3 sediment) collected from 16 locations.

**Inorganic Chemicals**

A total of 31 samples (10 soil, 18 tuff, and 3 sediment) were collected at AOC 12-004(a) and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.5-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 6.5-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in three samples with a maximum concentration of 10,600 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-21 and Table G-3). Aluminum is retained as a COPC.

Antimony was detected above the sediment and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) in 1 sediment sample and 2 tuff samples with a maximum concentration of 1.36 mg/kg and had DLs (1.01 mg/kg to 1.26 mg/kg) above BVs in 8 soil samples, 1 sediment sample, and 12 tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in one sample at a concentration of 3.14 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-22 and Table G-3). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in nine samples with a maximum concentration of 214 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-23 and Table G-3). Barium is retained as a COPC.

Cadmium was not detected above the soil and sediment BVs (0.4 mg/kg for both) but had DLs (0.541 mg/kg to 0.595 mg/kg) above BVs in six soil samples and two sediment samples. The DLs were only 0.141 mg/kg to 0.195 mg/kg above the BV, below the highest background DL (2 mg/kg), and below or similar to the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or not detected above BVs in the other 23 samples (detected below BVs in 5 samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in four samples with a maximum concentration of 4600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-24 and Table G-3). Calcium is retained as a COPC.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg) in 2 soil samples, 2 sediment samples, and 16 tuff samples with a maximum concentration of 60.4 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-25 and Table G-4). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-26 and Table G-3). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in seven samples with a maximum concentration of 6.96 mg/kg. The Gehan and slippage tests indicated site concentrations of cobalt in tuff are statistically different from background (Figure G-27 and Table G-3). Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in six samples with a maximum concentration of 6.76 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-28 and Table G-3). Copper is retained as a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in two samples with a maximum concentration of 22.6 mg/kg. The Gehan test indicated site concentrations of lead in tuff are statistically different from background (Table G-3). However, the quantile and slippage tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-29 and Table G-3). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in two samples with a maximum concentration of 2170 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are statistically different from background (Figure G-30 and Table G-3). Magnesium is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in four samples with a maximum concentration of 10.1 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-31 and Table G-3). Nickel is retained as a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00078 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs (0.3 mg/kg for both) but had DLs (0.996 mg/kg to 1.26 mg/kg) above BVs in 3 sediment samples and 18 tuff samples. Selenium is retained as a COPC.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs (1.82 mg/kg, 2.22 mg/kg, and 2.4 mg/kg) in eight soil samples, two sediment samples, and two tuff samples with a maximum concentration of 7.12 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-32 and Table G-4). The Gehan and quantile tests indicated site concentrations of uranium in tuff are not statistically different from background (Figure G-33 and Table G-3). Uranium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in three samples with a maximum concentration of 21.6 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-34 and Table G-3). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 60.6 mg/kg. The Gehan and slippage tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-35 and Table G-4). Zinc is not a COPC.

**Organic Chemicals**

A total of 31 samples (10 soil, 18 tuff, and 3 sediment) were collected at AOC 12-004(a) and analyzed for explosive compounds and SVOCs. Eight samples (three soil and five tuff) were also analyzed for PCBs. Table 6.5-3 summarizes the analytical results for detected organic chemicals. Figure 6.5-3 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons (PAHs) are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

AOC 12-004(a) was identified as an AOC because of possible radioactive soil contamination resulting from radiation experiments historically conducted at the site. PAHs were not used in the radiation exposure studies conducted at this site.

AOC 12-004(a) is located in an undeveloped portion of the Laboratory. This area of the Laboratory was affected by the 2000 Cerro Grande fire with low burn severity and low fire intensity (Balice et al. 2004, 601116, pp. 33–34). Surface soil at the site has been eroded, and remnants of the fire (e.g., burned wood) are not clearly visible but may still be present in soil (Appendix I, Figure I-1). Based on the fact that PAHs were not used in the radiation experiments conducted at this site, and the fact that the site was burned during the Cerro Grande fire, the low concentrations of PAHs detected in samples used to characterize this site [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, phenanthrene, and pyrene] are associated with the fire, are not related to historic Laboratory site operations, and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at AOC 12-004(a) include benzoic acid and di-n-butylphthalate. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 31 samples (10 soil, 18 tuff, and 3 sediment) were collected at AOC 12-004(a) and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 6.5-4 summarizes radionuclides detected or detected above BVs/FVs. Figure 6.5-4 shows the spatial distribution of detected radionuclides.

Cesium-137 was detected in five tuff samples with a maximum activity of 0.248 pCi/g. Cesium-137 is retained as a COPC.

Uranium-234 was detected above the sediment BV (2.59 pCi/g) in one sample at an activity of 3.81 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the sediment and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in one sediment sample and four tuff samples with a maximum activity of 0.253 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs (2.29 pCi/g, 2.29 pCi/g, and 1.93 pCi/g) in five soil samples, two sediment samples, and one tuff sample with a maximum activity of 6.81 pCi/g. Uranium-238 is retained as a COPC.

#### 6.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 12-004(a) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC 12-004(a) include aluminum, antimony, arsenic, barium, calcium, chromium, cobalt, copper, magnesium, nickel, perchlorate, selenium, uranium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 10,600 mg/kg. Concentrations increased with depth at locations 12-610527 and 12-610529. Concentrations decreased with depth at location 12-610528 (the concentration in the shallow sample at location 12-610528 was 18,300 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The residential

SSL was approximately 7.4 times the maximum concentration (the maximum concentration was 66,300 mg/kg below the residential SSL), and the industrial SSL was approximately 119 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was detected above the sediment and Qbt 2,3,4 BVs in 1 sediment sample and 2 tuff samples with a maximum concentration of 1.36 mg/kg and had DLs (1.01 mg/kg to 1.26 mg/kg) above BVs in 8 soil, 1 sediment, and 12 tuff samples. Concentrations did not change substantially with depth at location 12-610543 (0.512 mg/kg), decreased with depth at locations 12-610542 and 12-610546, and decreased downgradient. The residential SSL was approximately 23 times the maximum concentration and 25 times the maximum DL. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in one sample at a concentration of 3.14 mg/kg. Concentrations did not change substantially with depth (0.44 mg/kg) and increased laterally, but the maximum concentration was below the two highest Qbt 2,3,4 background concentrations (5 mg/kg and 4 mg/kg). The industrial SSL was approximately 6.8 times the maximum concentration above the BV. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 2,3,4 BV in nine samples with a maximum concentration of 214 mg/kg. Concentrations did not change substantially with depth at locations 12-610528 and 12-610529 (3 mg/kg for both); the concentrations in the shallow samples at locations 12-610528 and 12-610529 were 211 mg/kg and 166 mg/kg, respectively, and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at locations 12-610527, 12-610530, 12-610540, 12-610541, 12-610543, and 12-610544 (the concentrations in the shallow samples at locations 12-610530, 12-610540, 12-610541, and 12-610543 were 115 mg/kg, 73.3 mg/kg, 99.3 mg/kg, and 118 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally from location 12-610539 to location 12-610529 and decreased downgradient to the southwest. The residential SSL was approximately 92 times the maximum concentration at location 12-610529. The vertical extent of barium is defined, and further sampling for lateral extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 4600 mg/kg. Concentrations increased with depth at locations 12-610528 and 12-610529. Concentrations decreased with depth at locations 12-610543 (the concentration in the shallow sample at location 12-610543 was 5100 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and 12-610544. Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The NMED residential essential nutrient SSL was approximately 2800 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs in 2 soil samples, 2 sediment samples, and 16 tuff samples with a maximum concentration of 60.4 mg/kg. Concentrations increased with depth at locations 12-610539, 12-610540, 12-610543, 12-610547, 12-610548, and 12-610549. However, concentrations at locations 12-610547 and 12-610548 were below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Concentrations did not change substantially with depth at locations 12-610527 and 12-610530 (0.6 mg/kg and 0.1 mg/kg, respectively); the concentration in the shallow sample at location 12-610530 was 10.4 mg/kg and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at locations 12-610528, 12-610529, 12-610541, 12-610542, 12-610544, and 12-610546 (the concentration in the shallow sample at location 12-610529 was 9.32 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally from location 12-610539 to location 12-610529 and decreased downgradient to the southwest. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 1940 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 6.96 mg/kg. Concentrations decreased with depth at locations 12-610528, 12-610529, and 12-610542 (the concentrations in the shallow samples at locations 12-610528 and 12-610529 were 6.21 mg/kg and 8.12 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially with depth at locations 12-610530, 12-610527, and 12-610540 (1.6 mg/kg, 0.66 mg/kg, and 0.25 mg/kg, respectively); the concentrations in the shallow samples at locations 12-610530 and 12-610540 were 4.22 mg/kg and 3.96 mg/kg and below the soil BV (Appendix E, Pivot Tables). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The residential and industrial SSLs were approximately 3.3 times and 50 times the maximum concentration, respectively. Further sampling for extent of cobalt is not warranted.

Copper was detected above the Qbt 2,3,4 BV in six samples with a maximum concentration of 6.76 mg/kg. Concentrations decreased or did not change substantially with depth at all locations (the concentrations in the shallow samples at locations 12-610528, 12-610529, 12-610543, and 12-610548 were 8.83 mg/kg, 7.4 mg/kg, 8.69 mg/kg, and 4.46 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The residential SSL was approximately 460 times the maximum concentration. The vertical extent of copper is defined, and further sampling for lateral extent is not warranted.

Magnesium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 2170 mg/kg. Concentrations did not change substantially with depth at location 12-610529 (60 mg/kg) and decreased with depth at location 12-610528 (the concentrations in the shallow samples at locations 12-610528 and 12-610529 were 2570 mg/kg and 2110 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The NMED residential essential nutrient SSL was approximately 156 times the maximum concentration. The vertical extent of magnesium is defined, and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 10.1 mg/kg. Concentrations did not change substantially with depth at locations 12-610529, 12-610541, and 12-610543 (0.41 mg/kg, 1.68 mg/kg, and 1.18 mg/kg, respectively); the concentrations in the shallow samples at locations 12-610529, 12-610541, and 12-610543 were 9.69 mg/kg, 8.69 mg/kg, and 7.16 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased with depth at location 12-510628 (the concentration in the shallow sample at location 12-610528 was 12 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The residential SSL was approximately 154 times the maximum concentration. The vertical extent of nickel is defined, and further sampling for lateral extent is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00078 mg/kg. Concentrations increased with depth and increased laterally at location 12-610529. Concentrations decreased with depth at location 12-610541 and decreased downgradient to the southwest. Both detected concentrations were less than EDLs. The residential SSL was approximately 70,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (0.996 mg/kg to 1.26 mg/kg) above BVs in 3 sediment samples and 18 tuff samples. Because selenium was not detected above the BVs and the residential SSL was approximately 310 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs in eight soil samples, two sediment samples, and two tuff samples with a maximum concentration of 7.12 mg/kg. Concentrations increased with depth at location 12-610540, and only one depth was sampled at location 12-610550. Concentrations decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 33 times the maximum concentration. The lateral extent of uranium is defined, and further sampling for vertical extent is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 21.6 mg/kg. Concentrations decreased with depth at locations 12-610527, 12-610528, and 12-610529 (the concentrations in the shallow samples at locations 12-610528 and 12-610529 were 30.3 mg/kg and 25 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally at location 12-610529 but decreased downgradient to the southwest. The residential and industrial SSLs were approximately 18 times and 300 times the maximum concentration, respectively. The vertical extent of vanadium is defined, and further sampling for lateral extent is not warranted.

**Organic Chemicals**

Organic COPCs at AOC 12-004(a) include benzoic acid and di-n-butylphthalate.

Benzoic acid was detected in one sample at a concentration of 0.608 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of benzoic acid are defined.

Di-n-butylphthalate was detected in one sample at a concentration of 0.121 mg/kg. Concentrations increased with depth, but the concentration was below the EQL. Concentrations decreased downgradient. The residential SSL was approximately 51,000 times the concentration. The lateral extent of di-n-butylphthalate is defined, and further sampling for vertical extent is not warranted.

**Radionuclides**

Radionuclide COPCs at AOC 12-004(a) include cesium-137, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected in five tuff samples with a maximum activity of 0.248 pCi/g. Activities decreased with depth at all locations (the activities in the shallow samples at locations 12-610540, 12-610543, 12-610547, and 12-610549 were 0.438 pCi/g, 0.971 pCi/g, 0.483 pCi/g, and 0.35 pCi/g, respectively, and below the soil and sediment FVs [Appendix E, Pivot Tables]). Activities decreased downgradient. The lateral and vertical extent of cesium-137 are defined.

Uranium-234 was detected above the sediment BV in one sample at an activity of 3.81 pCi/g. Only one depth was sampled at location 12-610550, which was the most downgradient location. The residential SAL was approximately 77 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Uranium-235/236 was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and four tuff samples with a maximum activity of 0.253 pCi/g. Only one depth was sampled at location 12-610550. Activities did not change substantially with depth at the other locations (0.016 pCi/g to 0.054 pCi/g); the activities in the shallow samples at locations 12-610545, 12-610547, 12-610548, and

12-610549 were 0.0918 pCi/g, 0.159 pCi/g, 0.161 pCi/g, and 0.0819 pCi/g, respectively, and below the soil and sediment BVs (Appendix E, Pivot Tables). The residential SAL was approximately 166 times the maximum activity. Further sampling for extent of uranium-235/236 is not warranted.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs in five soil samples, two sediment samples, and one tuff sample with a maximum activity of 6.81 pCi/g. Only one depth was sampled at location 12-610550. Activities did not change substantially with depth at location 12-610548 (1.44 pCi/g) and decreased with depth at locations 12-610539, 12-610540, 12-610543, 12-610546, and 12-610547. The residential and industrial SALs were approximately 22 times and 104 times the maximum activity, respectively. Further sampling for extent of uranium-238 is not warranted.

### 6.5.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $5 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.4 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $7 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC 12-004(a).

### 6.5.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 12-004(a).

## 6.6 AOC 12-004(b)—Pipe

### 6.6.1 Site Description and Operational History

AOC 12-004(b) consists of a former aluminum pipe located at former TA-12 at the edge of Redondo Road approximately 78 ft north of a radiation shelter (structure 12-8) (Figure 6.5-1). The pipe was set vertically in the ground and protruded 8 in. aboveground without a cover. The pipe was 7.5 in. thick in diameter and 3 ft long with an inner diameter of 18 in. The pipe was filled with soil. Remnant fragments of HE were observed at the site in 1959 (Blackwell 1959, 005773). The pipe was removed during the 2009–2010 investigation.

### 6.6.2 Relationship to Other SWMUs and AOCs

AOC 12-004(b) is located adjacent to AOC 12-004(a) and is approximately 1.1 miles east of the other TA-12 SWMUs and AOCs (Plate 2).

### 6.6.3 Summary of Previous Investigations

A 1993 radiation survey was conducted, and no radionuclides were detected above background levels (LANL 1994, 034755, p. 5-2-2).

In 1995, RFI activities were performed at AOC 12-004(b). Two samples were collected from one location next to the aluminum pipe and analyzed for inorganic chemicals, SVOCs, HE, and radionuclides (LANL 1996, 054086, p. 5-25).

Data from two samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.6.4 Site Contamination

#### 6.6.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 12-004(b). As a result, the following activities were completed as part of the 2009−2010 investigation.

- Twelve samples were collected in 2009–2010 from four locations adjacent to the pipe. At each location, samples were collected at the surface (0.0–0.5 ft bgs to 0.0–1.0 ft bgs) and from two subsurface intervals (2.0–2.3 ft bgs to 2.0–3.0 ft bgs and 5.0–5.4 ft bgs to 5.0–6.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Six samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC 12-004(b) are shown on Figure 6.5-1. Table 6.6-1 presents the samples collected and analyses requested for AOC 12-004(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.6.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.6.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 12-004(b) consist of 12 samples (4 soil and 8 tuff) collected from four locations.

### Inorganic Chemicals

A total of 12 samples (4 soil and 8 tuff) were collected at AOC 12-004(b) and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.6-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 6.5-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in three samples with a maximum concentration of 15,200 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-36 and Table G-5). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.939 mg/kg to 1.05 mg/kg) above BVs in two soil samples and three tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in three samples with a maximum concentration of 3.8 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-37 and Table G-5). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in five samples with a maximum concentration of 406 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-38 and Table G-5). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in one sample at a concentration of 1.6 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure G-39 and Table G-5). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had a DL (0.543 mg/kg) above BV in one sample. The DL was only 0.143 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or not detected above BVs in the other 11 samples (detected below BVs in 6 samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in five samples with a maximum concentration of 5490 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-40 and Table G-5). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in seven samples with a maximum concentration of 21.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-41 and Table G-5). Chromium is retained as a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in one soil sample and seven tuff samples with a maximum concentration of 9.62 mg/kg. The Gehan and slippage tests indicated site concentrations of cobalt in tuff are statistically different from background (Figure G-42 and Table G-5). Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in five samples with a maximum concentration of 18 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-43 and Table G-5). Copper is retained as a COPC.

Cyanide was not detected above the soil and Qbt 2,3,4 BVs (0.5 mg/kg for both) but had DLs (0.52 mg/kg to 0.6 mg/kg) above BVs in two soil samples and four tuff samples. The DLs were only 0.02 mg/kg to 0.1 mg/kg above the BVs, and cyanide was not detected in any sample (six samples had DLs below BVs). Cyanide is not a COPC.

Iron was detected above the soil BV (21,500 mg/kg) in one sample at a concentration of 21,700 mg/kg. The concentration was only 200 mg/kg above the BV and below the five highest soil background concentrations (36,000 mg/kg, 27,000 mg/kg, 25,000 mg/kg, 24,000 mg/kg, and 22,000 mg/kg). Iron was detected below BVs in the other 11 samples. Iron is not a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in two soil samples and three tuff samples with a maximum concentration of 23.4 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are statistically different from background (Figure G-44 and Table G-5). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in three samples with a maximum concentration of 3230 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are statistically different from background (Figure G-45 and Table G-5). Magnesium is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in four samples with a maximum concentration of 13.9 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-46 and Table G-5). Nickel is retained as a COPC.

Perchlorate was detected in one sample at a concentration of 0.000832 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in four samples with a maximum concentration of 1.3 mg/kg and had DLs (1.01 mg/kg to 1.09 mg/kg) above the BV in four samples. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum concentration of 5.8 mg/kg. Uranium is retained as a COPC.

Vanadium was detected above the soil and Qbt 2,3,4 BVs (39.6 mg/kg and 17 mg/kg) in one soil sample and four tuff samples with a maximum concentration of 47.5 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-47 and Table G-5). Vanadium is retained as a COPC.

**Organic Chemicals**

A total of 12 samples (4 soil and 8 tuff) were collected at AOC 12-004(b) and analyzed for explosive compounds and SVOCs. Six samples (two soil and four tuff) were also analyzed for PCBs. Table 6.6-3 summarizes the analytical results for detected organic chemicals. Figure 6.5-3 shows the spatial distribution of detected organic chemicals.

#### *Polycyclic Aromatic Hydrocarbons*

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

#### *Site Activities*

AOC 12-004(b) was identified as an AOC because of possible radioactive soil contamination. PAHs were not used at this site.

AOC 12-004(b) is located in an undeveloped portion of the Laboratory. This area of the Laboratory was affected by the 2000 Cerro Grande fire with low burn severity and low fire intensity (Balice et al. 2004, 601116, pp. 33–34). Surface soil at and adjacent to the site has been eroded, and remnants of the fire (e.g., burned wood) are not clearly visible but may still be present in soil (Appendix I, Figure I-1). Based on the fact that PAHs were not used at this site, and the fact that the site was burned during the Cerro Grande fire, the low concentrations of PAHs detected in samples used to characterize this site [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and indeno(1,2,3-cd)pyrene] are associated with the fire, are not related to historic Laboratory site operations, and are not COPCs.

#### *Organic COPCs*

Other organic chemicals detected at AOC 12-004(b) include Aroclor-1254 and Aroclor-1260. The detected organic chemicals listed are retained as COPCs.

### Radionuclides

A total of 12 samples (4 soil and 8 tuff) were collected at AOC 12-004(b) and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 6.6-4 summarizes radionuclides detected or detected above BVs/FVs. Figure 6.5-4 shows the spatial distribution of detected radionuclides.

Plutonium-238 was detected above the soil FV (0.023 pCi/g) in one sample at an activity of 0.043 pCi/g. The activity was only 0.02 pCi/g above the FV and 0.006 pCi/g above the maximum soil background activity, and plutonium-238 was not detected in the other 11 samples. Plutonium-238 is not a COPC.

#### 6.6.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC 12-004(b) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC 12-004(b) include aluminum, antimony, arsenic, barium, calcium, chromium, cobalt, copper, lead, magnesium, nickel, perchlorate, selenium, uranium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 15,200 mg/kg. Concentrations decreased with depth in the two deepest samples at location 12-610939 and at location 12-610553. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The lateral and vertical extent of aluminum are defined.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.939 mg/kg to 1.05 mg/kg) above BVs in two soil samples and three tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 30 times the maximum DL, further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3.8 mg/kg. Concentrations did not change substantially with depth (0.3 mg/kg) in the two deeper samples at location 12-610939 and decreased with depth at location 12-611940. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The lateral and vertical extent of arsenic are defined.

Barium was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 406 mg/kg. Concentrations decreased with depth at all locations. Concentrations decreased downgradient of the maximum concentration at location 12-610554. The lateral and vertical extent of barium are defined.

Calcium was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 5490 mg/kg. Concentrations increased with depth at location 12-611939 and decreased with depth at the other three locations. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The NMED residential essential nutrient SSL was approximately 2400 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 21.3 mg/kg. Concentrations increased with depth at location 12-611939, did not change substantially with depth (0.5 mg/kg) at location 12-611940, and decreased with depth at locations 12-610553 and 12-610554. Concentrations decreased downgradient of the maximum concentration at location 12-610553. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 5500 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in one soil sample and seven tuff samples with a maximum concentration of 9.62 mg/kg. Concentrations decreased with depth at all locations. Concentrations decreased downgradient of the maximum concentration at location 12-610553. The lateral and vertical extent of cobalt are defined.

Copper was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 18 mg/kg. Concentrations increased with depth at location 12-611939, did not change substantially with depth (1 mg/kg) in the two deeper samples at location 12-611940, and decreased with depth at locations 12-610553 and 12-610554. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The residential SSL was approximately 170 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 23.4 mg/kg. Concentrations decreased with depth at locations 12-610553 and 12-611939 where lead was detected above BV. Concentrations did not change substantially (0.4 mg/kg) laterally at locations 12-610553 and 12-611939 and decreased downgradient of these locations. The lateral and vertical extent of lead are defined.

Magnesium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3230 mg/kg. Concentrations increased with depth at location 12-611939 and decreased with depth at location 12-610553. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The NMED residential essential nutrient SSL was approximately 105 times the maximum concentration. The lateral extent of magnesium is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 13.9 mg/kg. Concentrations increased with depth at location 12-611939 and did not change substantially with depth (1.0 mg/kg) in the deeper two samples at location 12-611940. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The residential SSL is approximately 110 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in one sample at a concentration of 0.000832 mg/kg, which is below the EQL. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of perchlorate are defined.

Selenium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 1.3 mg/kg and had DLs (1.01 mg/kg to 1.09 mg/kg) in four samples. Concentrations increased with depth at location 12-611940 and did not change substantially with depth (0.2 mg/kg) in the deeper two samples at location 12-611939. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The residential SSL was approximately 300 times the maximum concentration and 360 times the maximum DL. The lateral extent of selenium is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil BV in two samples with a maximum concentration of 5.8 mg/kg. Concentrations decreased with depth at locations 12-610553 and 12-611939 where uranium was detected above BV. Concentrations decreased downgradient of location 12-611939 (where the maximum concentration was detected) at location 12-610528 at AOC 12-004(a) (Figure 6.5-2). The lateral and vertical extent of uranium are defined.

Vanadium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 47.5 mg/kg. Concentrations decreased with depth at locations 12-610553, 12-611939, and 12-611940 and decreased downgradient of location 12-610553 where the maximum concentration was detected. The lateral and vertical extent of vanadium are defined.

**Organic Chemicals**

Organic COPCs at AOC 12-004(b) include Aroclor-1254 and Aroclor-1260.

Aroclor-1254 was detected in one sample at a concentration of 0.015 mg/kg. The concentration was below the EQL. Concentrations decreased with depth, and Aroclor-1254 was not detected downgradient at location 12-610528 at AOC 12-004(a) (Figure 6.5-3). The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in one sample at a concentration of 0.011 mg/kg. The concentration was below the EQL. Concentrations increased with depth, and Aroclor-1260 was not detected downgradient at location 12-610528 at AOC 12-004(a) (Figure 6.5-3). The residential SSL was approximately 220 times the concentration. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

***Radionuclides***

There were no radionuclide COPCs at AOC 12-004(b).

### 6.6.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $1 \times 10^{-8}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.07, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC 12-004(b).

### 6.6.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 12-004(b).

## 6.7 AOC C-12-001—Potential Soil Contamination Associated with Former Building 12-1

### 6.7.1 Site Description and Operational History

AOC C-12-001 is an area of potential soil contamination at former TA-12 associated with the former trim building (12-1) (Plate 6). The trim building was built in December 1944 and used to prepare HE for detonation experiments. The building was 16 ft long × 16 ft wide × 9 ft high and of wood-frame construction with a soil berm on three sides and on top. Activities at former TA-12 ceased in 1953, and building 12-1 was destroyed in 1960 by intentional burning. Concrete blocks and metal radiators were observed at the site in 1992 but have since been removed (LANL 1994, 034755).

### 6.7.2 Relationship to Other SWMUs and AOCs

AOC C-12-001 is located approximately 600 ft west of the SWMU 12-001(a) firing pit (Plate 2) and 100 ft southeast of AOC C-12-002 and 130 ft southeast of AOC C-12-004. AOC C-12-003 is approximately 200 ft to the northwest of AOC C-12-001 but is on the other side of Redondo Road.

### 6.7.3 Summary of Previous Investigations

A 1959 inspection reported that building 12-1 was contaminated with HE (Blackwell 1959, 005773).

In 1995, RFI activities were performed at AOC C-12-001. One sample was collected from one location and analyzed for inorganic chemicals and radionuclides (LANL 1996, 054086, pp. 5-1–5-5).

Data from the sample collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.7.4 Site Contamination

#### 6.7.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC C-12-001. As a result, the following activities were completed as part of the 2009−2010 investigation.

- Ten samples were collected in 2009–2010 from five locations within the footprint and around former building 12-1. At each location, a sample was collected at the surface (0.0–0.5 ft bgs or 0.0–1.0 ft bgs) and from the subsurface (2.0–3.0 ft bgs to 2.4–3.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Four samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC C-12-001 are shown on Plate 6. Table 6.7-1 presents the samples collected and analyses requested for AOC C-12-001. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.7.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.7.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-12-001 consist of 10 samples (5 soil and 5 tuff) collected from 5 locations.

**Inorganic Chemicals**

Ten samples (5 soil and 5 tuff) were collected at AOC C-12-001 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.7-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in four samples with a maximum concentration of 10,800 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.04 mg/kg to 1.25 mg/kg) above BVs in five soil samples and four tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in five samples with a maximum concentration of 161 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.548 mg/kg to 0.627 mg/kg) above BVs in five samples. The DLs were only 0.148 mg/kg to 0.227 mg/kg above the BV, below the highest background DL (2 mg/kg), and below or similar to the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected in the other five samples. Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in three samples with a maximum concentration of 4530 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in three samples with a maximum concentration of 27 mg/kg. Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 3.67 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in one sample at a concentration of 5.36 mg/kg. The detected concentration was only 0.7 mg/kg above the BV and was below the two highest Qbt 2,3,4 background concentrations (6.2 mg/kg and 5.7 mg/kg). Copper was detected below BV in the other nine samples. Copper is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in three samples with a maximum concentration of 2100 mg/kg. The maximum concentration was only 410 mg/kg above the BV and was below the two highest Qbt 2,3,4 background concentrations (2820 mg/kg and 2720 mg/kg). Magnesium was detected below BV in the other seven samples. Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in two samples with a maximum concentration of 9.26 mg/kg. Nickel is retained as a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00241 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.03 mg/kg to 1.09 mg/kg) above BV in five samples. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum concentration of 4.07 mg/kg. Uranium is retained as a COPC.

**Organic Chemicals**

Ten samples (5 soil and 5 tuff) were collected at AOC C-12-001 and analyzed for explosive compounds. Four samples (2 soil and 2 tuff) were also analyzed for PCBs. Table 6.7-3 summarizes the analytical results for detected organic chemicals. Plate 8 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC C-12-001 include Aroclor-1242, Aroclor-1254, and Aroclor-1260. The detected organic chemicals are retained as COPCs.

**Radionuclides**

Ten samples (5 soil and 5 tuff) were collected at AOC C-12-001 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-12-001.

#### 6.7.4.4 Nature and Extent of Soil and Rock Contamination

The nature and extent of inorganic and organic COPCs at AOC C-12-001 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-12-001 include aluminum, antimony, barium, calcium, chromium, cobalt, nickel, perchlorate, selenium, and uranium.

Aluminum was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 10,800 mg/kg. Concentrations increased with depth at locations 12-610627 and 12-610628, did not change substantially with depth (60 mg/kg) at location 12-610626, and decreased with depth at location 12-610625 (the concentrations in the shallow samples at locations 12-610625 and 12-610626 were 9590 mg/kg and 8280 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased downgradient at location 12-610628. The residential SSL was approximately 7.2 times the maximum concentration (the maximum concentration was 67,200 mg/kg below the residential SSL), and the industrial SSL was approximately 117 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.04 mg/kg to 1.25 mg/kg) above BVs in five soil samples and four tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 25 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 161 mg/kg. Concentrations increased with depth at locations 12-610627 and 12-610628, did not change substantially with depth (3 mg/kg) at location 12-610625, and decreased with depth at locations 12-610624 and 12-610626 (the concentrations in the shallow samples at locations 12-610624, 12-610625, and 12-610626 were 126 mg/kg, 135 mg/kg, and 107 mg/kg, respectively, and below the soil

BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610628. The residential SSL was approximately 97 times the maximum concentration. Further sampling for extent of barium is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 4530 mg/kg. Concentrations increased with depth at locations 12-610625, 12-610627, and 12-610628. Concentrations decreased downgradient at location 12-610628. The NMED residential essential nutrient SSL was approximately 2900 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 27 mg/kg. Concentrations increased with depth at locations 12-610624 and 12-610625 and decreased with depth at location 12-610628 (the concentration in the shallow sample at location 12-610628 was 9.7 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610628. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 4300 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3.67 mg/kg. Concentrations decreased with depth at locations 12-610624, 12-610626, and 12-610628 (the concentrations in the shallow samples at locations 12-610624, 12-610626, and 12-610628 were 4.74 mg/kg, 5.2 mg/kg, and 6.26 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially (0.51 mg/kg) downgradient. The residential and industrial SSLs were approximately 6.2 times and 95 times the maximum concentration, respectively. Further sampling for extent of cobalt is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 9.26 mg/kg. Concentrations increased with depth at location 12-610628 and decreased with depth at location 12-610625 (the concentration in the shallow sample at location 12-610625 was 9.28 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased downgradient at location 12-610628. The residential SSL was approximately 168 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00241 mg/kg. Concentrations increased with depth at locations 12-610625 and 12-610627 and decreased downgradient at location 12-610628. The residential SSL was approximately 23,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.03 mg/kg to 1.09 mg/kg) above BV in five samples. Because selenium was not detected above BVs and the residential SSL was approximately 360 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil BV in two samples with a maximum concentration of 4.07 mg/kg. Concentrations decreased with depth at locations 12-610625 and12-610628 and decreased downgradient at location 12-610628. The residential SSL was approximately 57 times the maximum concentration. The lateral and vertical extent of uranium are defined.

**Organic Chemicals**

Organic COPCs at AOC C-12-001 include Aroclor-1242, Aroclor-1254, and Aroclor-1260.

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were each detected in one sample at concentrations of 0.114 mg/kg, 0.109 mg/kg, and 0.0477 mg/kg, respectively. Concentrations decreased with depth and increased downgradient at location 12-610628. The residential SSLs for Aroclor-1242, Aroclor-1254, and Aroclor-1260 are approximately 21 times, 11 times, and 51 times the concentrations, respectively. The vertical extent of Aroclor-1242, Aroclor-1254, and Aroclor-1260 is defined, and further sampling for lateral extent is not warranted.

**Radionuclides**

There were no radionuclide COPCs at AOC C-12-001.

### 6.7.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-001.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-001. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC C-12-001.

### 6.7.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-12-001.

## 6.8 AOC C-12-002—Potential Soil Contamination Associated with Former Building 12-2

### 6.8.1 Site Description and Operational History

AOC C-12-002 is an area of potential soil contamination at former TA-12 associated with former control building 12-2 (Plate 6). Built in 1945 of wood-frame construction, the building measured 8 ft long × 8 ft wide × 8 ft high, with a soil berm on three sides and on top. The structure was located south of Redondo Road. Activities at former TA-12 ceased in the early 1950s, and the control building was destroyed in 1960 by intentional burning.

### 6.8.2 Relationship to Other SWMUs and AOCs

AOC C-12-002 is located approximately 600 ft west of the SWMU 12-001(a) firing pit (Plate 2) and 100 ft northwest of AOC C-12-001 and 30 ft southeast of AOC C-12-004. AOC C-12-003 is approximately 150 ft to the north of AOC C-12-002 but is on the other side of Redondo Road.

### 6.8.3 Summary of Previous Investigations

A 1959 inspection reported that building 12-2 was contaminated with HE (Blackwell 1959, 005773).

In 1995, RFI activities were performed at AOC C-12-002. One sample was collected from one location and analyzed for total uranium (LANL 1996, 054086, pp. 5-5–5-8).

Data from the sample collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.8.4 Site Contamination

#### 6.8.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC C-12-002. As a result, the following activities were completed as part of the 2009−2010 investigation.

- Ten samples were collected in 2009–2010 from five locations within the footprint and around former building 12-2. At each location, a sample was collected at the surface (0.0–0.5 ft bgs or 0.0–0.75 ft bgs) and from the subsurface (2.0–2.75 ft bgs or 2.0–3.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, PCBs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

The 2009–2010 sampling locations at AOC C-12-002 are shown on Plate 6. Table 6.8-1 presents the samples collected and analyses requested for AOC C-12-002. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.8.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-12-002 consist of 10 samples (8 soil and 2 tuff) collected from 5 locations.

**Inorganic Chemicals**

Ten samples (8 soil and 2 tuff) were collected at AOC C-12-002 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.8-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in two samples with a maximum concentration of 11,300 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.03 mg/kg to 1.11 mg/kg) above BVs in eight soil samples and two tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two samples with a maximum concentration of 275 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.514 mg/kg to 0.554 mg/kg) above BV in six samples. The DLs were only 0.114 mg/kg to 0.154 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or not detected above BVs in the other four samples (detected below BVs in two samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in one sample at a concentration of 2710 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 23 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-48 and Table G-6). Chromium is retained as a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 12.1 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-49 and Table G-6). The concentrations of cobalt above the Qbt 2,3,4 BV were above the maximum Qbt 2,3,4 background concentration. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in two samples with a maximum concentration of 7.21 mg/kg. Copper is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in two samples with a maximum concentration of 2310 mg/kg. The maximum concentration is only 620 mg/kg above the BV and was below the two highest Qbt 2,3,4 background concentrations (2820 mg/kg and 2720 mg/kg). Magnesium was detected below BVs in the other eight samples. Magnesium is not a COPC.

Manganese was detected above the soil BV (671 mg/kg) in one sample at a concentration of 1070 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-50 and Table G-6). Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 7.88 mg/kg. Nickel is retained as a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00164 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.08 mg/kg and 1.09 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum concentration of 3.13 mg/kg. The Gehan test indicated concentrations of uranium in soil are statistically different from background (Table G-6). However, the quantile and slippage tests indicated site concentrations of uranium in soil are not statistically different from background (Figure G-51 and Table G-6). Uranium is not a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in two samples with a maximum concentration of 21.5 mg/kg. Vanadium is retained as a COPC.

**Organic Chemicals**

Ten samples (8 soil and 2 tuff) were collected at AOC C-12-002 and analyzed for explosive compounds and PCBs.

No organic chemicals were detected at AOC C-12-002.

**Radionuclides**

Ten samples (8 soil and 2 tuff) were collected at AOC C-12-002 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-12-002.

#### 6.8.4.4 Nature and Extent of Contamination

The nature and extent of inorganic COPCs at AOC C-12-002 is discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-12-002 include aluminum, antimony, barium, calcium, chromium, cobalt, copper, nickel, perchlorate, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 11,300 mg/kg. Concentrations increased with depth at locations 12-610631 and 12-610632 and increased downgradient at location 12-610632. The residential SSL was approximately 6.9 times the maximum concentration (the maximum concentration was 66,700 mg/kg below the residential SSL), and the industrial SSL was approximately 106 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.03 mg/kg to 1.11 mg/kg) above BVs in eight soil samples and two tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 28 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 275 mg/kg. Concentrations did not change substantially with depth (20 mg/kg) at location 12-610631 and decreased with depth at location 12-610632 (the concentrations in the shallow samples at locations 12-610631 and 12-610632 were 236 mg/kg and 255 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610631. The residential SSL was approximately 45 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 2710 mg/kg. Concentrations increased with depth and decreased downgradient at location 12-610631. The NMED residential essential nutrient SSL was approximately 4800 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and two tuff samples with a maximum concentration of 23 mg/kg. Concentrations increased with depth at locations 12-610631 and 12-610633 and decreased with depth at location 12-610632 (the concentration in the shallow sample at location 12-610632 was 9.8 mg/kg and below the soil BV [Appendix E, Pivot Tables]). The concentration at location 12-610631 was below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Concentrations decreased downgradient at location 12-610631. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 5100 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in one soil sample and two tuff samples with a maximum concentration of 12.1 mg/kg. Concentrations increased with depth at location 12-610632, did not change substantially with depth (0.62 mg/kg) at location 12-610631 (the concentrations in the shallow samples at location 12-610631 were 4.66 mg/kg and 5.06 mg/kg and below the soil BV [Appendix E, Pivot Tables]), and decreased with depth at location 12-610633. Concentrations decreased downgradient at location 12-610631. The residential and industrial SSLs were approximately 1.9 times and 29 times the maximum concentration, respectively. The lateral extent of cobalt is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 7.21 mg/kg. Concentrations did not change substantially with depth (0.1 mg/kg) at location 12-610632 and decreased with depth at location 12-610631 (the concentrations in the shallow samples at locations 12-610631 and 12-610632 were 8.7 mg/kg and 7.11 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610631. The residential SSL was approximately 430 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 7.88 mg/kg. Concentrations increased with depth and decreased downgradient at location 12-610631. The residential SSL was approximately 200 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00164 mg/kg. Concentrations increased with depth, were below EDLs, and decreased downgradient at location 12-610631. The residential SSL was approximately 33,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.08 mg/kg and 1.09 mg/kg) above the BV in two samples. Because selenium was not detected above BVs and the residential SSL was approximately 359 times the maximum DL, further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 21.5 mg/kg. Concentrations decreased with depth at locations 12-610631 and 12-610632 (the concentrations in the shallow samples at locations 12-610631 and 12-610632 were 26.9 mg/kg and 27.8 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610631. The lateral and vertical extent of vanadium are defined.

**Organic Chemicals**

There were no organic COPCs at AOC C-12-002.

**Radionuclides**

There were no radionuclide COPCs at AOC C-12-002.

### 6.8.5 Summary of Human Health Risk Screening

**Industrial Scenario**

No carcinogenic COPCs were identified for the industrial scenario. The HI is 0.04, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-002.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-002. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC C-12-002.

### 6.8.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-12-002.

## 6.9 AOC C-12-003—Potential Soil Contamination Associated with Former Building 12-3

### 6.9.1 Site Description and Operational History

AOC C-12-003 is an area of potential soil contamination associated with a former HE-storage magazine (building 12-3) at former TA-12 (Plate 6). The magazine, built in 1944 of wood-frame construction, was 6 ft long × 6 ft wide × 7 ft high, with a soil berm on three sides and on top. The building was located north of Redondo Road. Activities at former TA-12 ceased in the early 1950s, and building 12-3 was destroyed by intentional burning in 1960.

### 6.9.2 Relationship to Other SWMUs and AOCs

AOC C-12-003 is located approximately 600 ft west of the SWMU 12-001(a) firing pit (Plate 2) and is approximately 200 ft north of AOC C-12-001, 150 ft north of AOC C-12-002, and 130 ft north of AOC C-12-004 and on the other side of Redondo Road from these three AOCs.

### 6.9.3 Summary of Previous Investigations

A 1959 inspection reported that building 12-3 was contaminated with HE (Blackwell 1959, 005773).

No sampling was conducted at this AOC before 2009.

### 6.9.4 Site Contamination

#### 6.9.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at AOC C-12-003. As a result, the following activities were completed as part of the 2009–2010 investigation.

- Ten samples were collected in 2009–2010 from five locations within the footprint and around former building 12-3. At each location, a sample was collected at the surface (0.0–0.5 ft bgs or 0.0–0.6 ft bgs) and from the subsurface (1.9–2.5 ft bgs to 2.5–3.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. In addition, four samples were analyzed for PCBs.

The 2009–2010 sampling locations at AOC C-12-003 are shown on Plate 6. Table 6.9-1 presents the samples collected and analyses requested for AOC C-12-003. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.9.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.9.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-12-003 consist of 10 samples (6 soil and 4 tuff) collected from 5 locations.

**Inorganic Chemicals**

Ten samples (6 soil and 4 tuff) were collected at AOC C-12-003 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.9-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in one sample at a concentration of 2.74 mg/kg and had DLs (1.02 mg/kg to 2.61 mg/kg) above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) in five soil samples and four tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in three samples with a maximum concentration of 111 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.523 mg/kg to 0.555 mg/kg) above BV in six samples. The DLs were only 0.123 mg/kg to 0.155 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected in the other four samples. Cadmium is not a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in two soil samples and two tuff samples with a maximum concentration of 104 mg/kg. Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in one sample at a concentration of 3.44 mg/kg. Cobalt is retained as a COPC.

Perchlorate was detected in one sample at a concentration of 0.0019 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.997 mg/kg to 1.1 mg/kg) above BV in four samples. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in one sample at a concentration of 2.35 mg/kg. The concentration was only 0.53 mg/kg above the BV and was below the two highest soil background concentrations (2.4 mg/kg and 3.6 mg/kg). Uranium was detected below BVs in the other nine samples. Uranium is not a COPC.

**Organic Chemicals**

Ten samples (6 soil and 4 tuff) were collected at AOC C-12-003 and analyzed for explosive compounds. Three soil samples and one tuff sample were also analyzed for PCBs.

No organic chemicals were detected at AOC C-12-003.

**Radionuclides**

Ten samples (6 soil and 4 tuff) were collected at AOC C-12-003 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-12-003.

#### 6.9.4.4 Nature and Extent of Contamination

The nature and extent of inorganic COPCs at AOC C-12-003 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-12-003 include antimony, barium, chromium, cobalt, perchlorate, and selenium.

Antimony was detected above the soil BV in one sample at a concentration of 2.74 mg/kg and had DLs (1.02 mg/kg to 2.61 mg/kg) above the soil and Qbt 2,3,4 BVs in five soil samples and four tuff samples. Concentrations increased with depth at location 12-610634 and decreased downgradient. The residential SSL was approximately 11 times the detected concentration and 12 times the maximum DL. The industrial SSL was approximately 189 times the detected concentration and 199 times the maximum DL. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Barium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 111 mg/kg. Concentrations decreased with depth at locations 12-610635, 12-610636, and 12-610638 (the concentrations in the shallow samples at locations 12-610635, 12-610636, and 12-610638 were 106 mg/kg, 94.3 mg/kg, and 122 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased downgradient at location 12-610635. The residential SSL was approximately 140 times the maximum concentration. The vertical extent of barium is defined, and further sampling for lateral extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and two tuff samples with a maximum concentration of 104 mg/kg. Concentrations increased with depth at locations 12-610637 and 12-610638 and decreased with depth at locations 12-610635 and 12-610636. Concentrations increased downgradient at location 12-610635. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 1100 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in one sample at a concentration of 3.44 mg/kg. Concentrations decreased with depth (the concentration in the shallow sample at location 12-610638 was 5.16 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient at location 12-610635. The lateral and vertical extent of cobalt are defined.

Perchlorate was detected in one sample at a concentration of 0.0019 mg/kg. Concentrations increased with depth and decreased downgradient at location 12-610635. The detected concentration was below the EDL, and the residential SSL was approximately 29,000 times the concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.997 mg/kg to 1.1 mg/kg) above BV in four samples. Because selenium was not detected above BVs and the residential SSL was approximately 355 times the maximum DL, further sampling for extent of selenium is not warranted.

**Organic Chemicals**

There were no organic COPCs at AOC C-12-003.

**Radionuclides**

There were no radionuclide COPCs at AOC C-12-003.

### 6.9.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.005, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-003.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-003. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC C-12-003.

### 6.9.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-12-003.

## 6.10 AOC C-12-004—Potential Soil Contamination Associated with Former Building 12-5

### 6.10.1 Site Description and Operational History

AOC C-12-004 is an area of potential soil contamination at former TA-12 associated with former generator building 12-5 (Plate 6). The generator building was built of wood-frame construction of unknown dimensions. The building was originally located next to a former junction box (former structure 12-6). In 1952, the generator building was relocated 10 ft north of former control building 12-2. Activities at former TA-12 ceased in the early 1950s. Building 12-5 was destroyed by intentional burning in 1960 (LANL 1996, 054086, pp. 5-12–5-15).

### 6.10.2 Relationship to Other SWMUs and AOCs

AOC C-12-004 is located approximately 600 ft west of the SWMU 12-001(a) firing pit (Plate 2) and is approximately 130 ft northwest of AOC C-12-001 and 25 ft north of AOC C-12-002. AOC C-12-003 is approximately 130 ft to the north of AOC C-12-004, but is on the other side of Redondo Road.

### 6.10.3 Summary of Previous Investigations

A 1959 survey showed that building 12-5 was free of radioactive and HE contamination (Blackwell 1959, 005773).

In 1995, RFI activities were conducted at AOC C-12-004. One sample was collected from one location and analyzed for SVOCs (LANL 1996, 054086, p. 5-12).

Data from the sample collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 6.10.4 Site Contamination

#### 6.10.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC C-12-004. As a result, the following activities were completed as part of the 2009−2010 investigation.

- Ten samples were collected in 2009–2010 from five locations within the footprint and around former building 12-5. At each location, a sample was collected at the surface (0.0–0.5 ft bgs or 0.0–0.75 ft bgs) and from the subsurface (1.75–2.7 ft bgs to 2.0–3.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. In addition, two samples were analyzed for PCBs.

The 2009–2010 sampling locations at AOC C-12-004 are shown on Plate 6. Table 6.10-1 presents the samples collected and analyses requested for AOC C-12-004. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.10.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.10.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-12-004 consist of 10 samples (7 soil and 3 tuff) collected from 5 locations.

**Inorganic Chemicals**

Ten samples (7 soil and 3 tuff) were collected at AOC C-12-004 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.10-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in three samples with a maximum concentration of 17,100 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.985 mg/kg to 1.21 mg/kg) above BVs in six soil samples and three tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in three samples with a maximum concentration of 171 mg/kg. Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in one sample at a concentration of 0.832 mg/kg and had DLs (0.505 mg/kg to 0.606 mg/kg) above the BV in six samples. The concentration was 0.432 mg/kg above the BV and below the two highest soil background concentrations (1.4 mg/kg and 2.6 mg/kg). The DLs were only 0.105 mg/kg to 0.206 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or was detected below BVs in the other three samples (detected below BV in one sample). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in two samples with a maximum concentration of 3810 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 33.5 mg/kg. Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 6.49 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 28.1 mg/kg. Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in two samples with a maximum concentration of 15,100 mg/kg. The concentrations were 200 mg/kg and 600 mg/kg above the BV and the maximum concentration was 4400 mg/kg below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg). Iron was detected below BVs in the other eight samples. Iron is not a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in two soil samples and one tuff sample with a maximum concentration of 58.6 mg/kg. Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in three samples with a maximum concentration of 2500 mg/kg. The concentrations were 190 mg/kg, 630 mg/kg, and 810 mg/kg above the BV and below the highest two Qbt 2,3,4 background concentrations (2720 mg/kg and 2820 mg/kg). Magnesium was detected below BVs in the other seven samples. Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in two samples with a maximum concentration of 8.43 mg/kg. Nickel is retained as a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.0012 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.07 mg/kg to 1.12 mg/kg) above BV in three samples. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 2.56 mg/kg. Silver is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in one sample at a concentration of 3.86 mg/kg and had DLs (1.91 mg/kg and 2.86 mg/kg) above BV in two samples. Uranium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in three samples with a maximum concentration of 26.7 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 54.9 mg/kg. The concentration was only 6.1 mg/kg above BV and was below the four highest soil background concentrations (55 mg/kg, 57 mg/kg, 60 mg/kg, and 75.5 mg/kg). Zinc was detected below BV in the other nine samples. Zinc is not a COPC.

**Organic Chemicals**

Ten samples (7 soil and 3 tuff) were collected at AOC C-12-004 and analyzed for explosive compounds. Two soil samples were also analyzed for PCBs.

No organic chemicals were detected at AOC C-12-004.

**Radionuclides**

Ten samples (7 soil and 3 tuff) were collected at AOC C-12-004 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-12-004.

#### 6.10.4.4 Nature and Extent of Contamination

The nature and extent of inorganic COPCs at AOC C-12-004 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-12-004 include aluminum, antimony, barium, calcium, chromium, cobalt, copper, lead, nickel, perchlorate, selenium, silver, uranium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 17,100 mg/kg. Concentrations increased with depth at location 12-610573, did not change substantially with depth (800 mg/kg) at location 12-610571, and decreased with depth at location 12-610570 (the concentrations in the shallow samples at locations 12-610570 and 12-610571 were 18,500 mg/kg and 12,000 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610632 at AOC C-12-002 (Plate 7). The residential SSL was approximately 4.6 times the maximum concentration (the maximum concentration was 60,990 mg/kg below the residential SSL), and the industrial SSL was approximately 74 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.985 mg/kg to 1.21 mg/kg) above BVs in six soil samples and three tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 26 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 171 mg/kg. Concentrations increased with depth at location 12-610571 and decreased with depth at locations 12-610570 and 12-610573 (the concentrations in the shallow samples at locations 12-610570 and 12-610573 were 202 mg/kg and 279 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially (5 mg/kg) downgradient from location 12-610570 to location 12-610571, increased at location 12-610632, and decreased at location 12-610631 at AOC C-12-002 (Plate 7). The residential SSL was approximately 91 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 3810 mg/kg. Concentrations increased with depth at location 12-610571 and decreased with depth at location 12-610573 (the concentration in the shallow sample at location 12-610573 was 2540 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased downgradient at location 12-610571 but decreased at location 12-610632 for AOC C-12-002 (Plate 7). The NMED residential essential nutrient SSL was approximately 3400 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above soil and Qbt 2,3,4 BVs in one soil sample and three tuff samples with a maximum concentration of 33.5 mg/kg. Concentrations increased with depth at locations 12-610571 and 12-610573 and decreased with depth at location 12-610570. Concentrations at locations 12-610571 and 12-610573 were either similar to or below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Concentrations decreased downgradient at location 12-610571. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 3500 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 6.49 mg/kg. Concentrations increased with depth at location 12-610573 and did not change substantially with depth (0.31 mg/kg and 0.4 mg/kg) at locations 12-610570 and 12-610571 (the concentrations in the shallow samples at locations 12-610570 and 12-610571 were 5.07 mg/kg and 4.96 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially downgradient (0.82 mg/kg) to location 12-610571 or at locations 12-610632 and 12-610631 (overall 0.1 mg/kg) at AOC C-12-002 (Plate 7). The residential and industrial SSLs were approximately 3.5 times and 54 times the maximum concentration, respectively. Further sampling for extent of cobalt is not warranted.

Copper was detected above the soil and Qbt 2,3,4 BVs in one soil sample and three tuff samples with a maximum concentration of 28.1 mg/kg. Concentrations decreased with depth at locations 12-610569, 12-610570, 12-610571, and 12-610573 (the concentrations in the shallow samples at locations 12-610570, 12-610571, and 12-610573 were 10.4 mg/kg, 7.65 mg/kg, and 8.27 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610571. The lateral and vertical extent of copper are defined.

Lead was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum concentration of 58.6 mg/kg. Concentrations decreased with depth at locations 12-610570 and 12-610572 (the concentration in the shallow sample at location 12-610570 was 13.9 mg/kg and below the soil BV [Appendix E, Pivot Tables]). The concentration at location 12-610570 was also below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Concentrations decreased downgradient at location 12-610571. The lateral and vertical extent of lead are defined.

Nickel was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 8.43 mg/kg. Concentrations did not change substantially with depth (0.59 mg/kg and 0.86 mg/kg) at locations 12-610571 and 12-610573 (the concentrations in the shallow samples at locations 12-610571 and 12-610573 were 6.5 mg/kg and 9.29 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). The concentration at location 12-610571 was also similar to the maximum Qbt 2,3,4 background concentration (7 mg/kg). Concentrations increased downgradient at location 12-610571 and decreased further downgradient at location 12-610631 at AOC C-12-002 (Plate 7). The residential SSL was approximately 185 times the maximum concentration. The vertical extent of nickel is defined, and further sampling for lateral extent is not warranted.

Perchlorate was detected in three samples with a maximum concentration of 0.0012 mg/kg. Concentrations increased with depth at locations 12-610569, 12-610571, and 12-610572 and did not change substantially downgradient (0.0012 mg/kg). Concentrations were below EDLs, and the residential SSL was approximately 46,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.07 mg/kg to 1.12 mg/kg) above BV in three samples. Because selenium was not detected above BVs and the residential SSL was approximately 350 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil BV in one sample at a concentration of 2.56 mg/kg. Concentrations decreased with depth and decreased downgradient at location 12-610571. The lateral and vertical extent of silver are defined.

Uranium was detected above the soil BV in one sample at a concentration of 3.86 mg/kg and had DLs (1.91 mg/kg and 2.86 mg/kg) above the BV in two samples. Concentrations decreased with depth and decreased downgradient at location 12-610571. The residential SSL was approximately 82 times the maximum DL. Further sampling for extent of uranium is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 26.7 mg/kg. Concentrations decreased with depth at locations12-610570, 12-610571, and 12-610573 (the concentrations in the shallow samples at locations 12-610570, 12-610571, and 12-610573 were 28.1 mg/kg, 27.8 mg/kg, and 27.7 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient at location 12-610571. The lateral and vertical extent of vanadium are defined.

#### Organic Chemicals

There were no organic COPCs at AOC C-12-004.

#### Radionuclides

There were no radionuclide COPCs at AOC C-12-004.

### 6.10.5 Summary of Human Health Risk Screening

#### Industrial Scenario

The total excess cancer risk for the industrial scenario is $7 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-004.

#### Residential Scenario

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.6, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-004. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC C-12-004.

#### 6.10.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-12-004.

### 6.11 AOC C-12-005—Potential Soil Contamination Associated with Former Junction Box

#### 6.11.1 Site Description and Operational History

AOC C-12-005 is the location of a former junction box (structure 12-6) at former TA-12 (Plate 2). The junction box was used to support experiments conducted at the firing pits, SWMUs 12-001(a) and 12-001(b). Constructed in 1945, the junction box was 3 ft long × 3 ft wide × 4 ft high and surrounded on three sides by a soil berm. The junction box served as a relay between former control building 12-2 and the two firing pits and housed diagnostic equipment, signal cables, and electrical power equipment. Approximately 750 ft of detonation wire connected the junction box to building 12-2. The junction box was not used after 1953 and was intentionally burned in place in 1960 (LANL 1994, 034755, p. 5-1-5).

#### 6.11.2 Relationship to Other SWMUs and AOCs

AOC C-12-005 is a component of Consolidated Unit 12-001(a)-99, along with SWMUs 12-001(a), 12-001(b), and 12-002. AOC C-12-005 is located approximately 70 ft southwest of the SWMU 12-001(a) firing pit (Plate 2) and is on the south side of Redondo Road.

#### 6.11.3 Summary of Previous Investigations

In 1995, RFI activities were performed at AOC C-12-005 (LANL 1996, 054086, p. 5-1–5-13). Two surface samples were collected from two locations and analyzed for total uranium (LANL 1996, 054086 p. 5-15).

Data from two samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

#### 6.11.4 Site Contamination

##### 6.11.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC C-12-005. As a result, the following activities were completed as part of the 2009−2010 investigation.

- Ten samples were collected in 2009–2010 from five locations adjacent to and around former structure 12-6. At each location, a sample was collected at the surface (0.0–0.4 ft bgs to 0.0–0.6 ft bgs) and from the subsurface (2.0–2.5 ft bgs to 2.0–3.6 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. In addition, two samples were analyzed for PCBs.

The 2009–2010 sampling locations at AOC C-12-005 are shown on Plate 2. Table 6.11-1 presents the samples collected and analyses requested for AOC C-12-005. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 6.11.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 6.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-12-005 consist of 10 soil samples collected from 5 locations.

**Inorganic Chemicals**

Ten soil samples were collected at AOC C-12-005 and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 6.11-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 3 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in one sample at a concentration of 3.89 mg/kg and had DLs (1.08 mg/kg to 1.32 mg/kg) above BV in nine samples. Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in one sample at a concentration of 0.502 mg/kg and had DLs (0.546 mg/kg to 0.661 mg/kg) above BV in seven samples. The concentration was only 0.102 mg/kg above the BV; and the DLs were only 0.146 mg/kg to 0.261 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the two highest soil background concentrations (1.4 mg/kg and 2.6 mg/kg). Cadmium was detected below BV in the other two samples. Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in three samples with a maximum concentration of 196 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-52 and Table G-7). Chromium is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 48.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-53 and Table G-7). Lead is not a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00197 mg/kg. Perchlorate is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum concentration of 2.77 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-54 and Table G-7). Uranium is retained as a COPC.

**Organic Chemicals**

Ten soil samples were collected at AOC C-12-005 and analyzed for explosive compounds. Two soil samples were also analyzed for PCBs.

No organic chemicals were detected at AOC C-12-005.

**Radionuclides**

Ten soil samples were collected at AOC C-12-005 and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-12-005.

#### 6.11.4.4 Nature and Extent of Soil and Rock Contamination

The nature and extent of inorganic COPCs at AOC C-12-005 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-12-005 include antimony, chromium, perchlorate, and uranium.

Antimony was detected above the soil BV in one sample at a concentration of 3.89 mg/kg and had DLs (1.08 mg/kg to 1.32 mg/kg) above BV in nine samples. Concentrations decreased with depth and decreased downgradient. The residential and industrial SSLs were approximately 8 times and 130 times the detected concentration, respectively. The residential SSL was approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Chromium was detected above the soil BV in three samples with a maximum concentration of 196 mg/kg. Concentrations decreased with depth at locations 12-610656, 12-610658, and 12-610659 and decreased downgradient. The lateral and vertical extent of chromium are defined.

Perchlorate was detected in two samples with a maximum concentration of 0.00197 mg/kg. Concentrations did not change substantially with depth (0.00073 mg/kg) and decreased downgradient. The residential SSL was approximately 27,400 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil BV in two samples with a maximum concentration of 2.77 mg/kg. Concentrations decreased with depth at locations 12-610658 and 12-610659 and decreased downgradient. The lateral and vertical extent of uranium are defined.

**Organic Chemicals**

There were no organic COPCs at AOC C-12-005.

**Radionuclides**

There were no radionuclide COPCs at AOC C-12-005.

### 6.11.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.008, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-005.

**Recreational Scenario**

The total excess cancer risk for the recreational scenario is $7 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-005.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-5}$, which is equivalent to the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-12-005. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC C-12-005.

### 6.11.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-12-005.

# 7.0 TA-14 BACKGROUND AND FIELD INVESTIGATION RESULTS

## 7.1 Background of TA-14

### 7.1.1 Operational History

TA-14 was established during World War II and used by X Division to test explosives beginning in 1944 (LANL 1996, 054086, p. 1-1). This site was used primarily for close-observation work on small explosive charges. Tests were conducted in open and closed firing chambers (LANL 1996, 054086, p. 1-1). Some of these tests used radioactive materials (LANL 1994, 034755). In 1994, experimental HE was subjected to performance testing. TA-14 remains active with scheduled tests at the firing area and bullet test facility (LANL 1994, 034755, p. 1-11). In May 2000, the Cerro Grande fire moved through this area, and surface structures were damaged or destroyed, along with surface and overstory vegetation.

One AOC within the Threemile Canyon Aggregate Area is located at TA-14 and is addressed in this supplemental investigation report.

- AOC C-14-006 is an area of potential soil contamination associated with a former HE-storage magazine, former building 14-9.

### 7.1.2 Summary of Releases

Potential contaminants at TA-14 may have been released into the environment through operational releases associated with HE testing activities.

#### 7.1.3 Current Site Usage and Status

TA-14 is actively used for HE testing operations and is expected to remain active for the foreseeable future. Only a small portion of TA-14 is located within Threemile Canyon Aggregate Area, and the one TA-14 site associated with the aggregate area is no longer active.

### 7.2 AOC C-14-006—Potential Soil Contamination Associated with Former Building 14-9

#### 7.2.1 Site Description and Operational History

AOC C-14-006 is an area of potential soil contamination associated with an HE-storage magazine (former building 14-9) at TA-14 (Figure 7.2-1). The magazine, located 60 ft northwest of building 14-22, was constructed of wood and was 6 ft long × 6 ft wide × 6 ft high. A soil berm surrounded three sides, and soil covered the top of the structure. The magazine was built in 1945 and removed in 1952. The location of the former magazine is covered with several feet of loose fill (LANL 1996, 054086, pp. 5-61–5-64).

#### 7.2.2 Relationship to Other SWMUs and AOCs

AOC C-14-006 is located approximately 60 ft north of SWMU 14-004(a), 60 ft west of AOC C-14-003, and 120 ft west of AOC C-14-005 (Figure 7.2-1). AOC C-14-006 is, however, located on the opposite side of Q-Site Road from these others sites and runoff from these sites would not impact AOC C-14-006.

#### 7.2.3 Summary of Previous Investigations

No sampling was conducted at this AOC before 2009.

#### 7.2.4 Site Contamination

##### 7.2.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at AOC C-14-006. As a result, the following activities were completed as part of the 2009–2010 investigation.

- Ten samples were collected in 2009–2010 from five locations within the footprint and around former building 14-9. At each location, a sample was collected at the surface (0.0–0.3 ft bgs to 0.0–0.8 ft bgs) and from the subsurface (2.0–3.1 ft bgs to 2.0–4.5 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, total uranium, perchlorate, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. In addition, two samples were analyzed for PCBs.

The 2009–2010 sampling locations at AOC C-14-006 are shown on Figure 7.2-1. Table 7.2-1 presents the samples collected and analyses requested for AOC C-14-006. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

##### 7.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 7.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-14-006 consist of 10 soil samples collected from 5 locations.

**Inorganic Chemicals**

Ten soil samples were collected at AOC C-14-006 and analyzed for TAL metals, cyanide, nitrate, total uranium, and perchlorate. Table 7.2-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 7.2-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in four samples with a maximum concentration of 1.1 mg/kg and had DLs above BV (1.17 mg/kg and 1.27 mg/kg) in two samples. The quantile and slippage tests indicated site concentrations of antimony in soil are statistically different from background (Figure G-55 and Table G-8). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.543 mg/kg to 0.662 mg/kg) above BV in 10 samples. The DLs were only 0.143 mg/kg to 0.262 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the two highest soil background concentrations (1.4 mg/kg and 2.6 mg/kg). Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 20.7 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-56 and Table G-8). Chromium is retained as a COPC.

Nitrate was detected in seven samples with a maximum concentration of 1.82 mg/kg. Although nitrate is naturally occurring, the AOC is a former HE storage site and HE stored at the site could be a source of nitrate. As a result, the concentrations detected might be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.00188 mg/kg. Perchlorate is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in one sample at a concentration of 1.94 mg/kg. The quantile and slippage tests indicated site concentrations of uranium in soil are not statistically different from background (Figure G-57 and Table G-8). Uranium is not a COPC.

**Organic Chemicals**

Ten soil samples were collected at AOC C-14-006 and analyzed for explosive compounds, SVOCs, and VOCs. Two soil samples were also analyzed for PCBs. Table 7.2-3 summarizes the analytical results for detected organic chemicals. Figure 7.2-3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC C-14-006 include acetone, 4-isopropyltoluene, TATB, and toluene. The detected organic chemicals are retained as COPCs.

**Radionuclides**

Ten soil samples were collected and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

Radionuclides were not detected or detected above BVs/FVs at AOC C-14-006.

#### 7.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC C-14-006 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC C-14-006 include antimony, chromium, nitrate, and perchlorate.

Antimony was detected above the soil BV in four samples with a maximum concentration of 1.1 mg/kg and had DLs above BV (1.17 mg/kg and 1.27 mg/kg) in two samples. Concentrations increased with depth at location 14-610661, but the concentration was below the maximum soil background concentration (1 mg/kg). Concentrations decreased with depth at locations 14-610662 and 14-610663. Concentrations increased downgradient at location 14-610663. The residential SSL was approximately 28 times the maximum concentration and 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Chromium was detected above the soil BV in one sample at a concentration of 20.7 mg/kg. Concentrations decreased with depth and increased downgradient at location 14-610664. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 5600 times the maximum concentration. The vertical extent of chromium is defined, and further sampling for lateral extent is not warranted.

Nitrate was detected in seven samples with a maximum concentration of 1.82 mg/kg. Concentrations increased with depth at locations 14-610662, 14-610664, and 14-610665 and did not change substantially with depth (0.19 mg/kg and 0.26 mg/kg) at locations 14-610661 and 14-610663. Concentrations did not change substantially (0.52 mg/kg) downgradient. The residential SSL was approximately 69,000 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in four samples with a maximum concentration of 0.00188 mg/kg. Concentrations increased with depth at locations 14-610661, 14-610662, and 14-610664 and decreased with depth at location 14-610663. Concentrations did not change substantially (0.00063 mg/kg) downgradient. All concentrations were below EDLs, and the residential SSL was approximately 29,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

**Organic Chemicals**

Organic COPCs at AOC C-14-006 include acetone, 4-isopropyltoluene, TATB, and toluene.

Acetone was detected in two samples with a maximum concentration of 0.00973 mg/kg. Concentrations decreased with depth at locations 14-610663 and 14-610665 and increased downgradient. The residential SSL was approximately 6,800,000 times the maximum concentration. The vertical extent of acetone is defined, and further sampling for lateral extent is not warranted.

Isopropyltoluene[4-] was detected in two samples with a maximum concentration of 0.00229 mg/kg. Concentrations decreased with depth at locations 14-610663 and 14-610665 and decreased downgradient. The lateral and vertical extent of 4-isopropyltoluene are defined.

TATB was detected in five samples with a maximum concentration of 11.3 mg/kg. Concentrations decreased with depth at all locations and increased downgradient. The residential SSL was approximately 195 times the maximum concentration. The vertical extent of TATB is defined, and further sampling for lateral extent is not warranted.

Toluene was detected in two samples with a maximum concentration of 0.000887 mg/kg. Concentrations decreased with depth at locations 14-610663 and 14-610665 and did not change substantially downgradient (0.000217 mg/kg). The residential SSL was approximately 5,900,000 times the maximum concentration. The vertical extent of toluene is defined, and further sampling for lateral extent is not warranted.

**Radionuclides**

There were no radionuclide COPCs at AOC C-14-006.

### 7.2.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.002, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-14-006.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.03, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified at AOC C-14-006. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC C-14-006.

### 7.2.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC C-14-006.

# 8.0 TA-15 BACKGROUND AND FIELD INVESTIGATION RESULTS

## 8.1 Background of TA-15

### 8.1.1 Operational History

TA-15 was established in 1945 as a firing site area. Current activities at TA-15 consist of HE research, development, and testing, mainly through hydrodynamic testing and dynamic experimentation. Many large explosive tests have taken place with the concurrent scattering of large amounts of natural uranium or depleted uranium (DU) and, to a lesser extent, beryllium and lead (LANL 1994, 040595).

Seven SWMUs and three AOCs within the Threemile Canyon Aggregate Area are located at TA-15 (Figure 8.1-1) and are addressed in this supplemental investigation report.

- AOC 15-005(c) is an outdoor container storage area located near storage building 15-41.
- SWMU 15-007(c) [part of Consolidated Unit 15-007(c)-00] is the location of a shaft (structure 15-264) that was used to conduct a single test involving approximately 2 tons of HE.
- SWMU 15-007(d) [also part of Consolidated Unit 15-007(c)-00] is the location of a shaft (structure 15-265) used to conduct a single test involving beryllium, HE, and tritium.
- SWMU 15-008(b) [part of Consolidated Unit 15-006(c)-99] is a surface disposal area located north of Firing Site R-44 [SWMU 15-006(c)] and extending along the edge of the mesa and downslope into Threemile Canyon.
- AOC 15-008(g) [part of Consolidated Unit 15-006(d)-99] is the location of a former pile of broken sandbags located at Firing Site R-45 [SWMU 15-006(d)].
- SWMU 15-009(b) is a septic system located at Firing Site R-45 that consists of a tank (structure 15-61), a seepage pit, associated drainlines, and a former outfall.
- SWMU 15-009(c) is a septic system located at Firing Site R-44 that consists of a tank (structure 15-62), associated drainlines, and an outfall.
- SWMU 15-009(h) is a septic system located near the Ector firing site [SWMU 15-006(b)] that consists of a tank (structure 15-282), associated drainlines, and a drain field.
- SWMU 15-010(b) is a settling tank (structure 15-147) located near shop building 15-8.
- AOC 15-014(h) consists of three outfalls that served a laboratory and an office (building 15-40).

Figure 8.1-1 shows the site features of the SWMUs and AOCs at TA-15.

#### 8.1.2 Summary of Releases

Potential contaminants at TA-15 may have been released into the environment through operational releases at the surface and subsurface firing sites and associated facilities, which include a storage area, surface disposal areas, septic systems, tanks, and outfalls.

#### 8.1.3 Current Site Usage and Status

TA-15 is actively used for HE testing operations and is expected to remain active for the foreseeable future. Although the TA-15 firing sites addressed in this supplemental investigation report are no longer active, other firing sites within TA-15 are active and investigation is deferred per Table IV-2 of the Consent Order.

### 8.2 AOC 15-005(c)—Container Storage Area (R-41)

#### 8.2.1 Site Description and Operational History

AOC 15-005(c) is the location of a former container storage area at building 15-41 (R-41), located at TA-15 near Firing Site C (Figures 8.1-1 and 8.2-1). The area was used to store containers of scrap HE and chem-wipes contaminated with acetone, ethanol, and mineral oil. The ground surface on the northern, western, and eastern sides of building 15-41 is unpaved, and an asphalt road (Priscilla Road) runs along the south side of the building. The date the storage area began to be used is not known; however, it was deactivated in April 1996.

### 8.2.2 Relationship to Other SWMUs and AOCs

AOC 15-005(c) is located to the west and upgradient of all other SWMUs and AOCs addressed in this supplemental investigation report, except for SWMU 15-010(b) and AOC 15-014(h), which are more than 1500 ft to the northwest.

### 8.2.3 Summary of Previous Investigations

RFI activities were performed at AOC 15-005(c) in 1995 and reported in November 1995 (LANL 1995, 050294). Four samples were collected from two locations and analyzed for inorganic chemicals.

Data from four samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 8.2.4 Site Contamination

#### 8.2.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 15-005(c). As a result, the following activities were completed as part of the 2009−2010 investigation.

- A total of 20 samples were collected in 2009–2010 from 10 locations adjacent to and around the former storage area near building 15-41 and in the drainage below the site. At each location, samples were collected at the surface (0.0–0.5 ft bgs or 0.0–0.7 ft bgs) and from the subsurface (1.0–2.0 ft bgs to 2.0–4.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Ten samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC 15-005(c) are shown on Figure 8.2-1. Table 8.2-1 presents the samples collected and analyses requested for AOC 15-005(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 15-005(c) consist of 20 samples (14 soil and 6 sediment) collected from 10 locations.

**Inorganic Chemicals**

A total of 20 samples (14 soil and 6 sediment) were collected at AOC 15-005(c) and analyzed for TAL metals, cyanide, total uranium, and perchlorate. Table 8.2-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.2-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in four samples with a maximum concentration of 1.22 mg/kg and had DLs (1.08 mg/kg to 1.41 mg/kg) above the soil and sediment BVs (0.83 mg/kg) in five soil samples and six sediment samples. The quantile test indicated site concentrations of antimony in soil are statistically different from background concentrations (Figure G-58 and Table G-9). Antimony is retained as a COPC.

Barium was detected above the sediment BV (127 mg/kg) in six samples with a maximum concentration of 214 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil and sediment BVs (0.4 mg/kg for both) but had DLs (0.536 mg/kg to 0.767 mg/kg) above BVs in 14 soil samples and 6 sediment samples. The DLs were only 0.136 mg/kg to 0.367 mg/kg above the BVs, below the highest background DL (2 mg/kg), and below the two or three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected in any samples. Cadmium is not a COPC.

Chromium was detected above the sediment BV (10.5 mg/kg) in three samples with a maximum concentration of 12.1 mg/kg. Chromium is retained as a COPC.

Cobalt was detected above the soil and sediment BVs (8.64 mg/kg and 4.73 mg/kg) in one soil sample and five sediment samples with a maximum concentration of 9.87 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-59 and Table G-9). The five concentrations in sediment are above the highest sediment background concentration (4.2 mg/kg). Cobalt is retained as a COPC.

Copper was detected above the sediment BV (11.2 mg/kg) in three samples with a maximum concentration of 30.6 mg/kg. Copper is retained as a COPC.

Iron was detected above the sediment BV (13,800 mg/kg) in two samples with a maximum concentration of 14,800 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in two samples with a maximum concentration of 69.6 mg/kg. The Gehan and slippage tests indicated site concentrations of lead in soil are statistically different from background (Figure G-60 and Table G-9). Lead is retained as a COPC.

Manganese was detected above the soil BV (671 mg/kg) in one sample at a concentration of 693 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-61 and Table G-9). Manganese is not a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.00149 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment BV (0.3 mg/kg) but had DLs (1.16 mg/kg to 1.28 mg/kg) above BV in six samples. Selenium is retained as a COPC.

Uranium was detected above the soil and sediment BVs (1.82 mg/kg and 2.22 mg/kg) in eight soil samples and three sediment samples with a maximum concentration of 17.4 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-62 and Table G-9). Uranium is retained as a COPC.

Vanadium was detected above the sediment BV (19.7 mg/kg) in six samples with a maximum concentration of 31.8 mg/kg. Vanadium is retained as a COPC.

**Organic Chemicals**

A total of 20 samples (14 soil and 6 sediment) were collected at AOC 15-005(c) and analyzed for explosive compounds, SVOCs, and VOCs. Ten samples (four soil and six sediment) were also analyzed for PCBs. Table 8.2-3 summarizes the analytical results for detected organic chemicals. Figure 8.2-3 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

AOC 15-005(c) was identified as an AOC because of possible soil contamination resulting from releases of the explosives stored at the site. PAHs were not present in the materials stored at this site.

AOC 15-005(c) is located adjacent to a paved parking/storage area and paved road (Priscilla Road) (Appendix I, Figures I-2 and I-3). The asphalt is weathered, and the AOC receives runoff from the weathered asphalt. PAHs were detected in samples from location 15-610562, which is adjacent to a creosote-treated power pole (Appendix I, Figure I-4), which is another source of PAHs. Because (1) the PAHs were not present in the explosives stored at this AOC, (2) the area receives runoff from weathered asphalt, and (3) one sample location is next to a creosote-treated power pole, the concentrations of PAHs detected in samples used to characterize this site [benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(b)fluoranthene, chrysene, fluoranthene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene] are not related to historic Laboratory site operations and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at AOC 15-005(c) include acetone; bis(2-ethylhexyl)phthalate; ethylbenzene; 4-isopropyltoluene; toluene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 20 samples (14 soil and 6 sediment) were collected at AOC 15-005(c) and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 8.2-4 summarizes radionuclides detected or detected above BVs/FVs. Figure 8.2-4 shows the spatial distribution of detected radionuclides.

Uranium-234 was detected above soil and sediment BVs (2.59 pCi/g for both) in five soil samples and two sediment samples with a maximum activity of 7.59 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above soil and sediment BVs (0.2 pCi/g for both) in four soil samples and one sediment sample with a maximum activity of 0.405 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above soil and sediment BVs (2.29 pCi/g for both) in seven soil samples and three sediment samples with a maximum activity of 7.77 pCi/g. Uranium-238 is retained as a COPC.

#### 8.2.2.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 15-005(c) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC 15-005(c) include antimony, barium, chromium, cobalt, copper, iron, lead, perchlorate, selenium, uranium, and vanadium.

Antimony was detected above the soil BV in four samples with a maximum concentration of 1.22 mg/kg and had DLs (1.08 mg/kg to 1.41 mg/kg) above the soil and sediment BVs in five soil samples and six sediment samples. Concentrations did not change substantially with depth at locations 15-610562 and 15-610564 (0.72 mg/kg and 0.01 mg/kg) and decreased with depth at location 15-610563. Concentrations decreased downgradient. The residential SSL was approximately 26 times the maximum concentration and 22 times the maximum DL. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Barium was detected above the sediment BV in six samples with a maximum concentration of 214 mg/kg. Concentrations did not change substantially with depth at locations 15-610555, 15-610556, and 15-610557 (12 mg/kg, 18 mg/kg, and 7 mg/kg). Concentrations did not change in surface samples and decreased in subsurface samples downgradient from location 15-610556 to location 15-610555. The residential SSL was approximately 73 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the sediment BV in three samples with a maximum concentration of 12.1 mg/kg. Concentrations did not change substantially with depth at location 15-610556 (0.9 mg/kg) (the concentration in the shallow sample at location 15-610556 was 9.8 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and decreased with depth at location 15-610555. Concentrations increased in the surface samples downgradient from location 15-610556 to location 15-610555. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 9770 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Cobalt was detected above the soil and sediment BVs in one soil sample and five sediment samples with a maximum concentration of 9.87 mg/kg. Concentrations did not change substantially at locations 15-610555 and 15-610556 (0.43 mg/kg and 0.51 mg/kg) and decreased with depth at locations 15-610557 and 15-610561. Concentrations decreased downgradient. The lateral and vertical extent of cobalt are defined.

Copper was detected above the sediment BV in three samples with a maximum concentration of 30.6 mg/kg. Concentrations decreased with depth at locations 15-610555 and 15-610556 and increased downgradient from location 15-610556 to location 15-610555. The residential SSL was approximately 103 times the maximum concentration. The vertical extent of copper is defined, and further sampling for lateral extent is not warranted.

Iron was detected above the sediment BV in two samples with a maximum concentration of 14,800 mg/kg. Concentrations increased with depth at location 15-610556 and decreased with depth at location 15-610555 and did not change substantially (600 mg/kg) downgradient from location 15-610556 to location 15-610555. The residential SSL was approximately 3.7 times the maximum concentration (the maximum concentration was 40,000 mg/kg below the residential SSL), and the industrial SSL was approximately 61 times the maximum concentration. The lateral extent of iron is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil BV in two samples with a maximum concentration of 69.6 mg/kg. Concentrations decreased with depth at locations 15-610559 and 15-610564 and decreased downgradient. The lateral and vertical extent of lead are defined.

Perchlorate was detected in four samples with a maximum concentration of 0.00149 mg/kg. Concentrations increased with depth at locations 15-610559 and 15-610561 but were below the EDLs. Concentrations decreased with depth at location 15-610564 and decreased downgradient. The residential SSL was approximately 37,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the sediment BV but had DLs (1.16 mg/kg to 1.28 mg/kg) above BV in six samples. Because selenium was not detected above BVs in any samples and the residential SSL was approximately 305 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil and sediment BVs in eight soil samples and three sediment samples with a maximum concentration of 17.4 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of uranium are defined.

Vanadium was detected above the sediment BV in six samples with a maximum concentration of 31.8 mg/kg. Concentrations did not change substantially with depth at location 15-610556 (1.6 mg/kg) and decreased with depth at locations 15-610555 and 15-610557. Concentrations increased slightly (5 mg/kg) downgradient from location 15-610556 to location 15-610555. The residential and industrial SSLs were approximately 12 times and 206 times the maximum concentration, respectively. Further sampling for extent of vanadium is not warranted.

**Organic Chemicals**

Organic COPCs at AOC 15-005(c) include acetone; bis(2-ethylhexyl)phthalate; ethylbenzene; 4-isopropyltoluene; toluene; and 1,3-xylene+1,4-xylene.

Acetone was detected in two samples with a maximum concentration of 0.0188 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of acetone are defined.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.0995 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Ethylbenzene was detected in two samples with a maximum concentration of 0.00063 mg/kg. Concentrations decreased with depth at location 15-610558, and the concentration was below the EQL at location 15-610556. The residential SSL was approximately 120,000 times the maximum concentration Concentrations decreased downgradient. The lateral extent of ethylbenzene is defined, and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in two samples with a maximum concentration of 0.00151 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of 4-isopropyltoluene are defined.

Toluene was detected in two samples with a maximum concentration of 0.000754 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of toluene are defined.

Xylene[1,3-]+1,4-xylene was detected in five samples with a maximum concentration of 0.000984 mg/kg. The concentration did not change substantially with depth at location 15-610556 (0.000082 mg/kg) and was below the EQL. Concentrations decreased with depth at the other locations and decreased downgradient. The residential SSL was approximately 885,000 times the maximum concentration. The lateral extent of 1,3-xylene+1,4-xylene is defined, and further sampling for vertical extent is not warranted.

**Radionuclides**

Radionuclide COPCs at AOC 15-005(c) include uranium-234, uranium-235/236, and uranium-238.

Uranium-234 was detected above soil and sediment BVs in five soil samples and two sediment samples with a maximum activity of 7.59 pCi/g. Activities decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above soil and sediment BVs in four soil samples and one sediment sample with a maximum activity of 0.405 pCi/g. Activities decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above soil and sediment BVs in seven soil samples and three sediment samples with a maximum activity of 7.77 pCi/g. Activities decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of uranium-238 are defined.

### 8.2.5 Summary of Human Health Risk Screening

#### Industrial Scenario

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.3 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

#### Residential Scenario

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.8, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC 15-005(c).

### 8.2.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 15-005(c).

## 8.3 SWMU 15-007(c)—Shaft

### 8.3.1 Site Description and Operational History

SWMU 15-007(c) is an underground shaft (structure 15-264) located at TA-15 approximately 300 ft east of building 15-263 and 100 ft north of underground shaft 15-265 [SWMU 15-007(d)] (Plate 9). The shaft, 6 ft in diameter by 120 ft deep, is situated within a 20- × 20-ft concrete pad and covered with a wooden lid. In 1972, the shaft was used to conduct a single underground test involving approximately 2 tons of HE, the only material used in the test (LANL 1993, 020946, p. 5-9). This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft by filling the shaft with layers of magnetite, cement, sand grout, bentonite, sand, and gravel. Before 2010, 0.25-in.-diameter lead shot was scattered on the surface of the concrete pad and on the soil on three sides of the pad. The source of the lead shot was probably bags of lead shot used for instrument shielding during the experiment (LANL 1997, 056562, p. 1).

The lead shot was removed from the concrete pad and from the surface of the surrounding soil during the 2009–2010 investigation.

### 8.3.2 Relationship to Other SWMUs and AOCs

SWMU 15-007(c) is a component of Consolidated Unit 15-007(c)-00, along with SWMU 15-007(d). SWMU 15-007(c) is located adjacent to SWMU 15-007(d), which is another underground test shaft, and these sites are approximately 300 ft east and downgradient of the R-45 firing site (Figure 8.1-1).

### 8.3.3 Summary of Previous Investigations

No sampling was conducted at this SWMU before 2009.

### 8.3.4 Site Contamination

#### 8.3.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 15-007(c). As a result, the following activities were completed as part of the 2009–2010 investigation.

- A total of 44 samples were collected in 2009–2010 from 22 locations around the shaft. At each location, a sample was collected at the surface (0.0–0.5 ft bgs) and from the subsurface (1.0–1.5 ft bgs to 1.0–2.1 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, and explosive compounds. In addition, six samples were analyzed for PCBs.
- Thirty-nine samples were collected in 2009–2010 from three boreholes around the area where the shallower samples were collected. At each location, 13 samples were collected from the depth interval 3.5 ft bgs to 182.5 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, explosive compounds, and tritium. In addition, 27 samples were analyzed for PCBs.
- All investigation samples were field-screened for gross-alpha and -beta radioactivity. Field-screening results were recorded on borehole logs and/or corresponding SCLs. Borehole logs are presented in Appendix C, and SCLs/COC forms are included in Appendix E.

The 2009–2010 sampling locations at SWMU 15-007(c) are shown on Plate 9. Table 8.3-1 presents the samples collected and analyses requested for SWMU 15-007(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.3.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-007(c) consist of 83 samples (37 soil and 46 tuff) collected from 25 locations.

**Inorganic Chemicals**

A total of 83 samples (37 soil and 46 tuff) were collected at SWMU 15-007(c) and analyzed for TAL metals, cyanide, and perchlorate. Table 8.3-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 10 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in six Qbt 3 samples and two Qbt 1g samples with a maximum concentration of 20,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in Qbt 2,3,4 are not statistically different from background (Figure G-63 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were all collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Aluminum concentrations in deep borehole samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 256 mg/kg to 6720 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 714 mg/kg to 4670 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Aluminum was detected above BV only in 2 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, aluminum is not a COPC.

Antimony was detected above the soil BV (0.83 mg/kg) in two samples with a maximum concentration of 243 mg/kg and had DLs (0.898 mg/kg to 5.13 mg/kg) above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg, 0.5 mg/kg, and 0.5 mg/kg) in 30 soil samples, 38 Qbt 2 and Qbt 3 samples, and 6 Qbt 1g samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (2.79 mg/kg and 0.56 mg/kg) in two Qbt 3 samples and two Qbt 1g samples with a maximum concentration of 3.2 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in Qbt 2,3,4 are not statistically different from background (Figure G-64 and Table G-10). The concentrations detected above BV in Qbt 1g were equivalent to the highest background concentration (0.7 mg/kg). Arsenic was not detected or not detected above BVs in the other 79 samples (detected below BVs in 70 samples). Arsenic is not a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in eight samples with a maximum concentration of 223 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in Qbt 2,3,4 are not statistically different from background (Figure G-65 and Table G-10). Barium is not a COPC.

Beryllium was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (1.21 mg/kg and 1.44 mg/kg) in four Qbt 2 and Qbt 3 samples and two Qbt 1g samples. The Gehan and quantile tests indicated site concentrations of beryllium in Qbt 2,3,4 are not statistically different from background (Figure G-66 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Beryllium concentrations in deep borehole tuff samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 0.212 mg/kg to 8.68 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 0.267 mg/kg to 3.14 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Beryllium was detected above BV only in 6 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, beryllium is not a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.527 mg/kg to 0.779 mg/kg) above BVs in 19 soil samples and 4 tuff samples. The DLs were only 0.127 mg/kg to 0.379 mg/kg above the BVs, below the highest background DL (2 mg/kg), and below the two or three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or not detected above BVs in the other 60 samples (detected below BVs in 36 samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in six samples with a maximum concentration of 3510 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in Qbt 2,3,4 are not statistically different from background (Figure G-67 and Table G-10). Calcium is not a COPC.

Chromium was detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 7.14 mg/kg, and 2.6 mg/kg) in 9 soil samples, 11 Qbt 3 and Qbt 2 samples, and 3 Qbt 1g samples with a maximum concentration of 151 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil and Qbt 2,3,4 are statistically different from background (Figure G-68 and Table G-11; Figure G-69 and Table G-10). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in eight samples with a maximum concentration of 7.48 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in Qbt 2,3,4 are not statistically different from background (Figure G-70 and Table G-10). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in nine samples with a maximum concentration of 10.2 mg/kg. The Gehan and slippage tests indicated site concentrations of copper in Qbt 2,3,4 are statistically different from background (Figure G-71 and Table G-10). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 and the Qbt 1g, Qct, Qbo BVs (14,500 mg/kg and 3700 mg/kg) in three Qbt 3 samples and six Qbt 1g samples with a maximum concentration of 17,300 mg/kg. The Gehan test indicated site concentrations of iron in Qbt 2,3,4 are statistically different from background (Table G-10). However, the quantile and slippage tests indicated site concentrations of iron in Qbt 2,3,4 are not statistically different from background (Figure G-72 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Iron concentrations in deep borehole tuff samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 4620 mg/kg to 11,500 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 5950 mg/kg to 7600 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Iron was detected above BV only in 6 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, iron is not a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in eight soil samples and eight tuff samples with a maximum concentration of 63,700 mg/kg. The Gehan and slippage tests indicated site concentrations of lead in soil are statistically different from background (Figure G-73 and Table G-11). The Gehan and quantile tests indicated that site concentrations of lead in tuff are not statistically different from background (Figure G-74 and Table G-10). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (1690 mg/kg and 739 mg/kg) in seven Qbt 3 samples and one Qbt 1g sample with a maximum concentration of 3080 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in Qbt 2,3,4 are not statistically different from background (Figure G-75 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Magnesium concentrations in deep borehole tuff samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 55 mg/kg to 1480 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 84.3 mg/kg to 777 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Magnesium was detected above BV in only 1 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, magnesium is not a COPC.

Manganese was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (482 mg/kg and 189 mg/kg) in one Qbt 3 and six Qbt 1g samples with a maximum concentration of 614 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in Qbt 2,3,4 are not statistically different from background (Figure G-76 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were all collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Manganese concentrations in deep borehole tuff samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 95.1 mg/kg to 614 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 243 mg/kg to 334 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Manganese was detected above BV in only 7 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, manganese is not a COPC.

Nickel was detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs (15.4 mg/kg, 6.58 mg/kg, and 2 mg/kg) in one soil sample, six Qbt 3 samples, and two Qbt 1g samples with a maximum concentration of 16.8 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are statistically different from background (Figure G-77 and Table G-11). The slippage test indicated site concentrations of nickel in Qbt 2,3,4 are statistically different from background (Figure G-78 and Table G-10). Nickel is retained as a COPC.

Perchlorate was detected in 11 samples with a maximum concentration of 0.00213 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) but had DLs (0.933 mg/kg to 2.11 mg/kg) above BVs in 1 soil sample, 40 Qbt 3 and Qbt 2 samples, and 6 Qbt 1g samples. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 14.7 mg/kg. Silver is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (17 mg/kg and 4.59 mg/kg) in six Qbt 3 samples and two Qbt 1g samples with a maximum concentration of 33.1 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in Qbt 2,3,4 are not statistically different from background (Figure G-79 and Table G-10). There were too few Qbt 1g samples to perform statistical comparisons. The Qbt 1g samples were all collected from the three deep boreholes at locations 15-610816, 15-610817, and 15-610818. Vanadium concentrations in deep borehole tuff samples were similar for the upper tuff (Qbt 2,3,4) and lower tuff (Qbt 1g, Qct, Qbo) units. Concentrations in Qbt 3 and Qbt 2 samples ranged from 1.42 mg/kg to 12.2 mg/kg for 33 samples collected over the interval 3.5 ft bgs to 157.5 ft bgs. Concentrations in Qbt 1g samples ranged from 1.76 mg/kg to 5.7 mg/kg for six samples collected over the interval 169 ft bgs to 182.5 ft bgs. Vanadium was detected above BV in only 2 of 39 deep borehole samples. Because (1) concentrations are similar in the upper and lower tuff units, (2) the concentrations in the upper tuff units are not statistically different from background, and (3) there was a low frequency of detection above BV in deep borehole samples, vanadium is not a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in five soil samples and six tuff samples with a maximum concentration of 206 mg/kg. The Gehan and slippage tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-80 and Table G-11). Zinc is retained as a COPC.

**Organic Chemicals**

A total of 83 samples (37 soil and 46 tuff) were collected at SWMU 15-007(c) and analyzed for explosive compounds, SVOCs, and VOCs. Thirty-three samples (5 soil and 28 tuff) were also analyzed for PCBs. Table 8.3-3 summarizes the analytical results for detected organic chemicals. Plate 11 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 15-007(c) include Aroclor-1242, Aroclor-1254, and TATB. The detected organic chemicals are retained as COPCs.

**Radionuclides**

Thirty-nine tuff samples were collected at SWMU 15-007(c) and analyzed for tritium. Table 8.3-4 presents the radionuclides detected or detected above BVs/FVs. Plate 12 shows the spatial distribution of detected radionuclides.

Tritium was detected in 32 samples with a maximum activity of 476 pCi/g. Tritium is retained as a COPC.

#### 8.3.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-007(c) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-007(c) include antimony, chromium, copper, lead, nickel, perchlorate, selenium, silver, and zinc.

Antimony was detected above the soil BV in two samples with a maximum concentration of 243 mg/kg and had DLs (0.898 mg/kg to 5.13 mg/kg) above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs in 30 soil samples, 38 Qbt 2 and Qbt 3 samples, and 6 Qbt 1g samples. Concentrations increased with depth at location 15-610813 and decreased with depth at location 15-610814, where the maximum concentration was detected. Concentrations decreased laterally. The residential SSL was approximately 18 times the concentration at location 15-610813. The residential and industrial SSLs were approximately 6 times and 101 times the maximum DL, respectively. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs in 9 soil samples, 11 Qbt 3 and Qbt 2 samples, and 3 Qbt 1g samples with a maximum concentration of 151 mg/kg. Concentrations increased with depth at locations 15-610792, 15-610797, 15-610798, 15-610803, 15-610807, and 15-610814. Concentrations did not change substantially with depth (0.6 mg/kg) at location 15-610794 and decreased with depth at locations 15-610799, 15-610801, 15-610802, 15-610804, 15-610805, 15-610808, 15-610809, 15-610816, 15-610817, and 15-610818 (the concentrations in the shallow samples at locations 15-610794, 15-610801, 15-610808, and 15-610809 were 13.7 mg/kg, 13.1 mg/kg, 15.6 mg/kg and 14.5 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 775 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in nine samples with a maximum concentration of 10.2 mg/kg. Concentrations increased with depth at location 15-610807 and did not change substantially with depth at locations 15-610798, 15-610801, 15-610809, and 15-610814 (0.52 mg/kg, 0.67 mg/kg, 0.22 mg/kg, and 0.12 mg/kg, respectively); the concentrations in the shallow samples at locations 15-610798, 15-610801, 15-610809, and 12-610814 were 6.29 mg/kg, 7.24 mg/kg, 7.56 mg/kg, and 9.11 mg/kg, respectively, and below the soil BV (Appendix E, Pivot Tables). Concentrations decreased with depth at locations 15-610794, 15-610808, and 15-610816 (the concentrations in the shallow samples at locations 15-610794 and 15-610808 were 9.54 mg/kg and 10 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. The residential SSL was approximately 307 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in eight soil samples and eight tuff samples with a maximum concentration of 63,700 mg/kg. Concentrations increased with depth at locations 15-610798, 15-610802, and 15-610813. The concentration at location 15-610798 was below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Concentrations decreased with depth at all other locations (the concentrations in the shallow samples at locations 15-610807 and 15-610808 were 18.2 mg/kg and 16.5 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. The residential and industrial SSLs were approximately 2 times and 4 times the concentrations in the deeper samples at locations 15-610802 and 15-610813 (180 mg/kg and 200 mg/kg, respectively). The lateral extent of lead is defined, and vertical extent at locations 15-610802 and 15-610813 is not defined.

Nickel was detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs in one soil sample, six Qbt 3 samples, and two Qbt 1g samples with a maximum concentration of 16.8 mg/kg. Concentrations increased with depth at locations 15-610797, 15-610798, 15-610807, and 15-610814. Concentrations did not change substantially with depth (0.91 mg/kg) at location 15-610794 and decreased with depth at locations 15-610801, 15-610808, and 15-610816 (the concentrations in the shallow samples at locations 15-610794, 15-610801, and 15-610808 were 10.6 mg/kg, 9.26 mg/kg, and 11.1 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. The residential SSL was approximately 93 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 11 samples with a maximum concentration of 0.00213 mg/kg. Concentrations increased with depth at locations 15-610804, 15-610807, and 15-610814 but were below the EDLs. Concentrations decreased with depth at locations 15-610816 and 15-610817 and decreased laterally. The residential SSL was approximately 32,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the soil, Qbt 2,3,4, and Qbt 1g, Qct, Qbo BVs but had DLs (0.933 mg/kg to 2.11 mg/kg) above BVs in 1 soil sample, 40 Qbt 3 and Qbt 2 samples, and 6 Qbt 1g samples. Because selenium was not detected above BVs and the residential SSL was approximately 185 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil BV in one sample at a concentration of 14.7 mg/kg. Concentrations decreased with depth and laterally. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in five soil samples and six tuff samples with a maximum concentration of 206 mg/kg. Concentrations increased with depth at locations 15-610792 and 15-610797 but were below the maximum soil background concentration (75.5 mg/kg). Concentrations at locations 15-610816, 15-610817, and 15-610818 ranged from 40.7 mg/kg to 59.4 mg/kg, 33.8 mg/kg to 52.4 mg/kg, and 23.4 mg/kg to 46.8 mg/kg, respectively. Concentrations decreased with depth at locations 15-610802 and 15-610814 and decreased laterally. The residential SSL was approximately 114 times the maximum concentration. The lateral extent of zinc is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 15-007(c) include Aroclor-1242, Aroclor-1254, and TATB.

Aroclor-1242 was detected in one sample at a concentration of 0.0034 mg/kg. Concentrations decreased with depth and decreased laterally at location 15-610820 at SWMU 15-007(d) (Plate 11). The lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in one sample at concentration of 0.0055 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of Aroclor-1254 are defined.

TATB was detected in three samples at a maximum concentration of 0.496 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of TATB are defined.

**Radionuclides**

Radionuclide COPCs at SWMU 15-007(c) include tritium.

Tritium was detected in 32 samples with a maximum activity of 476 pCi/g. Activities decreased with depth at all locations. Tritium was analyzed only in the deep boreholes, which were located around the area where the shaft was located and the shallower samples were collected. The residential SAL was approximately 6.4 times, 6.7 times, and 1.8 times the maximum activities at locations 15-610816, 15-610817, and 15-610818, respectively. The industrial SAL was approximately 18,100 times, 18,900 times, and 5000 times the maximum activities at locations 15-610816, 15-610817, and 15-610818, respectively. The vertical extent of tritium is defined, and further sampling for lateral extent is not warranted.

### 8.3.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 20, which is above the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead. No radionuclide COPCs were identified for the industrial scenario.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 26, which is above the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from antimony and lead. The total dose is 0.1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable cancer risks or doses exist for the industrial and residential scenarios. There are potential unacceptable noncancer risks for the industrial and residential scenarios at SWMU 15-007(c).

#### 8.3.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-007(c).

### 8.4 SWMU 15-007(d)—Shaft

#### 8.4.1 Site Description and Operational History

SWMU 15-007(d) is an underground shaft (structure 15-265) located at TA-15 approximately 300 ft east of building 15-263 and 100 ft south of underground shaft 15-264 [SWMU 15-007(c)] (Plate 9). The shaft, 6 ft in diameter by 120 ft deep, is situated within a 20- × 20-ft concrete pad and covered with a wooden lid. The shaft was used in 1972 to conduct a single test involving beryllium, tritium, and approximately 500 lb of HE. This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft by filling the shaft with layers of magnetite, cement, sand grout, bentonite, sand, and gravel (LANL 1993, 020946, p. 5-9).

Contrary to the site description provided for SWMU 15-007(d) in all previous documents, the site description for the SWMU 15-007(d) shaft in the investigation report (LANL 2010, 111324.14) stated that lead shot was scattered on the concrete pad at the surface of the shaft and in the surrounding soil at SWMU 15-007(d). The investigation report is incorrect: previous documentation substantiates that scattered lead shot has never been present at the SWMU 15-007(d) shaft. Site visits made to the shaft after the investigation report was written have confirmed no lead shot is present at the site.

#### 8.4.2 Relationship to Other SWMUs and AOCs

SWMU 15-007(d) is a component of Consolidated Unit 15-007(c)-00, along with SWMU 15-007(c). SWMU 15-007(d) is located adjacent to and approximately 150 ft from SWMU 15-007(c), which is another underground test shaft, and these sites are approximately 300 ft east and downgradient of the R-45 firing site (Figure 8.1-1).

#### 8.4.3 Summary of Previous Investigations

No sampling was conducted at this SWMU before 2009.

### 8.4.4 Site Contamination

#### 8.4.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 15-007(d). As a result, the following activities were completed as part of the 2009–2010 investigation.

- Twenty-six samples were collected in 2009–2010 from two boreholes approximately 70 ft southeast and southwest of the shaft. Because less HE was used at SWMU 15-007(d) than at SWMU 15-007(c) and there was less chance for release from the shaft, surface samples were not collected. The two boreholes were sampled to define vertical extent at locations around the borehole. At each location, 13 samples were collected from the depth interval 4.0 ft bgs to 182.5 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, explosive compounds, PCBs, and tritium.
- All investigation samples were field-screened for gross-alpha and -beta radioactivity. Field-screening results were recorded on borehole logs and/or corresponding SCLs. Borehole logs are presented in Appendix C, and SCLs/COC forms are included in Appendix E.

The 2009–2010 sampling locations at SWMU 15-007(d) are shown on Plate 9. Table 8.4-1 presents the samples collected and analyses requested for SWMU 15-007(d). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.4.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-007(d) consist of 26 tuff samples collected from 2 locations.

**Inorganic Chemicals**

Twenty-six tuff samples were collected at SWMU 15-007(d) and analyzed for TAL metals, cyanide, and perchlorate. Table 8.4-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 10 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the Qbt 2,3,4, Qbt 1v, and Qbt 1g, Qct, Qbo BVs (0.5 mg/kg for all) but had DLs (0.947 mg/kg to 4.69 mg/kg) above BVs in 23 Qbt 2 and Qbt 3 samples, 1 Qbt 1v sample, and 2 Qbt 1g samples. Antimony is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.44 mg/kg) in one sample at a concentration of 1.67 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure G-81 and Table G-12). Beryllium is not a COPC.

Cadmium was not detected above the Qbt 1v and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.501 mg/kg to 0.512 mg/kg) above BVs in one Qbt 1v sample and two Qbt 1g samples. The DLs are only 0.101 mg/kg to 0.112 mg/kg above the BVs. There are no background data for cadmium in units

Qbt 1v, Qbt 1g, Qct, and Qbo, and the BVs are based on detection limits. Cadmium was not detected or not detected above BVs in 23 Qbt 2 and Qbt 3 samples (detected below BV in 6 samples). Cadmium is not a COPC.

Chromium was detected above the Qbt 1v and Qbt 2,3,4 BVs (2.24 mg/kg and 7.14 mg/kg) in four samples with a maximum concentration of 18.7 mg/kg. The Gehan test indicated site concentrations of chromium in tuff are statistically different from background (Table G-12). However, the quantile and slippage tests indicated site concentrations of chromium in tuff are not statistically different from background (Figure G-82 and Table G-12). Chromium is not a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in two samples with a maximum concentration of 5910 mg/kg. Iron was detected below BV in 24 Qbt 1v, Qbt 2, and Qbt 3 samples. The iron concentrations detected in the two Qbt 1g samples (5890 mg/kg and 5910 mg/kg) were within the range detected in the upper (Qbt 2,3,4) and middle (Qbt 1v) tuff units (4910 mg/kg to 9480 mg/kg). Iron is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in two samples with a maximum concentration of 282 mg/kg. Manganese was detected below BV in 24 Qbt 1v, Qbt 2, and Qbt 3 samples. The manganese concentrations detected in the two Qbt 1g samples (268 mg/kg and 282 mg/kg) were within the range detected in the upper (Qbt 2,3,4) and middle (Qbt 1v) tuff units (147 mg/kg to 394 mg/kg). Manganese is not a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00237 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 1g, Qct, Qbo and Qbt 2,3,4 BVs (0.3 mg/kg for all) in one Qbt 1g sample and one Qbt 2 sample with a maximum concentration of 0.549 mg/kg and had DLs (0.928 mg/kg to 1.02 mg/kg) above BVs in 22 Qbt 2 and Qbt 3 samples, 1 Qbt 1v sample, and 2 Qbt 1g samples. Selenium is retained as a COPC.

Zinc was detected above the Qbt 1g, Qct, Qbo BV (40 mg/kg) in two samples with a maximum concentration of 42.4 mg/kg. The zinc concentrations detected the 2 Qbt 1g samples (40.8 mg/kg and 42.4 mg/kg) were within the range detected in the upper (Qbt 2,3,4) and middle (Qbt 1v) tuff units (31.7 mg/kg to 57.9 mg/kg). Zinc is not a COPC.

**Organic Chemicals**

Twenty-six tuff samples were collected at SWMU 15-007(d) and analyzed for explosive compounds and PCBs. Table 8.4-3 summarizes the analytical results for detected organic chemicals. Plate 11 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 15-007(d) include Aroclor-1242 and Aroclor-1254. The detected organic chemicals are retained as COPCs.

**Radionuclides**

Twenty-six tuff samples were collected at SWMU 15-007(d) and analyzed for tritium. Table 8.4-4 presents the radionuclides detected or detected above BVs/FVs. Plate 12 shows the spatial distribution of detected radionuclides.

Tritium was detected in 26 samples with a maximum activity of 114 pCi/g. Tritium is retained as a COPC.

#### 8.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-007(d) are discussed below. As noted in section 8.4.4.1, samples were collected to define vertical extent, and lateral extent is not evaluated.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-007(d) include antimony, perchlorate, and selenium.

Antimony was not detected above the Qbt 2,3,4, Qbt 1v, and Qbt 1g, Qct, Qbo BVs but had DLs (0.947 mg/kg to 4.69 mg/kg) above the BVs in 23 Qbt 2 and Qbt 3 samples, 1 Qbt 1v sample, and 2 Qbt 1g samples. Because antimony was not detected above BVs and the residential and industrial SSLs were approximately 6.7 and 110 times the maximum DL, respectively, further sampling for extent of antimony is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00237 mg/kg. Concentrations decreased with depth. The residential SSL was approximately 23,000 times the maximum concentration. The vertical extent of perchlorate is defined.

Selenium was detected above the Qbt 1g, Qct, Qbo and Qbt 2, 3, 4 BVs (0.3 mg/kg for all) in one Qbt 1g sample and one Qbt 2 sample with a maximum concentration of 0.549 mg/kg and had DLs (0.928 mg/kg to 1.02 mg/kg) above BVs in 22 Qbt 2 and Qbt 3 samples, 1 Qbt 1v sample, and 2 Qbt 1g samples. Concentrations were 0.213 mg/kg and 0.249 mg/kg above the BVs and did not change substantially with depth at location 15-610819 (0.036 mg/kg). The residential SSL was approximately 712 times the maximum concentration above BV and approximately 384 times the maximum DL. Further sampling for extent of selenium is not warranted

**Organic Chemicals**

Organic COPCs at SWMU 15-007(d) include Aroclor-1242 and Aroclor-1254.

Aroclor-1242 was detected in one sample at a concentration of 0.0032 mg/kg. Concentrations decreased with depth and were below the EQLs. The residential SSL was approximately 760 times the concentration. The vertical extent of Aroclor-1242 is defined

Aroclor-1254 was detected in one sample at a concentration of 0.0018 mg/kg. Concentrations decreased with depth and were below the EQL. The residential SSL was approximately 630 times the concentration. The vertical extent of Aroclor-1254 is defined.

**Radionuclides**

Radionuclide COPCs at SWMU 15-007(d) include tritium.

Tritium was detected in 26 samples with a maximum activity of 114 pCi/g. Activities decreased with depth at all locations. The residential and industrial SALs were approximately 15 times and 17,600 times the maximum activity, respectively. The vertical extent tritium is defined.

#### 8.4.5 Summary of Human Health Risk Screening

**Industrial Scenario**

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for SWMU 15-007(d).

**Residential Scenario**

No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.03, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.09 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at SWMU 15-007(d).

#### 8.4.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-007(d).

### 8.5 SWMU 15-008(b)—Surface Disposal Area

#### 8.5.1 Site Description and Operational History

SWMU 15-008(b) is a surface disposal area located at TA-15, north of Firing Site R-44 [SWMU 15-006(c)] and extending along the edge of the mesa and downslope into Threemile Canyon (Plate 13). The surface disposal area covers approximately 8.5 acres. Soil and debris generated from activities at the R-44 firing site were disposed of at SWMU 15-008(b). Activities at the firing site began in 1951. The firing site was used extensively until 1978 and sporadically until 1992 when firing site activities ceased (LANL 1993, 020946, p. 6-8; LANL 1995, 050294, p. 4-73).

#### 8.5.2 Relationship to Other SWMUs and AOCs

SWMU 15-008(b) is a component of Consolidated Unit 15-006(c)-99, along with SWMU 15-006(c), whose investigation is deferred per Table IV-2 of the Consent Order. SWMU 15-008(b) is located adjacent to the R-44 firing site [SWMU 15-006(c)] and is approximately 100 ft north of SWMU 15-009(c), though on the other side of a berm from that site. The nearest upgradient site is SWMU 15-009(h), which is approximately 650 ft to the west (Figure 8.1-1).

#### 8.5.3 Summary of Previous Investigations

During 1994 RFI activities, 24 samples were collected from 18 locations and analyzed for inorganic chemicals, HE, and radionuclides (LANL 1995, 050294).

An expedited cleanup (EC) was performed in July, 2000, following the Cerro Grande fire. The EC activities included removing 20 $yd^3$ of firing site debris from the SWMU and surrounding area and emplacing erosion-control features, such as straw wattles, rock check dams, and silt fencing (LANL 2001, 071342, pp. 22–23). No sampling was conducted as part of this EC.

Data from eight samples collected from four locations during the 1994 RFI meet current data-validation standards and are decision-level data included in this report. However, data from all other samples collected in 1994 are screening-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 8.5.4 Site Contamination

#### 8.5.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 15-008(b). As a result, the following activities were completed as part of the 2009–2010 investigation.

- A total of 163 samples were collected in 2009–2010 from 82 locations within and around the disposal area and on the canyon slope to the north. At all but one location, samples were collected at the surface (0.0–0.3 ft bgs to 0.0–1.0 ft bgs) and from the subsurface (1.0–1.5 ft bgs to 3.0–4.2 ft bgs). At the remaining location, only a surface sample (0.0–0.4 ft bgs) was collected. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Forty samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 15-008(b) are shown on Plate 13. Table 8.5-1 presents the samples collected and analyses requested for SWMU 15-008(b), including the 1994 RFI samples. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.5.4.2 Soil, Rock, and Sediment Field-Screening Results

Some radiological field-screening results exceeded twice the daily site background levels. A few locations were moved slightly so samples could be collected without exceeding the limits of the radiation work permit. No other changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-008(b) consist of 171 samples (90 soil, 19 sediment, and 62 tuff) collected from 86 locations.

**Inorganic Chemicals**

A total of 171 samples (90 soil, 19 sediment, and 62 tuff) were collected at SWMU 15-008(b) and analyzed for TAL metals and total uranium. A total of 163 samples (82 soil, 19 sediment, and 62 tuff) were also analyzed for cyanide and perchlorate. Table 8.5-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 14 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in five samples with a maximum concentration of 10,200 mg/kg. The Gehan test indicated site concentrations of aluminum in tuff are statistically different from background (Table G-13). However, the quantile and slippage tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure G-83 and Table G-13). Aluminum is not a COPC.

Antimony was detected above the soil, sediment, and Qbt 2,3,4 BVs (0.83 mg/kg, 0.83 mg/kg, and 0.5 mg/kg) in 23 soil samples, 1 sediment sample, and 12 tuff samples with a maximum concentration of 256 mg/kg. Antimony also had DLs (0.578 mg/kg to 8.6 mg/kg) above BVs in 62 soil samples, 17 sediment samples, and 46 tuff samples. The quantile and slippage tests indicated site concentrations of antimony in soil are statistically different from background (Figure G-84 and Table G-14). Antimony is retained as a COPC.

Arsenic was detected above the sediment and Qbt 2,3,4 BVs (3.98 mg/kg and 2.79 mg/kg) in one sediment sample and three tuff samples with a maximum concentration of 5.91 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in sediment are not statistically different from background (Figure G-85 and Table G-15). The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-86 and Table G-13). Arsenic is retained as a COPC.

Barium was detected above the soil and Qbt 2,3,4 BVs (295 mg/kg and 46 mg/kg) in 1 soil sample and 27 tuff samples with a maximum concentration of 344 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-87 and Table G-14). The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-88 and Table G-13). Barium is retained as a COPC.

Beryllium was detected above the soil, sediment, and Qbt 2,3,4 BVs (1.83 mg/kg, 1.31 mg/kg, and 1.21 mg/kg) in 35 soil samples, 11 sediment samples, and 16 tuff samples with a maximum concentration of 47.5 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil, sediment, and tuff are statistically different from background (Figure G-89 and Table G-14, Figure G-90 and Table G-15, and Figure G-91 and Table G-13, respectively). Beryllium is retained as a COPC.

Cadmium was detected above the soil and sediment BVs (0.4 mg/kg for both) in 13 soil samples and 2 sediment samples with a maximum concentration of 7.98 mg/kg. Cadmium also had DLs (0.402 mg/kg to 0.768 mg/kg) above BVs in 55 soil samples and 8 sediment samples. The quantile and slippage tests indicated site concentrations of cadmium in sediment are statistically different from background (Figure G-92 and Table G-15). Cadmium is retained as a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in three soil samples and nine tuff samples with a maximum concentration of 27,600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-93 and Table G-14). The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-94 and Table G-13). Calcium is retained as a COPC.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg) in 13 soil samples, 8 sediment samples, and 47 tuff samples with a maximum concentration of 55.8 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil, sediment, and tuff are statistically different from background (Figure G-95 and Table G-14, Figure G-96 and Table G-15, and Figure G-97 and Table G-13, respectively). Chromium is retained as a COPC.

Cobalt was detected above the soil, sediment, and Qbt 2,3,4 BVs (8.64 mg/kg, 4.73 mg/kg, and 3.14 mg/kg) in 5 soil samples, 1 sediment sample, and 42 tuff samples with a maximum concentration of 17.1 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil and sediment are not statistically different from background (Figure G-98 and Table G-14, and Figure G-99 and Table G-15, respectively). The Gehan and slippage tests indicated site concentrations of cobalt in tuff are statistically different from background (Figure G-100 and Table G-13). Cobalt is retained as a COPC.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg) in 44 soil samples, 12 sediment samples, and 39 tuff samples with a maximum concentration of 36,400 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil, sediment, and tuff are statistically different from background (Figure G-101 and Table G-14, Figure G-102 and Table G-15, and Figure G-103 and Table G-13, respectively). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 0.555 mg/kg. The detected concentration was only 0.055 mg/kg above the BV. Cyanide was not detected or was detected below BV in 162 other samples (detected below BV in 21 samples). Cyanide is not a COPC.

Iron was detected above the sediment and Qbt 2,3,4 BVs (13,800 mg/kg and 14,500 mg/kg) in four sediment samples and four tuff samples with a maximum concentration of 22,300 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in sediment are statistically different from background (Figure G-104 and Table G-15). The Gehan test indicated site concentrations of iron in tuff are statistically different from background (Table G-13). However, the quantile and slippage tests indicated site concentrations of iron in tuff are not statistically different from background (Figure G-105 and Table G-13). Iron is retained as a COPC.

Lead was detected above the soil, sediment, and Qbt 2,3,4 BVs (22.3 mg/kg, 19.7 mg/kg, and 11.2 mg/kg) in 48 soil samples, 8 sediment samples, and 22 tuff samples with a maximum concentration of 138,000 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil, sediment, and tuff are statistically different from background (Figure G-106 and Table G-14, Figure G-107 and Table G-15, and Figure G-108 and Table G-13, respectively). Lead is retained as a COPC.

Magnesium was detected above the sediment and Qbt 2,3,4 BVs (2370 mg/kg and 1690 mg/kg) in one sediment sample and three tuff samples with a maximum concentration of 2870 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in sediment are not statistically different from background (Figure G-109 and Table G-15). The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-13). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-110 and Table G-13). Magnesium is not a COPC.

Manganese was detected above the soil and sediment BVs (671 mg/kg and 543 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 765 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil and sediment are not statistically different from background (Figure G-111 and Table G-14, and Figure G-112 and Table G-15, respectively). Manganese is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 1.1 mg/kg and had DLs (0.11 mg/kg) above the BV in five samples. The concentrations were 0.01 mg/kg and 1.0 mg/kg above BV, and the DLs were 0.01 mg/kg above the BV. Mercury was not detected or was detected below BV in 164 other samples (detected below BV in 133 samples). Mercury is not a COPC.

Nickel was detected above the soil, sediment, and Qbt 2,3,4 BVs (15.4 mg/kg, 9.38 mg/kg, and 6.58 mg/kg) in 3 soil samples, 3 sediment samples, and 15 tuff samples with a maximum concentration of 21 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil and sediment are not statistically different from background (Figure G-113 and Table G-14, and Figure G-114 and Table G-15, respectively). The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-115 and Table G-13). Nickel is retained as a COPC.

Perchlorate was detected in 15 samples with a maximum concentration of 0.00243 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 3 samples with a maximum concentration of 0.67 mg/kg and had DLs (0.54 mg/kg to 1.86 mg/kg) above the soil and sediment BVs (1.52 mg/kg and 0.3 mg/kg) and the Qbt 2,3,4 BV in 6 soil samples, 19 sediment samples, and 59 tuff samples. Selenium is retained as a COPC.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs (1 mg/kg for all) in eight soil samples, one sediment sample, and two tuff samples with a maximum concentration of 6.95 mg/kg. Silver also had a DL (1.1 mg/kg) above the soil BV in one sample. The maximum concentration is substantially above BV. Silver is retained as a COPC.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs (1.82 mg/kg, 2.22 mg/kg, and 2.4 mg/kg) in 79 soil samples, 19 sediment samples, and 28 tuff samples with a maximum concentration of 659 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil, sediment, and tuff are statistically different from background (Figure G-116 and Table G-14, Figure G-117 and Table G-15, and Figure G-118 and Table G-13, respectively). Uranium is retained as a COPC.

Vanadium was detected above the sediment and Qbt 2,3,4 BVs (19.7 mg/kg and 17 mg/kg) in four sediment samples and two tuff samples with a maximum concentration of 34.8 mg/kg. The Gehan and slippage tests indicated site concentrations of vanadium in sediment are statistically different from background (Figure G-119 and Table G-15). The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-120 and Table G-13). Vanadium is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 60.2 mg/kg) in 27 soil samples and 2 sediment samples with a maximum concentration of 13,300 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil and sediment are statistically different from background (Figure G-121 and Table G-14, and Figure G-122 and Table G-15, respectively). Zinc is retained as a COPC.

**Organic Chemicals**

A total of 163 samples (82 soil, 19 sediment, and 62 tuff) were collected at SWMU 15-008(b) and analyzed for explosive compounds. Forty samples (17 soil, 6 sediment, and 17 tuff) were also analyzed for PCBs. Table 8.5-3 summarizes the analytical results for detected organic chemicals. Plate 15 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 15-008(b) include Aroclor-1242, Aroclor-1254, Aroclor-1260, Aroclor-1268, HMX, RDX, TATB, and TNT. The detected organic chemicals are retained as COPCs.

**Radionuclides**

A total of 163 samples (82 soil, 19 sediment, and 62 tuff) were collected at SWMU 15-008(b) and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 8.5-4 presents the radionuclides detected or detected above BVs/FVs. Plate 16 shows the spatial distribution of detected radionuclides.

Americium-241 was detected above the soil FV (0.013 pCi/g) in six samples and detected in one tuff sample with a maximum activity of 0.0769 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in two samples, was detected below 1 ft bgs in four soil samples, and was detected in four tuff samples with a maximum activity of 1.96 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in 10 samples, was detected below 1 ft bgs in 1 soil sample, and was detected in 1 tuff sample with a maximum activity of 0.333 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 67 soil samples and 57 tuff samples and was detected above the sediment FV (0.093 pCi/g) in 18 samples with a maximum activity of 199 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above soil, sediment, and Qbt 2,3,4 BVs (2.59 pCi/g, 2.59 pCi/g, and 1.98 pCi/g) in 38 soil samples, 13 sediment samples, and 13 tuff samples with a maximum activity of 43.4 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above soil, sediment, and Qbt 2,3,4 BVs (2.59 pCi/g, 2.59 pCi/g, and 1.98 pCi/g) in 37 soil samples, 15 sediment samples, and 20 tuff samples with a maximum activity of 6.57 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above soil, sediment, and Qbt 2,3,4 BVs (2.59 pCi/g, 2.59 pCi/g, and 1.98 pCi/g) in 59 soil samples, 17 sediment samples, and 24 tuff samples with a maximum activity of 291 pCi/g. Uranium-238 is retained as a COPC.

#### 8.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-008(b) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-008(b) include antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, nickel, perchlorate, selenium, silver, uranium, vanadium, and zinc.

Antimony was detected above the soil, sediment, and Qbt 2,3,4 BVs in 23 soil samples, 1 sediment sample, and 12 tuff samples with a maximum concentration of 256 mg/kg and had DLs (0.578 mg/kg to 8.6 mg/kg) above BVs in 62 soil samples, 17 sediment samples, and 46 tuff samples. Concentrations increased with depth at location 15-610723, did not change substantially with depth (0.26 mg/kg) at location 15-610724, and decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 16 times the maximum concentration at location 15-610723, where vertical extent is not defined. The residential and industrial SSLs were approximately 3.6 times and 60 times the maximum DL, respectively. The lateral extent of antimony is defined, and further sampling for vertical extent is not warranted.

Arsenic was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and three tuff samples with a maximum concentration of 5.91 mg/kg. Concentrations increased with depth at all locations and decreased downgradient. The maximum concentration was 0.91 mg/kg above the maximum Qbt 2,3,4 background concentration (5 mg/kg), while the other tuff concentrations were below the maximum background concentration. The sediment concentration was only 0.98 mg/kg above the sediment BV. The industrial SSL was approximately 3.6 times to 7.5 times the concentrations above BVs, and arsenic does not pose a potential unacceptable risk under the industrial and residential scenarios (Appendix H). The lateral extent of arsenic is defined, and further sampling for vertical extent is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 27 tuff samples with a maximum concentration of 344 mg/kg. Concentrations increased with depth at locations 15-610705, 15-610713, 15-610714, 15-610726, 15-610728, 15-610730, 15-610736, 15-610741, 15-610745, 15-610751, 15-610760, and 15-610781. Concentrations did not change substantially with depth (1.3 mg/kg and 1.8 mg/kg, respectively) at locations 15-610750 and 15-610776 and decreased with depth at all other locations (the concentrations in the shallow samples at locations 15-610711, 15-610723, 15-610725, 15-610734, 15-610735, 15-610739, 15-610743, 15-610746, 15-610747, 15-610750, 15-610755, 15-610763, 15-610774, and 15-610776 were 77.6 mg/kg, 101 mg/kg, 122 mg/kg, 157 mg/kg, 105 mg/kg, 82.6 mg/kg, 112 mg/kg, 89 mg/kg, 73.4 mg/kg, 46.5 mg/kg, 70.5 mg/kg, 91.7 mg/kg, 86.2 mg/kg, and 52.3 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient of the maximum concentration at location 15-610781. The residential SSL was approximately 45 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Beryllium was detected above the soil, sediment, and Qbt 2,3,4 BVs in 35 soil samples, 11 sediment samples, and 16 tuff samples with a maximum concentration of 47.5 mg/kg. Concentrations increased with depth at locations 15-610747, 15-610760, and 15-610781 and did not change substantially with depth (0.33 mg/kg, 0.01 mg/kg, 0.26 mg/kg, and 0.08 mg/kg, respectively) at locations 15-610705, 15-610717, 15-610718, and 15-610752 (the concentration in the shallow sample at location 15-610752 was 1.51 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient of the maximum concentration at location 15-610732. The residential and industrial SSLs were approximately 3.3 times and 54 times the maximum concentration, respectively. The lateral extent of beryllium is defined, and further sampling for vertical extent is not warranted.

Cadmium was detected above the soil and sediment BVs in 13 soil samples and 2 sediment samples with a maximum concentration of 7.98 mg/kg and had DLs (0.402 mg/kg to 0.768 mg/kg) above BVs in 55 soil samples and 8 sediment samples. Concentrations decreased with depth at all locations and decreased downgradient of the maximum concentration at location 15-610712. The residential SSL was approximately 92 times the maximum DL. The lateral and vertical extent of cadmium are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs in three soil samples and nine tuff samples with a maximum concentration of 27,600 mg/kg. Concentrations increased with depth at locations 15-610713, 15-610725, 15-610728, 15-610736, 15-610739, 15-610747, and 15-610760, and only one depth was sampled at location 15-610762. Concentrations decreased with depth at locations 15-610715, 15-610722, and 15-610726 (the concentration in the shallow sample at location 15-610726 was 2930 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The NMED residential essential nutrient SSL was approximately 470 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs in 13 soil samples, 8 sediment samples, and 47 tuff samples with a maximum concentration of 55.8 mg/kg. Concentrations increased with depth at locations 15-610708, 15-610709, 15-610710, 15-610712, 15-610714, 15-610715, 15-610717, 15-610718, 15-610719, 15-610721, 15-610728, 15-610730, 15-610731, 15-610732, 15-610734, 15-610736, 15-610738, 15-610739, 15-610740, 15-610741, 15-610742, 15-610743, 15-610745, 15-610746, 15-610747, 15-610753, 15-610760, 15-610763, 15-610765, and 15-610781. Concentrations did not change substantially with depth (0.45 mg/kg, 0.4 mg/kg, 0.8 mg/kg, 0.03 mg/kg, 0.11 mg/kg, 0.59 mg/kg, and 0.6 mg/kg, respectively) at locations 15-610729, 15-610749, 15-610751, 15-610755, 15-610774, 15-610779, and 15-610780 and decreased with depth at locations 15-02502, 15-610707, 15-610711, 15-610713, 15-610716, 15-610726, 15-610733, 15-610735, 15-610737, 15-610752, 15-610754, 15-610756, 15-610757, 15-610759, 15-610770, 15-610771, 15-610773, 15-610782, and 15-610783 (the concentrations in the shallow samples at locations 15-610707, 15-610711, 15-610713, 15-610726, 15-610729, 15-610733, 15-610749, 15-610751, 15-610752, 15-610755, 15-610757, 15-610759, 15-610774, 15-610779, and 15-610780 were 10.3 mg/kg, 12.7 mg/kg, 15 mg/kg, 11.6 mg/kg, 8.28 mg/kg, 12.6 mg/kg, 11.9 mg/kg, 12.7 mg/kg, 17.8 mg/kg, 9.15 mg/kg, 11.1 mg/kg, 18.3 mg/kg, 7.29 mg/kg, 7.79 mg/kg, and 9.09 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 2100 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil, sediment, and Qbt 2,3,4 BVs in 5 soil samples, 1 sediment sample, and 42 tuff samples with a maximum concentration of 17.1 mg/kg. Concentrations increased with depth at locations 15-610704, 15-610706, 15-610709, 15-610710, 15-610712, 15-610723, 15-610724, 15-610726, 15-610730, 15-610731, 15-610732, 15-610736, 15-610741, 15-610742, 15-610749, 15-610750, 15-610751, 15-610752, 15-610755, 15-610757, and 15-610758. Concentrations did not change substantially with depth (0.48 mg/kg, 0.45 mg/kg, 0.32 mg/kg, 0.57 mg/kg, 0.17 mg/kg, 0.71 mg/kg, 0.13 mg/kg, 0.68 mg/kg, 0.1 mg/kg, and 0.72 mg/kg, respectively) at locations 15-610707, 15-610708, 15-610713, 15-610714, 15-610719, 15-610734, 15-610735, 15-610740, 15-610761, and 15-610763 and decreased with depth at locations 15-610711, 15-610715, 15-610738, 15-610743, 15-610745, 15-610753, 15-610756, 15-610759, 15-610760, 15-610764, 15-610765, and 15-610773 (the concentrations in the shallow samples at locations 15-610707, 15-610708, 15-610711, 15-610713, 15-610734, 15-610735, 15-610740, 15-610743, 15-610753, 15-610756, 15-610759, 15-610761, 15-610763, and 15-610764 were 3.12 mg/kg, 3.41 mg/kg, 6.09 mg/kg, 8.08 mg/kg, 7.19 mg/kg, 3.39 mg/kg, 3.6 mg/kg, 5.66 mg/kg, 5.55 mg/kg, 4.18 mg/kg, 4.71 mg/kg, 4.77 mg/kg, 3.69 mg/kg, and 5.95 mg/kg, respectively, and below the soil FV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential and industrial SSLs were approximately 1.4 times and 20 times the maximum concentration, respectively. Further sampling for extent of cobalt is not warranted.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs in 44 soil samples, 12 sediment samples, and 39 tuff samples with a maximum concentration of 36,400 mg/kg. Concentrations increased with depth at locations 15-02502, 15-610726, 15-610730, 15-610741, and 15-610752, and only one depth was sampled at location 15-610762. Concentrations did not change substantially with depth (0.79 mg/kg) at location 15-610719 and decreased with depth at all other locations (the concentrations in the shallow samples at locations 15-610713, 15-610717, 15-610719, 15-610736, 15-610760, 15-610763, and 15-610765 were 11.9 mg/kg, 7.13 mg/kg, 5.52 mg/kg, 10.4 mg/kg, 11.1 mg/kg, 9.88 mg/kg, and 6.89 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential and industrial SSLs were approximately 2.2 times and 37 times the maximum concentration in the deeper samples where concentrations increased with depth (1410 mg/kg at location 15-610752). The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Iron was detected above the sediment and Qbt 2,3,4 BVs in four sediment samples and four tuff samples with a maximum concentration of 22,300 mg/kg. Concentrations increased with depth at locations 15-610718, 15-610730, and 15-610734; did not change substantially with depth (50 mg/kg) at location 15-610726; and decreased with depth at locations 15-610719 and 15-610773. Concentrations decreased downgradient. The residential SSL was approximately 2.5 times the maximum concentration (the maximum concentration was 32,500 mg/kg below the residential SSL), and the industrial SSL was approximately 41 times the maximum concentration. The lateral extent of iron is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil, sediment, and Qbt 2,3,4 BVs in 48 soil samples, 8 sediment samples, and 22 tuff samples with a maximum concentration of 138,000 mg/kg. Concentrations did not change substantially with depth (10 mg/kg and 9 mg/kg) at locations 15-610705 and 15-610723, and only one depth was sampled at location 15-610762. Concentrations decreased with depth at all other locations. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 9.4 and 18.7 times the concentration at location 15-610762, where only a surface sample was collected. The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the soil, sediment, and Qbt 2,3,4 BVs in 3 soil samples, 3 sediment samples, and 15 tuff samples with a maximum concentration of 21 mg/kg. Concentrations increased with depth at locations 15-610714, 15-610718, 15-610719, 15-610728, 15-610730, 15-610736, 15-610741, 15-610751, 15-610760, 15-610763, 15-610764, and 15-610765. Concentrations did not change substantially with depth (0.74 mg/kg and 0.7 mg/kg) at locations 15-610713 and 15-610747, respectively, and decreased with depth at locations 15-02502, 15-610705, 15-610726, 15-610739, 15-610746, and 15-610771 (concentrations in the shallow samples at locations 15-610713, 15-610739, 15-610746, and 15-610747 were 6.73 mg/kg, 12 mg/kg, 8.47 mg/kg, and 6.47 mg/kg, respectively and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 74 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 15 samples with a maximum concentration of 0.00243 mg/kg. Concentrations increased with depth at locations 15-610713, 15-610715, 15-610718, 15-610728, 15-610730, 15-610736, 15-610739, 15-610747, 15-610750, 15-610760, 15-610761, 15-610769, and 15-610782 and did not change substantially with depth (0.00006 mg/kg) at location 15-610779. All but one concentration were below EDLs. Concentrations decreased downgradient. The residential SSL was approximately 22,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 3 samples with a maximum concentration of 0.67 mg/kg and had DLs (0.54 mg/kg to 1.86 mg/kg) above the soil, sediment, and Qbt 2,3,4 BVs in 6 soil samples, 19 sediment samples, and 59 tuff samples. Concentrations increased with depth at locations 15-610713, 15-610714, and 15-610747, but all detected concentrations were below EDLs. Concentrations decreased downgradient. The residential SSL was approximately 558 times the maximum concentration and approximately 210 times the maximum DL. The lateral extent of selenium is defined, and further sampling for vertical extent is not warranted.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs in eight soil samples, one sediment sample, and two tuff samples with a maximum concentration of 6.95 mg/kg and had a DL (1.1 mg/kg) above the soil BV in one sample. Concentrations increased with depth at locations 15-610729 and 15-610730 and decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 59 times the maximum concentration. The lateral extent of silver is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs in 79 soil samples, 19 sediment samples, and 28 tuff samples with a maximum concentration of 659 mg/kg. Concentrations increased with depth at locations 15-610705, 15-610723, 15-610748, 15-610778, and 15-610784, and only one depth was sampled at location 15-610762. The residential SSL was approximately 4 times and the industrial SSL was approximately 67 times the concentration at location 15-610762. Concentrations decreased with depth at all other locations. Concentrations decreased downgradient. The industrial SSL was 21 times the maximum concentration at locations 15-610705, 15-610762, 15-610778, and 15-610784 and 7.6 times and 9.6 times the concentrations in the deeper samples at locations 15-610723 and 15-610748, respectively. The lateral extent of uranium is defined, and the vertical extent at locations 15-610723 and 15-610748 is not defined. Further sampling for vertical extent is warranted at location 15-610723 but not at location 15-610748, where vertical extent of all uranium isotopes is defined (see below).

Vanadium was detected above the sediment and Qbt 2,3,4 BVs in four sediment samples and two tuff samples with a maximum concentration of 34.8 mg/kg. Concentrations increased with depth at locations 15-610718 and 15-610751 and decreased with depth at locations 15-610719 and 15-610772. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 11 times and approximately 188 times the maximum concentration, respectively. The lateral extent of vanadium is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above the soil and sediment BVs in 27 soil samples and 2 sediment samples with a maximum concentration of 13,300 mg/kg. Concentrations increased with depth at location 15-610754, and only one depth was sampled at location 15-610762. Concentrations decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 369 times the maximum concentration at locations 15-610754 and 15-610762. The lateral extent of zinc is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 15-008(b) include Aroclor-1242, Aroclor-1254, Aroclor-1260, Aroclor-1268, HMX, RDX, TATB, and TNT.

Aroclor-1242 was detected in one sample at a concentration of 0.282 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in 20 samples with a maximum concentration of 0.143 mg/kg. Concentrations increased with depth at locations 15-610716 and 15-610720; did not change substantially with depth (0.005 mg/kg to 0.14 mg/kg) at locations 15-610705, 15-610706, 15-610707, 15-610714, and 15-610718; and decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 520 times the maximum concentration at location 15-610716 and approximately 137 times the maximum concentration at location 15-610720. The lateral extent of Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 16 samples with a maximum concentration of 0.0608 mg/kg. Concentrations increased with depth at location 15-610720; did not change substantially with depth (0.0046 mg/kg to 0.058 mg/kg) at locations 15-610705, 15-610706, 15-610714, and 15-610718; and decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 460 times the concentration at location 16-610720 and approximately 40 times the maximum concentration. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1268 was detected in three samples with a maximum concentration of 0.0205 mg/kg. Concentrations decreased with depth at location 15-610715, did not change substantially with depth (0.016 mg/kg) at location 15-610714, and decreased downgradient. The lateral and vertical extent of Aroclor-1268 are defined.

HMX was detected in 17 samples with a maximum concentration of 35.4 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of HMX are defined.

RDX was detected in six samples with a maximum concentration of 7.72 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of RDX are defined.

TATB was detected in 13 samples with a maximum concentration of 28.6 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of TATB are defined.

TNT was detected in two samples with a maximum concentration of 0.205 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of TNT are defined.

**Radionuclides**

Radionuclide COPCs at SWMU 15-008(b) include americium-241, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

Americium-241 was detected above the soil FV in six samples and detected in one tuff sample with a maximum activity of 0.0769 pCi/g. Activities decreased with depth at all locations except 15-610749 and decreased downgradient. The residential SAL was approximately 1080 times the maximum activity. The lateral extent of americium-241 is defined, and further sampling for vertical extent is not warranted.

Cesium-137 was detected above the soil FV in two samples, was detected below 1 ft bgs in four soil samples, and was detected in four tuff samples with a maximum activity of 1.96 pCi/g. Activities increased with depth at locations 15-610748 and 15-610784, and only one depth was sampled at location 15-610762. Activities decreased with depth at locations 15-610720, 15-610730, 15-610731, 15-610742, 15-610757, and 15-610758 (activities in shallow samples at locations 15-610720, 15-610742, 15-610757, and 15-610758 were 0.673 pCi/g, 0.842 pCi/g, 0.472 pCi/g, and 0.401 pCi/g, respectively, and below the soil FV [Appendix E, Pivot Tables]). Activities decreased downgradient. The residential SAL was approximately 84 times and 34 times the activities at locations 15-610748 and 15-610784, respectively. The residential and industrial SALs were approximately 6 times and 21 times the maximum activity, respectively. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected above the soil FV in 10 samples, was detected below 1 ft bgs in 1 soil sample, and was detected in 1 tuff sample with a maximum activity of 0.333 pCi/g. Activities increased with depth at location 15-610749, and only one depth was sampled at location 15-610762. Activities decreased with depth at all other locations (the activity in the shallow sample at location 15-610720 was 0.0317 pCi/g and below the soil FV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SAL was approximately 260 times the maximum activity at location 15-610749 and approximately 238 times the maximum activity. The lateral extent of plutonium-239/240 is defined, and further sampling for vertical extent is not warranted.

Tritium was detected in 67 soil samples and 57 tuff samples and was detected above the sediment FV in 18 samples with a maximum activity of 199 pCi/g. Activities increased with depth at locations 15-610709, 15-610710, 15-610713, 15-610728, 15-610739, 15-610741, 15-610748, 15-610749, 15-610765, and 15-610784, and only one depth was sampled at location 15-610762. Activities did not change substantially with depth (0.026 pCi/g, 0.036 pCi/g, 0.043 pCi/g, and 0.032 pCi/g) at locations 15-610734, 15-610735, 15-610736, and 15-610755. Activities decreased with depth at all other locations and decreased downgradient. The residential and industrial SALs were approximately 8.6 times and 12,300 times the maximum activity, respectively. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-234 was detected above soil, sediment, and Qbt 2,3,4 BVs in 38 soil samples, 13 sediment samples, and 13 tuff samples with a maximum activity of 43.4 pCi/g. Activities increased with depth at location 15-610784 and did not change substantially with depth (0.3 pCi/g and 0.4 pCi/g) at locations 15-610723 and 15-610747. Only one depth was sampled at location 15-610762 (the residential SAL was approximately 47 times the activity at this location). Activities decreased with depth at all other locations and decreased downgradient. The residential SAL was approximately 105 times the activity at location 15-610784. The lateral extent of uranium-234 is defined, and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above soil, sediment, and Qbt 2,3,4 BVs in 37 soil samples, 15 sediment samples, and 20 tuff samples with a maximum activity of 6.57 pCi/g. Activities increased with depth at location 15-610723, and only one depth was sampled at location 15-610762. The residential SAL was approximately 71 times the activity at location 15-610762. Activities did not change substantially with depth (1 pCi/g or less) at 13 locations and decreased with depth at all other locations (the activity in the shallow sample at location 15-610747 was 0.138 pCi/g and below the soil BV [Appendix E, Pivot Tables]). Activities decreased downgradient. The residential SAL was approximately 13 times and the industrial SAL was approximately 49 times the maximum activity at location 15-610723. The lateral extent of uranium-235/236 is defined, and further sampling for vertical extent is not warranted.

Uranium-238 was detected above soil, sediment, and Qbt 2,3,4 BVs in 59 soil samples, 17 sediment samples, and 24 tuff samples with a maximum activity of 291 pCi/g. Activities increased with depth at locations 15-610723, 15-610747, and 15-610784, and only one depth was sampled at location 15-610762. The residential SAL was approximately 7 times and the industrial SAL was approximately 31 times the activity at location 15-610762. Activities did not change substantially with depth (0.13 pCi/g) at location 15-610726, decreased with depth at all other locations, and decreased downgradient. The residential and industrial SALs were approximately 4.3 times and 20 times the maximum activity at location 15-610747 and approximately 28 times and 134 times the maximum activity at location 15-610784. The industrial SAL was approximately 3.8 times the maximum activity at location 15-610723. The lateral extent of uranium-238 is defined, and vertical extent at location 15-610723 is not defined.

#### 8.5.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $9 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 11, which is above the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead. The total dose is 2 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 12, which is above the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead. The total dose is 8 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable cancer risks and doses exist for the industrial and residential scenarios at SWMU 15-008(b). There are potential unacceptable noncancer risks for the industrial and residential scenarios at SWMU 15-008(b).

#### 8.5.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the American kestrel, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-008(b). There is the potential for adverse effects to the American robin, montane shrew, deer mouse, earthworm, and plant at SWMU 15-008(b).

### 8.6 AOC 15-008(g)—Surface Disposal Associated with Firing Site R-45

#### 8.6.1 Site Description and Operational History

AOC 15-008(g) is the location of a former pile of broken sandbags located in TA-15 at Firing Site R-45 [SWMU 15-006(d)] (Figure 8.6-1). The sandbags were used as shielding for the explosives tests carried out at the firing site (LANL 1996, 054977, p. 5-103). Firing Site R-45 was constructed in 1951 and was used until 1992 for experiments involving small amounts of explosives. The sandbags had been removed from the site.

#### 8.6.2 Relationship to Other SWMUs and AOCs

AOC 15-008(g) is a component of Consolidated Unit 15-006(d)-99, along with SWMU 15-006(d), whose investigation is deferred per Table IV-2 of the Consent Order. AOC 15-008(g) is located adjacent to the R-45 firing site [SWMU 15-006(d)], and is approximately 100 ft north of SWMU 15-009(b), though on the other side of a berm from that site. SWMUs 15-007(c) and 15-007(d) are approximately 300 ft to the east and downgradient (Figure 8.1-1).

#### 8.6.3 Summary of Previous Investigations

As part of RFI activities in 1995, a radiological survey of the site was conducted, and one surface sample was collected from one location. The sample was submitted for analyses of inorganic chemicals and HE (LANL 1996, 054977, p. 5-104).

Data from the sample collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 8.6.4 Site Contamination

#### 8.6.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 15-008(g). As a result, the following activities were completed as part of the 2009−2010 investigation.

- Eight samples were collected in 2009–2010 from four locations within and around AOC 15-008(g). At each location, samples were collected at the surface (0.0–0.5 ft bgs) and from the subsurface (2.0–2.5 ft bgs to 2.0–4.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, perchlorate, explosive compounds, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Two samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC 15-008(g) are shown on Figure 8.6-1. Table 8.6-1 presents the samples collected and analyses requested for AOC 15-008(g). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.6.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.6.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 15-008(g) consist of eight samples (six soil and two tuff) collected from four locations.

**Inorganic Chemicals**

Eight samples (six soil and two tuff) were collected at AOC 15-008(g) and analyzed for TAL metals, cyanide, perchlorate, and total uranium. Table 8.6-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.6-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 3.77 mg/kg and had DLs (1.01 mg/kg to 1.24 mg/kg) above BVs in five soil samples and one tuff sample. Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.508 mg/kg to 0.621 mg/kg) above the BV in six samples. The DLs were only 0.108 mg/kg to 0.221 mg/kg above the BV, below the highest background DL (2 mg/kg), and below or similar to the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected in any samples. Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in one sample at a concentration of 2810 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 25.4 mg/kg. The concentration is 6.1 mg/kg above the BV and below the two highest soil background concentrations (26 mg/kg and 36.5 mg/kg). Chromium was detected below BVs in the other seven samples. Chromium is not a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 14 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in three samples with a maximum concentration of 41.3 mg/kg. Copper is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in two samples with a maximum concentration of 370 mg/kg. Lead is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.13 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Uranium was detected above the soil and Qbt 2,3,4 BVs (1.82 mg/kg and 2.4 mg/kg) in four soil samples and two tuff samples with a maximum concentration of 7.77 mg/kg. Uranium is retained as a COPC.

**Organic Chemicals**

Eight samples (six soil and two tuff) were collected at AOC 15-008(g) and analyzed for explosive compounds. Two soil samples were also analyzed for PCBs. Table 8.6-3 summarizes the analytical results for detected organic chemicals. Figure 8.6-3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 15-008(g) include TATB. The detected organic chemical is retained as a COPC.

**Radionuclides**

Eight samples (six soil and two tuff) were collected at AOC 15-008(g) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 8.6-4 presents the radionuclides detected or detected above BVs/FVs. Figure 8.6-4 shows the spatial distribution of detected radionuclides.

Tritium was detected in three samples with a maximum activity of 0.037 pCi/g. Tritium is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in three samples with a maximum activity of 4.14 pCi/g. Uranium-238 is retained as a COPC.

#### 8.6.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 15-008(g) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC 15-008(g) include antimony, calcium, cobalt, copper, lead, selenium, and uranium.

Antimony was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 3.77 mg/kg and had DLs (1.01 mg/kg to 1.24 mg/kg) above the BVs in five soil samples and one tuff sample. Concentrations increased with depth at location 15-610566 and decreased with depth at location 15-610568. Concentrations increased laterally at location 15-610568 but decreased downgradient. The residential and industrial SSLs were approximately 8.3 times and 138 times the maximum concentration, and the residential SSL was approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 2810 mg/kg. Concentrations did not change substantially with depth (150 mg/kg) at location 15-610566 (the concentration in the shallow sample at location 15-610566 was 2960 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally and downgradient. The NMED residential essential nutrient SSL was approximately 4600 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil BV in one sample at a concentration of 14 mg/kg. Concentrations decreased with depth and downgradient but increased laterally at location 15-610568. The residential and industrial SSLs were approximately 1.6 times and 25 times the maximum concentration, respectively. The vertical extent of cobalt is defined, and further sampling for lateral extent is not warranted.

Copper was detected above the soil BV in three samples with a maximum concentration of 41.3 mg/kg. Concentrations decreased with depth at all locations and decreased laterally and downgradient. The lateral and vertical extent of copper are defined.

Lead was detected above the soil BV in two samples with a maximum concentration of 370 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient but increased laterally at location 15-610568. The residential SSL was approximately 1.1 times the maximum concentration and the industrial SSL was approximately 2.2 times the maximum concentration at location 15-610568. The vertical extent of lead is defined, and lateral extent at location 15-610568 is not defined.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.13 mg/kg) above the BV in two samples. Because selenium was not detected above BV and the residential SSL was approximately 346 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and two tuff samples with a maximum concentration of 7.77 mg/kg. Concentrations increased with depth at location 15-610565, did not change substantially with depth (0.56 mg/kg and 0.23 mg/kg) at locations 15-610566 and 15-610568, and decreased with depth at location 15-610567. Concentrations decreased or did not change substantially laterally (0.1 mg/kg to 0.23 mg/kg) at location 15-610568 and increased downgradient at location 15-610565. The residential SSL was approximately 30 times the maximum concentration. Further sampling for extent of uranium is not warranted.

**Organic Chemicals**

Organic COPCs at AOC 15-008(g) include TATB.

TATB was detected in six samples with a maximum concentration of 27.3 mg/kg. Concentrations increased with depth at locations 15-610566, 15-610567, and 15-610568 and decreased with depth at location 15-610565. Concentrations increased laterally and downgradient. The residential SSL was approximately 81 times the maximum concentration. Further sampling for extent of TATB is not warranted.

**Radionuclides**

Radionuclide COPCs at AOC 15-008(g) include tritium and uranium-238.

Tritium was detected in three samples with a maximum activity of 0.037 pCi/g. Activities increased with depth at locations 15-610566 and 15-610568 and decreased with depth at location 15-610565. Activities did not change substantially (0.011 pCi/g to 0.021 pCi/g) laterally and downgradient. The residential SAL was approximately 46,000 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-238 was detected above the soil BV in three samples with a maximum activity of 4.14 pCi/g. Activities increased with depth at location 15-610565 and decreased with depth at locations 15-610566 and 15-610568. Activities decreased laterally and downgradient. The residential SAL was approximately 36 times the maximum activity. The lateral extent of uranium-238 is defined, and further sampling for vertical extent is not warranted.

### 8.6.5 Summary of Human Health Risk Screening

**Industrial Scenario**

No carcinogenic COPCs were identified for the industrial scenario. The HI is 0.5, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

No carcinogenic COPCs were identified for the residential scenario. The HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The HI is primarily from lead. The lead EPC is less than the residential SSL, and the HI without lead is 0.6. The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC 15-008(g).

### 8.6.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 15-008(g).

## 8.7 SWMU 15-009(b)—Septic System

### 8.7.1 Site Description and Operational History

SWMU 15-009(b) is a septic system located at Firing Site R-45 at TA-15. The septic system consists of a former septic tank (structure 15-61), a seepage pit, associated drainlines, and a former outfall (Figure 8.7-1). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity. This septic system served restroom facilities in the firing site control building 15-45. The septic tank originally discharged to an outfall located approximately 20 ft southeast of the septic tank. In the 1970s, a seepage pit measuring approximately 4 ft in diameter × 50 ft deep, was constructed to receive discharges from the septic tank. A 2003 engineering drawing shows the outfall pipe has been plugged (LANL 2003, 102118).

The septic tank (structure 15-61) was removed in 2010 during the 2009–2010 investigation, but the drainlines and seepage pit remain in place.

### 8.7.2 Relationship to Other SWMUs and AOCs

SWMU 15-009(b) is located approximately 100 ft south of Firing Site R-45 [SWMU 15-006(d)] and AOC 15-008(g), though on the other side of a berm from those sites. SWMUs 15-007(c) and 15-007(d) are located approximately 300 ft to the east (Figure 8.1-1).

### 8.7.3 Summary of Previous Investigations

No sampling was conducted at this SWMU before 2009.

### 8.7.4 Site Contamination

#### 8.7.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 15-009(b). As a result, the following activities were completed as part of the 2009–2010 investigation.

- Twenty samples were collected in 2009–2010 from nine locations. Eight samples were collected from four locations beneath the inlet drainline, septic tank inlet and outlet, and septic tank. Samples were collected from two depth intervals (7.0–8.0 ft bgs or 15.0–16.0 ft bgs and 12.0−13.0 ft bgs or 17.0–18.0 ft bgs) at each location. Eight samples were collected from four locations in the drainage below the septic tank outfall. Samples were collected from two depth intervals (0.0–0.3 ft bgs to 0.0–1.0 ft bgs and 1.0–1.5 ft bgs or 1.0–2.0 ft bgs). Four samples were collected from a borehole adjacent to the seepage pit. Samples were collected at intervals of 47.5–50.0 ft bgs, 58.5–60.0 ft bgs, 68.5–70.0 ft bgs, and 78.5–80.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, total uranium, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Eight samples were also analyzed for PCBs.
- All investigation samples were field-screened for gross-alpha and -beta radioactivity. Field-screening results were recorded on borehole logs and/or corresponding SCLs. Borehole logs are presented in Appendix C, and SCLs/COC forms are included in Appendix E.

The 2009–2010 sampling locations at SWMU 15-009(b) are shown on Figure 8.7-1. Table 8.7-1 presents the samples collected and analyses requested for SWMU 15-009(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.7.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.7.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-009(b) consist of 20 samples (8 soil, 5 sediment, and 7 tuff) collected from 9 locations.

**Inorganic Chemicals**

A total of 20 samples (8 soil, 5 sediment, and 7 tuff) were collected at SWMU 15-009(b) and analyzed for TAL metals, cyanide, nitrate, perchlorate, and total uranium. Table 8.7-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.7-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs (0.83 mg/kg, 0.83 mg/kg, and 0.5 mg/kg) but had DLs (0.787 mg/kg to 1.44 mg/kg) above the BVs in three soil samples, four sediment samples, and seven tuff samples. Antimony is retained as a COPC.

Barium was detected above the sediment and Qbt 2,3,4 BVs (127 mg/kg and 46 mg/kg) in one sediment sample and one tuff sample with a maximum concentration of 134 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil and sediment BVs (0.4 mg/kg for both) but had DLs (0.556 mg/kg to 0.757 mg/kg) above the BVs in one soil sample and five sediment samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 6640 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-123 and Table G-16). Calcium is not a COPC.

Chromium was detected above the sediment and Qbt 2,3,4 BVs (10.5 mg/kg and 7.14 mg/kg) in one sediment sample and two tuff samples with a maximum concentration of 19.1 mg/kg. Chromium is retained as a COPC.

Copper was detected above the sediment and Qbt 2,3,4 BVs (11.2 mg/kg and 4.66 mg/kg) in one sediment sample and one tuff sample with a maximum concentration of 17.8 mg/kg. Copper is retained as a COPC.

Cyanide was detected above the sediment BV (0.82 mg/kg) in one sample at a concentration of 1.22 mg/kg. Cyanide is retained as a COPC.

Lead was detected above the sediment BV (19.7 mg/kg) in one sample at a concentration of 28.2 mg/kg. Lead is retained as a COPC.

Nitrate was detected in three samples at a maximum concentration of 2.76 mg/kg. Although nitrate is naturally occurring, the SWMU is a septic system that managed sanitary wastewater. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.00247 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above sediment and Qbt 2,3,4 BVs (0.3 mg/kg for both) but had DLs (0.669 mg/kg to 1.59 mg/kg) above BVs in five sediment samples and seven tuff samples. Selenium is retained as a COPC.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs (1.82 mg/kg, 2.22 mg/kg, and 2.4 mg/kg) in five soil samples, four sediment samples, and two tuff samples with a maximum concentration of 615 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-124 and Table G-16). Uranium is retained as a COPC.

Zinc was detected above soil BV (48.8 mg/kg) in four samples with a maximum concentration of 114 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-125 and Table G-16). Zinc is retained as a COPC.

**Organic Chemicals**

A total of 20 samples (8 soil, 5 sediment, and 7 tuff) were collected at SWMU 15-009(b) and analyzed for explosive compounds, SVOCs, and VOCs. Eight samples (two soil, one sediment, and five tuff) were also analyzed for PCBs. Table 8.7-3 summarizes the analytical results for detected organic chemicals. Figure 8.7-3 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

SWMU 15-009(b) was identified as a SWMU because of possible soil contamination resulting from releases from the R-45 firing site control building to the septic tank and associated outfall and seepage pit. PAHs were not used in the firing site control building.

SWMU 15-009(b) is located adjacent to a paved parking/storage area and paved road providing access to the control building (Appendix I, Figures I-5 and I-6). The asphalt in these areas is weathered, and runoff from the asphalt flows to the area where samples were collected. Although PAHs were detected in samples collected from depth at this site, sampling was performed during septic tank removal and samples were collected from a backhoe bucket during sampling, making cross contamination from the surface likely. Based on the fact that PAHs were not used in the building associated with the septic tank, and the fact that the sampled area receives storm-water runoff from weathered asphalt, the low concentrations of PAHs detected in samples used to characterize this site [acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, fluorene, indeno(1.2.3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene] are associated with the weathered asphalt, are not related to historic Laboratory site operations, and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at SWMU 15-009(b) include acetone; Aroclor-1242; Aroclor-1254; Aroclor-1260; 2-butanone; 4-isopropyltoluene; methylene chloride; toluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 20 samples (8 soil, 5 sediment, and 7 tuff) were collected at SWMU 15-009(b) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 8.7-4 presents the radionuclides detected or detected above BVs/FVs. Figure 8.7-4 shows the spatial distribution of detected radionuclides.

Cesium-137 was detected above the sediment FV (0.9 pCi/g) in one sample and was detected below 1 ft bgs in three soil samples with a maximum activity of 2.54 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the sediment FV (0.068 pCi/g) in one sample at an activity of 0.134 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected above the sediment FV (0.093 pCi/g) in one sample and was detected in eight soil samples and seven tuff samples with a maximum activity of 0.263 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and sediment BVs (2.59 pCi/g for both) in one soil sample and four sediment samples with a maximum activity of 303 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the sediment BV (0.2 pCi/g) in four samples with a maximum activity of 20.3 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil and sediment BVs (2.29 pCi/g for both) in one soil sample and four sediment samples with a maximum activity of 311 pCi/g. Uranium-238 is retained as a COPC.

#### 8.7.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-009(b) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-009(b) include antimony, barium, cadmium, chromium, copper, cyanide, lead, nitrate, perchlorate, selenium, uranium, and zinc.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs but had DLs (0.787 mg/kg to 1.44 mg/kg) above BVs in three soil samples, four sediment samples, and seven tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 22 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and one tuff sample with a maximum concentration of 134 mg/kg. Concentrations increased with depth at location 15-610833 and decreased with depth at location 15-610831. Concentrations increased downgradient. The residential SSL was approximately 116 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was not detected above the soil and sediment BVs but had DLs (0.556 mg/kg to 0.757 mg/kg) above BVs in one soil sample and five sediment samples. Because cadmium was not detected above BVs and the residential SSL was approximately 93 times the maximum DL, further sampling for extent of cadmium is not warranted.

Chromium was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and two tuff samples with a maximum concentration of 19.1 mg/kg. Concentrations increased with depth at locations 15-610829 and 15-610833 and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 6100 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and one tuff sample with a maximum concentration of 17.8 mg/kg. Concentrations increased with depth at location 15-610833 and decreased with depth at location 15-610831. The concentration at location 15-610833 was below the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Concentrations increased downgradient. The residential SSL was approximately 176 times the maximum concentration. Further sampling for extent of copper is not warranted.

Cyanide was detected above the sediment BV in one sample at a concentration of 1.22 mg/kg. Concentrations decreased with depth and increased downgradient. The residential and industrial SSLs were approximately 9.2 times and 52 times the maximum concentration, respectively. The vertical extent of cyanide is defined, and further sampling for lateral extent is not warranted.

Lead was detected above the sediment BV in one sample at a concentration of 28.2 mg/kg. Concentrations decreased with depth and increased downgradient. The downgradient concentration at location 15-610831 was only 0.2 mg/kg above the maximum soil background concentration (28 mg/kg). The residential and industrial SSLs were approximately 14 times and 238 times the maximum concentration, respectively. The vertical extent of lead is defined, and further sampling for lateral extent is not warranted.

Nitrate was detected in three samples at a maximum concentration of 2.76 mg/kg. Concentrations increased with depth at locations 15-610829 and 15-610830, decreased with depth at location 15-610832, and decreased downgradient. The residential SSL was approximately 45,000 times the maximum concentration. Lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in four samples with a maximum concentration of 0.00247 mg/kg. Concentrations increased with depth at location 15-610829 but were below the EDL. Concentrations decreased with depth at location 15-610834 and did not change substantially with depth (0.00141 mg/kg) at location 15-610836. Concentrations decreased downgradient. The residential SSL was approximately 22,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (0.669 mg/kg to 1.59 mg/kg) above BVs in five sediment samples and seven tuff samples. Because selenium was not detected above BVs and the residential SSL was approximately 246 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs in five soil samples, four sediment samples, and two tuff samples with a maximum concentration of 615 mg/kg. Concentrations increased with depth at locations 15-610829 and 15-610835 and decreased with depth at locations 15-610830, 15-610831, 15-610832, 15-610833, and 15-610834. Concentrations increased downgradient. The residential SSL was approximately 89 times and 50 times the maximum concentrations at locations 15-610829 and 15-610835, respectively. The industrial SSL was approximately 6.3 times the maximum concentration. Further sampling for vertical extent of uranium is not warranted, and lateral extent at location 15-610831 is not defined.

Zinc was detected above the soil BV in four samples with a maximum concentration of 114 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of zinc are defined.

**Organic Chemicals**

Organic COPCs at SWMU 15-009(b) include acetone; Aroclor-1242; Aroclor-1254; Aroclor-1260; 2-butanone; 4-isopropyltoluene; methylene chloride; toluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Acetone was detected in seven samples with a maximum concentration of 0.131 mg/kg. Concentrations decreased with depth at locations 15-610829, 15-610830, and 15-610831 and did not change substantially with depth (0.018 mg/kg and 0.014 mg/kg) at locations 15-610834 and 15-610835. Concentrations increased downgradient. The residential SSL was approximately 4,700,000 times the downgradient concentration at location 15-610831 and approximately 500,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were each detected in one sample at concentrations of 0.0272 mg/kg, 0.0312 mg/kg, and 0.0131 mg/kg, respectively. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of Aroclor-1242, Aroclor-1254, and Aroclor-1260 are defined.

Butanone[2-] was detected in one sample at a concentration of 0.0024 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 2-butanone are defined.

Isopropyltoluene[4-] was detected in nine samples with a maximum concentration of 0.0167 mg/kg. Concentrations decreased with depth at locations 15-610829, 15-610831, 15-610834, and 15-610836 and did not change substantially with depth (0.0028 mg/kg and 0.0045 mg/kg) at locations 15-610830 and 15-610835. Concentrations did not change substantially downgradient (0.00815 mg/kg). The residential SSL was approximately 141,000 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Methylene chloride was detected in one sample at a concentration of 0.0024 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of methylene chloride are defined.

Toluene was detected in eight samples with a maximum concentration of 0.0102 mg/kg. Concentrations increased with depth at location 15-610836, decreased with depth at location 15-610831, and did not change substantially with depth (0.000383 mg/kg to 0.00169 mg/kg) at locations 15-610830, 15-610834, and 15-610835. Concentrations increased downgradient. The residential SSL was approximately 513,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Trimethylbenzene[1,2,4-]; 1,2-xylene; and 1,3-xylene+1,4-xylene were each detected in two samples with maximum concentrations of 0.000651 mg/kg, 0.000574 mg/kg, and 0.000702 mg/kg, respectively. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene are defined.

**Radionuclides**

Radionuclide COPCs at SWMU 15-009(b) include cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected above the sediment FV in one sample and was detected below 1 ft bgs in three soil samples with a maximum activity of 2.54 pCi/g. Activities decreased with depth at all locations but increased downgradient. The residential and industrial SALs were approximately 4.7 times and 16 times the maximum activity, respectively. The vertical extent of cesium-137 is defined, and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the sediment FV in one sample at an activity of 0.134 pCi/g. Activities decreased with depth but increased downgradient. The residential SAL was approximately 592 times the maximum activity. The vertical extent of plutonium-239/240 is defined, and further sampling for lateral extent is not warranted.

Tritium was detected above the sediment FV in one sample and was detected in eight soil samples and seven tuff samples with a maximum activity of 0.263 pCi/g. Activities increased with depth at locations 15-610829 and 15-610833, did not change substantially with depth (0.006 pCi/g to 0.076 pCi/g) at all other locations, and decreased downgradient. The residential SAL was approximately 6500 times the maximum activity. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil and sediment BVs in one soil sample and four sediment samples with a maximum activity of 303 pCi/g. Activities decreased with depth at all locations and increased downgradient. The industrial SAL was approximately 10 times the maximum activity. The vertical extent of uranium-234 is defined, and lateral extent is not defined.

Uranium-235/236 was detected above the sediment BV in four samples with a maximum activity of 20.3 pCi/g. Activities decreased with depth at all locations and increased downgradient. The industrial SAL was approximately 7.9 times the maximum activity. The vertical extent of uranium-235/236 is defined, and lateral extent is not defined.

Uranium-238 was detected above the soil and sediment BVs in one soil sample and four sediment samples with a maximum activity of 311 pCi/g. Activities decreased with depth at all locations and increased downgradient. The industrial SAL was approximately 2.3 times the maximum activity. The vertical extent of uranium-238 is defined, and lateral extent is not defined.

#### 8.7.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $3 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 18 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 2, which is above the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is primarily from uranium. The total dose is 46 mrem/yr, which is above the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The dose is primarily from isotopic uranium.

Based on the risk-screening assessment results, there are no potential unacceptable risks or doses for the industrial scenario at SWMU 15-009(b). There is also no potential unacceptable cancer risk, but there are potential unacceptable noncancer risks and doses for the residential scenario at SWMU 15-009(b).

#### 8.7.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-009(b).

### 8.8 SWMU 15-009(c)—Septic System

#### 8.8.1 Site Description and Operational History

SWMU 15-009(c) is a septic system located at Firing Site R-44 at TA-15. The septic system consists of a former septic tank (structure 15-62), associated drainlines, and a former outfall (Plate 17). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity. The septic system served restroom facilities in the firing site control building 15-44. The drainlines were constructed of cast iron and discharged to an outfall into the south fork of Threemile Canyon. The outfall, located approximately 25 ft downgradient of the tank, has been plugged (LANL 2003, 102119).

The septic tank (structure 15-62) was removed during the 2009–2010 investigation but the drainlines remain in place.

### 8.8.2 Relationship to Other SWMUs and AOCs

SWMU 15-009(c) is located approximately 150 ft south of Firing Site R-44 [SWMU 15-006(c)] and SWMU 15-008(b), though on the other side of a berm from those sites (Plate 17).

### 8.8.3 Summary of Previous Investigations

In 1998, interim action RFI activities were performed at SWMU 15-009(c). Nine samples were collected from four locations and analyzed for inorganic chemicals and radionuclides. Data from these samples meet the current data-validation standards and are decision-level data included in this report.

### 8.8.4 Site Contamination

#### 8.8.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 15-009(c). As a result, the following activities were completed as part of the 2009–2010 investigation.

- A total of 33 samples were collected in 2009–2010 from 17 locations. Eight samples were collected from four locations beneath the inlet drainline, septic tank inlet and outlet, and septic tank. Samples were collected from two depth intervals (2.0–2.5 ft bgs to 10.5–11.0 ft bgs and 7.0–7.5 ft bgs to 15.5–16.0 ft bgs) at each location. Twenty-five samples were collected from 13 locations in the drainage below the septic tank outfall. Samples were collected from two depth intervals (0.0–0.5 ft bgs to 0.0–1.0 ft bgs and 1.0–1.2 ft bgs to 1.0–2.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, total uranium, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Eight samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 15-009(c) are shown on Plate 17. Table 8.8-1 presents the samples collected and analyses requested for SWMU 15-009(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.8.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-009(c) consist of 42 samples (18 soil, 12 sediment, and 12 tuff) collected from 21 locations.

**Inorganic Chemicals**

A total of 42 samples (18 soil, 12 sediment, and 12 tuff) were collected at SWMU 15-009(c) and analyzed for TAL metals. A total of 33 samples (9 soil, 12 sediment, and 12 tuff) were also analyzed for cyanide, nitrate, perchlorate, and total uranium. Table 8.8-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 18 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in 1 sample at a concentration of 0.602 mg/kg and had DLs (0.577 mg/kg to 11 mg/kg) above the soil and sediment BVs (0.83 mg/kg and 0.5 mg/kg) and the Qbt 2,3,4 BV in 16 soil samples, 10 sediment samples, and 10 tuff samples. Antimony is retained as a COPC.

Beryllium was detected above the soil BV (1.83 mg/kg) in one sample at a concentration of 2.4 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil are not statistically different from background (Figure G-126 and Table G-17). Beryllium is not a COPC.

Cadmium was not detected above the soil and sediment BVs (0.4 mg/kg for both) but had DLs (0.5 mg/kg to 0.635 mg/kg) above BVs in 11 soil samples and 6 sediment samples. The DLs were 0.1 mg/kg to 0.235 mg/kg above the BVs, and the soil DLs were below or similar to the three highest background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected or detected below BVs in the other 25 samples (detected below BVs in 16 samples). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 6730 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-127 and Table G-17). Calcium is not a COPC.

Chromium was detected above the sediment and Qbt 2,3,4 BVs (10.5 mg/kg and 7.14 mg/kg) in 5 sediment samples and 9 tuff samples with a maximum concentration of 23.6 mg/kg. The quantile and slippage tests indicated site concentrations of chromium in sediment are statistically different from background (Figure G-128 and Table G-18). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-129 and Table G-19). Chromium is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 1.69 mg/kg. Cyanide is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 130 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-130 and Table G-17). Lead is not a COPC.

Mercury was not detected above the soil BV (0.1 mg/kg) but had DLs (0.11 mg/kg) above the BV in four samples. The DLs were only 0.01 mg/kg above the BV. Mercury was not detected or detected above BV in the other 38 samples (detected below BV in 21 samples). Mercury is not a COPC.

Nitrate was detected in seven samples with a maximum concentration of 2.24 mg/kg. Although nitrate is naturally occurring, the SWMU is a septic system that managed sanitary wastewater. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in seven samples with a maximum concentration of 0.00135 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs (0.3 mg/kg for both) but had DLs (0.97 mg/kg to 1.3 mg/kg) above the BVs in 12 sediment samples and 12 tuff samples. Selenium is retained as a COPC.

Silver was not detected above the soil BV (1 mg/kg) but had DLs (2.0 mg/kg to 2.2 mg/kg) above the BV in nine samples. Silver is retained as a COPC.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs (1.82 mg/kg, 2.22 mg/kg, and 2.4 mg/kg) in four soil samples, nine sediment samples, and four tuff samples with a maximum concentration of 8.8 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil, sediment, and tuff are statistically different from background (Figure G-131 and Table G-17, Figure G-132 and Table G-18, and Figure G-133 and Table G-19, respectively). Uranium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in three samples with a maximum concentration of 56.3 mg/kg. The Gehan test indicated site concentrations of zinc in soil are statistically different from background (Table G-17). However, the quantile and slippage tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-134 and Table G-17). Zinc is not a COPC.

**Organic Chemicals**

A total of 42 samples (18 soil, 12 sediment, and 12 tuff) were collected at SWMU 15-009(c) and analyzed for explosive compounds, SVOCs, and VOCs. Eight samples (two soil, two sediment, and four tuff) were also analyzed for PCBs, and eight soil samples were analyzed for pesticides. Table 8.8-3 summarizes the analytical results for detected organic chemicals. Plate 19 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 15-009(c) include acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; phenanthrene; pyrene; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene. The detected organic chemicals are retained as COPCs.

**Radionuclides**

A total of 42 samples (18 soil, 12 sediment, and 12 tuff) were collected at SWMU 15-009(c) and analyzed for gamma-emitting radionuclides, isotopic uranium, and tritium. A total of 33 samples (9 soil, 12 sediment, and 12 tuff) were also analyzed for americium-241 and isotopic plutonium. Table 8.8-4 presents the radionuclides detected or detected above BVs/FVs. Plate 20 shows the spatial distribution of detected radionuclides.

Tritium was detected above the sediment FV (0.093 pCi/g) in one sample and was detected in eight soil samples and nine tuff samples with a maximum activity of 0.173 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the sediment and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in two sediment samples and one tuff sample with a maximum activity of 13.9 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the sediment and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in one sediment sample and one tuff sample with a maximum activity of 0.78 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs (2.29 pCi/g, 2.29 pCi/g, and 1.93 pCi/g) in one soil sample, seven sediment samples, and two tuff samples with a maximum activity of 15.1 pCi/g. Uranium-238 is retained as a COPC.

#### 8.8.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-009(c) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-009(c) include antimony, chromium, cyanide, nitrate, perchlorate, selenium, silver, and uranium.

Antimony was detected above the Qbt 2,3,4 BV in 1 sample at a concentration of 0.602 mg/kg and had DLs (0.577 mg/kg to 11 mg/kg) above the soil, sediment, and Qbt 2,3,4 BVs in 16 soil samples, 10 sediment samples, and 10 tuff samples. Concentrations increased with depth at location 15-610844 and decreased downgradient. The residential SSL was approximately 52 times the maximum concentration, and the residential and industrial SSLs were approximately 2.8 times and 47 times the maximum DL, respectively. Further sampling for extent of antimony is not warranted.

Chromium was detected above the sediment and Qbt 2,3,4 BVs in 5 sediment samples and 9 tuff samples with a maximum concentration of 23.6 mg/kg. Concentrations increased with depth at locations 15-610838, 15-610848, and 15-610852, and only one depth was sampled at location 15-610854 (concentration was the same as the maximum Qbt 2,3,4 background concentration). Concentrations did not change substantially with depth (1.0 mg/kg) at location 15-610845 and decreased with depth at locations 15-610839, 15-610840, 15-610846, and 15-610850 and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 4960 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cyanide was detected above the soil BV in one sample at a concentration of 1.69 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of cyanide are defined.

Nitrate was detected in seven samples with a maximum concentration of 2.24 mg/kg. Concentrations increased with depth at locations 15-610838 and 15-610841, did not change substantially with depth (0.1 mg/kg and 0.11 mg/kg) at locations 15-610842 and 15-610844, decreased with depth at location 15-610843, and decreased downgradient. The residential SSL was approximately 56,000 times the maximum concentration. Lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in seven samples with a maximum concentration of 0.00135 mg/kg. Concentrations increased with depth at location 15-610841, did not change substantially with depth (0.00026 mg/kg and 0.000037 mg/kg) at locations 15-610842 and 15-610844, decreased with depth at locations 15-610843 and 15-610848, and decreased downgradient. The detected concentrations were below EDLs. The residential SSL was approximately 40,600 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (0.97 mg/kg to 1.3 mg/kg) above the BVs in 12 sediment samples and 12 tuff samples. Because selenium was not detected above BVs and the residential SSL was approximately 300 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was not detected above the soil BV but had DLs (2.0 mg/kg to 2.2 mg/kg) above the BV in nine samples. Because silver was not detected above BVs and the residential SSL was approximately 178 times the maximum DL, further sampling for extent of silver is not warranted.

Uranium was detected above the soil, sediment, and Qbt 2,3,4 BVs in four soil samples, nine sediment samples, and four tuff samples with a maximum concentration of 8.8 mg/kg. Concentrations increased with depth at locations 15-610838, 15-610845, and 15-610846 and did not change substantially with depth (0.09 mg/kg to 1.28 mg/kg) at locations 15-610849, 15-610850, 15-610852, and 15-610853. Only one depth was sampled at location 15-610854. Concentrations decreased with depth at locations 15-610839, 15-610842, 15-610843, 15-610847, and 15-610848. Concentrations did not change substantially downgradient (0.61 mg/kg). The residential SSL was approximately 26 times the maximum concentration. Further sampling for extent of uranium is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 15-009(c) include acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene, phenanthrene; pyrene; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene.

Acetone was detected in five samples with a maximum concentration of 0.0527 mg/kg. Concentrations increased with depth at locations 15-610839, 15-610840, 15-610852, and 15-610853 and decreased with depth at location 15-610851. Concentrations did not change substantially downgradient (0.051 mg/kg). The residential SSL was approximately 1,260,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Anthracene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene were each detected in two samples with maximum concentrations of 0.031 mg/kg, 0.0346 mg/kg, and 0.0324 mg/kg, respectively. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of anthracene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene are defined.

Benzo(a)anthracene and phenanthrene were each detected in four samples with maximum concentrations of 0.101 mg/kg and 0.189 mg/kg, respectively. Concentrations decreased with depth at locations 15-610842 and 15-610843, did not change substantially with depth (0.044 mg/kg) at location 15-610841, and decreased downgradient. The lateral and vertical extent of benzo(a)anthracene and phenanthrene are defined.

Benzo(a)pyrene was detected in four samples with a maximum concentration of 0.0596 mg/kg. Concentrations were below the EQL but increased with depth at location 15-610844; decreased with depth at locations 15-610841, 15-610842, and 15-610843; and decreased downgradient. The residential SSL was approximately 13 times the maximum concentration at location 15-610844. The lateral extent of benzo(a)pyrene is defined, and further sampling for vertical extent is not warranted.

Benzo(b)fluoranthene, fluoranthene, and pyrene were each detected in five samples with maximum concentrations of 0.111 mg/kg, 0.226 mg/kg, and 0.152 mg/kg, respectively. Concentrations were below the EQLs but increased with depth at location 15-610844; decreased with depth at locations 15-610841, 15-610842, and 15-610843; and decreased downgradient. The residential SSLs for benzo(b)fluoranthene, fluoranthene, and pyrene were approximately 69 times, 100,000 times, and 87,000 times the concentrations at location 15-610844, respectively. The lateral extent of benzo(b)fluoranthene, fluoranthene, and pyrene are defined, and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.105 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Chrysene was detected in three samples with a maximum concentration of 0.0814 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of chrysene are defined.

Fluorene was detected in one sample at a concentration of 0.0154 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of fluorene are defined.

Isopropyltoluene[4-] was detected in five samples with a maximum concentration of 0.00428 mg/kg. Concentrations did not change substantially with depth (0.000076 mg/kg and 0.003 mg/kg) at locations 15-610839 and 15-610851. Concentrations decreased with depth at location 15-610848 and decreased downgradient. The residential SSL was approximately 551,000 times the maximum concentration. The lateral extent of 4-isopropyltoluene is defined, and further sampling for vertical extent is not warranted.

Toluene was detected in seven samples with a maximum concentration of 0.0122 mg/kg. Concentrations were below EQLs but increased with depth at locations 15-610839, 15-610849, and 15-610850. Concentrations decreased with depth at locations 15-610848 and 15-610852 and did not change substantially with depth (0.01 mg/kg) at location 15-610851. Concentrations decreased downgradient. The residential SSL was approximately 429,000 times the maximum concentration. The lateral extent of toluene is defined, and further sampling for vertical extent is not warranted.

Trimethylbenzene[1,2,4-] was detected in one sample at a concentration of 0.00049 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

Xylene[1,3-]+1,4-xylene was detected in two samples with a maximum concentration of 0.000572 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,3-xylene+1,4-xylene are defined.

**Radionuclides**

Radionuclide COPCs at SWMU 15-009(c) include tritium, uranium-234, uranium-235/236, and uranium-238.

Tritium was detected above the sediment FV in one sample and was detected in eight soil and nine tuff samples with a maximum activity of 0.173 pCi/g. Activities increased with depth at locations 15-610838, 15-610839, 15-610840, 15-610847, and 15-610849, and only one depth was sampled at location 15-610854. Activities decreased with depth at location15-610845 and did not change substantially with depth (0.0059 pCi/g to 0.0198 pCi/g) at locations 15-610841, 15-610842, 15-610843, 15-610844, and 15-610848. Activities did not change substantially downgradient (0.066 pCi/g). The residential SAL was approximately 9900 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-234 was detected above the sediment and Qbt 2,3,4 BVs in two sediment samples and one tuff sample with a maximum activity of 13.9 pCi/g. Activities increased with depth at locations 15-610846 and 15-610850, decreased with depth at location 15-610853, and decreased downgradient of the maximum activity at location 15-610850. The residential SAL was approximately 21 times the maximum activity. The lateral extent of uranium-234 is defined, and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and one tuff sample with a maximum activity of 0.78 pCi/g. Activities increased with depth at locations 15-610846 and 15-610850 and decreased downgradient. The residential SAL was approximately 54 times the maximum activity. The lateral extent of uranium-235/236 is defined, and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil, sediment, and Qbt 2,3,4 BVs in one soil sample, seven sediment samples, and two tuff samples with a maximum activity of 15.1 pCi/g. Activities increased with depth at locations 15-610839, 15-610846, and 15-610850, and only one depth was sampled at location 15-610854. Activities decreased with depth at locations 15-610847, 15-610848, 15-610849, and 15-610852; did not change substantially with depth (0.5 pCi/g) at location 15-610853; and decreased downgradient. The residential and industrial SALs were approximately 9.7 times and 47 times the maximum activity, respectively. The lateral extent of uranium-238 is defined, and further sampling for vertical extent is not warranted.

### 8.8.5 Summary of Human Health Risk Screening

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at SWMU 15-009(c).

### 8.8.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-009(c).

## 8.9 SWMU 15-009(h)—Septic System

### 8.9.1 Site Description and Operational History

SWMU 15-009(h) is a septic system located at the Ector firing site on the eastern side of TA-15. The septic system consists of a 6-ft × 4-ft × 5-ft septic tank (structure 15-282), associated drainlines, and a drain field (Figure 8.9-1). The septic tank was constructed in the late 1970s of reinforced concrete with a 905-gal. capacity and flowed to a drain field. The septic system served restroom facilities in the Ector firing site control building 15-280. In the 1990s, the sanitary waste drainlines that served this septic system were rerouted to the Sanitary Wastewater Systems Consolidation (SWSC) plant at TA-46 and are currently active (LANL 2003, 102117). Although the investigation work plan proposed removing the septic tank, the tank could not be removed because it is next to active utility lines (LANL 2010, 111324.14).

### 8.9.2 Relationship to Other SWMUs and AOCs

SWMU 15-009(h) is located approximately 225 ft east of the Ector firing site [SWMU 15-006(b)] and the associated drainline and outfall [SWMU 15-014(m)] though on the other side of the control building (Figure 8.9-1).

### 8.9.3 Summary of Previous Investigations

No sampling was conducted at this SWMU before 2009.

### 8.9.4 Site Contamination

#### 8.9.4.1 Soil, Rock, and Sediment Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 15-009(h). As a result, the following activities were completed as part of the 2009–2010 investigation.

- Fourteen samples were collected in 2009–2010 from seven locations beneath the inlet drainline, septic tank inlet and outlet, septic tank, and drain field. Samples were collected from two depth intervals (4.8–6.1 ft bgs to 6.5–8.0 ft bgs and 6.0–7.1 ft bgs to 11.5–13.0 ft bgs) at each location. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, total uranium, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. In addition, four samples were analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 15-009(h) are shown on Figure 8.9-1. Table 8.9-1 presents the samples collected and analyses requested for SWMU 15-009(h). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.9.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.9.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-009(h) consist of 14 samples (11 soil and 3 tuff) collected from 7 locations.

**Inorganic Chemicals**

A total of 14 samples (11 soil and 3 tuff) were collected at SWMU 15-009(h) and analyzed for TAL metals, cyanide, nitrate, perchlorate, and total uranium. Table 8.9-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.9-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.992 mg/kg to 1.12 mg/kg) in 11 soil samples and 3 tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two samples with a maximum concentration of 70.9 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.497 mg/kg to 0.551 mg/kg) above BV in eight samples. The DLs were only 0.097 mg/kg to 0.151 mg/kg above the BV, below the highest background DL (2 mg/kg), and below the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg and 2.6 mg/kg). Cadmium was not detected or was detected below BVs in the other six samples (detected below BV in three samples). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 45,400 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-135 and Table G-20). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in two soil samples and three tuff samples with a maximum concentration of 36.1 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-136 and Table G-20). Chromium is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.118 mg/kg. The concentration was only 0.018 mg/kg above the BV, and mercury was not detected or detected below BVs in the other 13 samples (detected below BVs in 12 samples). Mercury is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 7.31 mg/kg. Nickel is retained as a COPC.

Nitrate was detected in eight samples with a maximum concentration of 9.71 mg/kg. Although nitrate is naturally occurring, the SWMU is a septic system that managed sanitary wastewater. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.0015 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.919 mg/kg to 1.23 mg/kg) above the BV in three samples. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in eight samples with a maximum concentration of 6.41 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-137 and Table G-20). Uranium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 86.5 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-138 and Table G-20). Zinc is not a COPC.

**Organic Chemicals**

A total of 14 samples (11 soil and 3 tuff) were collected at SWMU 15-009(h) and analyzed for explosive compounds, SVOCs, and VOCs. Four samples (three soil and one tuff) were also analyzed for PCBs. Table 8.9-3 summarizes the analytical results for detected organic chemicals. Figure 8.9-3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 15-009(h) include acetone, ethylbenzene, and 2-hexanone. The detected organic chemicals are retained as COPCs.

**Radionuclides**

A total of 14 samples (11 soil and 3 tuff) were collected at SWMU 15-009(h) and analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 8.9-4 presents the radionuclides detected or detected above BVs/FVs. Figure 8.9-4 shows the spatial distribution of detected radionuclides.

Plutonium-239/240 was detected below 1 ft bgs in one soil sample at an activity of 0.0286 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in six samples with a maximum activity of 19.6 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in one sample at an activity of 2.74 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil BV (0.2 pCi/g) in one sample at an activity of 0.291 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in four samples with a maximum activity of 3.96 pCi/g. Uranium-238 is retained as a COPC.

### 8.9.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-009(h) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-009(h) include antimony, barium, chromium, nickel, nitrate, perchlorate, selenium, and uranium.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.992 mg/kg to 1.12 mg/kg) in 11 soil samples and 3 tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 28 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 70.9 mg/kg. Concentrations increased with depth at location 15-610855 and decreased with depth at location 15-610858 (the concentration in the shallow sample at location 15-610858 was 108 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially (2.1 mg/kg) downgradient. The residential SSL was approximately 220 times the maximum concentration. Further sampling for extent of barium is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 36.1 mg/kg. Concentrations increased with depth at all locations and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 3200 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 7.31 mg/kg. Concentrations decreased with depth at location 15-610858 (the concentration in the shallow sample was 8.63 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The lateral and vertical extent of nickel are defined.

Nitrate was detected in eight samples with a maximum concentration of 9.71 mg/kg. Concentrations did not change substantially with depth (0.17 mg/kg to 0.49 mg/kg) at locations 15-610855, 15-610856, 15-610857, and 15-610860 and decreased downgradient. The residential SSL was approximately 13,000 times the maximum concentration. Lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.0015 mg/kg. Concentrations did not change substantially with depth (0.00005 mg/kg to 0.000593 mg/kg) at locations 15-610859, 15-610860, and 15-610861. Concentrations increased downgradient. All detected concentrations were below EDLs. The residential SSL was approximately 36,500 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.919 mg/kg to 1.23 mg/kg) above the BV in three samples. Because selenium was not detected above BVs and the residential SSL was approximately 318 times the maximum DL, further sampling for extent of selenium is not warranted.

Uranium was detected above the soil BV in eight samples with a maximum concentration of 6.41 mg/kg. Concentrations increased with depth at location 15-610860; decreased with depth at locations 15-610855, 15-610856, 15-610857, and 15-610861; and did not change substantially downgradient (approximately 2.5 mg/kg). The residential SSL was approximately 36 times the maximum concentration. Further sampling for extent of uranium is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 15-009(h) include acetone, ethylbenzene, and 2-hexanone.

Acetone was detected in two samples with a maximum concentration of 0.00919 mg/kg. Concentrations were below EQLs, decreased with depth, and decreased downgradient. The residential SSL was approximately 7,340,000 times the maximum concentration. The vertical extent of acetone is defined, and further sampling for lateral extent is not warranted.

Ethylbenzene was detected in one sample at a concentration of 0.00117 mg/kg. Concentrations increased with depth and decreased downgradient. The residential SSL was approximately 59,700 times the maximum concentration. Further sampling for extent of ethylbenzene is not warranted.

Hexanone[2-] was detected in one sample at a concentration of 0.00201 mg/kg. Concentrations were below the EQL, decreased with depth, and decreased downgradient. The residential SSL was approximately 104,000 times the maximum concentration. The vertical extent of 2-hexanone is defined, and further sampling for lateral extent is not warranted.

**Radionuclides**

Radionuclide COPCs at SWMU 15-009(h) include plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

Plutonium-239/240 was detected below 1 ft bgs in one soil sample at an activity of 0.0286 pCi/g. Activities did not change substantially with depth (0.0005 pCi/g) at location 15-610861 (the activity in the shallow sample was 0.0281 pCi/g and below the soil FV [Appendix E, Pivot Tables]) and decreased downgradient. The residential SAL is approximately 1150 times the maximum activity. The vertical extent of plutonium-239/240 is defined, and further sampling for lateral extent is not warranted.

Tritium was detected in six samples at a maximum activity of 19.6 pCi/g. Activities increased with depth at location 15-610861, decreased with depth at locations 15-610855 and 15-610860, did not change substantially with depth (0.0206 pCi/g) at location 15-610859, and decreased downgradient. The residential SAL was approximately 38 times the maximum activity. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil BV in one sample at an activity of 2.74 pCi/g. Activities decreased with depth and decreased downgradient. The lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above the soil BV in one sample at an activity of 0.291 pCi/g. Activities decreased with depth and decreased downgradient. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the soil BV in four samples with a maximum activity of 3.96 pCi/g. Activities increased with depth at location 15-610860, decreased with depth at location 15-610856, did not change substantially with depth (0.85 pCi/g) at location 15-610857, and decreased downgradient. The residential SAL was approximately 22 times the maximum activity. The lateral extent of uranium-238 is defined, and further sampling for vertical extent is not warranted.

### 8.9.5 Summary of Human Health Risk Screening

**Industrial Scenario**

No samples were collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for SWMU 15-009(h).

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-10}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.07, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.7 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at SWMU 15-009(h).

#### 8.9.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-009(h).

### 8.10 SWMU 15-010(b)—Settling Tank

#### 8.10.1 Site Description and Operational History

SWMU 15-010(b) is a settling tank (structure 15-147) located in the northwest corner of TA-15 near former shop building 15-8 (Figure 8.10-1). The tank, constructed in 1947 of concrete, measures 5 ft × 5 ft × 5.5 ft with an approximate capacity of 900 gal. The tank was originally designed to be a septic tank; however, subsequent engineering records confirm the tank was used as an HE settling tank. The settling tank served former building 15-8, which housed HE-machining operations during the 1950s and discharged to an outfall at the edge of Threemile Canyon (LANL 1993, 020946, p. 10-25). The tank is no longer in operation; however, the date it ceased to be used is not known.

The investigation work plan proposed removing the tank. However, facility restrictions on the handling of HE prevented removing the tank, which was found to contain liquid, until the contents were characterized. The liquid contents were sampled for waste characterization purposes and found to be nonhazardous and nonradioactive and were removed (Appendix F).

#### 8.10.2 Relationship to Other SWMUs and AOCs

SWMU 15-010(b) is located approximately 1000 ft west of AOC 15-014(h) (Plate 1).

#### 8.10.3 Summary of Previous Investigations

In 1995, RFI activities were performed at SWMU 15-010(b) (LANL 1996, 054977). Four samples were collected from three locations and analyzed for HE.

Data from four samples collected in the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

#### 8.10.4 Site Contamination

##### 8.10.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 15-010(b). As a result, the following activities were completed as part of the 2009–2010 investigation.

- Seventeen samples were collected in 2009–2010 from nine locations in the drainage below the site. At all but one location, samples were collected from two depth intervals (0.0–0.5 ft bgs to 0.0–0.7 ft bgs and 1.0–1.6 ft bgs to 1.0–2.0 ft bgs). At one location, only a surface sample (0.0−0.8 ft bgs) was collected. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, total uranium, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Four samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 15-010(b) are shown on Figure 8.10-1. Table 8.10-1 presents the samples collected and analyses requested for SWMU 15-010(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

The approved investigation work plan (LANL 2010, 111324.14; NMED 2010, 111458) specified collection of confirmation samples below the tank, tank inlet, and tank outlet following removal of the tank. As described above, the tank was not removed and confirmation samples were not collected. Therefore, additional sampling at these locations will be performed during the Phase II investigation.

#### 8.10.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.10.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 15-010(b) consist of 17 samples (15 sediment and 2 tuff) collected from 9 locations.

**Inorganic Chemicals**

A total of 17 samples (15 sediment and 2 tuff) were collected at SWMU 15-010(b) and analyzed for TAL metals, cyanide, nitrate, perchlorate, and total uranium. Table 8.10-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.10-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the sediment and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.01 mg/kg to 1.35 mg/kg) above the BVs in 15 sediment samples and 2 tuff samples. Antimony is retained as a COPC.

Barium was detected above the sediment BV (127 mg/kg) in one sample at a concentration of 143 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in sediment are not statistically different from background (Figure G-139 and Table G-21). Barium is not a COPC.

Cadmium was not detected above the sediment BV (0.4 mg/kg) but had DLs (0.528 mg/kg to 0.673 mg/kg) above the BV in 15 samples. Cadmium is retained as a COPC.

Calcium was detected above the sediment BV (4420 mg/kg) in one sample at a concentration of 4480 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in sediment are not statistically different from background (Figure G-140 and Table G-21). Calcium is not a COPC.

Chromium was detected above the sediment and Qbt 2,3,4 BVs (10.5 mg/kg and 7.14 mg/kg) in three sediment samples and one tuff sample with a maximum concentration of 18.2 mg/kg. The Gehan and slippage tests indicated site concentrations of chromium in sediment are statistically different from background (Figure G-141 and Table G-21). Chromium is retained as a COPC.

Copper was detected above the sediment BV (11.2 mg/kg) in two samples with a maximum concentration of 16.9 mg/kg. The Gehan and slippage tests indicated site concentrations of copper in sediment are not statistically different from background (Figure G-142 and Table G-21). Copper is not a COPC.

Iron was detected above the sediment BV (13,800 mg/kg) in three samples with a maximum concentration of 19,100 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in sediment are statistically different from background (Figure G-143 and Table G-21). Iron is retained as a COPC.

Manganese was detected above the sediment BV (543 mg/kg) in one sample at a concentration of 574 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in sediment are not statistically different from background (Figure G-144 and Table G-21). Manganese is not a COPC.

Mercury was detected above the sediment BV (0.1 mg/kg) in five samples with a maximum concentration of 0.688 mg/kg. Mercury is retained as a COPC.

Nitrate was detected in three samples at a maximum concentration of 1.65 mg/kg. Although nitrate is naturally occurring, the SWMU is a former HE settling tank and HE could be a source of nitrate. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.000762 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the sediment and Qbt 2,3,4 BVs (0.3 mg/kg for both) in 1 sediment sample and 1 tuff sample with a maximum concentration of 0.72 mg/kg and had DLs (0.971 mg/kg to 1.33 mg/kg) above the BVs in 14 sediment samples and 1 tuff sample. Selenium is retained as a COPC.

Uranium was detected above the sediment BV (2.22 mg/kg) in five samples with a maximum concentration of 13.3 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in sediment are statistically different from background (Figure G-145 and Table G-21). Uranium is retained as a COPC.

Vanadium was detected above the sediment BV (19.7 mg/kg) in two samples with a maximum concentration of 23.7 mg/kg. The Gehan and slippage tests indicated site concentrations of vanadium in sediment are statistically different from background (Figure G-146 and Table G-21). Vanadium is retained as a COPC.

Zinc was detected above the sediment BV (60.2 mg/kg) in two samples with a maximum concentration of 72.9 mg/kg. The Gehan test indicated site concentrations of zinc in sediment are statistically different from background (Table G-21). However, the quantile and slippage tests indicated site concentrations of zinc in sediment are not statistically different from background (Figure G-147 and Table G-21). Zinc is not a COPC.

**Organic Chemicals**

A total of 17 samples (15 sediment and 2 tuff) were collected at SWMU 15-010(b) and analyzed for explosive compounds, SVOCs, and VOCs. Four sediment samples were also analyzed for PCBs. Table 8.10-3 summarizes the analytical results for detected organic chemicals. Figure 8.10-3 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

SWMU 15-010(b) was identified as an SWMU because of possible soil contamination resulting from releases associated with HE machining performed in former building 15-8. PAHs were not known to have been used at this site.

SWMU 15-010(b) is located on a slope near the top of the canyon wall. Storm-water best management practices (BMPs) have been installed at the site to direct run-on around the site. Before installation of BMPs, however, the site received runoff from a weathered asphalt roadway (Appendix I, Figures I-8 and I-9). In addition, the site is in an area of the Laboratory that burned during the Cerro Grande fire, and trees in the area where samples were collected have been burned (Appendix I, Figures I-10 and I-11). Based on the fact that PAHs were not present in the HE materials machined at this site, the fact that the sampled area formerly received runoff from weathered asphalt, and the fact that the area was burned during the Cerro Grande fire, the low concentrations of PAHs detected in samples used to characterize this site [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene] are associated with the weathered asphalt and fire residue, are not related to historic Laboratory site operations, and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at SWMU 15-010(b) include acetone; Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; 1,1-dichloroethene; di-n-butylphthalate; methylene chloride; styrene; tetrachloroethene; toluene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 17 samples (15 sediment and 2 tuff) were collected at SWMU 15-010(b) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 8.10-4 presents the radionuclides detected or detected above BVs/FVs. Figure 8.10-4 shows the spatial distribution of detected radionuclides.

Cesium-137 was detected above the sediment FV (0.9 pCi/g) in two samples with a maximum activity of 2.34 pCi/g. Because the only detections or detections above FV were in sediment, statistics were evaluated. The quantile and slippage tests indicated site activities of cesium-137 in sediment are not statistically different from background (Figure G-148 and Table G-21). Cesium-137 is not a COPC.

Plutonium-239/240 was detected above the sediment FV (0.068 pCi/g) in one sample at an activity of 0.121 pCi/g. Because the only detections or detections above FV were in sediment, statistics were evaluated. The quantile and slippage tests indicated site activities of plutonium-239/240 in sediment are not statistically different from background (Figure G-149 and Table G-21). Plutonium-239/240 is not a COPC.

Uranium-234 was detected above the sediment BV (2.59 pCi/g) in one sample at an activity of 4.93 pCi/g. Because the only detections or detections above BV were in sediment, statistics were evaluated. The Gehan and quantile tests indicated site activities of uranium-234 in sediment are not statistically different from background (Figure G-150 and Table G-21). Uranium-234 is not a COPC.

Uranium-235/236 was detected above the sediment BV (0.2 pCi/g) in one sample at an activity of 0.386 pCi/g. Because the only detections or detections above BV were in sediment, statistics were evaluated. The quantile and slippage tests indicated site activities of uranium-235/236 in sediment are not statistically different from background (Figure G-151 and Table G-21). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the sediment BV (2.29 pCi/g) in three samples with a maximum activity of 6.93 pCi/g. Because the only detections or detections above BV were in sediment, statistics were evaluated. The quantile and slippage tests indicated site activities of uranium-238 in sediment are statistically different from background (Figure G-152 and Table G-21). Uranium-238 is retained as a COPC.

#### 8.10.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 15-010(b) are discussed below. As described in section 8.10.4.1, samples were collected in the drainage downgradient of the tank, but not beneath the tank, tank inlet, and tank outlet. Therefore, nature and extent is evaluated only for the drainage downgradient of the tank,

**Inorganic Chemicals**

Inorganic COPCs at SWMU 15-010(b) include antimony, cadmium, chromium, iron, mercury, nitrate, perchlorate, selenium, uranium, and vanadium.

Antimony was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (1.01 mg/kg to 1.35 mg/kg) above the BVs in 15 sediment samples and 2 tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 23 times the maximum DL, further sampling for extent of antimony is not warranted.

Cadmium was not detected above the sediment BV but had DLs (0.528 mg/kg to 0.673 mg/kg) above BV in 15 samples. Because cadmium was not detected above BV and the residential SSL was approximately 105 times the maximum DL, further sampling for extent of cadmium is not warranted.

Chromium was detected above the sediment and Qbt 2,3,4 BVs in three sediment samples and one tuff sample with a maximum concentration of 18.2 mg/kg. Concentrations increased with depth at locations 15-610863 and 15-610872, decreased with depth at locations 15-610868 and 15-610870, and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 6400 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Iron was detected above the sediment BV in three samples with a maximum concentration of 19,100 mg/kg. Concentrations increased with depth at locations 15-610866 and 15-610868, and only one depth was sampled at location 15-610867. Concentrations increased downgradient. The residential SSL was approximately 2.9 times the maximum concentration (the maximum concentration was 35,700 mg/kg below the SSL), and the industrial SSL was 48 times the maximum concentration. Further sampling for extent of iron is not warranted.

Mercury was detected above the sediment BV in five samples with a maximum concentration of 0.688 mg/kg. Concentrations decreased with depth at location 15-610868, did not change substantially with depth (0.059 mg/kg and 0.436 mg/kg) at locations 15-610864 and 15-610869, and decreased downgradient. The residential SSL was approximately 34 times the maximum concentration. The lateral extent of mercury is defined, and further sampling for vertical extent is not warranted.

Nitrate was detected in three samples at a maximum concentration of 1.65 mg/kg. Concentrations increased with depth at location 15-610868 and decreased with depth at location 15-610871. Only a surface sample was collected at location 15-610867. Concentrations decreased downgradient. The residential SSL was approximately 76,000 times the maximum concentration. Lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.000762 mg/kg. Concentrations increased with depth at location 15-610869, decreased with depth at location 15-610872, and decreased downgradient. The residential SSL was approximately 72,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was detected above the sediment and Qbt 2,3,4 BVs in 1 sediment sample and 1 tuff sample with a maximum concentration of 0.72 mg/kg and had DLs (0.971 mg/kg to 1.33 mg/kg) above the BVs in 14 sediment samples and 1 tuff sample. Concentrations did not change substantially with depth (0.141 mg/kg) at location 15610871 and decreased downgradient. The residential SSL was approximately 543 times the maximum concentration and 294 times the maximum DL. Further sampling for extent of selenium is not warranted.

Uranium was detected above the sediment BV in five samples with a maximum concentration of 13.3 mg/kg. Concentrations increased with depth at location 15-610864; decreased with depth at locations 15-610863, 15-610869, and 15-610872; and decreased downgradient. The lateral extent of uranium is defined, and further sampling for vertical extent is not warranted.

Vanadium was detected above the sediment BV in two samples with a maximum concentration of 23.7 mg/kg. Concentrations increased with depth at locations 15-610866 and 15-610868 and increased downgradient. The residential SSL was approximately 17 times and the industrial SSL was approximately 276 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 15-010(b) include acetone; Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; 1,1-dichloroethene; di-n-butylphthalate; methylene chloride; styrene; tetrachloroethene; toluene; and 1,3-xylene+1,4-xylene.

Acetone was detected in seven samples with a maximum concentration of 0.689 mg/kg. Concentrations increased with depth at locations 15-610863 and 15-610871, decreased with depth at location 15-610869, did not change substantially with depth (0.052 mg/kg and 0.011 mg/kg) at locations 15-610864 and 15-610872, and decreased downgradient. The residential SSL was approximately 96,000 times the maximum concentration. The lateral extent of acetone is defined, and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in two samples with a maximum concentration of 0.0065 mg/kg. Concentrations did not change substantially with depth (0.0019 mg/kg) and decreased downgradient. The residential SSL was approximately 175 times the maximum concentration. The lateral extent of Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in one sample at a concentration of 0.0025 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 0.17 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dichloroethene[1,1-] was detected in one sample at a concentration of 0.00037 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,1-dichloroethene are defined.

Di-n-butylphthalate was detected in five samples with a maximum concentration of 3.64 mg/kg. Concentrations did not change substantially with depth (0.038 mg/kg) at location 15-610869, decreased with depth at locations 15-610864 and 15-610872, and decreased downgradient. The lateral and vertical extent of di-n-butylphthalate are defined.

Methylene chloride was detected in five samples with a maximum concentration of 0.00434 mg/kg. Concentrations increased with depth at location 15-610864, decreased with depth at locations 15-610869 and 15-610872, did not change substantially with depth (0.0014 mg/kg) at location 15-610863, and decreased downgradient. All detected concentrations were below the EQLs. The residential SSL was approximately 94,000 times the maximum concentration. The lateral extent of methylene chloride is defined, and further sampling for vertical extent is not warranted.

Styrene was detected in one sample at a concentration of 0.000555 mg/kg. The concentration was below the EQL, increased with depth, and decreased downgradient. The residential SSL was approximately 13,100,000 times the concentration. The lateral extent of styrene is defined, and further sampling for vertical extent is not warranted.

Tetrachloroethene was detected in one sample at a concentration of 0.000584 mg/kg. The concentration was below the EQL, decreased with depth, and decreased downgradient. The lateral and vertical extent of tetrachloroethene are defined.

Toluene was detected in six samples with a maximum concentration of 0.0185 mg/kg. Concentrations increased with depth at locations 15-610863, 15-610864, and 15-610871; decreased with depth at locations 15-610868, 15-610869, and 15-610872; and decreased downgradient. The residential SSL was approximately 283,000 times the maximum concentration. The lateral extent of toluene is defined, and further sampling for vertical extent is not warranted.

Xylene[1,3-]+1,4-xylene was detected in two samples with a maximum concentration of 0.000732 mg/kg. Concentrations increased with depth at location 15-610863, decreased with depth at location 15-610864, and decreased downgradient. The residential SSL was approximately 1,190,000 times the maximum concentration. The lateral extent of 1,3-xylene+1,4-xylene is defined, and further sampling for vertical extent is not warranted.

#### Radionuclides

Radionuclide COPCs at SWMU 15-010(b) include uranium-238.

Uranium-238 was detected above the sediment BV in three samples with a maximum activity of 6.93 pCi/g. Activities increased with depth at location 15-610864, decreased with depth at locations 15-610863 and 15-610872, and decreased downgradient. The residential SAL was approximately 21 times the maximum activity. The lateral extent of uranium-238 is defined, and further sampling for vertical extent is not warranted.

### 8.10.5 Summary of Human Health Risk Screening

#### Industrial Scenario

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.8 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

#### Residential Scenario

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.4, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 2 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at SWMU 15-010(b).

### 8.10.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 15-010(b).

## 8.11 AOC 15-014(h)—Outfalls from Building 15-40

### 8.11.1 Site Description and Operational History

AOC 15-014(h) consists of three outfalls located in the northwest corner of TA-15 (Plate 21). The outfalls served a former laboratory and office (former building 15-40). All three outfalls daylight north of former building 15-40 and discharge to Threemile Canyon (LANL 1990, 007512; LANL 1993, 020946, p. 10-22).

The westernmost outfall is a former National Pollutant Discharge Elimination System– (NPDES-) permitted outfall that received industrial effluent, including wastewater from a photographic laboratory from former building 15-40. This outfall consists of an 8-in.-diameter vitrified-clay pipe (VCP) that daylights approximately 75 ft north of the northwest corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1994 (Dale 1998, 057524).

The middle outfall is a former NPDES-permitted outfall that received noncontact cooling water, roof runoff, and floor-drain effluent from former building 15-40. The floor drains received water from drain valves in a potable water system. This outfall consists of an 8-in.-diameter VCP that daylights approximately 100 ft north of the northeast corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1990 (EPA 1990, 012454).

The easternmost outfall receives storm water from yard drains and is located north and east of former building 15-40. This outfall consists of a 12-in.-diameter corrugated metal pipe that daylights approximately 75 ft northeast of the northeast corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). From the outfall, an approximately 60-ft-long ditch connects to a 30-ft-long, 12-in.-diameter corrugated metal pipe that accommodates drainage beneath a security fence.

### 8.11.2 Relationship to Other SWMUs and AOCs

AOC 15-014(h) is located approximately 1000 ft east of SWMU 15-010(b), which is the nearest other SWMU or AOC (Plate 1).

### 8.11.3 Summary of Previous Investigations

In 1995, RFI activities were performed at AOC 15-014(h) (LANL 1996, 054977). Four samples were collected from two locations and analyzed for inorganic chemicals, SVOCs, and VOCs.

Data from four samples collected during the 1995 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 8.11.4 Site Contamination

#### 8.11.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 15-014(h). As a result, the following activities were completed as part of the 2009−2010 investigation.

- A total of 52 samples were collected in 2009–2010 from 3 locations beneath drainlines and 23 locations in the 3 drainages below each of the outfalls. At each location, samples were collected from two depth intervals (0.0–0.5 ft bgs to 2.0–3.9 ft bgs and 1.0–1.4 ft bgs to 7.0–8.8 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, total uranium, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Sixteen samples were also analyzed for PCBs.

The 2009–2010 sampling locations at AOC 15-014(h) are shown on Plate 21. Table 8.11-1 presents the samples collected and analyses requested for AOC 15-014(h). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 8.11.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 8.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 15-014(h) consist of 52 samples (20 soil, 26 sediment, and 6 tuff) collected from 26 locations.

**Inorganic Chemicals**

A total of 52 samples (20 soil, 26 sediment, and 6 tuff) were collected at AOC 15-014(h) and analyzed for TAL metals, cyanide, perchlorate, and total uranium. Table 8.11-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 22 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in three samples with a maximum concentration of 10,700 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs (0.83 mg/kg, 0.83 mg/kg, and 0.5 mg/kg) but had DLs (0.817 mg/kg to 1.57 mg/kg) above BVs in 17 soil samples, 22 sediment samples, and 5 tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the sediment BV (3.98 mg/kg) in one sample at a concentration of 4.45 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in sediment are not statistically different from background (Figure G-153 and Table G-22). Arsenic is not a COPC.

Barium was detected above the sediment and Qbt 2,3,4 BVs (127 mg/kg and 46 mg/kg) in 17 sediment samples and 6 tuff samples with a maximum concentration of 195 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in sediment are statistically different from background (Figure G-154 and Table G-22). Barium is retained as a COPC.

Beryllium was detected above the sediment BV (1.31 mg/kg) in one sample at a concentration of 1.33 mg/kg. The Gehan test indicated site concentrations of beryllium in sediment are statistically different from background (Table G-22). However, the quantile and slippage tests indicated site concentrations of beryllium in sediment are not statistically different from background (Figure G-155 and Table G-22). Beryllium is not a COPC.

Cadmium was detected above the soil and sediment BVs (0.4 mg/kg for both) in 1 soil sample and 2 sediment samples with a maximum concentration of 1.54 mg/kg and had DLs (0.519 mg/kg to 0.716 mg/kg) above BVs in 17 soil samples and 21 sediment samples. The slippage test indicated site concentrations of cadmium in sediment are statistically different from background (Figure G-156 and Table G-22). Cadmium is retained as a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 8490 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-157 and Table G-23). There were too few tuff samples to perform statistical comparisons. The concentration above BV in tuff was only 40 mg/kg above BV and 10 mg/kg above the maximum Qbt 2,3,4 background concentration. Calcium was detected below BVs in the other 50 samples and was not statistically different from soil background. Calcium is not a COPC.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg) in 4 soil samples, 16 sediment samples, and 6 tuff samples with a maximum concentration of 48.9 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil and sediment are statistically different from background (Figure G-158 and Table G-23, and Figure G-159 and Table G-22, respectively). Chromium is retained as a COPC.

Cobalt was detected above the soil, sediment, and Qbt 2,3,4 BVs (8.64 mg/kg, 4.73 mg/kg, and 3.14 mg/kg) in 1 soil sample, 14 sediment samples, and 3 tuff samples with a maximum concentration of 9.41 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-160 and Table G-23). The Gehan and quantile tests indicated site concentrations of cobalt in sediment are statistically different from background (Figure G-161 and Table G-22). Cobalt is retained as a COPC.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg) in one soil sample, six sediment samples, and four tuff samples with a maximum concentration of 53.6 mg/kg. The Gehan test indicated site concentrations of copper in soil are statistically different from background (Table G-23). However, the quantile and slippage tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-162 and Table G-23). The Gehan and quantile tests indicated site concentrations of copper in sediment are statistically different from background (Figure G-163 and Table G-22). Copper is retained as a COPC.

Cyanide was detected above the soil and sediment BVs (0.5 mg/kg and 0.82 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 3.25 mg/kg. The quantile and slippage tests indicated site concentrations of cyanide in sediment are not statistically different from background (Figure G-164 and Table G-22). There is no background data set for cyanide in soil. Cyanide was not detected or was detected below BVs in the other 50 samples (detected below BVs in 19 samples). Cyanide is not a COPC.

Iron was detected above the sediment BV (13,800 mg/kg) in four samples with a maximum concentration of 16,900 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in sediment are statistically different from background (Figure G-165 and Table G-22). Iron is retained as a COPC.

Lead was detected above the soil, sediment, and Qbt 2,3,4 BVs (22.3 mg/kg, 19.7 mg/kg, and 11.2 mg/kg) in two soil samples, eight sediment samples, and three tuff samples with a maximum concentration of 80.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-166 and Table G-23). The Gehan and quantile tests indicated site concentrations of lead in sediment are statistically different from background (Figure G-167 and Table G-22). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in three samples with a maximum concentration of 1830 mg/kg. The maximum concentration was only 140 mg/kg above BV and was below the two highest Qbt 2,3,4 background concentrations (2720 mg/kg and 2820 mg/kg). Magnesium was detected below BVs in the other 49 samples. Magnesium is not a COPC.

Manganese was detected above the sediment and Qbt 2,3,4 BVs (543 mg/kg and 482 mg/kg) in one sediment sample and one tuff sample with a maximum concentration of 610 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in sediment are not statistically different from background (Figure G-168 and Table G-22). The maximum concentration in tuff was 92 mg/kg above BV and 178 mg/kg below the maximum Qbt 2,3,4 background concentration (752 mg/kg). Manganese was detected below BV in the other 50 samples. Manganese is not a COPC.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs (0.1 mg/kg for all) in two soil samples, seven sediment samples, and one tuff sample with a maximum concentration of 1.54 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the sediment and Qbt 2,3,4 BVs (9.38 mg/kg and 6.58 mg/kg) in six sediment samples and four tuff samples with a maximum concentration of 12.1 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in sediment are statistically different from background (Figure G-169 and Table G-22). Nickel is retained as a COPC.

Perchlorate was detected in 18 samples with a maximum concentration of 0.00284 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs (0.3 mg/kg for both) but had DLs (1.05 mg/kg to 1.5 mg/kg) above the BVs in 26 sediment samples and 6 tuff samples. Selenium is retained as a COPC.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs (1 mg/kg for all) in five soil samples, seven sediment samples, and one tuff sample with a maximum concentration of 21 mg/kg. Silver is retained as a COPC.

Uranium was detected above the soil and sediment BVs (1.82 mg/kg and 2.22 mg/kg) in 6 soil samples and 16 sediment samples with a maximum concentration of 13.9 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil and sediment are statistically different from background (Figure G-170 and Table G-23, and Figure G-171 and Table G-22). Uranium is retained as a COPC.

Vanadium was detected above the sediment and Qbt 2,3,4 BVs (19.7 mg/kg and 17 mg/kg) in 19 sediment samples and 3 tuff samples with a maximum concentration of 30.8 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in sediment are statistically different from background (Figure G-172 and Table G-22). Vanadium is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 60.2 mg/kg) in one soil sample and three sediment samples with a maximum concentration of 126 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil and sediment are not statistically different from background (Figure G-173 and Table G-23, and Figure G-174 and Table G-22). Zinc is not a COPC.

**Organic Chemicals**

A total of 52 samples (20 soil, 26 sediment, and 6 tuff) were collected at AOC 15-014(h) and analyzed for explosive compounds, SVOCs, and VOCs. Sixteen samples (six soil, seven sediment, and three tuff) were also analyzed for PCBs. Table 8.11-3 summarizes the analytical results for detected organic chemicals. Plate 23 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

AOC 15-014(h) was identified as an AOC because of possible soil contamination resulting from releases from the three outfalls. Discharges from these outfalls were associated with a photographic laboratory, noncontact cooling water, roof drains, floor drains receiving potable water, and yard drainage. PAHs were not known to have been associated with any materials used at this site, which could have been discharged to the outfalls.

The three drainages below the outfalls sampled during the 2009–2010 investigation all receive runoff from the paved area surrounding the former structures and roof drains. This area contains weathered asphalt (Appendix I, Figures I-12 to I-16), and the building roof also has tar. Based on the fact that PAHs were not used in the facilities that discharged to the outfalls, and the fact that the sampled area receives runoff from weathered asphalt and a tarred roof, the low concentrations of PAHs detected in samples used to characterize this site [acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene] are not related to historic Laboratory site operations and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at AOC 15-014(h) include acetone; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-ethylhexyl)phthalate; chloroform; 1,1-dichloroethene; di-n-butylphthalate; di-n-octylphthalate; ethylbenzene; 4-isopropyltoluene; methylene chloride; tetrachloroethene; toluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 52 samples (20 soil, 26 sediment, and 6 tuff) were collected at AOC 15-014(h) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 8.11-4 presents the radionuclides detected or detected above BVs/FVs. Plate 24 shows the spatial distribution of detected radionuclides.

Cesium-137 was detected above the sediment FV (0.9 pCi/g) in one sample and was detected below 1 ft bgs in six soil samples with a maximum activity of 1.53 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected above the sediment FV (0.006 pCi/g) in one sample at an activity of 0.0599 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample and detected below 1 ft bgs in two soil samples with a maximum activity of 0.0622 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in eight samples with a maximum activity of 0.883 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and sediment BVs (2.59 pCi/g for both) in one soil sample and three sediment samples with a maximum activity of 4.17 pCi/g. The quantile and slippage tests indicated site activities of uranium-234 in sediment are statistically different from background (Figure G-175 and Table G-22). Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and sediment BVs (0.2 pCi/g for both) in one soil sample and one sediment sample with a maximum activity of 0.23 pCi/g. The maximum activities in soil and sediment were only 0.019 pCi/g and 0.03 pCi/g above the BVs, respectively, and uranium-235/236 was not detected or not detected above BVs in the other 50 samples (detected below BVs in 32 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the soil and sediment BVs (2.29 pCi/g for both) in four soil samples and nine sediment samples with a maximum activity of 5.21 pCi/g. Uranium-238 is retained as a COPC.

#### 8.11.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 15-014(h) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at AOC 15-014(h) include aluminum, antimony, barium, cadmium, chromium, cobalt, copper, iron, lead, mercury, nickel, perchlorate, selenium, silver, uranium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 10,700 mg/kg. Concentrations did not change with depth at location 15-610505 and decreased with depth at locations 15-610508 and 15-610524 (the concentrations in shallow samples at locations 15-610505, 15-610508, and 15-610524 were 10,700 mg/kg, 10,800 mg/kg, and 11,800 mg/kg, respectively, and below the soil and sediment BVs [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The lateral and vertical extent of aluminum are defined.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs but had DLs (0.817 mg/kg to 1.57 mg/kg) above the BVs in 17 soil samples, 22 sediment samples, and 5 tuff samples. Because antimony was not detected above BVs and the residential SSL was approximately 20 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the sediment and Qbt 2,3,4 BVs in 17 sediment samples and 6 tuff samples with a maximum concentration of 195 mg/kg. Concentrations increased with depth at location 15-610525, did not change substantially with depth (2 mg/kg) at location 15-610505, and decreased with depth at all other locations (the concentrations in the shallow samples at locations 15-610508 and 15-610526 were 167 mg/kg and 111 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 80 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Cadmium was detected above the soil and sediment BVs in 1 soil sample and 2 sediment samples with a maximum concentration of 1.54 mg/kg and had DLs (0.519 mg/kg to 0.716 mg/kg) above BVs in 17 soil samples and 21 sediment samples. Concentrations did not change substantially with depth (0.612 mg/kg) at location 15-610523, decreased with depth at location 15-610502 and decreased downgradient. The residential SSL was approximately 46 times the maximum concentration and 98 times the maximum DL. Further sampling for extent of cadmium in not warranted.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs in 4 soil samples, 16 sediment samples, and 6 tuff samples with a maximum concentration of 48.9 mg/kg. Concentrations increased with depth at locations 15-610501, 15-610502, 15-610508, 15-610510, 15-610511, 15-610512, 15-610517, 15-610519, 15-610520, 15-610523, and 15-610525. Concentrations did not change substantially with depth (0.43 mg/kg) at location 15-610524 and decreased with depth at locations 15-610504, 15-610505, 15-610513, 15-610515, 15-610516, 15-610521, and 15-610526 (concentrations in the shallow samples at locations 15-610524 and 15-610526 were 9.87 mg/kg and 14.7 mg/kg, respectively, and below the soil and sediment BVs [Appendix E, Pivot Tables]). Concentrations decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 2400 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the soil, sediment, and Qbt 2,3,4 BVs in 1 soil sample, 14 sediment samples, and 3 tuff samples with a maximum concentration of 9.41 mg/kg. Concentrations increased with depth at locations 15-610504, 15-610505, 15-610508, and 15-610525. The concentrations at location 15-610506 and 15-610515 did not change substantially with depth (1.5 mg/kg and 0.08 mg/kg) with the medium for the surface samples being sediment and the medium for the deep samples being soil (the concentrations in the deep samples were 6.39 mg/kg and 5.29 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations did not change substantially with depth (0.04 mg/kg, 0.15 mg/kg, 0.7 mg/kg, and 0.11 mg/kg) at locations 15-610501, 15-610510, 15-610512, and 15-610513 and decreased with depth at locations 15-610502, 15-610516, 15-610519, 15-610521, 15-610523, and 15-610526. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 2.4 times and 37 times the maximum concentration, respectively. The lateral extent of cobalt is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs in one soil sample, six sediment samples, and four tuff samples with a maximum concentration of 53.6 mg/kg. Concentrations increased with depth at location 15-610523 and decreased with depth at all other locations (the concentrations in the shallow samples at locations 15-610505, 15-610508, and 15-610524 were 8.28 mg/kg, 10.4 mg/kg, and 7.39 mg/kg, respectively, and below the soil and sediment BVs [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 58 times the maximum concentration. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Iron was detected above the sediment BV in four samples with a maximum concentration of 16,900 mg/kg. Concentrations increased with depth at locations 15-610504 and 15-610525, decreased with depth at locations 15-610502 and 15-610515, and decreased downgradient. The residential SSL was approximately 3.2 times the maximum concentration (the maximum concentration was 37,900 mg/kg below the SSL), and the industrial SSL was 54 times the maximum concentration. The lateral extent of iron is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil, sediment, and Qbt 2,3,4 BVs in two soil samples, eight sediment samples, and three tuff samples with a maximum concentration of 80.2 mg/kg. Concentrations increased with depth at location 15-610523, did not change substantially with depth (0.1 mg/kg) at location 15-610510, and decreased with depth at all other locations (concentrations in the shallow samples at locations 15-610505 and 15-610508 were 15.9 mg/kg and 19.4 mg/kg, respectively, and below the sediment or soil BVs [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential and industrial SSLs were approximately 5 times and 10 times the maximum concentration, respectively. The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs in two soil samples, seven sediment samples, and one tuff sample with a maximum concentration of 1.54 mg/kg. Concentrations increased with depth at location 15-610523; decreased with depth at locations 15-610501, 15-610502, 15-610513, and 15-610515; did not change substantially with depth (0.052 mg/kg) at location 15-610510; and decreased downgradient. The residential SSL was approximately 15 times and the industrial SSL was approximately 253 times the maximum concentration. The lateral extent of mercury is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the sediment and Qbt 2,3,4 BVs in six sediment samples and four tuff samples with a maximum concentration of 12.1 mg/kg. Concentrations increased with depth at location 15-610525; did not change substantially with depth (0.56 mg/kg, 0.11 mg/kg, and 0.27 mg/kg) at locations 15-610501, 15-610502, and 15-610508; and decreased with depth at locations 15-610505, 15-610515, and 15-610524 (concentration in the shallow sample at location 15-610505 was 7.46 mg/kg and below the sediment BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 129 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 18 samples with a maximum concentration of 0.00284 mg/kg. Concentrations increased with depth at locations 15-610520 and 15-610521; did not change substantially with depth (0.00003 mg/kg to 0.00164 mg/kg) at locations 15-610507, 15-610508, 15-610509, 15-610510, and 15-610515; decreased with depth at locations 15-610501, 15-610504, 15-610505, 15-610506, 15-610513, and 15-610525; and decreased downgradient. All but one of the concentrations were below the EDLs. The residential SSL was approximately 19,300 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the sediment and Qbt 2,3,4 BVs but had DLs (1.05 mg/kg to 1.5 mg/kg) above the BVs in 26 sediment samples and 6 tuff samples. Because selenium was not detected above BVs and the residential SSL was approximately 260 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs in five soil samples, seven sediment samples, and one tuff sample with a maximum concentration of 21 mg/kg. Concentrations increased with depth at location 15-610523; did not change substantially with depth (0.15 mg/kg to 0.44 mg/kg) at locations 15-610514, 15-610517, 15-610520, and 15-610525; decreased with depth at locations 15-610501, 15-610502, and 15-610503; and decreased downgradient. The residential SSL was approximately 19 times and the industrial SSL was approximately 309 times the maximum concentration. The lateral extent of silver is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil and sediment BVs in 6 soil samples and 16 sediment samples with a maximum concentration of 13.9 mg/kg. Concentrations increased with depth at locations 15-610614 and 15-610523, decreased with depth at all other locations, and decreased downgradient. The residential SSL was approximately 17 times and the industrial SSL was approximately 279 times the maximum concentration. The lateral extent of uranium is defined, and further sampling for vertical extent is not warranted.

Vanadium was detected above the sediment and Qbt 2,3,4 BVs in 19 sediment samples and 3 tuff samples with a maximum concentration of 30.8 mg/kg. Concentrations increased with depth at locations 15-610504, 15-610505, 15-610517, and 15-610525; did not change substantially with depth (0.2 mg/kg) at location 15-610501; and decreased with depth at all other locations (the concentration in the shallow sample at location 15-610508 was 23.8 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 13 times and the industrial SSL was approximately 212 times the maximum concentration. The lateral extent of vanadium is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at AOC 15-014(h) include acetone; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-ethylhexyl)phthalate; chloroform; 1,1-dichloroethene; di-n-butylphthalate; di-n-octylphthalate; ethylbenzene; 4-isopropyltoluene; methylene chloride; tetrachloroethene; toluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Acetone was detected in six samples with a maximum concentration of 0.0295 mg/kg. Concentrations were below the EQLs; increased with depth at locations 15-610507 and 15-610508; decreased with depth at locations 15-610504, 15-610516, 15-610523, and 15-610526; and decreased downgradient. The residential SSL was approximately 2,250,000 times the maximum concentration. The lateral extent of acetone is defined, and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in four samples with a maximum concentration of 0.704 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in four samples with a maximum concentration of 0.258 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of Aroclor-1260 are defined.

Benzoic acid was detected in three samples with a maximum concentration of 1.01 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected in three samples with a maximum concentration of 0.343 mg/kg. Concentrations increased with depth at location 15-610523, decreased with depth at locations 15-610508 and 15-610515, and decreased downgradient. The residential SSL was approximately 1100 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined, and further sampling for vertical extent is not warranted.

Chloroform was detected in one sample at a concentration of 0.000687 mg/kg. The concentration was below the EQL, increased with depth, and decreased downgradient. The residential SSL was approximately 8600 times the concentration. The lateral extent of chloroform is defined, and further sampling for vertical extent is not warranted.

Dichloroethene[1,1-] was detected in one sample at a concentration of 0.000772 mg/kg. The concentration was below the EQL, decreased with depth, and decreased downgradient. The lateral and vertical extent of 1,1-dichloroethene are defined.

Di-n-butylphthalate was detected in two samples with a maximum concentration of 0.129 mg/kg. Concentrations were below the EQL, did not change substantially (0.036 mg/kg) with depth, and decreased downgradient. The lateral and vertical extent of di-n-butylphthalate are defined.

Di-n-octylphthalate was detected in one sample at a concentration of 1.43 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of di-n-octylphthalate are defined.

Ethylbenzene was detected in two samples with a maximum concentration of 0.00076 mg/kg. Concentrations were below the EQL, increased with depth at location 15-610517, decreased with depth at location 15-610515, and decreased downgradient. The residential SSL was approximately 99,000 times the maximum concentration. The lateral extent of ethylbenzene is defined, and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in six samples with a maximum concentration of 0.0425 mg/kg. Concentrations increased with depth at location 15-610523, decreased with depth at the other locations, and decreased downgradient. The residential SSL was approximately 56,000 times the maximum concentration. The lateral extent of 4-isopropyltoluene is defined, and further sampling for vertical extent is not warranted.

Methylene chloride was detected in seven samples with a maximum concentration of 0.00941 mg/kg. Concentrations increased with depth at location 15-610510 and decreased with depth at the other locations and downgradient. The residential SSL was approximately 43,000 times the maximum concentration. The lateral extent of methylene chloride is defined, and further sampling for vertical extent is not warranted.

Tetrachloroethene was detected in 14 samples with a maximum concentration of 0.00155 mg/kg. Concentrations increased with depth at locations 15-610514, 15-610517, and 15-610519; decreased with depth at the other locations; did not change substantially with depth (0.000155 mg/kg to 0.00109 mg/kg) at locations 15-610513, 15-610515, and 15-610516; and decreased downgradient. The residential SSL was approximately 72,000 times the maximum concentration. The lateral extent of tetrachloroethene is defined, and further sampling for vertical extent is not warranted.

Toluene was detected in 15 samples with a maximum concentration of 0.00244 mg/kg. Concentrations increased with depth at locations 15-610510, 15-610515, and 15-610517; did not change substantially with depth (0.00013 mg/kg to 0.0018 mg/kg) at locations 15-610519, 15-610520, and 15-610523; decreased with depth at the other locations; and decreased or did not change substantially

(0.000152 mg/kg and 0.000654 mg/kg) downgradient. The residential SSL was approximately 2,140,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Trimethylbenzene[1,2,4-] was detected in one sample at a concentration of 0.000383 mg/kg. The concentration was below the EQL, increased with depth, and decreased downgradient. The residential SSL was approximately 151,000 times the maximum concentration. The lateral extent of 1,2,4-trimethylbenzene is defined, and further sampling for vertical extent is not warranted.

Xylene[1,2-] was detected in two samples with a maximum concentration of 0.000371 mg/kg. Concentrations were below the EQLs, increased with depth at location 15-610520, decreased with depth at location 15-610526, and decreased downgradient. The residential SSL was approximately 2,170,000 times the maximum concentration. The lateral extent of 1,2-xylene is defined, and further sampling for vertical extent is not warranted.

Xylene[1,3-]+1,4-xylene was detected in 19 samples with a maximum concentration of 0.00114 mg/kg. Concentrations were below the EQLs; increased with depth at locations 15-610502, 15-610505, 15-610506, 15-610507, 15-610517, 15-610518, 15-610520, and 15-610523; did not change substantially with depth (0.000201 mg/kg to 0.00071 mg/kg) at locations 15-610515, 15-610516, and 15-610519; decreased with depth at the other locations; and decreased or did not change substantially (0.000368 mg/kg and 0.000664 mg/kg) downgradient. The residential SSL was approximately 764,000 times the maximum concentration. Further sampling for extent of 1,3-xylene+1,4-xylene is not warranted.

**Radionuclides**

Radionuclide COPCs at AOC 15-014(h) include cesium-137, plutonium-238, plutonium-239/240, tritium, uranium-234, and uranium-238.

Cesium-137 was detected above the sediment FV in one sample and was detected below 1 ft bgs in six soil samples with a maximum activity of 1.53 pCi/g. Activities did not change substantially with depth (0.041 pCi/g, 0.182 pCi/g, and 0.148 pCi/g) at locations 15-610513, 15-610514, and 15-610523; decreased with depth at locations 15-610509, 15-610510, 15-610515, and 15-610520; and increased, did not change substantially (0.18 pCi/g), or decreased downgradient. The residential and industrial SALs were approximately 7.8 times and 27 times the maximum activity, respectively. Further sampling for extent of cesium-137 is not warranted.

Plutonium-238 was detected above the sediment FV in one sample at an activity of 0.0599 pCi/g. Activities decreased with depth and decreased downgradient. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the soil FV in one sample and detected below 1 ft bgs in two soil samples with a maximum activity of 0.0622 pCi/g. Activities did not change substantially with depth (0.0017 pCi/g and 0.0075 pCi/g) at locations 15-610509 and 15-610523, decreased with depth at location 15-610507, and decreased downgradient. The residential SAL was approximately 1280 times the maximum activity. The lateral extent of plutonium-239/240 is defined, and further sampling for vertical extent is not warranted.

Tritium was detected in eight samples with a maximum activity of 0.883 pCi/g. Activities increased with depth at locations 15-610520, 15-610523, and 15-610526; did not change substantially with depth (0.0047 pCi/g and 0.062 pCi/g) at locations 15-610502 and 15-610524; decreased with depth at locations 15-610509 and 15-610521; and decreased or did not change substantially (0.016 pCi/g) downgradient. The residential SAL was approximately 1950 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-234 was detected above the soil and sediment BVs in one soil sample and three sediment samples with a maximum activity of 4.17 pCi/g. Activities did not change substantially with depth (0.62 pCi/g) at location 15-610523; decreased with depth at locations 15-610505, 15-610506, and 15-610520; and increased or decreased downgradient. The residential SAL was approximately 700 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Uranium-238 was detected above the soil and sediment BVs in four soil samples and nine sediment samples with a maximum activity of 5.21 pCi/g. Activities did not change substantially with depth (0.13 pCi/g and 0.63 pCi/g) at locations 15-610510 and 15-610523; decreased with depth at the other locations; and increased, decreased, or did not change substantially (0.17 pCi/g) downgradient. The residential SAL was approximately 28 times the maximum activity. Further sampling for extent of uranium-238 is not warranted.

### 8.11.5 Summary of Human Health Risk Screening

#### Industrial Scenario

The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.07, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.5 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

#### Residential Scenario

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at AOC 15-014(h).

### 8.11.6 Summary of Ecological Risk Screening

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 15-014(h).

# 9.0 TA-36 BACKGROUND AND FIELD INVESTIGATION RESULTS

## 9.1 Background of TA-36

### 9.1.1 Operational History

TA-36 is located east of TA-15 and south of Pajarito Road (Plate 1). TA-36 contains four active firing sites (Eenie, Meenie, Minie, and Lower Slobovia) that support explosives testing. The firing sites and associated buildings are used for a wide variety of nonnuclear ordnance tests for the U.S. Department of Defense. Activities include shipping, receiving, transporting, and testing HE; developing diagnostic techniques; testing armor/anti-armor systems; and testing weapons components and guns (LANL 1993, 015313, p. 2-5). TA-36 operations associated with the Threemile Canyon Aggregate Area include a laboratory and an experiment facility located on a mesa top south of Threemile Canyon and west of TA-18.

The following four SWMUs within the Threemile Canyon Aggregate Area and located in TA-36 are addressed in this supplemental investigation report:

- SWMU 36-002 is a former sump (former structure 36-49) located approximately 40 ft northwest of controlled environmental building 36-48.
- SWMU 36-003(a) is a septic system located east of building 36-1.
- SWMU 36-008 is a surface disposal area located on the south rim of Threemile Canyon.
- SWMU C-36-003 is a former NPDES-permitted outfall located on the south rim of Threemile Canyon.

Figure 9.1-1 shows the site features of the SWMUs at TA-36.

### 9.1.2 Summary of Releases

Potential contaminants at TA-36 may have been released into the environment through operational releases at the firing sites, a former laboratory and experimental area, and associated facilities.

### 9.1.3 Current Site Usage and Status

TA-36 is actively used to support a variety of programs related to HE testing and other activities and is expected to remain active for the foreseeable future. TA-36 operations associated with the Threemile Canyon Aggregate Area include an active laboratory and experiment facility.

## 9.2 SWMU 36-002—Former Sump

### 9.2.1 Site Description and Operational History

SWMU 36-002 is a former sump (structure 36-49) that was located at TA-36, near the edge of Threemile Canyon and approximately 40 ft northwest of building 36-48 (Figure 9.2-1). The 4-ft-diameter × 8-ft-deep sump was constructed in 1965 by excavating directly into native tuff. A 4-ft-diameter corrugated metal pipe was placed vertically into the excavation. The interior of the pipe was filled with 3-in.-diameter gravel to a depth of 2 ft bgs. The sump had a metal cover. From 1965 to 1993, the sump received effluent from two sinks in building 36-48 via a 4-in.-diameter VCP that connected to the sump at 2 ft bgs. Building 36-48 was used for shot assembly and controlled-temperature experiments as well as cutting, lapping, and polishing DU. One of the sinks connected to the sump had a chemical-resistant coating. The sinks were disconnected from the sump in 1993, and the sump was removed during the 1994 RFI (LANL 1995, 062839).

### 9.2.2 Relationship to Other SWMUs and AOCs

No SWMUs and AOCs are being investigated in the vicinity of SWMU 36-002 (Plate 1). The nearest site is SWMU 36-008, which is approximately 650 ft to the east of SWMU 36-002 and on the opposite side of Potrillo Road.

### 9.2.3 Summary of Previous Investigations

In 1994, Phase I RFI activities were performed at SWMU 36-002. The soil and rock in and around the sump was excavated and stockpiled on the site on a lined, bermed pad. Five samples were collected from five depths within the excavation and analyzed for inorganic chemicals, SVOCs, and VOCs (LANL 1995, 062839, p. 1-6).

Based on the Phase I RFI results, the stockpiled material excavated during sampling was returned to the original sump excavation. The sump and part of the inlet pipe were removed and disposed of as construction debris (LANL 1995, 062839, p. 1-6).

Data from five samples collected during the 1994 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 9.2.4 Site Contamination

#### 9.2.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was needed to assess potential contamination at SWMU 36-002. As a result, the following activities were completed as part of the 2009−2010 investigation:

- Six samples were collected from three locations to define the nature and extent of contamination. Sampling locations were within the footprint of the former sump, at the drainline elbow, and downgradient of the former sump. Samples were collected from two depth intervals (4.0−5.0 ft bgs to 9.0–10.0 ft bgs and 9.0–10.0 ft bgs to 15.0–16.0 ft bgs) at each location. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Four samples were also analyzed for PCBs.
- All investigation samples were field screened for gross-alpha and –beta radioactivity, and surface samples were screened for HE using a spot test. Field-screening results were recorded on borehole logs and/or corresponding SCLs. Borehole logs are presented in Appendix C, and SCLs/COC forms are included in Appendix E.

The 2009–2010 sampling locations at SWMU 36-002 are shown on Figure 9.2-1. Table 9.2-1 presents the samples collected and analyses requested at SWMU 36-002. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 9.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 9.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 36-002 consist of results from six tuff samples collected from three locations.

**Inorganic Chemicals**

Six tuff samples were collected and analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 9.2-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Figure 9.2-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in one sample at a concentration of 13,800 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the Qbt 2,3,4 BV (0.5 mg/kg) but had DLs (0.857 mg/kg to 1.07 mg/kg) above the BV in six samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in three samples with a maximum concentration of 84.6 mg/kg. Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in one sample at a concentration of 2.69 mg/kg. Beryllium is retained as a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in one sample at a concentration of 4700 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in two samples with a maximum concentration of 9.64 mg/kg. The concentrations were 2.5 mg/kg and 1.24 mg/kg above the BV and below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Chromium was detected below the BV in the other four samples. Chromium is not a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in one sample at a concentration of 4.2 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in two samples with a maximum concentration of 9.92 mg/kg. Copper is retained as a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in one sample at a concentration of 13 mg/kg. The concentration was 1.8 mg/kg above the BV and below the two highest Qbt 2,3,4 background concentrations (14.5 mg/kg and 15.5 mg/kg). Lead was detected below the BV in the other five samples. Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in two samples with a maximum concentration of 3080 mg/kg. Magnesium is retained as a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in one sample at a concentration of 497 mg/kg. The concentration was 15 mg/kg above the BV and below the three highest Qbt 2,3,4 background concentrations (1700 mg/kg, 2720 mg/kg, and 2820 mg/kg). Manganese was detected below the BV in the other five samples. Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in two samples with a maximum concentration of 10.6 mg/kg. Nickel is retained as a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.00377 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.884 mg/kg to 1.02 mg/kg) above the BV in six samples. Selenium is retained as a COPC.

**Organic Chemicals**

Six tuff samples were collected and analyzed for explosive compounds, SVOCs, and VOCs. Four tuff samples were also analyzed for PCBs. Table 9.2-3 lists the organic chemicals detected. Figure 9.2-3 shows the spatial distribution of detected organic chemicals.

Ethylbenzene was the only organic chemical detected and is retained as a COPC.

**Radionuclides**

Six tuff samples were collected and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 9.2-4 presents the radionuclides detected or detected above BVs/FVs. Figure 9.2-4 shows the spatial distribution of detected radionuclides.

Plutonium-238 was detected in one sample below 1 ft bgs at an activity of 0.033 pCi/g. Plutonium-238 is retained as a COPC.

Tritium was detected in one sample at an activity of 0.01 pCi/g. Tritium is retained as a COPC.

#### 9.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 36-002 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 36-002 include aluminum, antimony, barium, beryllium, calcium, cobalt, copper, magnesium, nickel, perchlorate, and selenium.

Aluminum was detected above the Qbt 2,3,4 BV in one sample at a concentration of 13,800 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of aluminum are defined.

Antimony was not detected above the Qbt 2,3,4 BV but had DLs (0.857 mg/kg to 1.07 mg/kg) above the BV in six samples. Because antimony was not detected above BV and the residential SSL was approximately 29 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 84.6 mg/kg. Concentrations decreased with depth at locations 36-610877 and 36-610878. Concentrations did not change substantially (2.4 mg/kg) laterally from location 36-610877 to location 36-610878 in shallow samples but increased laterally in deep samples. The residential SSL was approximately 184 times the maximum concentration. The vertical extent of barium is defined, and further sampling for lateral extent is not warranted.

Beryllium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 2.69 mg/kg. Beryllium concentrations decreased with depth and decreased laterally. The lateral and vertical extent of beryllium are defined.

Calcium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 4700 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of calcium are defined.

Cobalt was detected above the Qbt 2,3,4 BV in one sample at a concentration of 4.2 mg/kg. Concentrations decreased with depth and increased laterally from location 36-610877 to location 36-610878. The residential and industrial SSLs were approximately 5.5 times and 83 times the maximum concentration, respectively. The vertical extent of cobalt is defined, and further sampling for lateral extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 9.92 mg/kg. Concentrations decreased with depth at both locations and decreased laterally from location 36-610877 to location 36-610878. The lateral and vertical extent of copper are defined.

Magnesium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 3080 mg/kg. Concentrations decreased with depth at both locations and decreased laterally from location 36-610877 to location 36-610878. The lateral and vertical extent of magnesium are defined.

Nickel was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 10.6 mg/kg. Concentrations decreased with depth at both locations and decreased laterally from location 36-610877 to location 36-610878. The lateral and vertical extent of nickel are defined.

Perchlorate was detected in three samples with a maximum concentration of 0.00377 mg/kg. Concentrations did not change substantially with depth (0.00145 mg/kg) at location 36-610878, decreased with depth at location 36-610877, and did not change substantially laterally (0.00105 mg/kg) from location 36-610877 to location 36-610878. The residential SSL was approximately 14,500 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.884 mg/kg and 1.02 mg/kg) above the BV in six samples. Because selenium was not detected above the BV and the residential SSL was approximately 380 times the maximum DL, further sampling for extent of selenium is not warranted.

**Organic Chemicals**

Organic COPC at SWMU 36-002 includes ethylbenzene.

Ethylbenzene was detected in one sample at a concentration of 0.000482 mg/kg. The concentration was below the EQL, decreased with depth, and decreased laterally from location 36-610877 to location 36-610878. The lateral and vertical extent of ethylbenzene are defined.

**Radionuclides**

Radionuclide COPCs at SWMU 36-002 include plutonium-238 and tritium.

Plutonium-238 was detected in one sample at an activity of 0.033 pCi/g. Activities decreased with depth and increased laterally from location 36-610877 to location 36-610878. The residential SAL was approximately 2500 times the maximum activity. The vertical extent of plutonium-238 is defined, and further sampling for lateral extent is not warranted.

Tritium was detected in one sample at an activity of 0.01 pCi/g. Activities increased with depth and increased laterally from location 36-610877 to location 36-610878. The residential SAL was approximately 172,000 times the maximum activity. Further sampling for extent of tritium is not warranted.

#### 9.2.5 Summary of Human Health Risk-Screening Assessments

**Industrial Scenario**

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated at SWMU 36-002.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $6 \times 10^{-11}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.4, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.01 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at SWMU 36-002.

#### 9.2.6 Summary of Ecological Risk-Screening Assessment

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 36-002.

### 9.3 SWMU 36-003(a)—Septic System

#### 9.3.1 Site Description and Operational History

SWMU 36-003(a) is a septic system located at TA-36 approximately 115 ft east of building 36-1 (Figure 9.3-1). The septic system consists of a septic tank (structure 36-17), associated drainlines, a manhole (structure 36-38), a distribution box / drain field, and a seepage pit (LASL 1965, 102122; LANL 2004, 102121). The septic tank is a single-chamber tank constructed of reinforced concrete with an 1160-gal. capacity. The drain field consists of four 200-ft-long perforated tile pipes spaced 10 ft apart. The drain field was replaced with the seepage pit in late 1973 or early 1974.

This septic system was constructed in 1949 and received effluent from the restroom facilities in an office and laboratory in building 36-1. In addition to sanitary wastes, spent photo-processing chemicals from x-ray developing may have been discharged to the septic system (LANL 1993, 015313, pp. 5-24, 5-27). The main guard station at TA-36 (building 36-22) was later added to the septic system. In 1988, the guard station was disconnected from the septic tank and rerouted to an adjacent septic system. In 1992, the sanitary waste drainlines that previously served SWMU 36-003(a) were rerouted to the SWSC plant and are currently active (LANL 1993, 015313, pp. 5-22–5-23). In 1995, the septic tank was decontaminated by steam cleaning and the tank was filled with concrete.

### 9.3.2 Relationship to Other SWMUs and AOCs

SWMU 36-003(a) is located approximately 50 ft south and 150 ft east of SWMU 36-008 (Figure 9.3-1).

### 9.3.3 Summary of Previous Investigations

In 1994, RFI activities were performed at SWMU 36-003(a). Four sludge samples were collected from four locations in the septic tank. Twelve subsurface samples were collected from borings at six locations. A sample was collected from each boring at the soil-tuff interface and in the tuff 2 ft below the interface. The samples were analyzed for inorganic chemicals, SVOCs, and VOCs (LANL 1995, 053985, p. 1-15).

In 1995, an EC was performed at SWMU 36-003(a). The cleanup involved excavating soil to expose the top of the tank, opening the tank and removing the contents, decontaminating the tank by steam cleaning, filling the tank with concrete, and placing backfill above the tank. The tank contents were disposed of as hazardous waste. Five confirmation subsurface samples were collected from four locations outside the tank walls, beneath the tank inlet, beneath the tank outlet, and below the bottom of the tank and were submitted for analyses of inorganic chemicals and VOCs (LANL 1996, 054484, pp. 1–5).

Data from all samples collected during the 1994 RFI and the 1995 EC do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 9.3.4 Site Contamination

#### 9.3.4.1 Soil and Rock Sampling

Based on previous investigation results, further characterization was needed to assess potential contamination at SWMU 36-003(a). As a result, the following activities were completed as part of the 2009–2010 investigation:

- Twenty samples were collected in 2009–2010 from 10 locations. Six samples were collected from four locations beneath the inlet drainline, septic tank inlet, and septic tank. Samples were collected from one or two depth intervals (3.0–4.0 ft bgs, 1.5–2.5 ft bgs, 5.0–5.6 ft bgs and 5.6−6.1 ft bgs, and 2.0–3.0 ft bgs and 3.0–4.2 ft bgs) at each location. Four samples were collected from a borehole adjacent to the seepage pit. Samples were collected at intervals of 49.0–50.0 ft bgs, 59.0–60.0 ft bgs, 69.0–70.0 ft bgs, and 77.5–80.0 ft bgs. Ten samples were collected from five locations within and adjacent to the drain field. Samples were collected from two depth intervals (0.5–1.0 ft bgs to 2.0–3.5 ft bgs and 1.0–2.5 ft bgs to 7.0–8.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Six samples were also analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 36-003(a) are shown on Figure 9.3-1. Table 9.3-1 presents the samples collected and analyses requested at SWMU 36-003(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 9.3.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 9.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 36-003(a) consist of results from 20 samples (7 soil and 13 tuff) collected from 10 locations.

**Inorganic Chemicals**

A total of 20 samples (7 soil and 13 tuff) were collected at SWMU 36-003(a) and analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 9.3-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Figure 9.3-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.944 mg/kg to 1.29 mg/kg) above the BVs in 20 samples. Antimony is retained as a COPC.

Beryllium was detected above the soil BV (1.83 mg/kg) in one sample at a concentration of 5.57 mg/kg. Beryllium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.492 mg/kg to 0.644 mg/kg) above the BV in seven samples. The DLs were 0.092 mg/kg to 0.244 mg/kg above the BV, below the highest background DL (2 mg/kg), and below or similar to the three highest soil background concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg). Cadmium was not detected in the other 13 samples. Cadmium is not a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg) in two soil samples and eight tuff samples with a maximum concentration of 59.1 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-176 and Table G-24). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 6.75 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure G-177 and Table G-24). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in one sample at a concentration of 5.36 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-178 and Table G-24). Copper is retained as a COPC.

Nickel was detected above the soil BV (15.4 mg/kg) in one sample at a concentration of 39.9 mg/kg. Nickel is retained as a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 2.87 mg/kg. Although nitrate is naturally occurring, the SWMU is a septic system that managed sanitary wastewater. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in five samples with a maximum concentration of 0.00229 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.93 mg/kg to 1.1 mg/kg) above the BV in 13 samples. Selenium is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in three samples with a maximum concentration of 1720 mg/kg. The concentrations were below or similar to the three highest soil background concentrations (1600 mg/kg, 1700 mg/kg, and 1800 mg/kg). Sodium was detected below BVs in the other 17 samples. Sodium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 50.5 mg/kg. The concentration was 1.7 mg/kg above the BV and below the five highest soil background concentrations (53 mg/kg, 55 mg/kg, 57 mg/kg, 60 mg/kg, and 75.5 mg/kg). Zinc was detected below BVs in the other 19 samples. Zinc is not a COPC.

**Organic Chemicals**

A total of 20 samples (7 soil and 13 tuff) were collected at SWMU 36-003(a) and analyzed for SVOCs, VOCs, and explosive compounds. Six tuff samples were also analyzed for PCBs. Table 9.3-3 summarizes the analytical results for detected organic chemicals. Figure 9.3-3 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

SWMU 36-003(a) was identified as a SWMU because of possible contamination resulting from potential releases of hazardous materials from the septic system that served building 36-1. This septic system was constructed in 1949 and received effluent from the restroom facilities in an office and laboratory in building 36-1. In addition, spent photo-processing chemicals from x-ray developing may have been discharged to the septic system. PAHs were not used in building 36-1.

SWMU 36-003(a) is located directly adjacent to and downgradient of a paved parking area around building 36-1 and a paved roadway (Potrillo Drive), consisting of old and weathered asphalt (Appendix I, Figures I-17 to I-19. The area where samples were collected receives runoff from the asphalt. Based on the fact that PAHs were not used in building 36-1, and the long-term presence of an old and weathered asphalt-paved road and parking area directly adjacent to SWMU 36-003(a), the PAHs detected in samples used to characterize this site [acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene] are from the adjacent weathered roadway, parking area, and storm drainage; are not related to historic Laboratory site operations; and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at SWMU 36-003(a) include 4-isopropyltoluene, RDX, and 1,2,4-trimethylbenzene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 20 samples (7 soil and 13 tuff) were collected at SWMU 36-003(a) and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 9.3-4 summarizes radionuclides detected or detected above BVs/FVs. Figure 9.3-4 shows the spatial distribution of detected radionuclides.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in one sample at an activity of 0.0957 pCi/g. The activity was only 0.057 pCi/g above the BV, and uranium-235/236 was not detected or detected below the BVs in the other 19 samples (detected below BVs in 4 samples). Uranium-235/236 is not a COPC.

### 9.3.3.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 36-003(a) are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 36-003(a) include antimony, beryllium, chromium, copper, nickel, nitrate, perchlorate, and selenium.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.944 mg/kg to 1.29 mg/kg) above the BVs in 20 samples. Because antimony was not detected above BVs and the residential SSL was approximately 24 times the maximum DL, further sampling for extent of antimony is not warranted.

Beryllium was detected above the soil BV in one sample at a concentration of 5.57 mg/kg. Beryllium concentrations increased with depth and decreased downgradient. The residential SSL was approximately 28 times the concentration. The lateral extent of beryllium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and eight tuff samples with a maximum concentration of 59.1 mg/kg. Concentrations increased with depth at locations 36-610882, 36-610884, 36-610885, 36-610887, 36-610888, and 36-610889, and only one depth was sampled at location 36-610880. Concentrations decreased with depth at location 36-610879. Concentrations decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 1980 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in one sample at a concentration 5.36 mg/kg. Only one depth was sampled at location 36-610880. The concentration was below the maximum Qbt 2,3,4 background concentration (6.2 mg/kg), and the residential SSL was approximately 584 times the concentration. Concentrations decreased downgradient. The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the soil BV in one sample at a concentration of 39.9 mg/kg. Concentrations increased with depth and decreased downgradient. The residential SSL was approximately 390 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Nitrate was detected in 14 samples with a maximum concentration of 2.87 mg/kg. Concentrations did not change substantially with depth (0.09 mg/kg to 0.32 mg/kg) at locations 36-610879, 36-610882, 36-610884, 36-610886, and 36-610889 and decreased with depth at location 36-610888. Only one depth was sampled at location 36-610880. Concentrations did not change substantially (0.63 mg/kg) downgradient. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in five samples with a maximum concentration of 0.00229 mg/kg. Concentrations increased with depth at locations 36-610884, 36-610886, and 36-610887; did not change substantially with depth (0.0015 mg/kg) at location 36-610889; and decreased downgradient. The residential SSL was approximately 24,000 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.93 mg/kg to 1.1 mg/kg) above the BV in 13 samples. Because selenium was not detected above the BV and the residential SSL was approximately 355 times the maximum DL, further sampling for extent of selenium is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 36-003(a) include 4-isopropyltoluene, RDX and 1,2,4-trimethylbenzene.

Isopropyltoluene[4-] was detected in two samples with a maximum concentration of 0.00811 mg/kg. Concentrations increased with depth at locations 36-610882 and 36-610884 and decreased downgradient. The residential SSL was approximately 295,000 times the maximum concentration. The lateral extent of 4-isopropyltoluene is defined, and further sampling for vertical extent is not warranted.

RDX was detected in one sample at a concentration of 0.184 mg/kg. The concentration was below the EQL, decreased with depth, and increased downgradient. The residential SSL was approximately 330 times the maximum concentration. The vertical extent of RDX is defined, and further sampling for lateral extent is not warranted.

Trimethylbenzene[1,2,4-] was detected in one sample at a concentration of 0.000343 mg/kg. Only one depth was sampled at location 36-610880. The concentration was below the EQL, and the residential SSL was approximately 170,000 times the concentration. Concentrations decreased downgradient. The lateral extent of 1,2,4-trimethylbenzene is defined, and further sampling for vertical extent is not warranted.

**Radionuclides**

No radionuclide COPCs were identified at SWMU 36-003(a).

### 9.3.5 Summary of Human Health Risk-Screening Assessments

**Industrial Scenario**

No carcinogenic COPCs were identified in 0.0−1.0 ft bgs depth interval. The HI is 0.002, which is below the NMED target HI of 0.006 (NMED 2015, 600915). No radionuclide COPCs were identified for the industrial scenario.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-8}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified for the residential scenario. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at SWMU 36-003(a).

### 9.3.6 Summary of Ecological Risk-Screening Assessment

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 36-003(a).

## 9.4 SWMU 36-008—Surface Disposal Area Located Near Building 36-1

### 9.4.1 Site Description and Operational History

SWMU 36-008 is a surface disposal area located at TA-36 north of building 36-1, an office and laboratory (Plate 25). The disposal area is on the south rim of Threemile Canyon and extends down the steeply sloping edge of the mesa. The approximately 1-acre disposal area was discovered in June 2000 after the Cerro Grande fire burned through the area. The dates the site was used for disposal are not known. The materials strewn over the site seemed to be associated with building activities, and it is possible the disposal area may have been used as early as 1949, when building 36-1 was constructed. Surface debris included laboratory glassware, metal cans, metal pipe, and miscellaneous metal fragments. As part of Cerro Grande fire response efforts, visible debris was removed from the surface disposal area. Approximately 5 $yd^3$ of debris was collected from the site, segregated, and staged for disposal; in addition, storm-water BMPs were implemented to prevent erosion (LANL 2000, 068656).

### 9.4.2 Relationship to Other SWMUs and AOCs

SWMU 36-008 is located approximately 100 ft northwest and downgradient of SWMU 36-003(a). The SWMU C-36-003 outfall is located approximately 20 ft inside the southern boundary of SWMU 36-008 (Plate 25).

### 9.4.3 Summary of Previous Investigations

No sampling was conducted at SWMU 36-008 before 2009.

#### 9.4.4 Site Contamination

##### 9.4.4.1 Soil, Sediment, and Rock Sampling

Because no previous investigations had been conducted, characterization was required to assess potential contamination at SWMU 36-008. The following activities were completed as part of the 2009–2010 investigation.

- A total of 91 samples were collected in 2009–2010 from 48 locations to define the nature and extent of contamination. Sampling locations were located throughout the SWMU and adjacent to and downgradient of the SWMU. At each location a sample was collected from the surface (0.0−0.5 ft bgs to 0.0–1.0 ft bgs), and at 43 locations a sample was also collected from the subsurface (0.5–2.0 ft bgs to 2.0–3.0 ft bgs). All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, nitrate, perchlorate, explosive compounds, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. In addition, 15 samples were analyzed for PCBs.

The 2009–2010 sampling locations at SWMU 36-008 are shown on Plate 25. Table 9.4-1 presents the samples collected and analyses requested at SWMU 36-008. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

##### 9.4.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

##### 9.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 36-008 consist of results from 91 samples (78 soil, 7 sediment, and 6 tuff) collected from 48 locations. In addition, there are decision-level data for 16 samples (9 soil, 6 sediment, and 1 tuff) collected at SWMU C-36-003 (see section 9.5.4). Because SWMU C-36-003 is located within the footprint of SWMU 36-008, the following COPC identification and nature and extent evaluations for SWMU 36-008 include the combined data sets for SWMUs 36-008 and C-36-003.

**Inorganic Chemicals**

A total of 107 samples (87 soil, 13 sediment, and 7 tuff) were collected and analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 9.4-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 26 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in one sample at a concentration of 11,000 mg/kg. The concentration was 3660 mg/kg above the BV, and aluminum was detected below BVs in the other 106 samples. Aluminum is not a COPC.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs (0.83 mg/kg, 0.83 mg/kg, and 0.5 mg/kg) but had DLs (0.919 mg/kg to 5.62 mg/kg) above the BVs in 83 soil samples, 13 sediment samples, and 7 tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in one sample at a concentration of 3.2 mg/kg. The concentration was 0.41 mg/kg above the BV and below the two highest Qbt 2,3,4 background concentrations (4 mg/kg and 5 mg/kg). Arsenic was not detected or detected below BVs in the other 106 samples (detected below BVs in 105 samples). Arsenic is not a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two samples with a maximum concentration of 153 mg/kg. Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in one sample at a concentration of 2.44 mg/kg. The maximum concentration was 1.23 mg/kg above the BV and 0.64 mg/kg above the maximum Qbt 2,3,4 background concentration (1.8 mg/kg). Beryllium was not detected or not detected above BVs in the other 106 samples (detected below BVs in 105 samples). Beryllium is not a COPC.

Cadmium was detected above the soil and sediment BVs (0.4 mg/kg for both) in 9 soil samples and 3 sediment samples with a maximum concentration of 3.35 mg/kg and had DLs (0.478 mg/kg to 0.882 mg/kg) above the BVs in 59 soil samples and 8 sediment samples. The quantile and slippage tests indicated site concentrations of cadmium in sediment are statistically different from background (Figure G-179 and Table G-25). Cadmium is retained as a COPC.

Calcium was detected above the soil, sediment, and Qbt 2,3,4 BVs (6120 mg/kg, 4420 mg/kg, and 2200 mg/kg) in two soil samples, three sediment samples, and one tuff sample with a maximum concentration of 11,700 mg/kg. The Gehan test indicated site concentrations of calcium in soil are statistically different from background (Table G-26), However, the quantile and slippage tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-180 and Table G-26). The Gehan and quantile tests indicated site concentrations of calcium in sediment are statistically different from background (Figure G-181 and Table G-25). Calcium is retained as a COPC.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg) in 19 soil samples, 5 sediment samples, and 7 tuff samples with a maximum concentration of 192 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil and sediment are statistically different from background (Figure G-182 and Table G-26, and Figure G-183 and Table G-25, respectively). Chromium is retained as a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in one soil sample and one tuff sample with maximum concentration of 11.3 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-184 and Table G-26). The concentration above the Qbt 2,3,4 BV (5.34 mg/kg) was 2.2 mg/kg above the BV and maximum Qbt 2,3,4 background concentration (3.14 mg/kg). Cobalt was detected below BVs in the other 105 samples (including the other 6 tuff samples). Cobalt is not a COPC.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg) in 14 soil samples, 5 sediment samples, and 3 tuff samples with a maximum concentration of 4870 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil and sediment are statistically different from background (Figure G-185 and Table G-26, and Figure G-186 and Table G-25, respectively). Copper is retained as a COPC.

Cyanide was detected above the soil and sediment BVs (0.5 mg/kg and 0.82 mg/kg) in 31 soil samples and 1 sediment sample with a maximum concentration of 4.24 mg/kg. The Gehan and quantile tests indicated site concentrations of cyanide in sediment are not statistically different from background (Figure G-187 and Table G-25). Cyanide was detected substantially above the soil BV. Cyanide is retained as a COPC.

Lead was detected above the soil, sediment, and Qbt 2,3,4 BVs (22.3 mg/kg, 19.7 mg/kg, and 11.2 mg/kg) in 10 soil samples, 4 sediment samples, and 2 tuff samples with a maximum concentration of 202 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-188 and Table G-26). The Gehan and quantile tests indicated site concentrations of lead in sediment are statistically different from background (Figure G-189 and Table G-25). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in one sample at a concentration of 2590 mg/kg. The concentration was 900 mg/kg above the BV and below the two highest Qbt 2,3,4 background concentrations (2820 mg/kg and 2720 mg/kg). Magnesium was detected below BVs in the other 106 samples. Magnesium is not a COPC.

Manganese was detected above the soil and sediment BVs (671 mg/kg and 543 mg/kg) in three soil samples and three sediment samples with a maximum concentration of 893 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-190 and Table G-26). The Gehan and quantile tests indicated site concentrations of manganese in sediment are statistically different from background (Figure G-191 and Table G-25). Manganese is retained as a COPC.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs (0.1 mg/kg for all) in 22 soil samples, 8 sediment samples, and 1 tuff sample with a maximum concentration of 25 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil, sediment, and Qbt 2,3,4 BVs (15.4 mg/kg, 9.38 mg/kg, and 6.58 mg/kg) in one soil sample, one sediment sample, and one tuff sample with a maximum concentration of 53 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure G-192 and Table G-26). The Gehan test indicated site concentrations of nickel in sediment are statistically different from background (Table G-25). However, the quantile and slippage tests indicated site concentrations of nickel in sediment are not statistically different from background (Figure G-193 and Table G-25). The concentration in tuff (9.22 mg/kg) was above the maximum Qbt 2,3,4 background concentration (7 mg/kg). Nickel is retained as a COPC.

Nitrate was detected in 101 samples with a maximum concentration of 540 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in 71 samples with a maximum concentration of 0.688 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 1 sample at a concentration of 0.635 mg/kg and had DLs (1.01 mg/kg to 2.03 mg/kg) above the soil and sediment BVs (1.52 mg/kg and 0.3 mg/kg) and the Qbt 2,3,4 BV in 4 soil samples, 13 sediment samples, and 6 tuff samples. Selenium is retained as a COPC.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs (1 mg/kg for all) in 10 soil samples, 3 sediment samples, and 1 tuff sample with a maximum concentration of 348 mg/kg. Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in one sample at a concentration of 1000 mg/kg. The quantile and slippage tests indicated site concentrations of sodium in soil are not statistically different from background (Figure G-194 and Table G-26). Sodium is not a COPC.

Uranium was detected above the soil and sediment BVs (1.82 mg/kg and 2.22 mg/kg) in 24 soil samples and 2 sediment samples with a maximum concentration of 10.4 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil and sediment are statistically different from background (Figure G-195 and Table G-26, and Figure G-196 and Table G-25, respectively). Uranium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample at a concentration of 26.2 mg/kg. The concentration was 9.2 mg/kg above the BV and only 5.2 mg/kg above the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium was detected below BVs in the other 106 samples. Vanadium is not a COPC.

Zinc was detected above the soil, sediment, and Qbt 2,3,4 BVs (48.8 mg/kg, 60.2 mg/kg, and 63.5 mg/kg) in 26 soil samples, 2 sediment samples, and 1 tuff sample with a maximum concentration of 1320 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil and sediment are statistically different from background (Figure G-197 and Table G-26, and Figure G-198 and Table G-25, respectively). Zinc is retained as a COPC.

**Organic Chemicals**

A total of 107 samples (87 soil, 13 sediment, and 7 tuff) were collected and analyzed for SVOCs, VOCs, and explosive compounds. A total of 31 samples (23 soil, 1 sediment, and 7 tuff) were also analyzed for PCBs. Table 9.4-3 summarizes the analytical results for detected organic chemicals. Plate 27 shows the spatial distribution of detected organic chemicals.

***Polycyclic Aromatic Hydrocarbons***

Polycyclic aromatic hydrocarbons are a class of SVOCs frequently detected as a result of environmental sampling but generally were not released from the SWMUs or AOCs being investigated. PAHs unrelated to site activities are thus often detected in samples analyzed for the presence of site-related SVOCs.

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds. Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

The principal sources of PAHs in soil along parking lots, roads, and highways are vehicular exhaust and emissions, the wearing of tires, and asphalt. PAH-containing materials, such as asphalt and rubber particles, do not easily dissolve in water, preventing migration, except as suspended particles in storm water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

***Site Activities***

SWMU 36-008 was identified as a SWMU because of possible contamination resulting from potential releases of hazardous materials from the disposal area located on the steeply sloping edge of the mesa below building 36-1. The site appears to be associated with building 36-1 (an office and laboratory), which was constructed in 1949. PAHs were not used in building 36-1. This disposal area was revealed in June 2000 after the Cerro Grande fire burned the vegetation surrounding the site.

Currently, SWMU 36-008 is located directly adjacent to and downgradient of a paved parking area around building 36-1, consisting of old and weathered asphalt (Appendix I, Figure I-20). Currently, storm-water BMPs consisting of a rock berm are present along the edge of the paved area (Appendix I, Figure I-21), but storm-water runoff previously went directly onto SWMUs 36-008 and C-36-003. This area was also impacted by the Cerro Grande fire, and evidence of burned trees is present in the area (Appendix I, Figures I-22 to I-24). Based on the fact that PAHs were not used in building 36-1, and on the long-term presence of an old and weathered asphalt-paved road and parking area directly adjacent to SWMU 36-008 and the presence of burned trees within the SWMU, the PAHs detected in samples used to characterize these sites [acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene] are not related to historic Laboratory site operations and are not COPCs.

***Organic COPCs***

Other organic chemicals detected at SWMU 36-008 include acetone; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-ethylhexyl)phthalate; bromodichloromethane; butylbenzylphthalate; chlorodibromomethane; chloroform; chloromethane; 2-chloronaphthalene; 4-chlorotoluene; dibenzofuran; 1,1-dichloroethene; di-n-butylphthalate; 4-isopropyltoluene; methylene chloride; RDX; styrene; TATB; toluene; trichloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 107 samples (87 soil, 13 sediment, and 7 tuff) were collected and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 9.4-4 summarizes radionuclides detected or detected above BVs/FVs. Plate 28 shows the spatial distribution of detected radionuclides.

Americium-241 was detected above the soil and sediment FVs (0.013 pCi/g and 0.04 pCi/g) in five soil samples and one sediment sample with a maximum activity of 0.0465 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected above the soil and sediment FVs (1.65 pCi/g and 0.9 pCi/g) in 1 soil sample and 3 sediment samples, was detected below 1 ft bgs in 30 soil samples, and was detected in 1 tuff sample with a maximum activity of 3.31 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected above the sediment FV (0.006 pCi/g) in one sample at an activity of 0.026 pCi/g. The activity was only 0.02 pCi/g above the FV. Plutonium-238 was not detected in the other 106 samples. Plutonium-238 is not a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in five soil samples and one sediment sample and was detected below 1 ft bgs in four soil samples with a maximum activity of 0.0953 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in nine samples with a maximum activity of 0.98 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in seven samples with a maximum activity of 6.1 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in one soil sample and one tuff sample with a maximum activity of 0.278 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in 10 samples with a maximum activity of 5.17 pCi/g. Uranium-238 is retained as a COPC.

#### 9.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 36-008 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU 36-008 include antimony, barium, cadmium, calcium, chromium, copper, cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, uranium, and zinc.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs but had DLs (0.919 mg/kg to 5.62 mg/kg) above the BVs in 83 soil samples, 13 sediment samples, and 7 tuff samples. Because antimony was not detected above BVs and the residential and industrial SSLs were approximately 5.6 times and 92 times the maximum DL, respectively, further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 153 mg/kg. Concentrations increased with depth at location 36-610584 and decreased with depth at location 36-610600 (the concentration in the shallow sample at location 36-610600 was 137 mg/kg and below the soil BV [Appendix E, Pivot Tables]). Concentrations increased downgradient at location 36-610584. The residential and industrial SSLs were approximately 10 times and 1670 times the maximum concentration, respectively. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil and sediment BVs in 9 soil samples and 3 sediment samples with a maximum concentration of 3.35 mg/kg and had DLs (0.478 mg/kg to 0.882 mg/kg) above the BVs in 59 soil samples and 8 sediment samples. Concentrations increased with depth at locations 36-610824 and 36-610827, decreased with depth at all other locations, and decreased downgradient. The residential SSL was approximately 21 times the maximum concentration and 80 times the maximum DL. The lateral extent of cadmium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the soil, sediment, and Qbt 2,3,4 BVs in two soil samples, three sediment samples, and one tuff sample with a maximum concentration of 11,700 mg/kg. Concentrations increased with depth at location 36-610584, only one depth was sampled at location 36-610609, and concentrations decreased with depth at all other locations. Concentrations decreased downgradient. The NMED residential essential nutrient SSL was approximately 1100 times the maximum concentration. The lateral extent of calcium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil, sediment and Qbt 2,3,4 BVs in 19 soil samples, 5 sediment samples, and 7 tuff samples with a maximum concentration of 192 mg/kg. Concentrations increased with depth at locations 36-610584, 36-610591, 36-610594, 36-610599, 36-610600, 36-610602, 36-610613, 36-610615, and 36-610825; did not change substantially with depth (1.7 mg/kg and 1.2 mg/kg) at locations 36-610598 and 36-610822; and only one depth was sampled at location 36-610609. Concentrations decreased with depth at all other locations and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at these sites, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 609 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the soil, sediment, and Qbt 2,3,4 BVs in 14 soil samples, 5 sediment samples, and 3 tuff samples with a maximum concentration of 4870 mg/kg. Concentrations increased with depth at locations 36-610603, 36-610605, 36-610824, and 36-610827; did not change substantially with depth (0.47 mg/kg) at location 36-610584; and only one depth was sampled at location 36-610609. Concentrations decreased with depth at all other locations and decreased downgradient. The residential and industrial SSLs were approximately 7.5 times and 123 times the maximum concentration of the locations where concentrations were increasing with depth (420 mg/kg at location 36-610603). The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Cyanide was detected above the soil and sediment BVs in 31 soil samples and 1 sediment sample with a maximum concentration of 4.24 mg/kg. Concentrations increased with depth at location 36-610598; did not change substantially with depth (0.043 mg/kg, 0.89 mg/kg, 0.28 mg/kg, and 0.18 mg/kg) at locations 36-610589, 36-610596, 36-610824, and 36-610827; and only one depth was sampled at locations 36-610576 and 36-610595. Concentrations decreased with depth at all other locations. Concentration increased downgradient at location 36-610598 where the maximum concentration was detected. The residential and industrial SSLs were approximately 2.6 times and 15 times the maximum concentration, respectively. Further sampling for extent of cyanide is not warranted.

Lead was detected above the soil, sediment, and Qbt 3 BVs in 10 soil samples, 4 sediment samples, and 2 tuff samples with a maximum concentration of 202 mg/kg. Concentrations increased with depth at location 36-610603 and decreased with depth at all other locations. Concentrations decreased downgradient. The residential SSL was approximately 11 times and the industrial SSL was approximately 22 times the maximum concentration at location 36-610603. The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Manganese was detected above the soil and sediment BVs in three soil samples and three sediment samples with a maximum concentration of 893 mg/kg. Only one depth was sampled at location 36-610595, and concentrations decreased with depth at locations 36-610590, 36-610602, 36-610619, 36-610821, and 36-610828. Concentrations decreased downgradient. The residential SSL was approximately 15 times and the industrial SSL was approximately 231 times the maximum concentration at location 36-610595. The lateral extent of manganese is defined, and further sampling for vertical extent is not warranted.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs in 22 soil samples, 8 sediment samples, and 1 tuff sample with a maximum concentration of 25 mg/kg. Concentrations increased with depth at location 36-610605; did not change substantially with depth (0.051 mg/kg to 0.72 mg/kg) at locations 36-610574, 36-610606, 36-610608, 36-610610, 36-610824, 36-610825, 36-610826, and 36-610827; and decreased with depth at the other seven locations. Only one depth was sampled at locations 36-610576, 36-610595, and 36-610609. Concentrations decreased downgradient. The residential SSL was approximately 50 times the maximum concentration at location 36-610605. The lateral extent of mercury is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the soil, sediment, and Qbt 2,3,4 BVs in one soil sample, one sediment sample, and one tuff sample with a maximum concentration of 53 mg/kg. Concentrations increased with depth at location 36-610584 and decreased with depth at locations 36-610607 and 36-610825. Concentrations decreased downgradient. The residential SSL was approximately 29 times the maximum concentration. The lateral extent of nickel is defined, and further sampling for vertical extent is not warranted.

Nitrate was detected in 101 samples with a maximum concentration of 540 mg/kg. Concentrations were consistent with naturally occurring levels of nitrate at most locations. Nitrate was elevated at six locations: 36-610574, 36-610585, 36-610607, 36-610824, 36-610825, and 36-610826. Concentrations decreased or did not change substantially (1.9 mg/kg at location 36-610574) with depth at these locations. Concentrations decreased downgradient. The residential SSL was approximately 230 times the maximum concentration. The lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 71 samples with a maximum concentration of 0.688 mg/kg. Concentrations increased with depth at locations 36-610590, 36-610594, 36-610616, and 36-610822. Only one depth was sampled at locations 36-610576, 36-610595, 36-610609, and 36-610623. Concentrations did not change substantially with depth (less than 0.48 mg/kg) and decreased at the other locations. Concentrations decreased downgradient. The residential SSL was approximately 80 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 1 sample at a concentration of 0.635 mg/kg and had DLs (1.01 mg/kg to 2.03 mg/kg) above the soil, sediment, and Qbt 2,3,4 BVs in 4 soil samples, 13 sediment samples, and 6 tuff samples. Concentrations decreased with depth (the concentration in the shallow sample at location 36-610825 was 1.35 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The residential SSL was approximately 192 times the maximum DL. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs in 10 soil samples, 3 sediment samples, and 1 tuff sample with a maximum concentration of 348 mg/kg. Concentrations increased with depth at locations 36-610825 and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The industrial SSL was approximately 21 times the maximum concentration at locations 36-610825 and 36-610827. The lateral extent of silver is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil and sediment BVs in 24 soil samples and 2 sediment samples with a maximum concentration of 10.4 mg/kg. Concentrations increased with depth at location 36-610824, did not change substantially with depth (0.69 mg/kg) at location 36-610615, and decreased with depth at the other locations. Concentrations decreased downgradient. The residential SSL was approximately 22 times the maximum concentration. The lateral extent of uranium is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above the soil, sediment, and Qbt 2,3,4 BVs in 26 soil samples, 2 sediment samples, and 1 tuff sample with a maximum concentration of 1320 mg/kg. Concentrations increased with depth at locations 36-610603 and 36-610619, and only one depth was sampled at locations 36-610576 and 36-610595. The concentrations at locations 36-610576, 36-610595, and 36-610619 were below the maximum soil background concentration (75.5 mg/kg). Concentrations decreased with depth at the other locations and decreased downgradient. The residential SSL was approximately 18 times and the industrial SSL was approximately 295 times the maximum concentration. The lateral extent of zinc is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU 36-008 include acetone; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-ethylhexyl)phthalate; bromodichloromethane; butylbenzylphthalate; chlorodibromomethane; chloroform; chloromethane; 2-chloronaphthalene; 4-chlorotoluene; dibenzofuran; 1,1-dichloroethene; di-n-butylphthalate; 4-isopropyltoluene; methylene chloride; RDX; styrene; TATB; toluene; trichloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Acetone was detected in 14 samples with a maximum concentration of 0.0394 mg/kg. Concentrations decreased with depth or did not change substantially with depth (0.00097 mg/kg to 0.00328 mg/kg) except at locations 36-610595 and 36-610623, where only one depth was sampled, and at location 36-610591, where concentrations increased with depth. Concentrations at locations 36-610591 and 36-610594 were below the EQLs. Concentrations did not change substantially (0.037 mg/kg) downgradient. The residential SSL was approximately 1,680,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1254 was detected in 18 samples with a maximum concentration of 1.03 mg/kg. Concentrations did not change substantially with depth (0.0001 mg/kg to 0.17 mg/kg) at locations 36-610574, 36-610579, 36-610583, 36-610824, 36-610826, and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 6 times and 60 times the maximum concentration at the locations listed above. The lateral extent of Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 15 samples with a maximum concentration of 0.617 mg/kg. Concentrations did not change substantially with depth (0.0014 mg/kg and 0.1 mg/kg) at locations 36-610574, 36-610579, 36-610583, 36-610824, 36-610826, and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 21 times and 100 times the maximum concentration at the locations listed above. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Benzoic acid was detected in 13 samples with a maximum concentration of 1.65 mg/kg. Concentrations increased with depth at location 36-610582, and only one depth was sampled at locations 36-610576 and 36-610595. Concentrations did not change substantially with depth (0.016 mg/kg to 0.09 mg/kg) or decreased with depth at the other locations. Concentrations decreased downgradient. All concentrations were below the EQLs. The residential SSL was approximately 152,000 times the maximum concentration. The lateral extent of benzoic acid is defined, and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in five samples with a maximum concentration of 0.604 mg/kg. Concentrations increased with depth at locations 36-610579 and 36-610620, decreased with depth at locations 36-610588 and 36-610605, and decreased downgradient. All but the maximum detected concentrations were below the EQLs. The residential SSL was approximately 630 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined, and further sampling for vertical extent is not warranted.

Bromodichloromethane was detected in one sample at a concentration of 0.000117 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bromodichloromethane are defined.

Butylbenzylphthalate was detected in one sample at a concentration of 0.214 mg/kg. The concentration was below the EQL, increased with depth, and decreased downgradient. The residential SSL was approximately 13,600 times the concentration. The lateral extent of butylbenzylphthalate is defined, and further sampling for vertical extent is not warranted.

Chlorodibromomethane was detected in one sample at a concentration of 0.000635 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of chlorodibromomethane are defined.

Chloroform was detected in two samples with a maximum concentration of 0.00982 mg/kg. Concentrations did not change substantially with depth (0.0093 mg/kg) and decreased downgradient. The residential SSL was approximately 6000 times the maximum concentration. The lateral extent of chloroform is defined, and further sampling for vertical extent is not warranted.

Chloromethane was detected in one sample at a concentration of 0.000633 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of chloromethane are defined.

Chloronaphthalene[2-] was detected in one sample at a concentration of 0.0215 mg/kg. The concentration was below the EQL, increased with depth, and increased downgradient. The residential SSL was approximately 291,000 times the concentration. Further sampling for extent of 2-chloronaphthalene is not warranted.

Chlorotoluene[4-] was detected in one sample at a concentration of 0.000496 mg/kg. The concentration was below the EQL, increased with depth, and decreased downgradient. The residential SSL was approximately 3,220,000 times the concentration. The lateral extent of 4-chlorotoluene is defined, and further sampling for vertical extent is not warranted.

Dibenzofuran was detected in six samples with a maximum concentration of 2.94 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of dibenzofuran are defined.

Dichloroethene[1,1-] was detected in four samples with a maximum concentration of 0.00246 mg/kg. Concentrations decreased with depth and increased downgradient. The residential SSL was approximately 179,000 times the maximum concentration. The vertical extent of 1,1-dichloroethene is defined, and further sampling for lateral extent is not warranted.

Di-n-butylphthalate was detected in 13 samples with a maximum concentration of 8.07 mg/kg. Concentrations did not change substantially with depth (0.18 mg/kg and 0.19 mg/kg) at locations 36-610588 and 36-610826, decreased with depth at the other locations, and decreased downgradient. The residential SSL was approximately 760 times the maximum concentration. The lateral extent of di-n-butylphthalate is defined, and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in 40 samples with a maximum concentration of 0.0893 mg/kg. Concentrations increased with depth at eight locations and did not change substantially with depth (0.000435 mg/kg to 0.0859 mg/kg) at eight locations. Concentrations decreased with depth at the other locations and did not change substantially downgradient (0.04 mg/kg or less). The residential SSL was approximately 26,400 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Methylene chloride was detected in eight samples with a maximum concentration of 0.00573 mg/kg. Concentrations were below the EQLs. Concentrations increased with depth at location 36-610615, and only one depth was sampled at location 36-610609. Concentrations decreased with depth at the other locations and decreased downgradient. The residential SSL was approximately 71,400 times the maximum concentration. The lateral extent of methylene chloride is defined, and further sampling for vertical extent is not warranted.

RDX was detected in one sample at a concentration of 0.106 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of RDX are defined.

Styrene was detected in one sample at a concentration of 0.00197 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of styrene are defined.

TATB was detected in two samples with a maximum concentration of 0.331 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of TATB are defined.

Toluene was detected in 42 samples with a maximum concentration of 0.015 mg/kg. Concentrations increased with depth at 9 locations and did not change substantially with depth (0.00006 mg/kg to 0.012 mg/kg) at 10 locations. Only one depth was sampled at location 36-610623. Concentrations decreased with depth at the other locations and did not change substantially (0.015 mg/kg) downgradient. The residential SSL was approximately 349,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Trichloroethene was detected in seven samples with a maximum concentration of 0.000905 mg/kg. Concentrations were below the EQLs. Concentrations increased with depth at locations 36-610612 and 36-610622, and only one depth was sampled at locations 36-610576 and 36-610595. Concentrations decreased with depth at the other locations and did not change substantially (0.0004 mg/kg) downgradient. The residential SSL was approximately 7480 times the maximum concentration. Further sampling for extent of trichloroethene is not warranted.

Trimethylbenzene[1,2,4-] was detected in seven samples with a maximum concentration of 0.00499 mg/kg. Concentrations were below the EQLs. Concentrations increased with depth at locations 36-610600, 36-610618, and 36-610619; and only one depth was sampled at location 36-610576. Concentrations decreased with depth at the other locations and did not change substantially (0.0046 mg/kg) downgradient. The residential SSL was approximately 11,600 times the maximum concentration. Further sampling for extent of 1,2,4-trimethylbezene is not warranted.

Trimethylbenzene[1,3,5-] was detected in two samples with a maximum concentration of 0.00569 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,3,5-trimethylbenzene are defined.

Xylene[1,2-] was detected in four samples with a maximum concentration of 0.000616 mg/kg. Concentrations were below the EQLs. Concentrations increased with depth at locations 36-610611 and 36-610618, decreased with depth at locations 36-610590 and 36-610614, and did not change substantially (0.00025 mg/kg) downgradient. The residential SSL was approximately 1,310,000 times the maximum concentration. Further sampling for extent of 1,2-xylene is not warranted.

Xylene[1,3-]+1,4-xylene was detected in 14 samples with a maximum concentration of 0.00096 mg/kg. Concentrations were below the EQLs. Concentrations increased with depth at seven locations, and only one depth was sampled at locations 36-610576 and 36-610595. Concentrations decreased with depth at the other locations. Concentrations did not change substantially (0.00042 mg/kg) downgradient. The residential SSL was approximately 907,000 times the maximum concentration. Further sampling for extent of 1,3-xylene+1,4-xylene is not warranted.

**Radionuclides**

Radionuclide COPCs at SWMU 36-008 include americium-241, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

Americium-241 was detected above the soil and sediment FVs in five soil samples and one sediment sample with a maximum activity of 0.0465 pCi/g. Activities decreased with depth at all locations and increased downgradient at locations 36-610580 and 36-610584. The residential SAL was approximately 1780 times the maximum activity. The vertical extent of americium-241 is defined, and further sampling for lateral extent is not warranted.

Cesium-137 was detected above the soil and sediment FVs in 1 soil sample and 3 sediment samples, was detected below 1 ft bgs in 30 soil samples, and was detected in 1 tuff sample with a maximum activity of 3.31 pCi/g. Activities increased with depth at location 36-610603 and decreased with depth at the other locations (activities in the shallow samples at locations 36-610574, 36-610580, 36-610581, 36-610582, 36-610585, 36-610588, 36-610589, 36-610592, 36-610593, 36-610594, 36-610596, 36-610598, 36-610601, 36-610602, 36-610605, 36-610611, 36-610612, 36-610613, 36-610614, 36-610615, 36-610617, 36-610618, 36-610629, 36-610622, 36-610824, 36-610826, 36-610827, and 36-610828 were 0.883 pCi/g, 1.08 pCi/g, 0.645 pCi/g, 0.61 pCi/g, 0.357 pCi/g, 0.412 pCi/g, 1.07 pCi/g, 0.726 pCi/g, 1.15 pCi/g, 0.691 pCi/g, 0.765 pCi/g, 0.691 pCi/g, 0.485 pCi/g, 0.615 pCi/g, 0.256 pCi/g, 0.176 pCi/g, 0.616 pCi/g, 0.978 pCi/g, 1.03 pCi/g, 0.794 pCi/g, 0.335 pCi/g, 1.48 pCi/g, 1.31 pCi/g, 0.91 pCi/g, 0.625 pCi/g, 0.335 pCi/g, 0.669 pCi/g, and 0.58 pCi/g, respectively, and below the soil FV [Appendix E, Pivot Tables]). Activities increased downgradient at location 36-610584, where the maximum activity was detected. The residential and industrial SALs were approximately 3.6 times and 12 times the maximum activity, respectively. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in five soil samples and one sediment sample and was detected below 1 ft bgs in four soil samples, with a maximum activity of 0.0953 pCi/g. Activities increased with depth at location 36-610598, did not change substantially with depth (0.003 pCi/g) at location 36-610615, and decreased with depth at all other locations (activities in the shallow samples at locations 36-610615, 36-610620, and 36-610622 were 0.0259 pCi/g, 0.0409 pCi/g, and 0.0414 pCi/g, respectively, and below the soil FV [Appendix E, Pivot Tables]). Activities did not change substantially downgradient (0.006 pCi/g to 0.008 pCi/g). The residential SAL was approximately 830 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected in nine samples with a maximum activity of 0.98 pCi/g. Activities increased with depth at locations 36-610607 and 36-610825, did not change substantially with depth (0.0037 pCi/g) at location 36-610826, and decreased with depth at the other locations. Activities decreased downgradient. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil BV in seven samples with a maximum activity of 6.1 pCi/g. Activities did not change substantially with depth (0.06 pCi/g) at location 36-610824, decreased with depth at the other locations, and decreased downgradient. The lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum activity of 0.278 pCi/g. Activities decreased with depth at both locations (the activity in the shallow sample at location 36-601825 was 0.134 pCi/g and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the soil BV in 10 samples with a maximum activity of 5.17 pCi/g. Activities increased with depth at location 36-610605, did not change substantially with depth (<1 pCi/g) at locations 36-610824 and 36-610826, decreased with depth at the other locations, and did not change substantially downgradient (1.9 pCi/g). The residential SAL was approximately 28 times the maximum activity. Further sampling for extent of uranium-238 is not warranted.

#### 9.4.5 Summary of Human Health Risk-Screening Assessments

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.6 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is below the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The HI is 0.9, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 2 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The residential exposure scenario is also protective of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at SWMU 36-008.

#### 9.4.6 Summary of Ecological Risk-Screening Assessment

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 36-008.

### 9.5 SWMU C-36-003—Outfall from Building 36-1

#### 9.5.1 Site Description and Operational History

SWMU C-36-003 is a former NPDES-permitted outfall (EPA 06A106) located at TA-36 on the south rim of Threemile Canyon, north of office and laboratory building 36-1 (Plate 25). The outfall became operational in the 1950s and served the sink and floor drains on the first floor of the building and the floor, sink, and equipment drains in the photoprocessing labs on the second floor of the building. In 1993 the floor and sink drains were rerouted to the SWSC plant. The outfall was removed from the NPDES permit in 2001 (EPA 2001, 082282).

#### 9.5.2 Relationship to Other SWMUs and AOCs

The SWMU C-36-003 outfall is located approximately 20 ft inside the southern boundary of SWMU 36-008. Portions of SWMU 36-003(a) are located approximately 50 ft south and upgradient of the SWMU C-36-003 outfall (Plate 25).

### 9.5.3 Summary of Previous Investigations

In 1994, RFI activities were performed at SWMU C-36-003 (LANL 1995, 053985). One surface and one water sample were collected from one location just below the outfall. Water from a source in building 36-1 was flushed through the drainline and outfall to provide water for sampling. Five surface samples were collected from five locations in the drainage channel below the outfall. The samples were analyzed for inorganic chemicals and SVOCs.

Data from all samples collected during the 1994 RFI do not meet current data-validation standards and are not decision-level data. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

### 9.5.4 Site Contamination

#### 9.5.4.1 Soil, Sediment, and Rock Sampling

Based on previous investigation results, further characterization was needed to assess potential contamination at SWMU C-36-003. As a result, the following activities were completed as part of the 2009–2010 investigation:

- Sixteen samples were collected in 2009–2010 from eight locations to define the nature and extent of contamination. Sampling locations were below the outfall and in the drainage below the outfall. Samples were collected at two depth intervals (0.0–0.5 ft bgs or 0.0–1.0 ft bgs and 2.0–2.5 ft bgs or 2.0–3.0 ft bgs) at each location. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, total uranium, nitrate, perchlorate, explosive compounds, SVOCs, VOCs, PCBs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2009–2010 sampling locations at SWMU C-36-003 are shown on Plate 25. Table 9.4-1 presents the samples collected and analyses requested at SWMU C-36-003. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

#### 9.5.4.2 Soil, Sediment, and Rock Field-Screening Results

No radiological field-screening results exceeded twice the daily site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Table 3.2-2.

#### 9.5.4.3 Soil, Sediment, and Rock Sampling Analytical Results

Decision-level data collected at SWMU C-36-003 consist of results from 16 samples (9 soil, 6 sediment, and 1 tuff) collected from 8 locations.

**Inorganic Chemicals**

A total of 16 samples (9 soil, 6 sediment, and 1 tuff) were collected and analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 9.4-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 26 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs (0.83 mg/kg, 0.83 mg/kg, and 0.5 mg/kg) but had DLs (0.955 mg/kg to 1.49 mg/kg) above the BVs in nine soil samples, six sediment samples, and one tuff sample. Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in five samples with a maximum concentration of 3.35 mg/kg and had DLs (0.478 mg/kg to 0.745 mg/kg) above the soil BV and sediment BV (0.4 mg/kg) in two soil samples and six sediment samples. Cadmium is retained as a COPC.

Calcium was detected above the soil and sediment BVs (6120 mg/kg and 4420 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 11,700 mg/kg. The Gehan test indicated site concentrations of calcium in soil are statistically different from background (Table G-27), However, the quantile and slippage tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-199 and Table G-27). There were too few sediment samples for statistical tests. The maximum concentration in sediment (4470 mg/kg) was above the maximum sediment background concentration (4240 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg) in seven soil samples, four sediment samples, and one tuff sample with a maximum concentration of 192 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-200 and Table G-27). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg) in five soil samples and one tuff sample with a maximum concentration of 2720 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure G-201 and Table G-27). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in seven samples with a maximum concentration of 2.18 mg/kg. Cyanide is retained as a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 144 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-202 and Table G-27). The maximum tuff concentration (35.7 mg/kg) is above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Manganese was detected above the sediment BV (543 mg/kg) in two soil samples with a maximum concentration of 860 mg/kg. Manganese is retained as a COPC.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs (0.1 mg/kg for all) in seven soil samples, three sediment samples, and one tuff sample with a maximum concentration of 0.815 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil BV (15.4 mg/kg) in one sample with a maximum concentration of 53 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure G-203 and Table G-27); however, the maximum concentration was substantially above the soil BV and maximum soil background concentration (29 mg/kg). Nickel is retained as a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 540 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in 13 samples with a maximum concentration of 0.688 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in one sample at a concentration of 0.635 mg/kg and had DLs (1.04 mg/kg to 1.56 mg/kg) above the sediment BV (0.3 mg/kg) in six samples. Selenium is retained as a COPC.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs (1 mg/kg for all) in nine soil samples, two sediment samples, and one tuff sample with a maximum concentration of 348 mg/kg. Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in one sample at a concentration of 1000 mg/kg. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Figure G-204 and Table G-27). Sodium is not a COPC.

Uranium was detected above the soil and sediment BVs (1.82 mg/kg and 2.22 mg/kg) in seven soil samples and two sediment samples with a maximum concentration of 10.4 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are statistically different from background (Figure G-205 and Table G-27). Uranium is retained as a COPC.

Zinc was detected above the soil and Qbt 2,3,4 BVs (48.8 mg/kg and 63.5 mg/kg) in seven soil samples and one tuff sample with a maximum concentration of 1320 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-206 and Table G-27). Zinc is retained as a COPC.

**Organic Chemicals**

A total of 16 samples (9 soil, 6 sediment, and 1 tuff) were collected and analyzed for SVOCs, VOCs, and explosive compounds. A total of 31 samples (23 soil, 1 sediment, and 7 tuff) were also analyzed for PCBs. Table 9.4-3 summarizes the analytical results for detected organic chemicals. Plate 27 shows the spatial distribution of detected organic chemicals.

As described in section 9.4.4.3, PAHs are not related to historic Laboratory site operations at SWMU C-36-003 and are not COPCs. Other organic chemicals detected at SWMU C-36-003 include Aroclor-1254; Aroclor-1260; benzoic acid; bromodichloromethane; chlorodibromomethane; chloroform; di-n-butylphthalate; 4-isopropyltoluene; methylene chloride; RDX; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

**Radionuclides**

A total of 16 samples (9 soil, 6 sediment, and 1 tuff) were collected and analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 9.4-4 summarizes radionuclides detected or detected above BVs/FVs. Plate 28 shows the spatial distribution of detected radionuclides.

Cesium-137 was detected above the sediment FV (0.9 pCi/g) in one sample and was detected below 1 ft bgs in five soil samples with a maximum activity of 2.02 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected above the sediment FV (0.006 pCi/g) in 1 sample at an activity of 0.026 pCi/g. The activity was only 0.02 pCi/g above the FV. Plutonium-238 was not detected in the other 15 samples. Plutonium-238 is not a COPC.

Plutonium-239/240 was detected above the sediment FV (0.068 pCi/g) in 1 sample at an activity of 0.0762 pCi/g. The activity was only 0.0082 pCi/g above the FV. Plutonium-239/240 was not detected in the other 15 samples. Plutonium-239/240 is not a COPC.

Tritium was detected in five samples with a maximum activity of 0.154 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in six samples with a maximum activity of 6.1 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in one soil sample and one tuff sample with a maximum activity of 0.278 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in six samples with a maximum activity of 4.51 pCi/g. Uranium-238 is retained as a COPC.

#### 9.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU C-36-003 are discussed below.

**Inorganic Chemicals**

Inorganic COPCs at SWMU C-36-003 include antimony, cadmium, calcium, chromium, copper, cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, uranium, and zinc.

Antimony was not detected above the soil, sediment, and Qbt 2,3,4 BVs but had DLs (0.955 mg/kg to 1.49 mg/kg) above the BVs in nine soil samples, six sediment samples, and one tuff sample. Because antimony was not detected above BVs and the residential SSL was approximately 21 times the maximum DL, further sampling for extent of antimony is not warranted.

Cadmium was detected above the soil BV in five samples with a maximum concentration of 3.35 mg/kg and had DLs (0.478 mg/kg to 0.745 mg/kg) above the soil and sediment BVs in two soil samples and six sediment samples. Concentrations increased with depth at locations 36-610824 and 36-610827 and decreased with depth at locations 36-610825 and 36-610826. Concentrations decreased downgradient. The residential SSL was approximately 21 times the maximum concentration and 95 times the maximum DL. The lateral extent of cadmium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 11,700 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of calcium are defined.

Chromium was detected above the soil, sediment, and Qbt 2,3,4 BVs in seven soil samples, four sediment samples, and one tuff sample with a maximum concentration of 192 mg/kg. Concentrations increased with depth at locations 36-610824 and 36-610825, did not change substantially with depth (1.2 mg/kg) at location 36-610822 (the concentration in the surface sample at location 36-610822 was 9.5 mg/kg and below the sediment BV [Appendix E, Pivot Tables]), and decreased with depth at all other locations. Concentrations decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential SSL was approximately 610 times the maximum concentration. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Copper was detected above the soil and Qbt 2,3,4 BVs in five soil samples and one tuff sample with a maximum concentration of 2720 mg/kg. Concentrations increased with depth at locations 36-610824 and 36-610827 and decreased with depth at location 36-610825. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 7.5 times and 120 times respectively the maximum concentration of the locations where concentrations were increasing with depth (27.8 mg/kg at location 36-610824). The lateral extent of copper is defined, and further sampling for vertical extent is not warranted.

Cyanide was detected above the soil BV in seven samples with a maximum concentration of 2.18 mg/kg. Concentrations did not change substantially with depth (0.28 mg/kg and 0.18 mg/kg) at locations 36-610824 and 36-610827 and decreased with depth at locations 36-610825 and 36-610826. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 5.1 times and 29 times the maximum concentration, respectively. The lateral extent of cyanide is defined, and further sampling for vertical extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 144 mg/kg. Concentrations of lead decreased with depth at location 36-610825 and decreased downgradient. The lateral and vertical extent of lead are defined.

Manganese was detected above the sediment BV in two soil samples with a maximum concentration of 860 mg/kg. Concentrations decreased with depth at locations 36-610821 and 36-610828 and decreased downgradient. The lateral and vertical extent of manganese are defined.

Mercury was detected above the soil, sediment, and Qbt 2,3,4 BVs in seven soil samples, three sediment samples, and one tuff sample with a maximum concentration of 0.815 mg/kg. Concentrations did not change substantially with depth (0.057 mg/kg to 0.233 mg/kg) at locations 36-610824, 36-610825, 36-610826, and 36-610827 and decreased with depth at locations 36-610821, 36-610822, and 36-610828. Concentrations decreased downgradient. The residential SSL was approximately 29 times the maximum concentration. The lateral extent of mercury is defined, and further sampling for vertical extent is not warranted.

Nickel was detected above the soil BV in one sample with a maximum concentration of 53 mg/kg. Concentrations of nickel decreased with depth and decreased downgradient. The lateral and vertical extent of nickel are defined.

Nitrate was detected in 14 samples with a maximum concentration of 540 mg/kg. Concentrations were consistent with naturally occurring levels of nitrate at most locations. Nitrate was elevated at three locations: 36-610824, 36-610825, and 36-610826. Concentrations decreased with depth at these locations. Concentrations decreased downgradient. The residential SSL was approximately 230 times the maximum concentration. The lateral extent of nitrate is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in 13 samples with a maximum concentration of 0.688 mg/kg. Concentrations increased with depth at location 36-610822; did not change substantially with depth (0.000065 mg/kg to 0.0054 mg/kg) at locations 36-610821, 36-610824, 36-610827, and 36-610828; and decreased with depth at locations 36-610825 and 36-610826. Concentrations decreased downgradient. The residential SSL was approximately 80 times the maximum concentration. The lateral extent of perchlorate is defined, and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.635 mg/kg and had DLs (1.04 mg/kg to 1.56 mg/kg) above the sediment BV in six samples. Concentrations decreased with depth at location 36-610825 (the concentration in the surface sample at location 36-610825 was 1.35 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The residential SSL was approximately 250 times the maximum DL. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil, sediment, and Qbt 2,3,4 BVs in nine soil samples, two sediment samples, and one tuff sample with a maximum concentration of 348 mg/kg. Concentrations increased with depth at locations 36-610825 and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The industrial SSL was approximately 21 times the maximum concentration at locations 36-610825 and 36-610827. The lateral extent of silver is defined, and further sampling for vertical extent is not warranted.

Uranium was detected above the soil and sediment BVs in seven soil samples and two sediment samples with a maximum concentration of 10.4 mg/kg. Concentrations increased with depth at location 36-610824 and decreased with depth at the other locations. Concentrations decreased downgradient. The residential SSL was approximately 22 times the maximum concentration. The lateral extent of uranium is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and one tuff sample with a maximum concentration of 1320 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The residential SSL was approximately 18 times the maximum concentration, and the industrial SSL was approximately 295 times the maximum concentration. The lateral extent of zinc is defined, and further sampling for vertical extent is not warranted.

**Organic Chemicals**

Organic COPCs at SWMU C-36-003 include Aroclor-1254; Aroclor-1260; benzoic acid; bromodichloromethane; chlorodibromomethane; chloroform; di-n-butylphthalate; 4-isopropyltoluene; methylene chloride; RDX; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene.

Aroclor-1254 was detected in eight samples with a maximum concentration of 1.03 mg/kg. Concentrations did not change substantially with depth (0.0037 mg/kg to 0.034 mg/kg) at locations 36-610824, 36-610826, and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 8.3 times and 84 times respectively the maximum concentration at the locations listed above. The lateral extent of Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in seven samples with a maximum concentration of 0.617 mg/kg. Concentrations did not change substantially with depth (0.0043 mg/kg and 0.045 mg/kg) at locations 36-610824, 36-610826, and 36-610827 and decreased with depth at the other locations. Concentrations decreased downgradient. The residential and industrial SSLs were approximately 24 times and 110 times respectively the maximum concentration at the locations listed above. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Benzoic acid was detected in one sample at a concentration of 0.355 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of benzoic acid are defined.

Bromodichloromethane was detected in one sample at a concentration of 0.00117 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bromodichloromethane are defined.

Chlorodibromomethane was detected in one sample at a concentration of 0.000635 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of chlorodibromomethane are defined.

Chloroform was detected in two samples with a maximum concentration of 0.00982 mg/kg. Concentrations did not change substantially with depth (0.0093 mg/kg) and decreased downgradient. The residential SSL was approximately 6000 times the maximum concentration. The lateral extent of chloroform is defined, and further sampling for vertical extent is not warranted.

Di-n-butylphthalate was detected in six samples with a maximum concentration of 8.07 mg/kg. Concentrations did not change substantially with depth (0.19 mg/kg) at location 36-610826, decreased with depth at the other locations, and decreased downgradient. The residential SSL was approximately 760 times the maximum concentration. The lateral extent of di-n-butylphthalate is defined, and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in eight samples with a maximum concentration of 0.0124 mg/kg. Concentrations did not change substantially with depth (0.0114 mg/kg and 0.00774 mg/kg) at locations 36-610823 and 36-610826, decreased with depth at the other locations, and did not change substantially downgradient (0.012 mg/kg or less). The residential SSL was approximately 190,000 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Methylene chloride was detected in two samples with a maximum concentration of 0.00378 mg/kg. Concentrations were below the EQLs. Concentrations decreased with depth at both sample locations and decreased downgradient. The lateral and vertical extent of methylene chloride are defined.

RDX was detected in one sample at a concentration of 0.106 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of RDX are defined.

Toluene was detected in 11 samples with a maximum concentration of 0.00135 mg/kg. Concentrations increased with depth at locations 36-610823 and 36-610827; did not change substantially with depth (0.00006 mg/kg to 0.00068 mg/kg) at locations 36-610824, 36-610826, and 36-610828; and decreased with depth at locations 36-610821, 36-610822, and 36-610825. Concentrations did not change substantially (0.00102 mg/kg) downgradient. The residential SSL was approximately 3,900,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Trimethylbenzene[1,2,4-] was detected in one sample at a concentration of 0.001 mg/kg. The detected concentration was below the EQL. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

Xylene[1,3-]+1,4-xylene was detected in one sample at a concentration of 0.000822 mg/kg. The detected concentration was below the EQL. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 1,3-xylene+1,4-xylene are defined.

**Radionuclides**

Radionuclide COPCs at SWMU C-36-003 include cesium-137, tritium, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected above the sediment FV in one sample and was detected below 1 ft bgs in five soil samples with a maximum activity of 2.02 pCi/g. Activities decreased with depth at all locations (activities in the shallow samples at locations 36-610824, 36-610826, 36-610827, and 36-610828 were 0.625 pCi/g, 0.335 pCi/g, 0.669 pCi/g, and 0.58 pCi/g, respectively, and below the soil FV [Appendix E, Pivot Tables]). Activities decreased downgradient. The lateral and vertical extent of cesium-137 are defined.

Tritium was detected in five samples with a maximum activity of 0.154 pCi/g. Activities increased with depth at location 36-610825, did not change substantially with depth (0.0037 pCi/g) at location 36-610826, and decreased with depth at location 36-610827. Activities decreased downgradient. The residential SAL was approximately 11,000 times the maximum activity. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil BV in six samples with a maximum activity of 6.1 pCi/g. Activities did not change substantially with depth (0.06 pCi/g) at location 36-610824, decreased with depth at locations 36-610826 and 36-610827, and decreased downgradient. The residential SAL was approximately 48 times the maximum activity. The lateral extent of uranium-234 is defined, and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum activity of 0.278 pCi/g. Activities decreased with depth at locations 36-610825 and 36-610827 (the activity in the shallow sample at location 36-601825 was 0.134 pCi/g and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the soil BV in six samples with a maximum activity of 4.51 pCi/g. Activities did not change substantially with depth (<1 pCi/g) at locations 36-610824 and 36-610826, decreased with depth at location 36-610827, and decreased downgradient. The residential SAL was approximately 33 times the maximum activity. The lateral extent of uranium-238 is defined, and further sampling for vertical extent is not warranted.

### 9.5.5 Summary of Human Health Risk-Screening Assessments

#### Industrial Scenario

The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.2, which is less than the NMED target HI of 1. The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

#### Residential Scenario

The total excess cancer risk for the residential scenario is $1 \times 10^{-5}$, which is equivalent to the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 1, which is equivalent to the NMED target HI of 1. The noncarcinogenic risk is primarily from silver, copper, Aroclor-1254, and lead. The total dose is 2.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

#### Construction Worker Scenario

The residential exposure scenario is protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is 1, which is equivalent to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, residential, and construction worker scenarios at SWMU C-36-003.

#### 9.5.6 Summary of Ecological Risk-Screening Assessment

Based on the evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU C-36-003.

## 10.0 CONCLUSIONS

### 10.1 Nature and Extent of Contamination

Based on the revised evaluation of the data, the nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for 20 sites investigated previously or during the 2009–2010 Threemile Canyon Aggregate Area investigation. The nature and extent of contamination have not been defined, and further sampling is warranted for 5 sites. Summaries of the nature and extent of contamination and remaining characterization requirements for the sites at former TA-12, TA-14, TA-15, and TA-36 are presented below.

#### 10.1.1 Former TA-12

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at former TA-12:

- SWMU 12-001(a), Steel-lined Firing Pit
- SWMU 12-001(b), Former Firing Pit
- SWMU 12-002, Potential Soil Contamination
- AOC 12-004(a), Radiation Test Site
- AOC 12-004(b), Belowground Pipe
- AOC C-12-001, Potential Soil Contamination Associated with Former Building
- AOC C-12-002, Potential Soil Contamination Associated with Former Building
- AOC C-12-003, Potential Soil Contamination Associated with Former Building
- AOC C-12-004, Potential Soil Contamination Associated with Former Building
- AOC C-12-005, Potential Soil Contamination Associated with Former Junction Box

#### 10.1.2 TA-14

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following site at TA-14:

- AOC C-14-006, Potential Soil Contamination Associated with Former Building

#### 10.1.3 TA-15

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at TA-15:

- AOC 15-005(c), Container Storage Area
- SWMU 15-007(d), Shaft
- SWMU 15-009(c), Septic System
- SWMU 15-009(h), Septic System
- AOC 15-014(h), Outfalls from Building 15-40

The nature and extent of contamination have not been defined, and further sampling is warranted for five sites at TA-15. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, or radionuclides at the following sites:

- SWMU 15-007(c), Shaft—Vertical extent of lead
- SWMU 15-008(b), Surface Disposal Area—Vertical extent of uranium and uranium-238
- AOC 15-008(g), Surface Disposal Associated with Firing Site R-45—Lateral extent of lead
- SWMU 15-009(b), Septic System—Lateral extent of uranium, uranium-234, uranium-235/236, and uranium-238
- SWMU 15-010(b), Settling Tank—Vertical extent of inorganic and organic chemicals and radionuclides beneath the tank, tank inlet, and tank outlet

In addition, barium and 4-nitrotoluene data from sampling locations 15-610565, 15-610566, 15-610567, and 15-610568 at AOC 15-008(g) were rejected during the data validation process, and resampling to replace the rejected data is warranted.

#### 10.1.4 TA-36

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at TA-36:

- SWMU 36-002, Former Sump
- SWMU 36-003(a), Septic System
- SWMU 36-008, Surface Disposal Area
- SWMU C-36-003, Outfall from Building 36-1

### 10.2 Summary of Risk-Screening Assessments

Twenty-five SWMUs/AOCs were evaluated for potential risk by human health and ecological risk-screening assessments.

### 10.2.1 Human Health Risk-Screening Assessment

For the industrial scenario, the total excess cancer risks were less than the $1 \times 10^{-5}$ target risk level at all sites. The industrial HIs were less than the target level of 1 at all SWMUs/AOCs, except for SWMUs 15-007(c) and 15-008(b). The elevated HIs at these two SWMUs under the industrial scenario were from lead. SWMUs 15-007(d), 15-009(h), and 36-002 were not evaluated under the industrial scenario because no samples were collected in the 0.0–1.0 ft bgs depth interval.

The recreational scenario was applicable at SWMUs 12-001(a), 12-001(b), and 12-002, and AOC C-12-005. There were no potential unacceptable risks for any of the sites evaluated under the recreational scenario. The total excess cancer risks were less than $1 \times 10^{-5}$ and HIs were less than 1.

Twenty-two SWMUs/AOCs had total excess cancer risks and HIs below or equivalent to the target risk levels under the residential scenario. Three SWMUs had HIs above 1 under the residential scenario. The SWMUs with HIs greater than 1 were SWMU 15-007(c) (lead and antimony), SWMU 15-008(b) (lead), and SWMU 15-009(b) (uranium).

The total doses were below the target dose limit of 25 mrem/yr as authorized by DOE Order 458.1 for the industrial, recreational, and residential scenarios at all but one site. The residential total dose was greater than the target dose limit at SWMU 15-009(b) from isotopic uranium.

For SWMUs/AOCs not posing an unacceptable residential risk or dose, the residential scenario was also protective of construction workers, except for potential noncarcinogenic risk at SWMUs 12-001(a) and 12-001(b) and SWMU C-36-003, where manganese was a COPC. Noncarcinogenic construction worker risk was evaluated for SWMUs 12-001(a) and 12-001(b) and SWMU C-36-003 and HIs were equivalent to or below the target level of 1.

Sites at former TA-12 and TA-14, TA-15, and TA-36 are not accessible by the public and are not planned for release by DOE in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time.

### 10.2.2 Ecological Risk-Screening Assessment

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at 24 of the Threemile Canyon Aggregate Area sites. There is the potential for adverse effects to the American robin, montane shrew, deer mouse, earthworm, and plant at SWMU 15-008(b).

## 11.0 RECOMMENDATIONS

The determination of site status is based on the results of the risk-screening assessments and the nature and extent evaluation. Depending upon the decision scenario used, the sites are recommended as corrective actions complete either with or without controls or for additional action. The residential scenario is the only scenario under which corrective action complete without controls is applicable; that is, no additional corrective actions or conditions are necessary. The other decision scenarios (industrial and recreational) result in corrective action complete with controls; that is, some type of institutional controls must be in place to ensure land use remains consistent with site cleanup levels. The current and reasonably foreseeable future land use for the Threemile Canyon Aggregate Area is industrial and possibly recreational for some sites.

### 11.1 Additional Field Characterization and Remediation Activities

The nature and extent of contamination have not been defined for five sites investigated in the Threemile Canyon Aggregate Area (Table 11.1-1). Additional sampling is needed to define the extent of contamination for one or more inorganic and/or organic chemicals at the following sites:

- SWMU 15-007(c), SWMU 15-008(b), AOC 15-008(g), SWMU 15-009(b), and SWMU 15-010(b)

SWMUs 15-007(c) and 15-008(b) also pose an unacceptable risk under the industrial scenario [as well as to ecological receptors at SWMU 15-008(b)], and removal of contaminated soil to reduce risk is recommended at these two sites. A revised Phase II investigation work plan will be developed based on the conclusions and recommendations presented in this supplemental investigation report. The revised Phase II investigation work plan will specify sampling locations, numbers of samples, and analytical suites required to define the extent of contamination for the above sites and areas requiring soil removal to meet risk targets. Upon completion of the proposed Phase II sampling, the data will be used to confirm the extent of contamination has been defined and to revise the human health and ecological risk-screening assessments for the four sites listed above. The results will be presented in a Phase II investigation report for the Threemile Canyon Aggregate Area.

### 11.2 Recommendations for Corrective Actions Complete

Twenty sites do not pose a potential unacceptable risk or dose under the industrial, recreational, and residential scenarios; have no potential ecological risks for any receptor; and have the nature and extent of contamination defined and/or no further sampling for extent is warranted. At these sites, Newport News Nuclear BWXT – Los Alamos, LLC (N3B) recommends no further investigations or remediation activities are warranted (Table 11.1-1).

Twenty sites have been found to pose no potential unacceptable risks or doses to human health under the industrial and residential scenarios (also under the recreational scenario for four sites) and to ecological receptors and are appropriate for corrective actions complete without controls (Table 11.1-1). They include the following:

- SWMU 12-001(a), Steel-lined Firing Pit
- SWMU 12-001(b), Former Firing Pit
- SWMU 12-002, Potential Soil Contamination
- AOC 12-004(a), Radiation Test Site
- AOC 12-004(b), Belowground Pipe
- AOC C-12-001, Potential Soil Contamination Associated with Former Building
- AOC C-12-002, Potential Soil Contamination Associated with Former Building
- AOC C-12-003, Potential Soil Contamination Associated with Former Building
- AOC C-12-004, Potential Soil Contamination Associated with Former Building
- AOC C-12-005, Potential Soil Contamination Associated with Former Junction Box
- AOC C-14-006, Potential Soil Contamination Associated with Former Building

- AOC 15-005(c), Container Storage Area
- SWMU 15-007(d), Shaft
- SWMU 15-009(c), Septic System
- SWMU 15-009(h), Septic System
- AOC 15-014(h), Outfalls from Building 15-40
- SWMU 36-002, Former Sump
- SWMU 36-003(a), Septic System
- SWMU 36-008, Surface Disposal Area
- SWMU C-36-003, Outfall from Building 36-1

## 11.3 Schedule for Recommended Activities

A revised Phase II investigation work plan will be developed and submitted to NMED after this supplemental investigation report is approved. The Phase II work plan will provide details and a schedule for implementing sampling activities and submitting a Phase II investigation report.

# 12 0 REFERENCES AND MAP DATA SOURCES

## 12.1 References

*The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

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## 12.2 Map Data Sources

Data sources for all figures are provided below, unless otherwise indicated on the figures themselves.

Sampling location- er_location_ids_pnt; Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2010-0035; 21 January 2010.

SWMU or AOC: er_prs_all_reg, Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0633; 1:2,500 Scale Data; 25 January 2010.

Structure or Building: ksl_structures_ply; Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Fence: ksl_fences_arc; Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Paved road: ksl_paved_rds_arc; Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Dirt road: ksl_dirt_rds_arc; Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Storm drain: ksl_stormdrn_arc; Storm Drain Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Contours: lanl_contour1991_; Hypsography, 2, 10, 20, 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

Communication: ksl_comm_arc; Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009.

Electric: ksl_electric_arc; Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Gas: ksl_gas_arc; Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Industrial waste: wfm_indstrl_waste_arc; Primary Industrial Waste Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Sewer: ksl_sewer_arc; Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Steam: ksl_steam_arc; Steam Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Water: ksl_water_arc; Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

LANL Boundary: plan_ownerclip_reg; Ownership Boundaries Around LANL Area; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 04 December 2008.

Roads: lac_streets_arc; Streets; County of Los Alamos, Information Services; as published 16 May 2006.

Landscape: ksl_landscape_arc; Primary Landscape Features; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Former structures: frmr_structures_ply; Former Structures of the Los Alamos Site; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0441; 1:2,500 Scale Data; 08 August 2008.

Technical area boundary: plan_tecareas_ply; Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.

Inactive Outfall: wqh_inact_outfalls_pnt; WQH Inactive Outfalls; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.

NPDES Outfalls: wqh_npdes_outfalls_pnt: WQH NPDES Outfalls; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.

Outfalls: er_outfalls_pnt: Outfalls; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; Unknown publication date.

Monitoring wells: Environmental Surveillance at Los Alamos During 2006, Groundwater monitoring; LANL Report LA-14341-ENV, September 2007.

Supply Wells: Locations of Monitoring and Supply Wells at Los Alamos National Laboratory, Table A-2, 2009 General Facility Information; LANL Report LA-UR-09-1341; March 2009.

Drainage: wqh_drainage_arc: WQH Drainage_arc; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; 1:24,000 Scale Data; 03 June 2003.

Aggregate Area: er_agg_areas_ply: Aggregate Areas; Los Alamos National Laboratory, ENV Environmental Remediation & Surveillance Program, ER2005-0496; 1:2,500 Scale Data; 22 September 2005.

Canyon Reaches: er_reaches_ply: Canyon Reaches; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0592; 1:24,000 Scale Data; Unknown publication date.

Springs: er_springs_pnt: Locations of Springs; Los Alamos National Laboratory, Waste and Environmental Services Division in cooperation with the New Mexico Environment Department, Department of Energy Oversight Bureau, EP2008-0138; 1:2,500 Scale Data; 17 March 2008.

Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating, and Mapping Section; 06 January 2004; Development Edition of 05 January 2005.

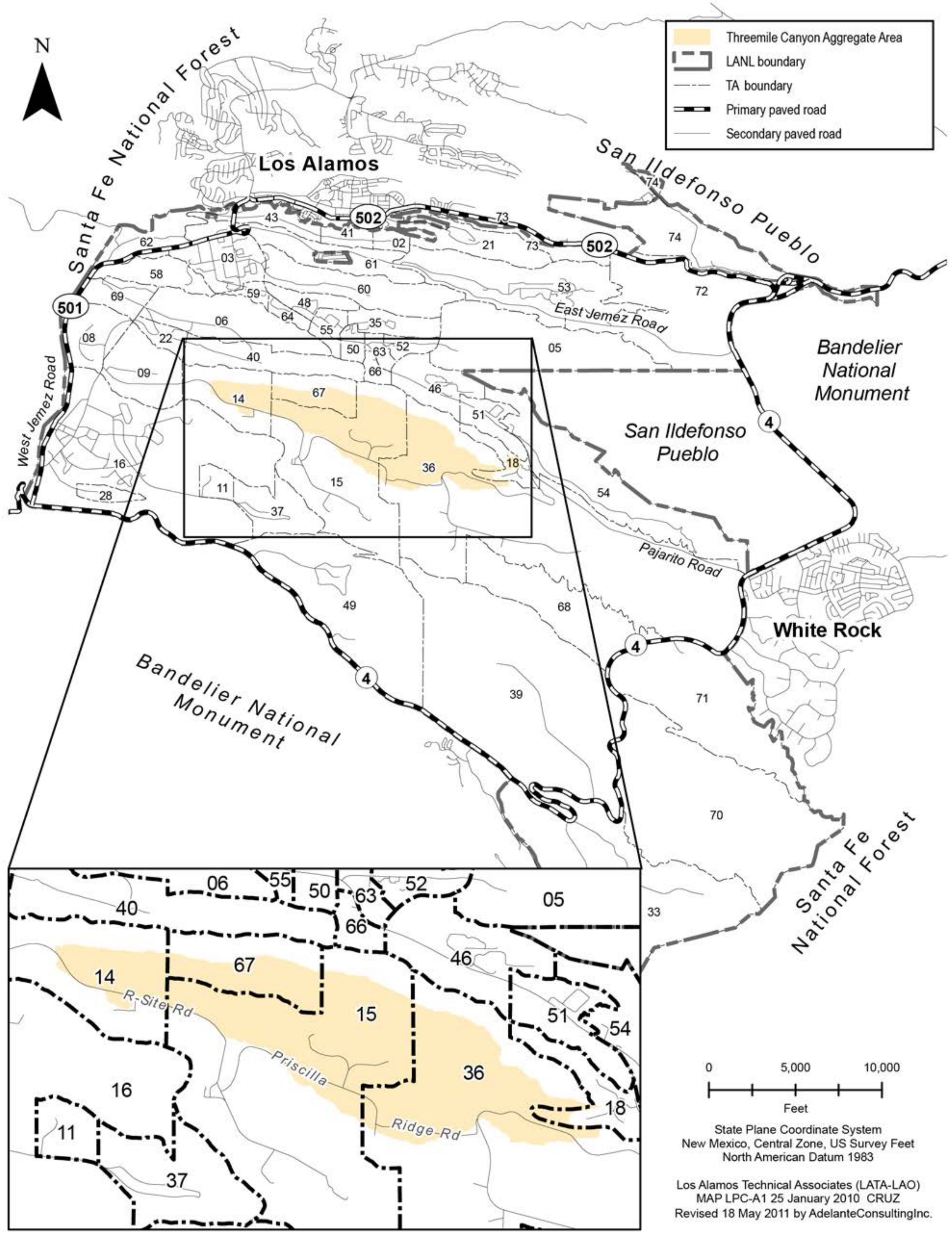


**Figure 1.1-1 Location of Threemile Canyon Aggregate Area with respect to Laboratory technical areas**

| | | | |
|---|---|---|---|
| Bandelier Tuff | Tshirege Member | Qbt 4 | Ash-flow units |
| | | Qbt 3 | |
| | | Qbt 2 | |
| | | Qbt 1v | |
| | | Qbt 1g | |
| | | Tsankawi Pumice Bed | |
| Cerro Toledo interval | | Volcaniclastic sediments and ash-falls | |
| Bandelier Tuff | Otowi Member | Ash-flow units | |
| | | Guaje Pumice Bed | |
| Puye Formation and intercalated volcanic rocks | Fanglomerate | Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments | |
| | Volcanic rocks | Cerros del Rio basalts intercalated within the Puye Formation, includes up to four interlayered basaltic flows. Andesites of the Tschicoma Formation present in western part of plateau | |
| | Fanglomerate | Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments; includes “old alluvium” | |
| | Axial facies deposits of the ancestral Rio Grande | Totavi Lentil | |
| Santa Fe Group | Coarse sediments | Coarse-grained upper facies (called the ”Chaquehui Formation” by Purtymun 1995, 45344) | |
| | Basalt | | |
| | Coarse sediments | | |
| | Basalt | | |
| | Coarse sediments | | |
| | Basalt | | |
| | Coarse sediments | | |
| | Basalt | | |
| | Coarse sediments | | |
| | Arkosic clastic sedimentary deposits | Undivided Santa Fe Group (includes Chamita[?] and Tesuque Formations) | |

Source: Baltz et al. 1963, 8402; Purtymun 1995, 45344; LANL 1998, 59599; Broxton and Reneau 1995, 49726.

**Figure 2.2-1 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau**

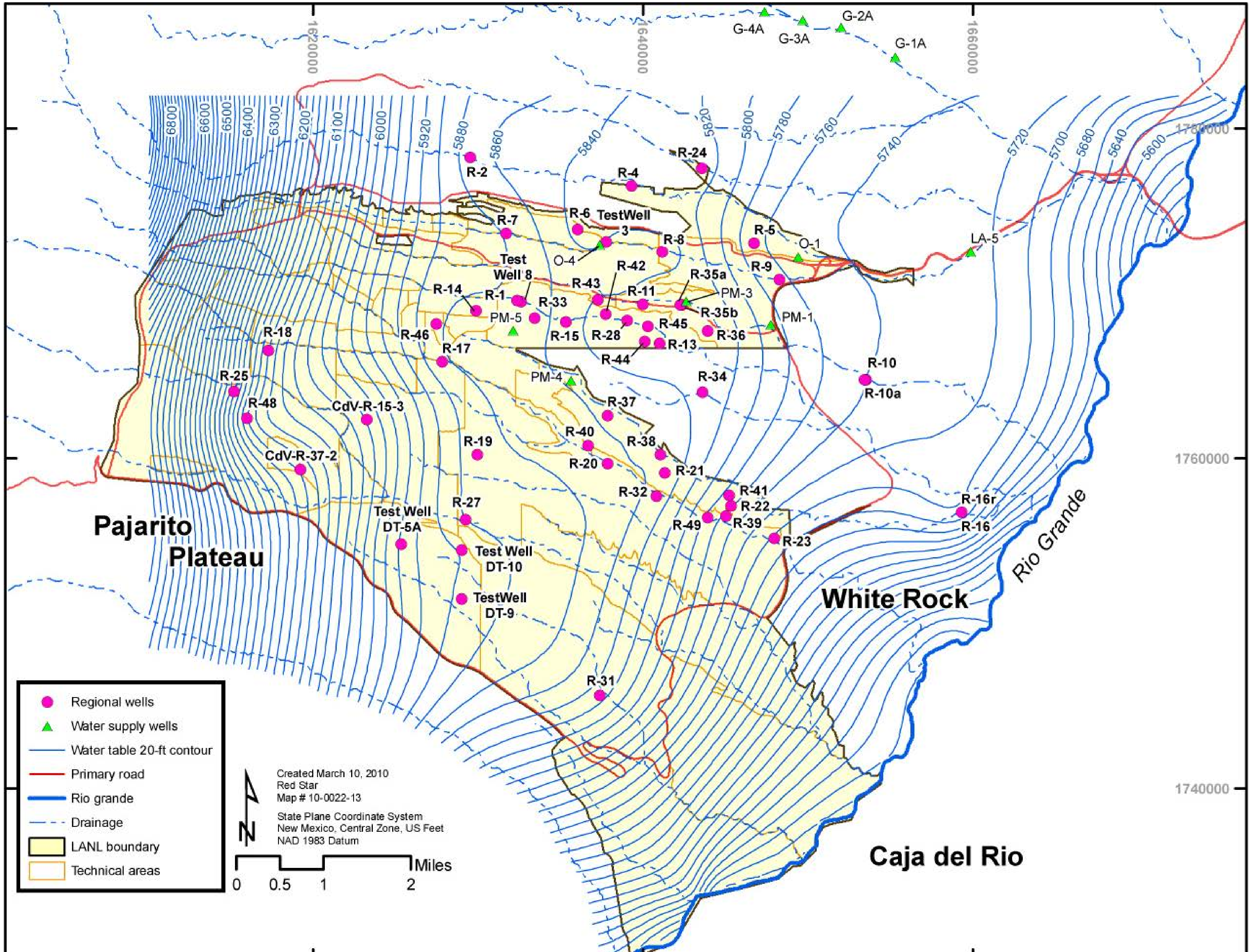


**Figure 2.2-2 Elevations of top of regional aquifer across the Laboratory**

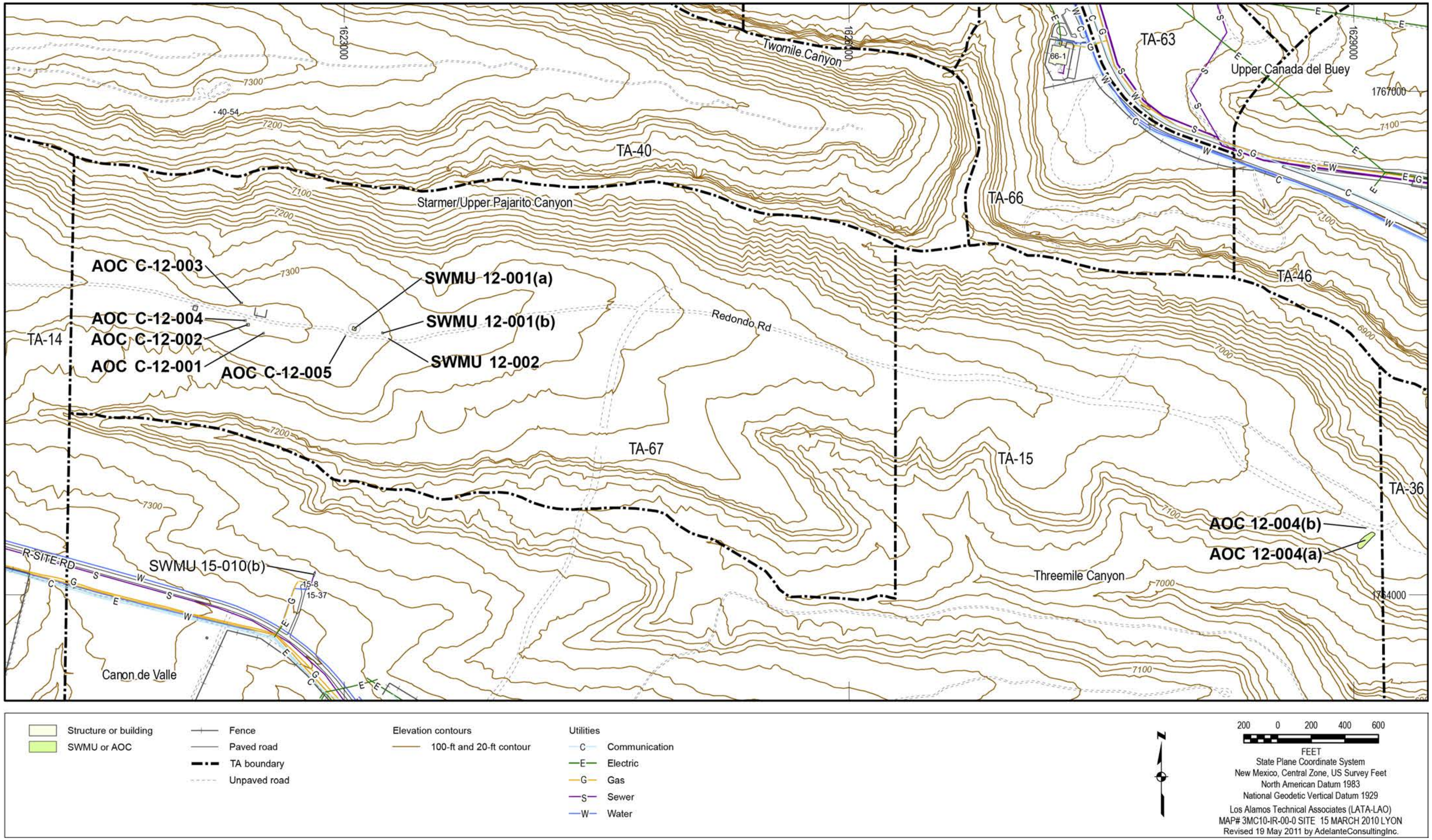


**Figure 6.1-1 Former TA-12 site map**

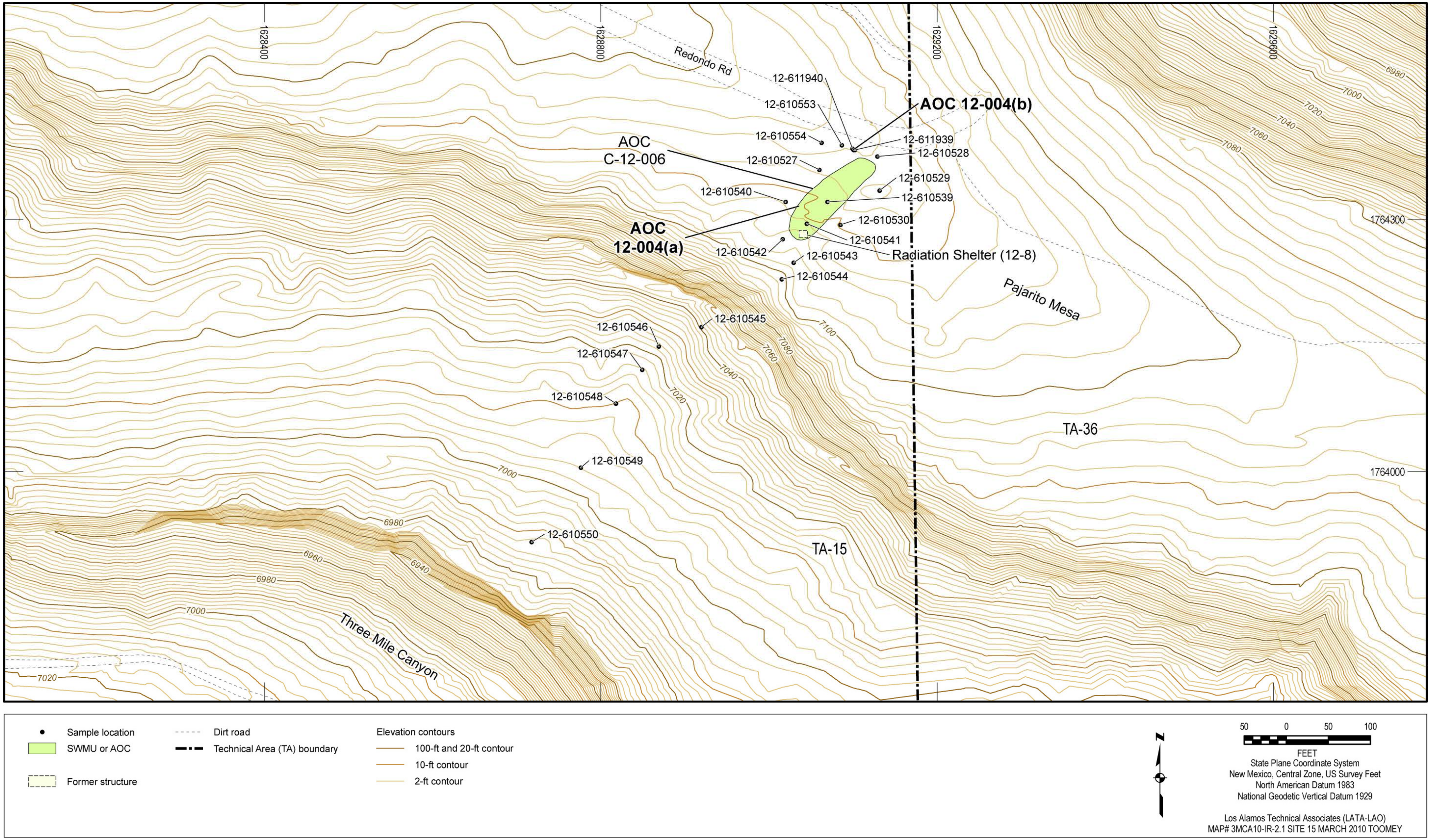


**Figure 6.5-1 Site map and sampling locations at AOCs 12-004(a) and 12-004(b)**

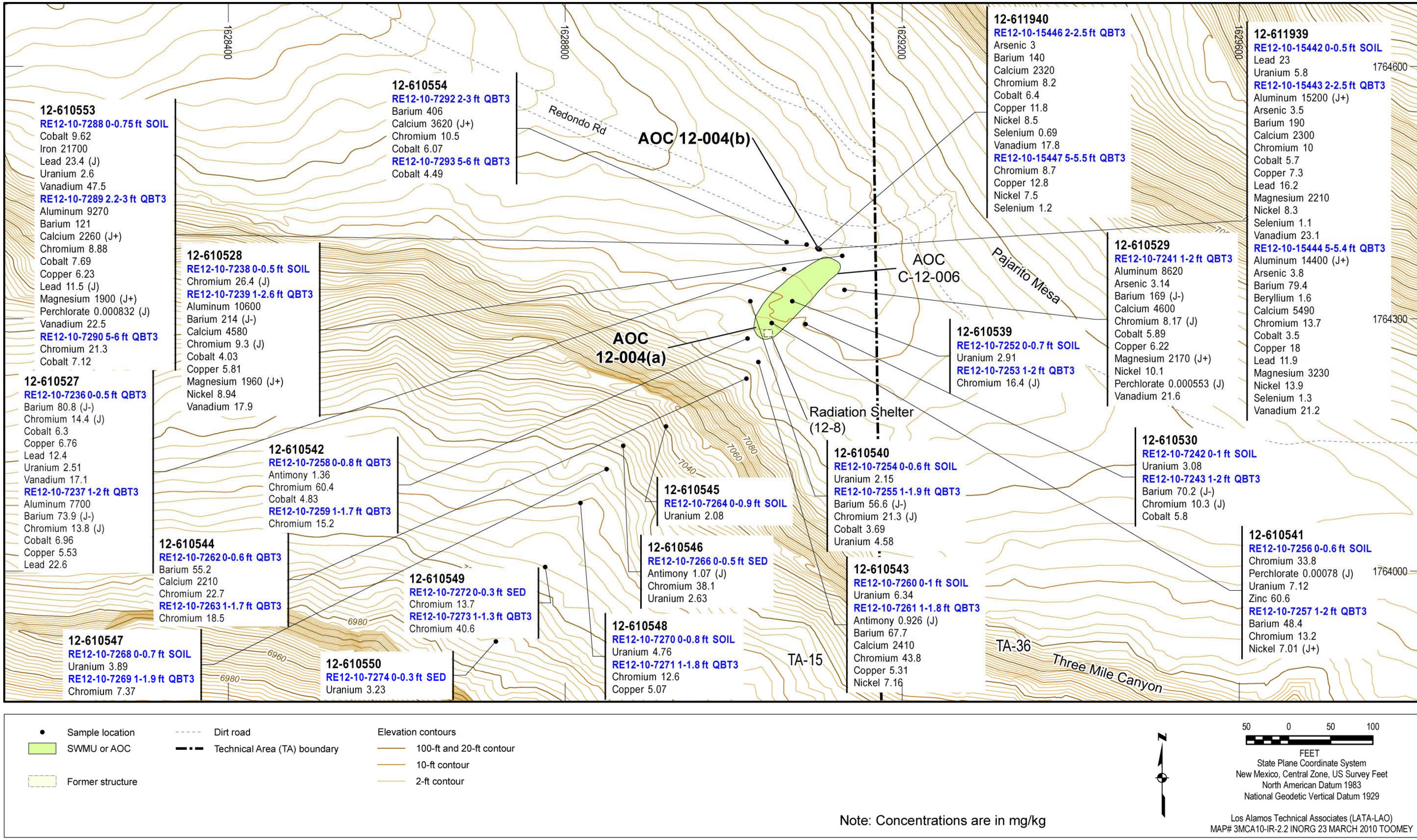


**Figure 6.5-2 Inorganic chemicals detected or detected above BVs at AOCs 12-004(a) and 12-004(b)**

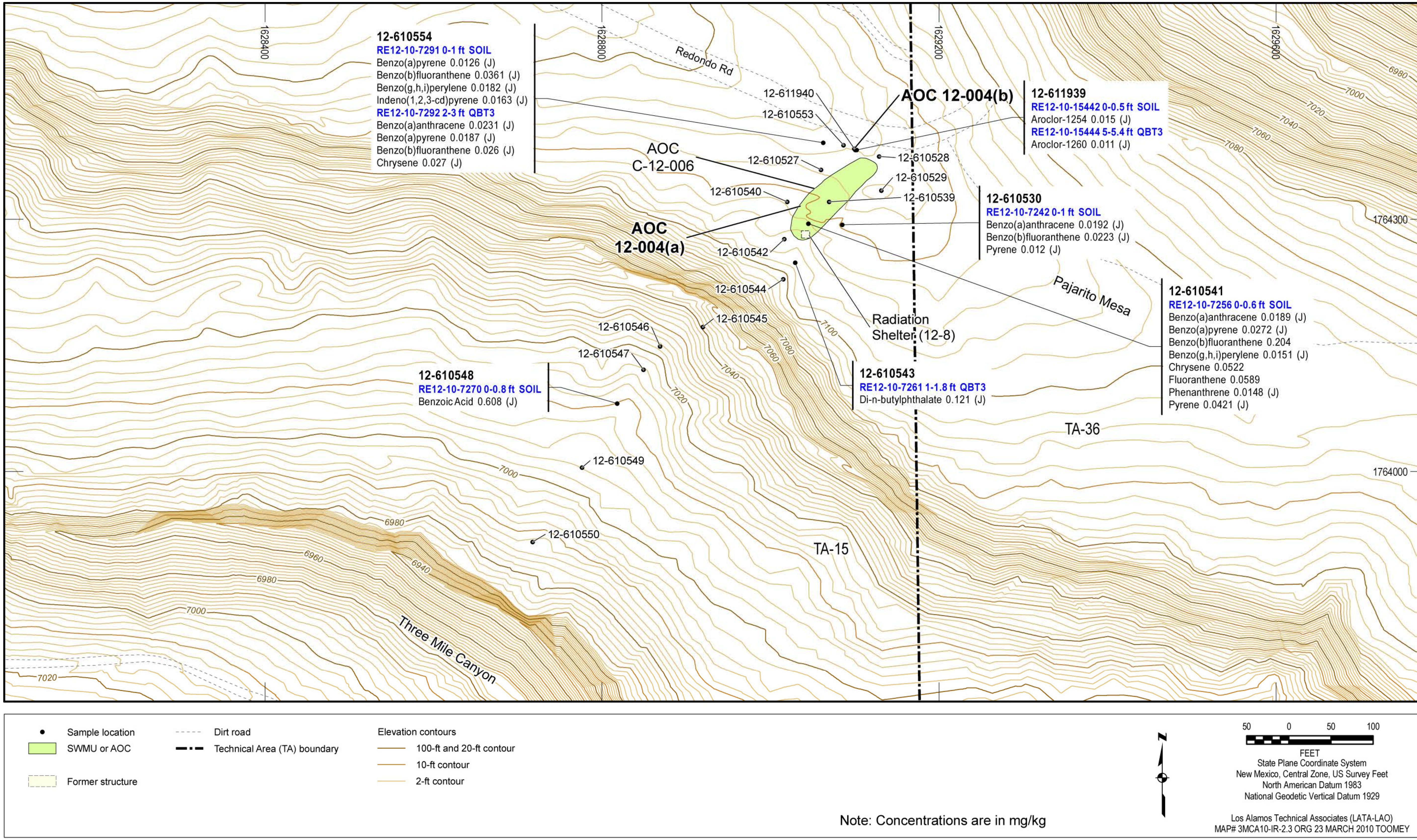


**Figure 6.5-3 Organic chemicals detected at AOCs 12-004(a) and 12-004(b)**

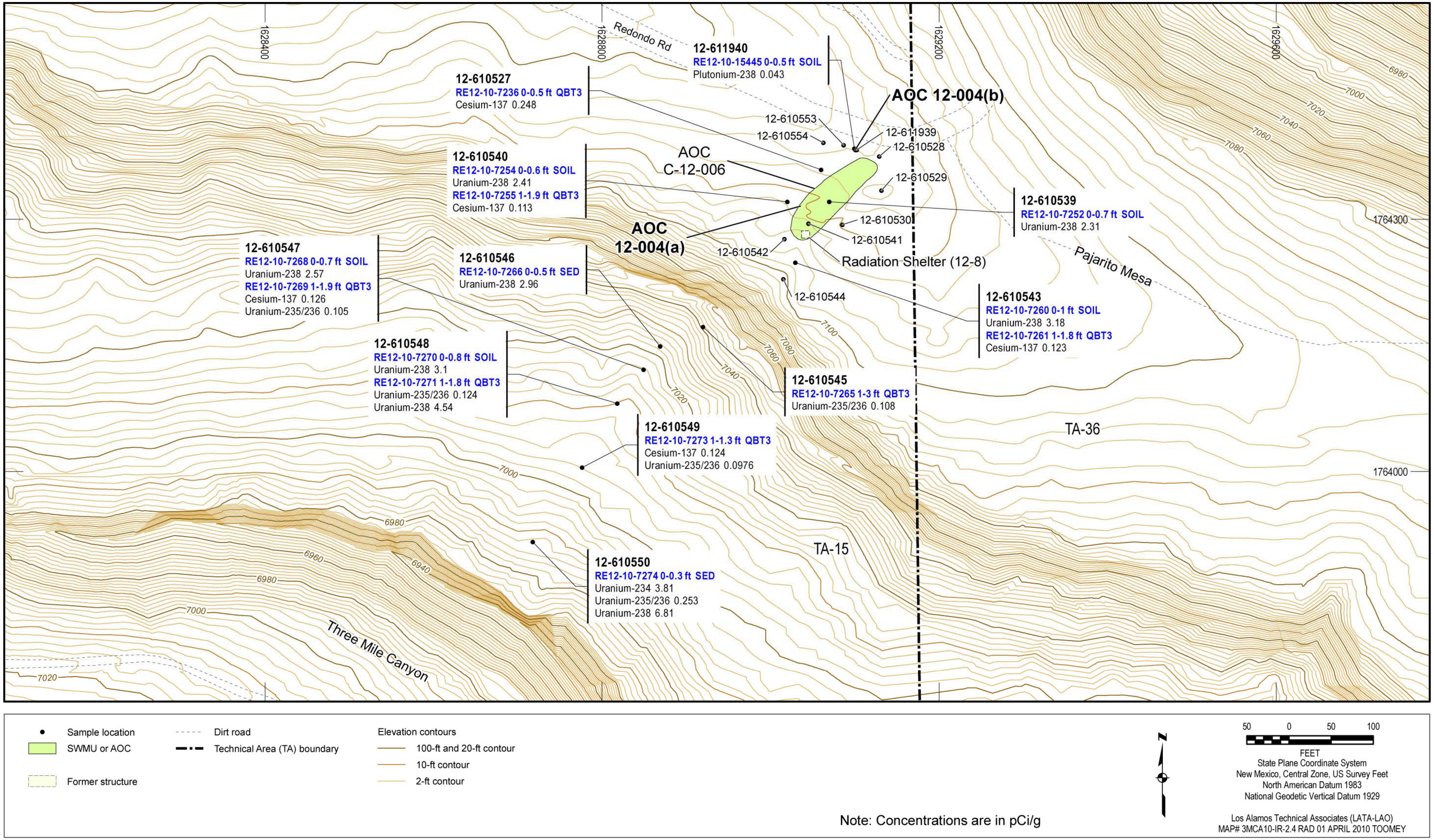


**Figure 6.5-4 Radionuclides detected or detected above BVs/FVs at AOCs 12-004(a) and 12-004(b)**

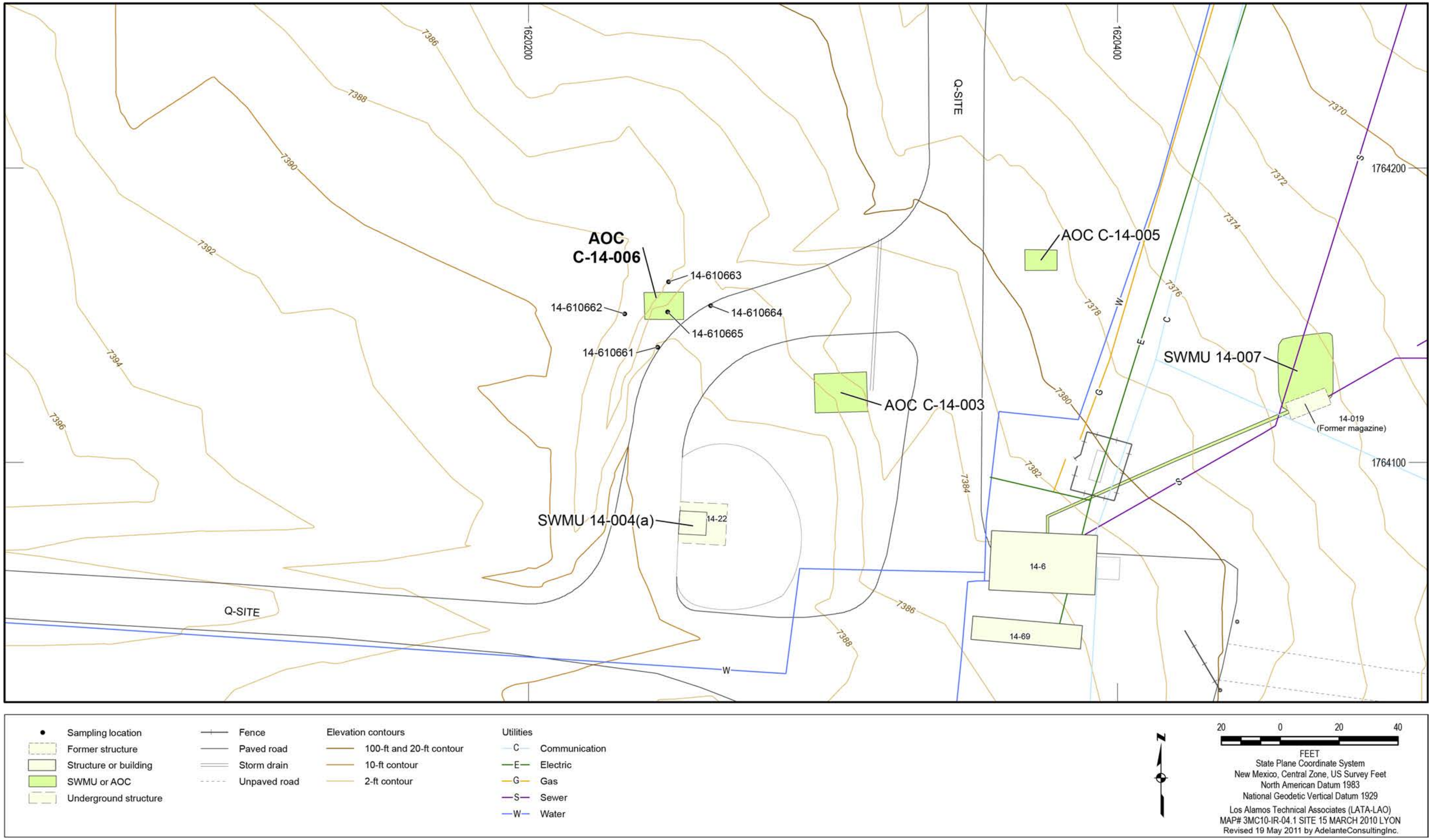


**Figure 7.2-1 AOC C-14-006 site map and sampling locations**

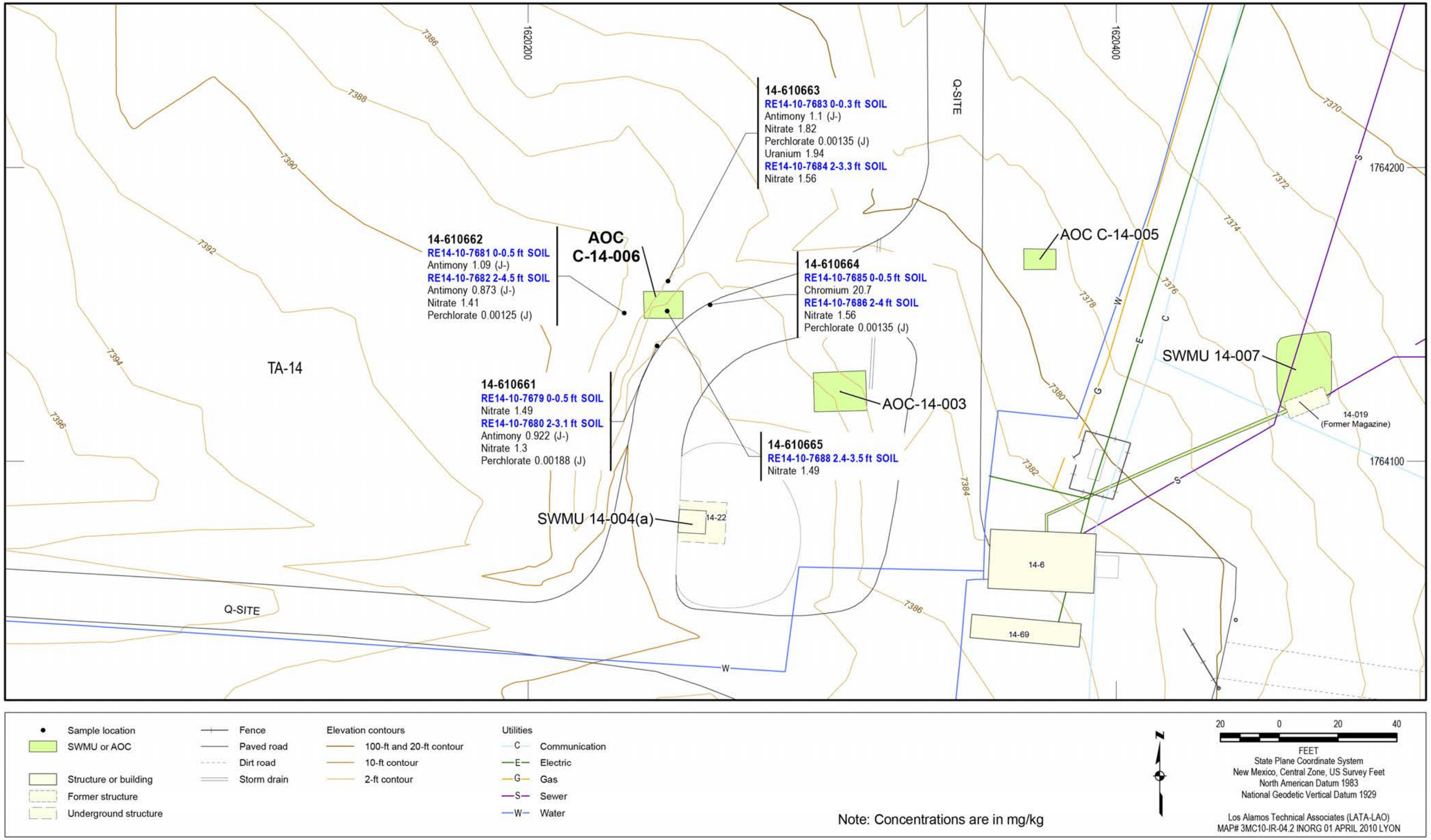


**Figure 7.2-2 Inorganic chemicals detected or detected above BVs at AOC C-14-006**

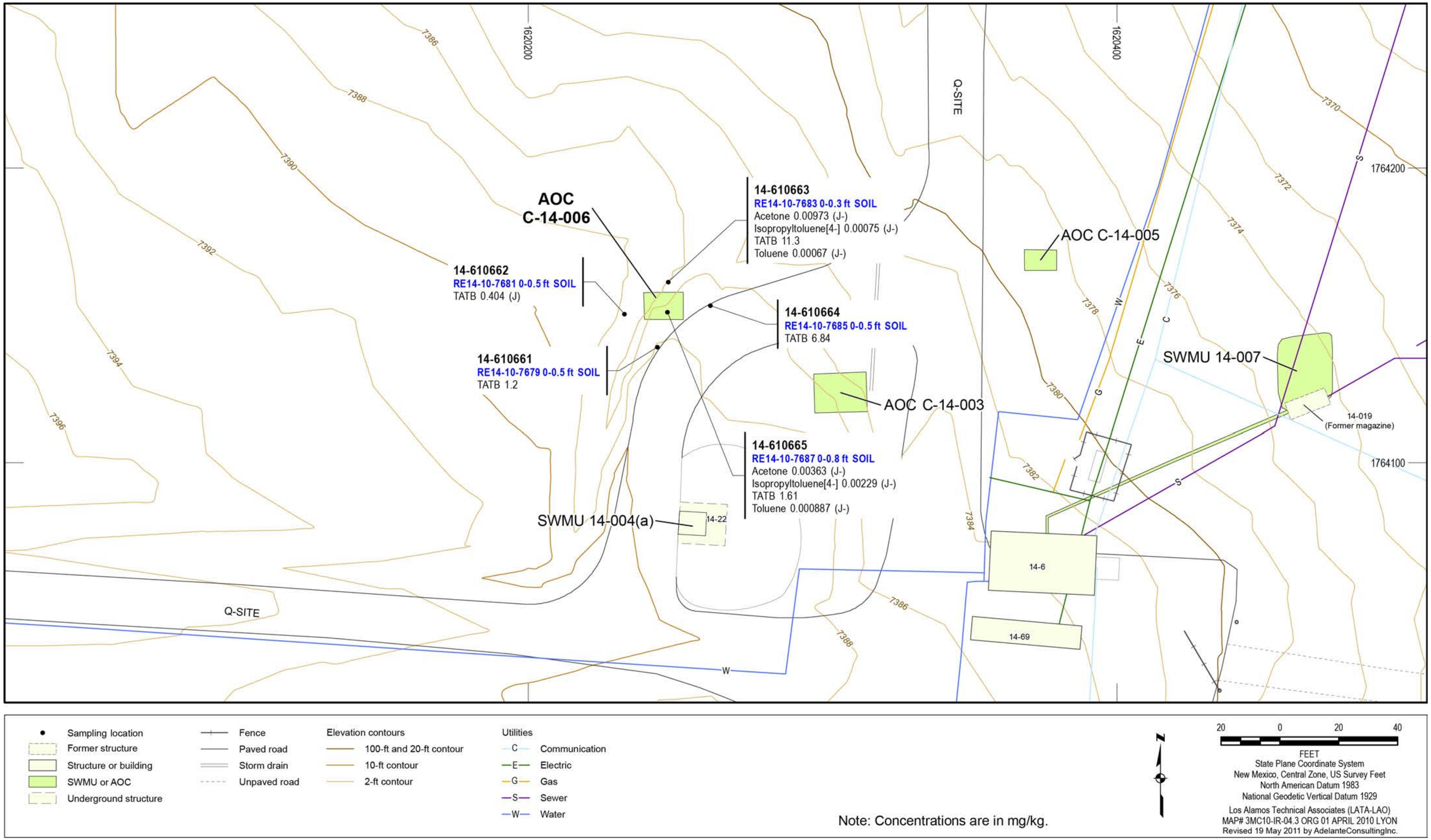


**Figure 7.2-3 Organic chemicals detected at AOC C-14-006**

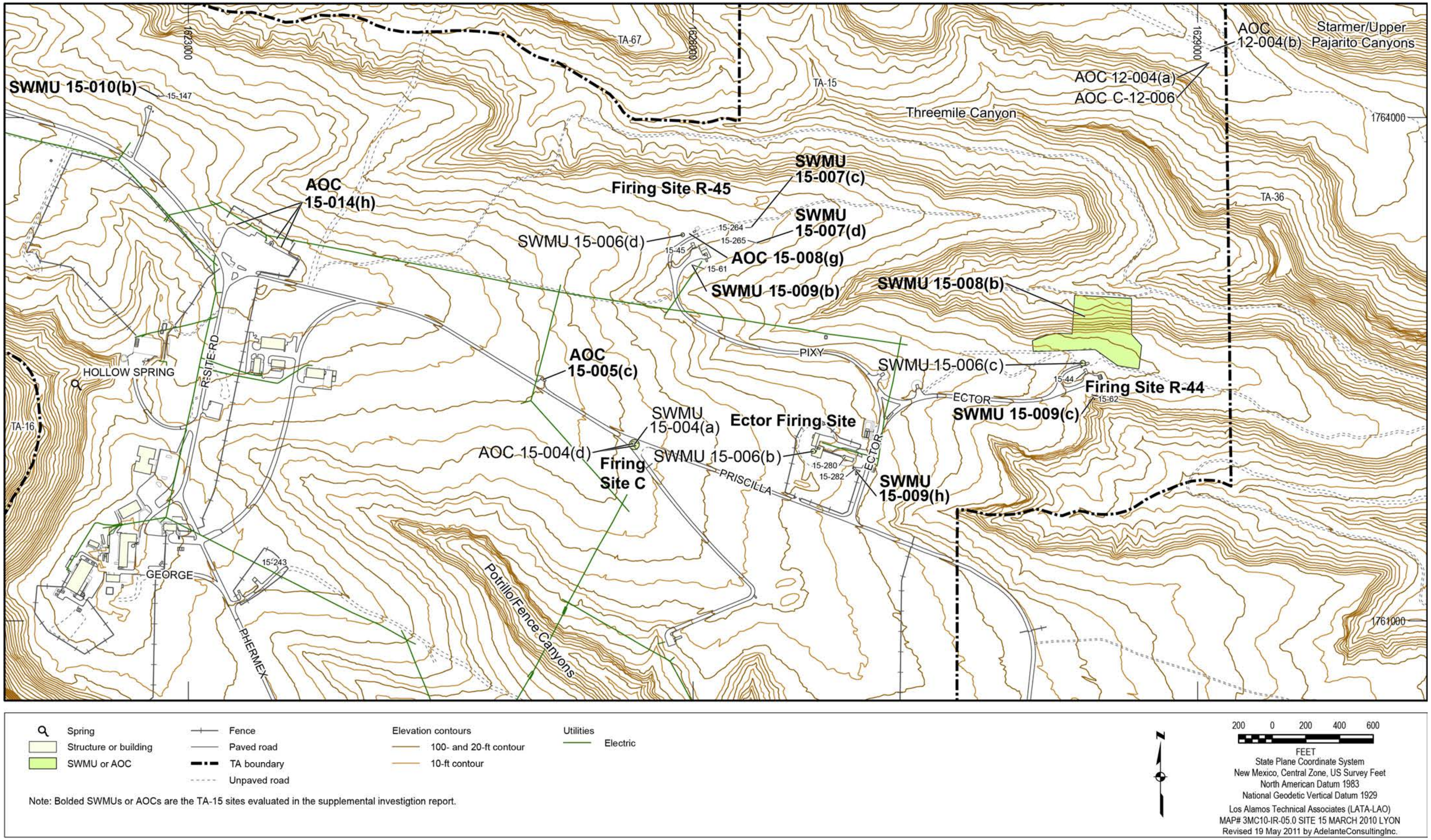


**Figure 8.1-1 Site map of TA-15**

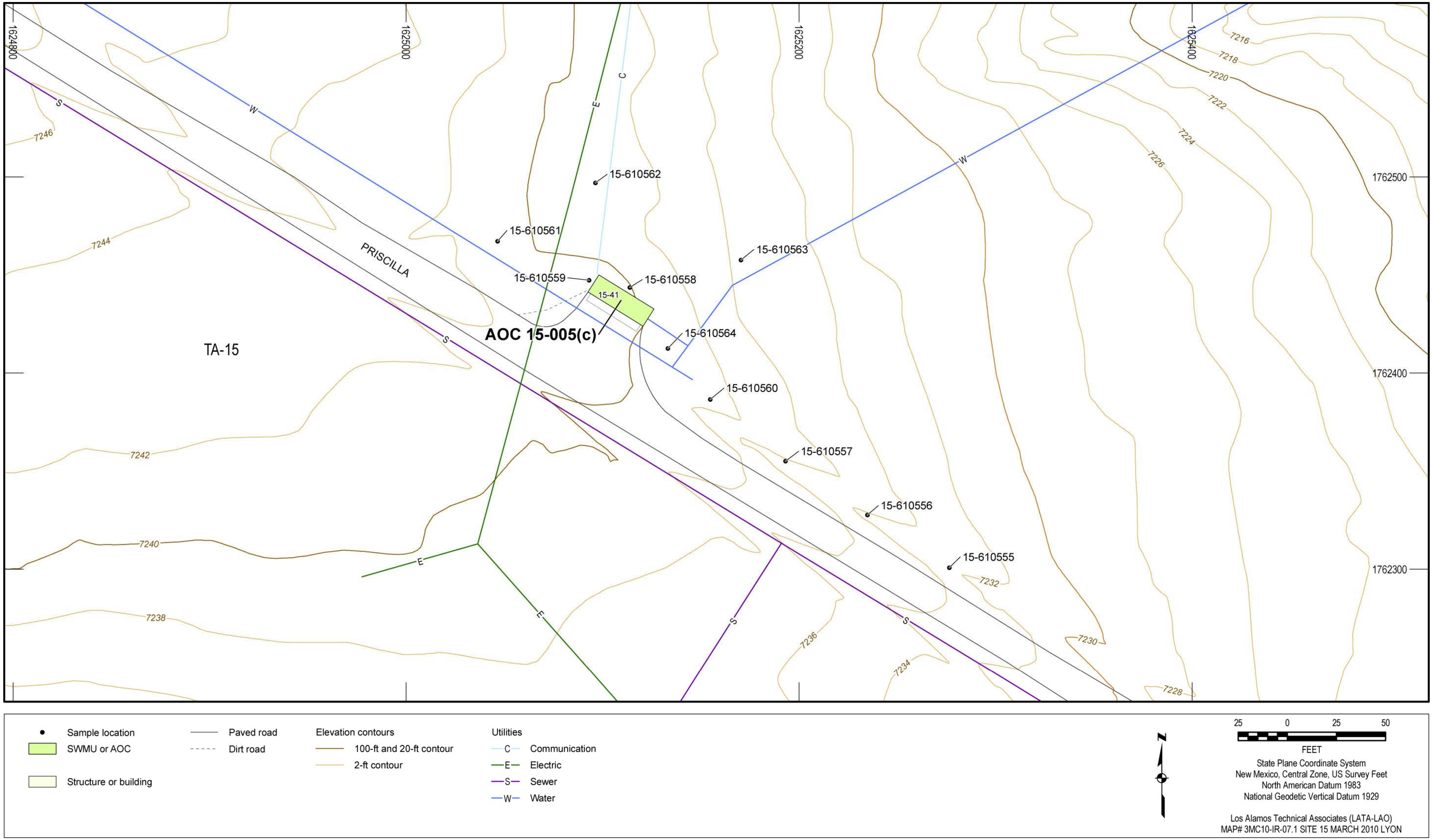


**Figure 8.2-1 AOC 15-005(c) site map and sampling locations**

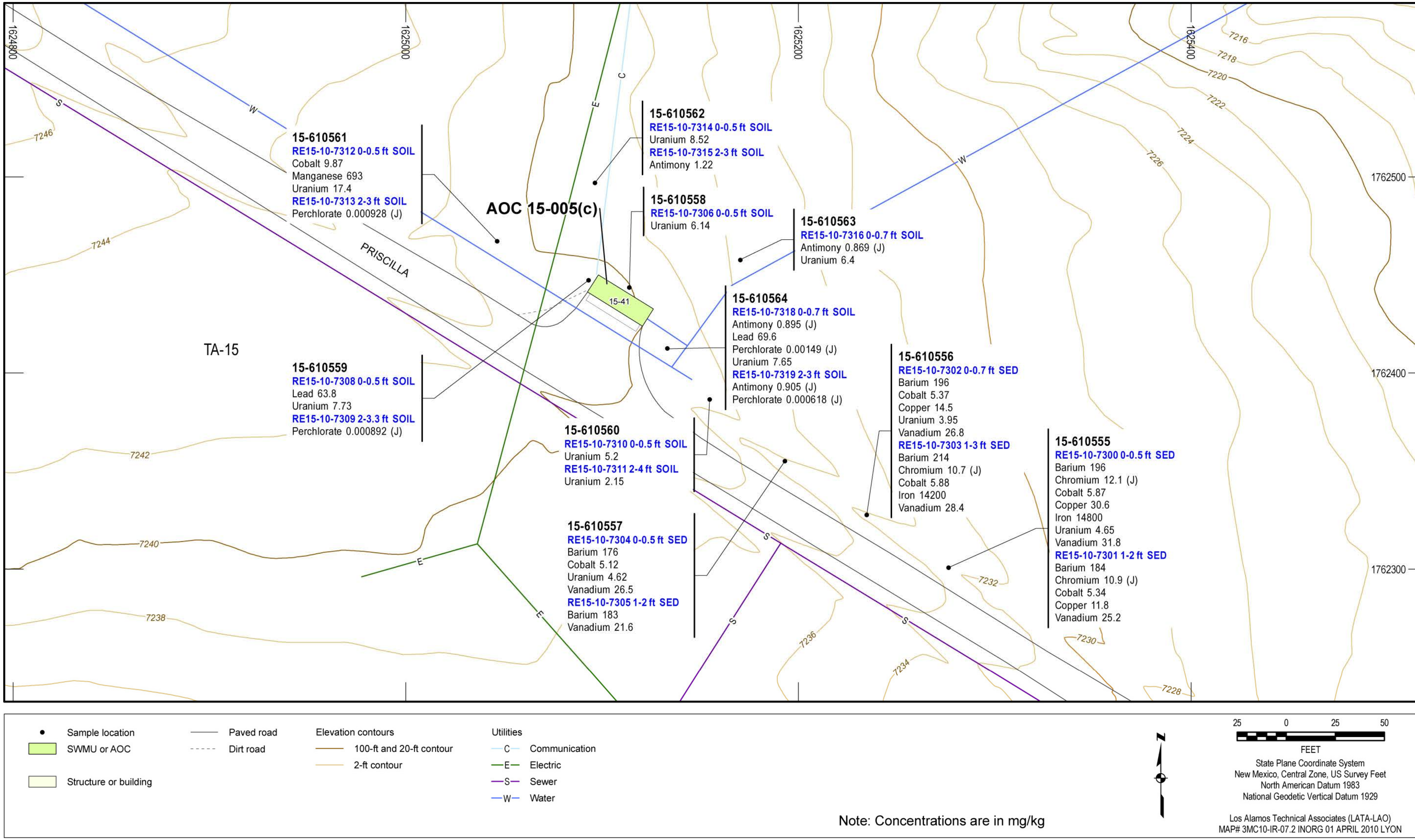


**Figure 8.2-2 Inorganic chemicals detected or detected above BVs at AOC 15-005(c)**

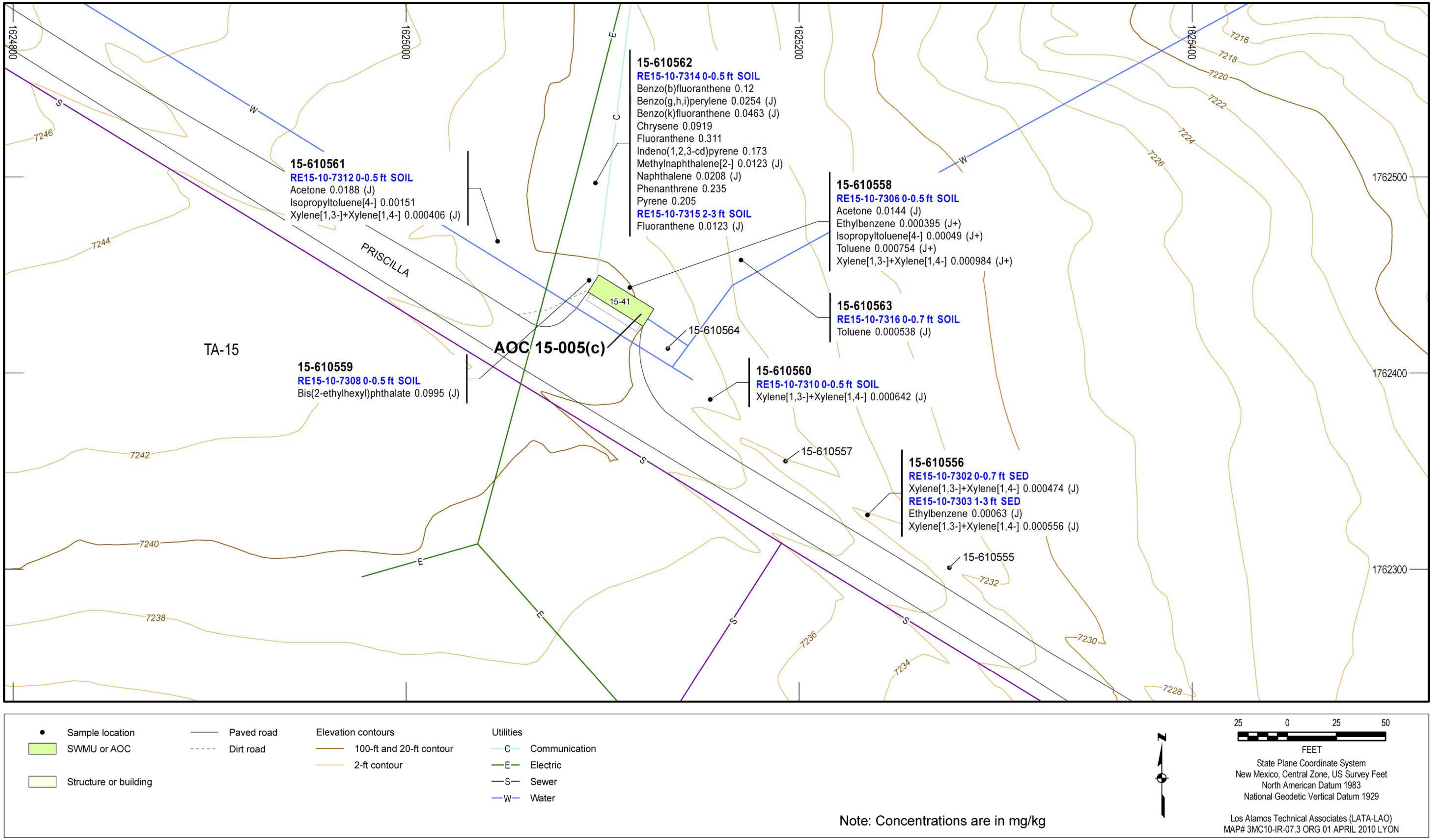


**Figure 8.2-3 Organic chemicals detected at AOC 15-005(c)**

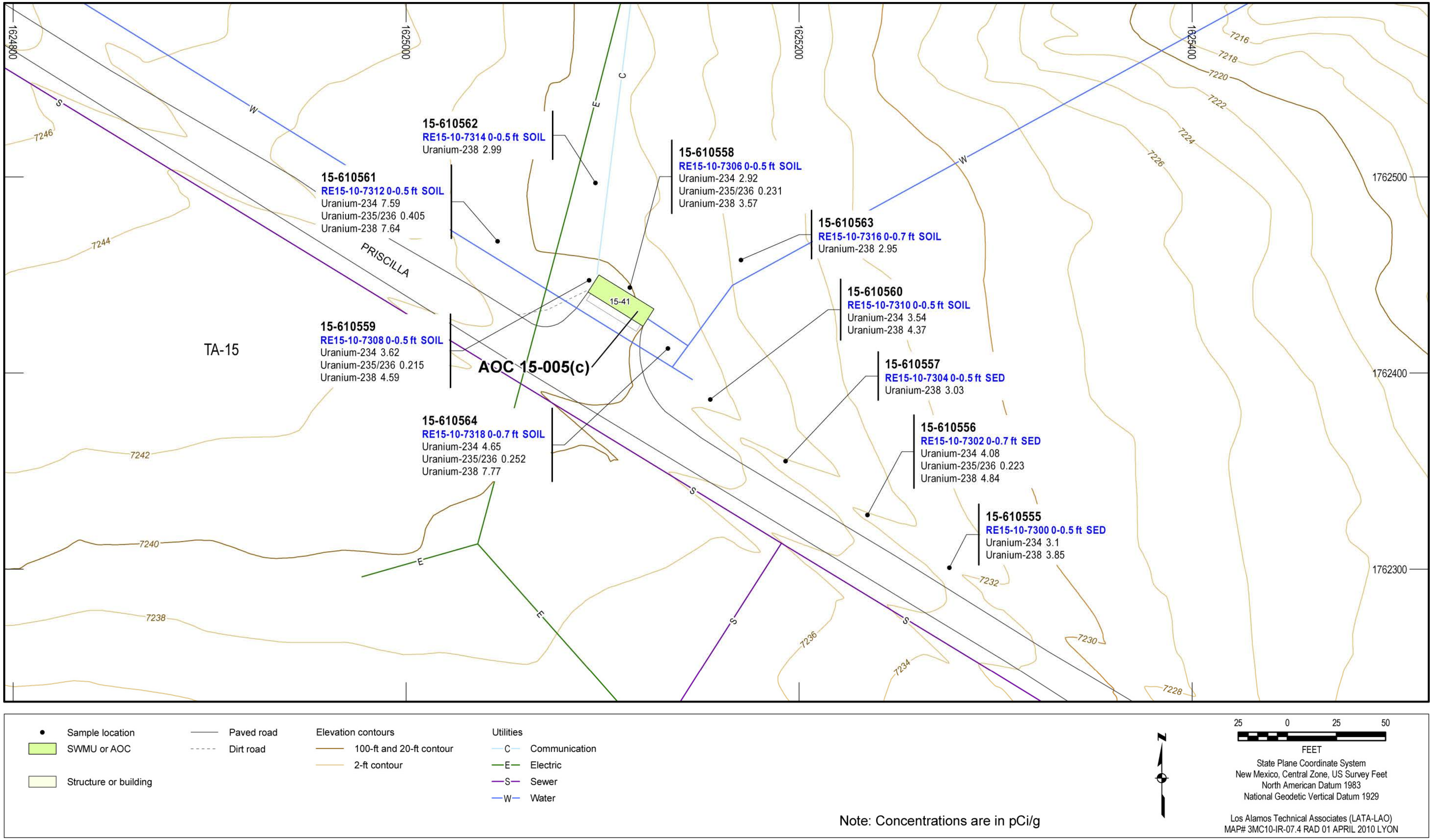


**Figure 8.2-4 Radionuclides detected or detected above BVs/FVs at AOC 15-005(c)**

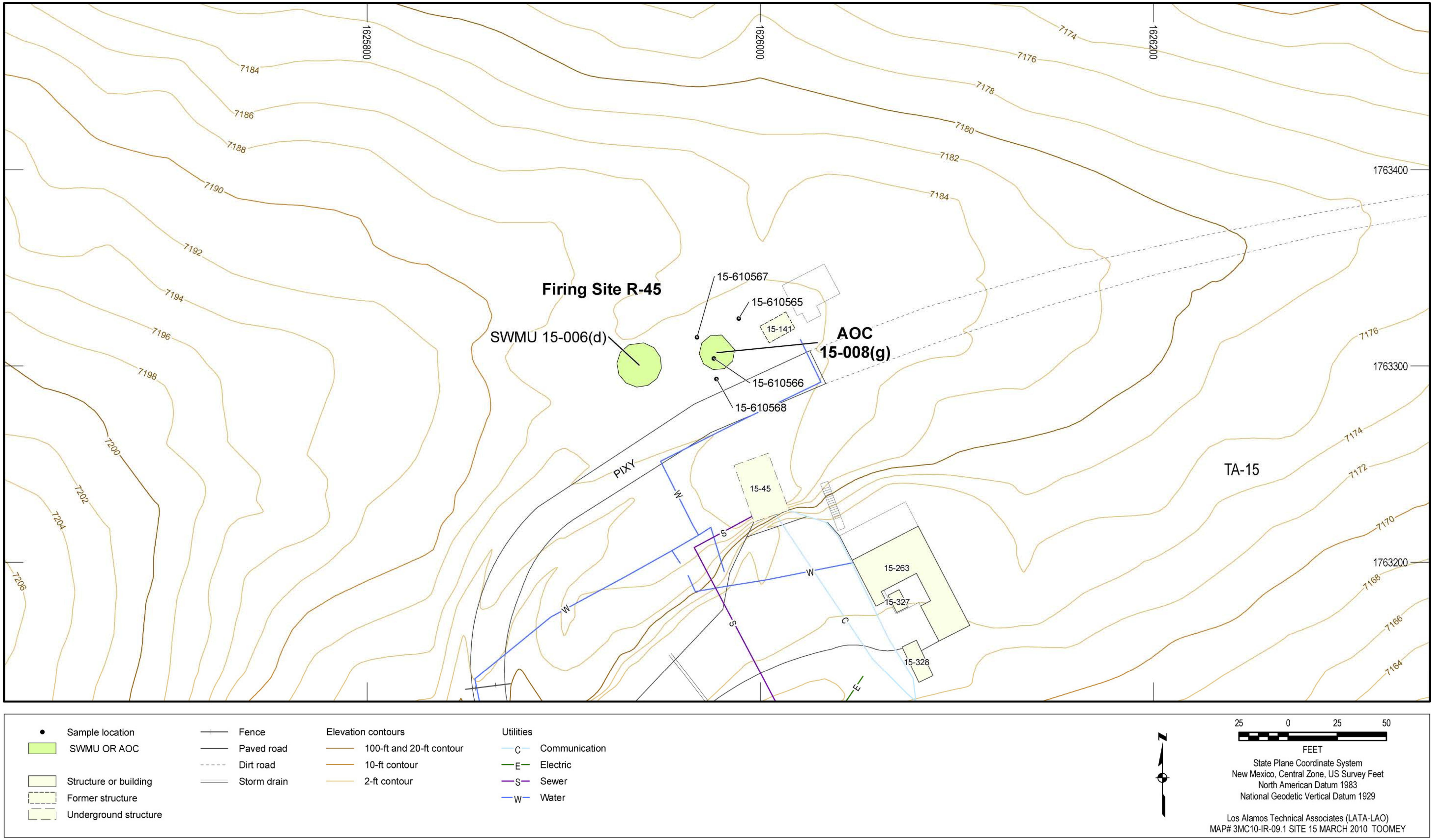


**Figure 8.6-1 AOC 15-008(g) site map and sampling locations**

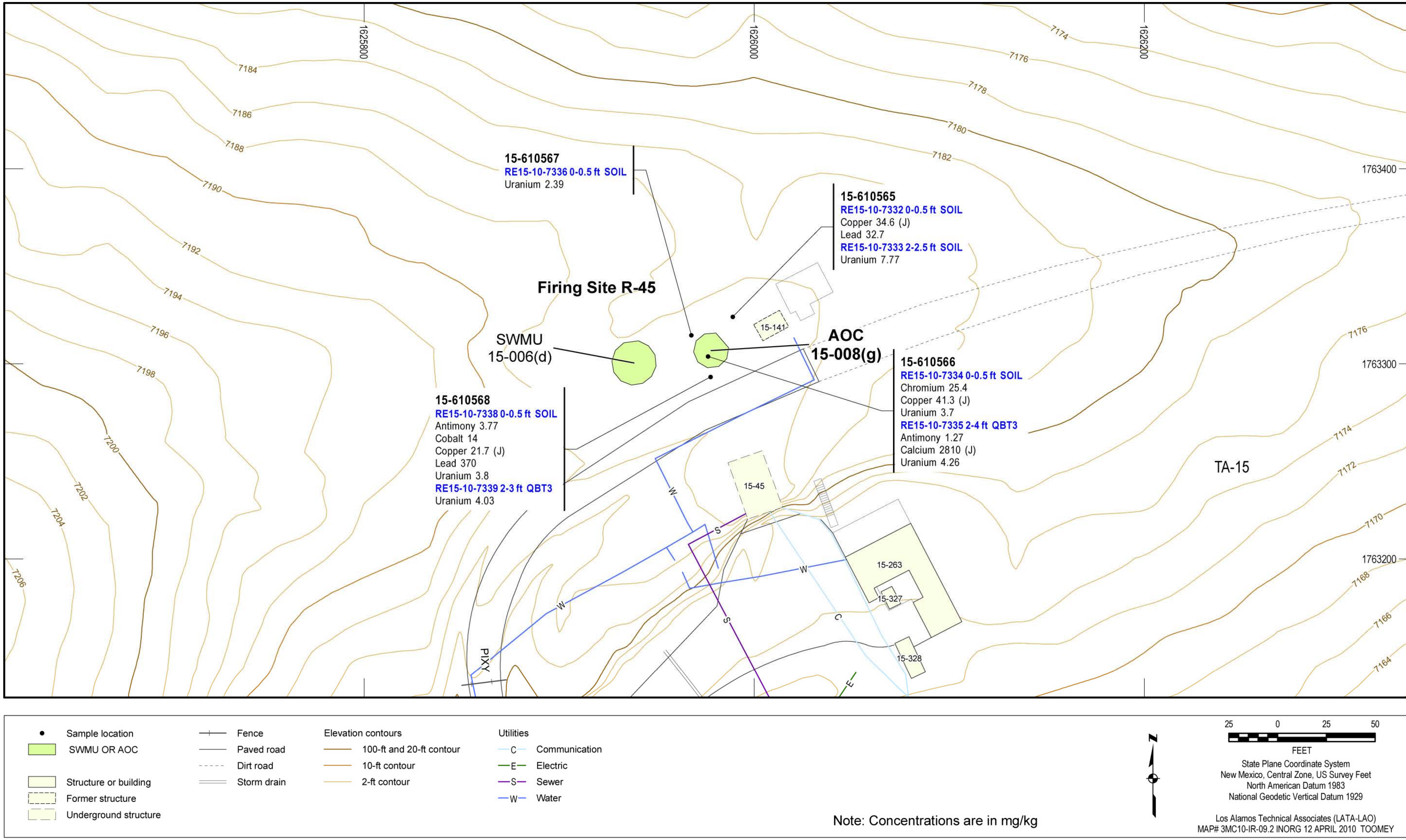


**Figure 8.6-2** **Inorganic chemicals detected or detected above BVs at AOC 15-008(g)**

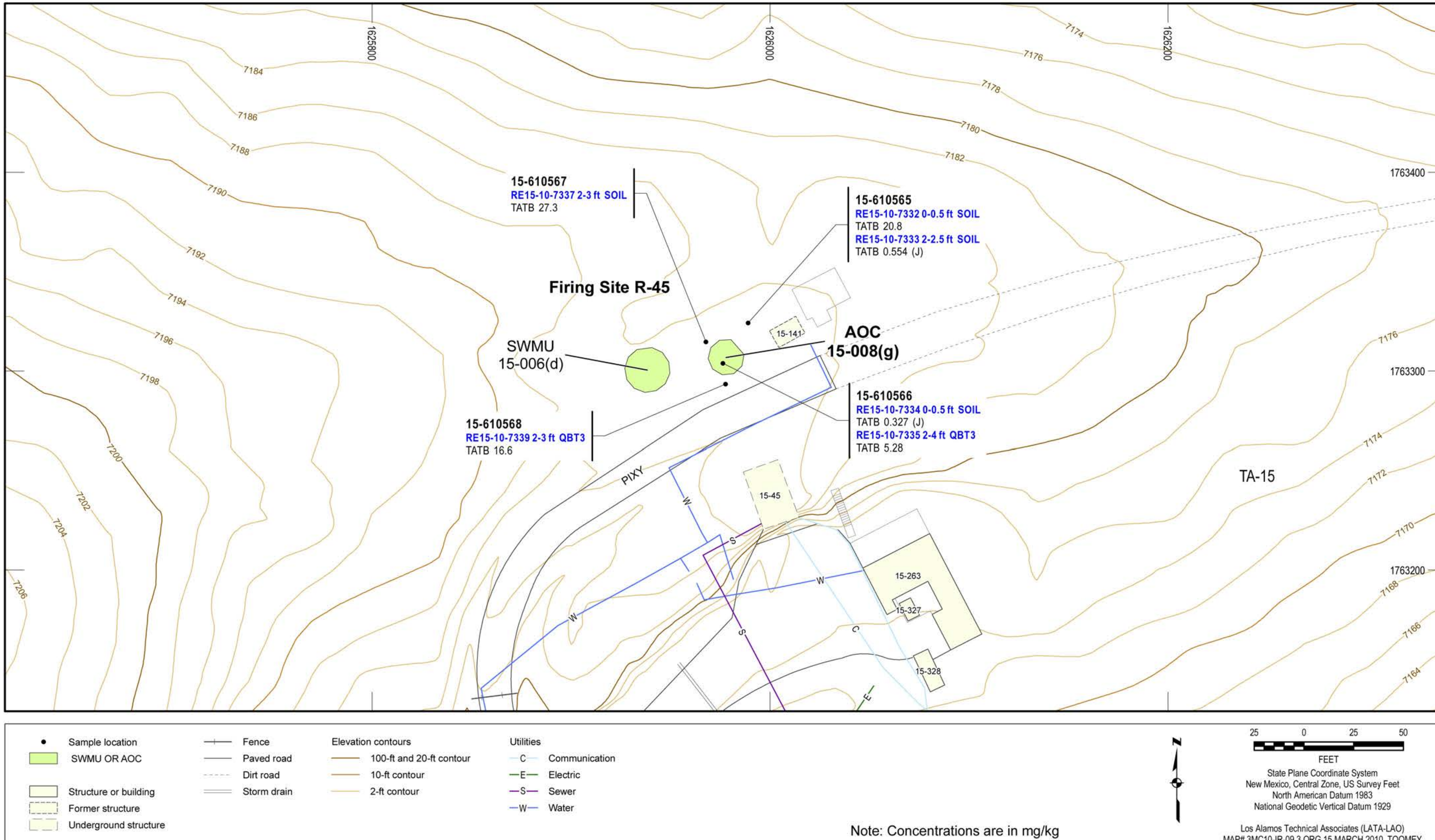


**Figure 8.6-3 Organic chemicals detected at AOC 15-008(g)**

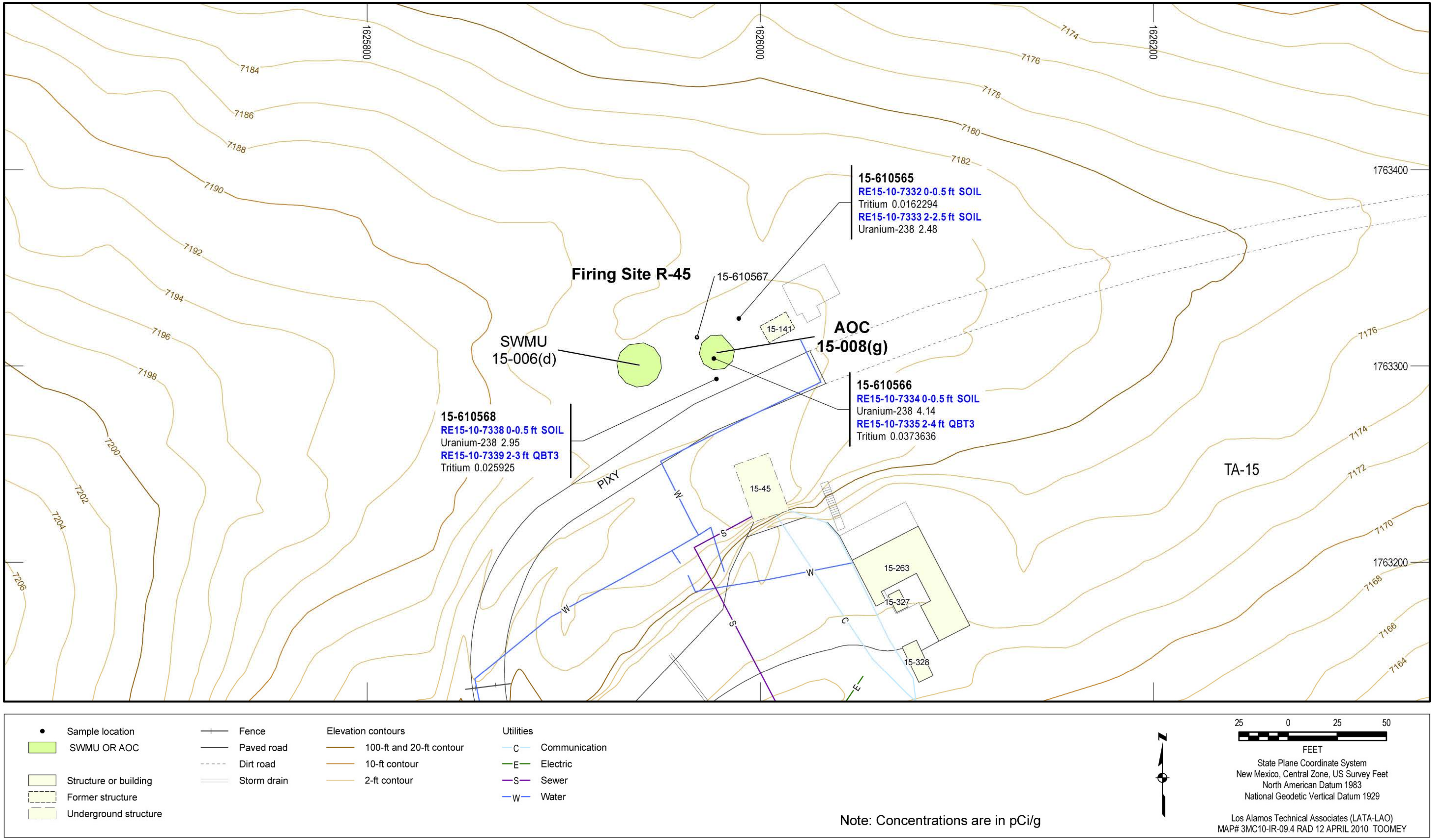


**Figure 8.6-4 Radionuclides detected or detected above BVs/FVs at AOC 15-008(g)**

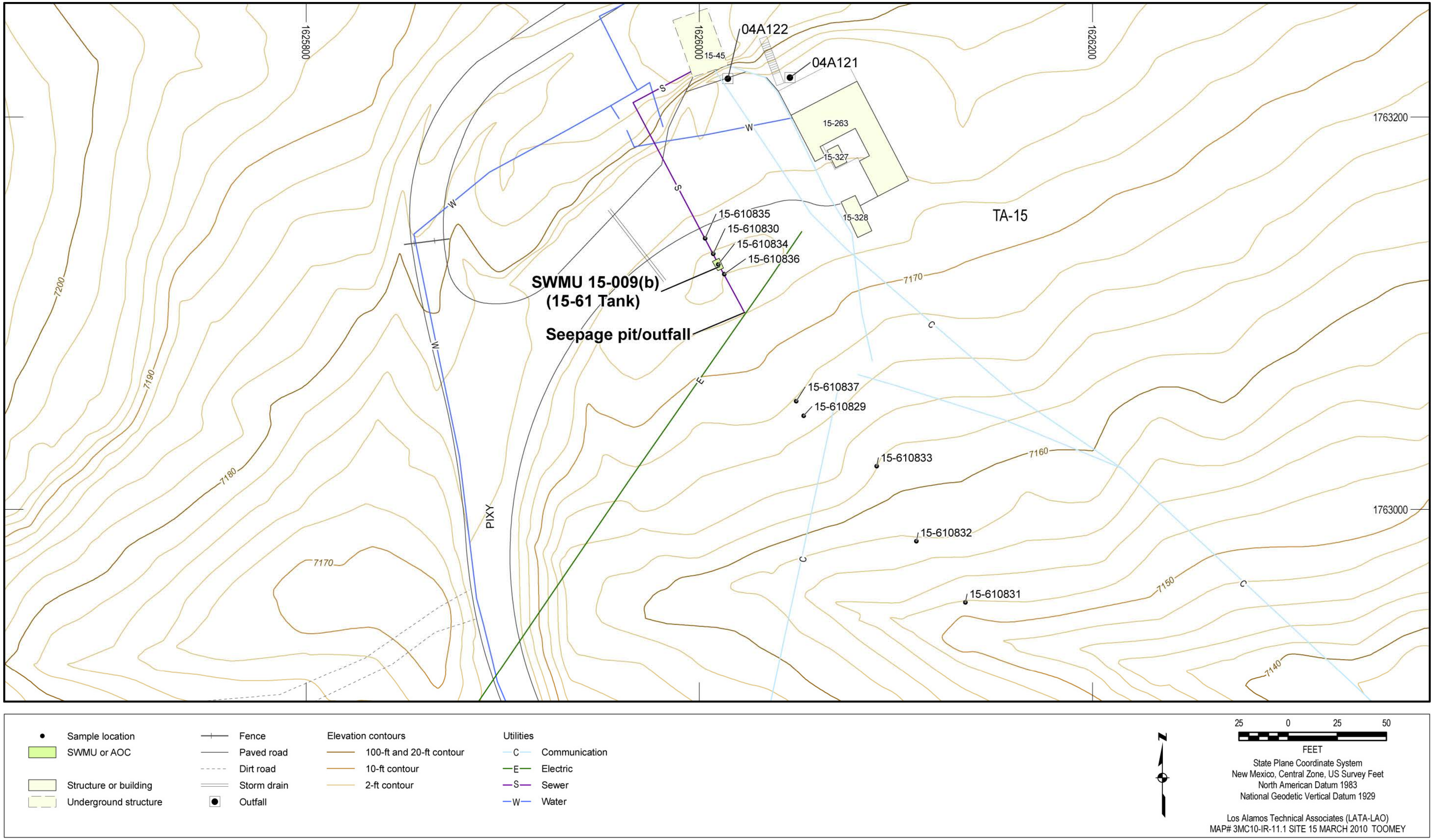


**Figure 8.7-1 SWMU 15-009(b) site map and sampling locations**

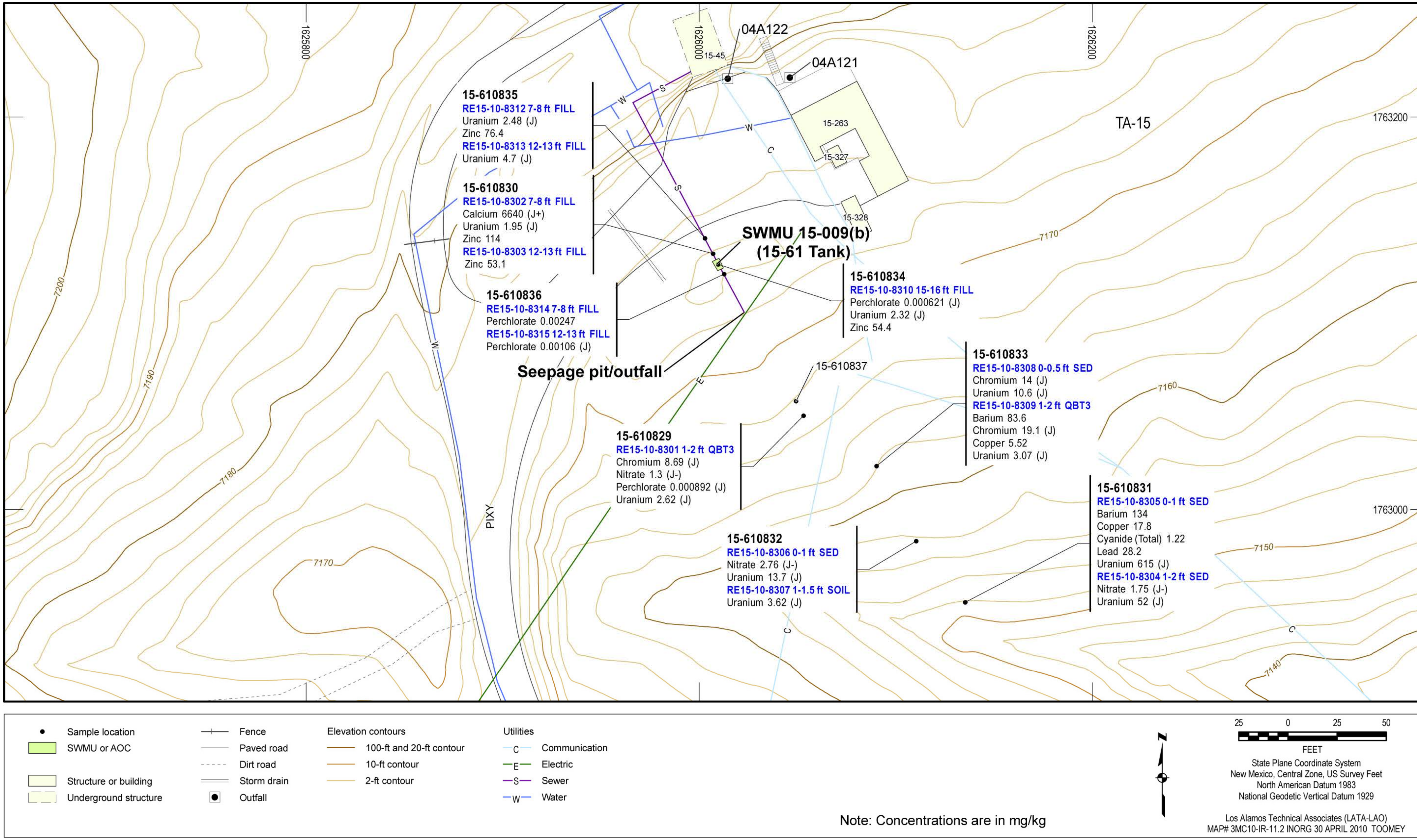


**Figure 8.7-2 Inorganic chemicals detected or detected above BVs at SWMU 15-009(b)**

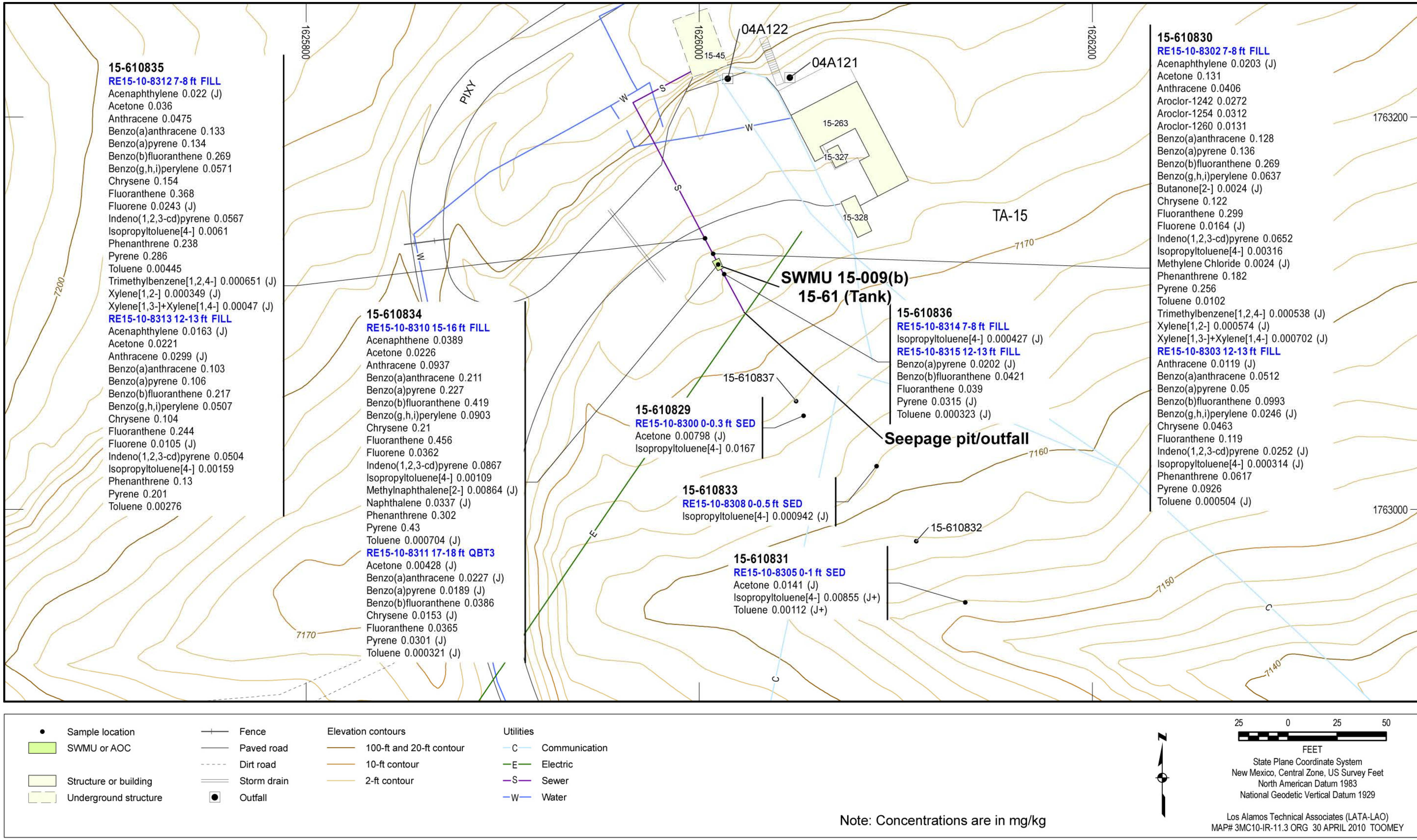


**Figure 8.7-3 Organic chemicals detected at SWMU 15-009(b)**

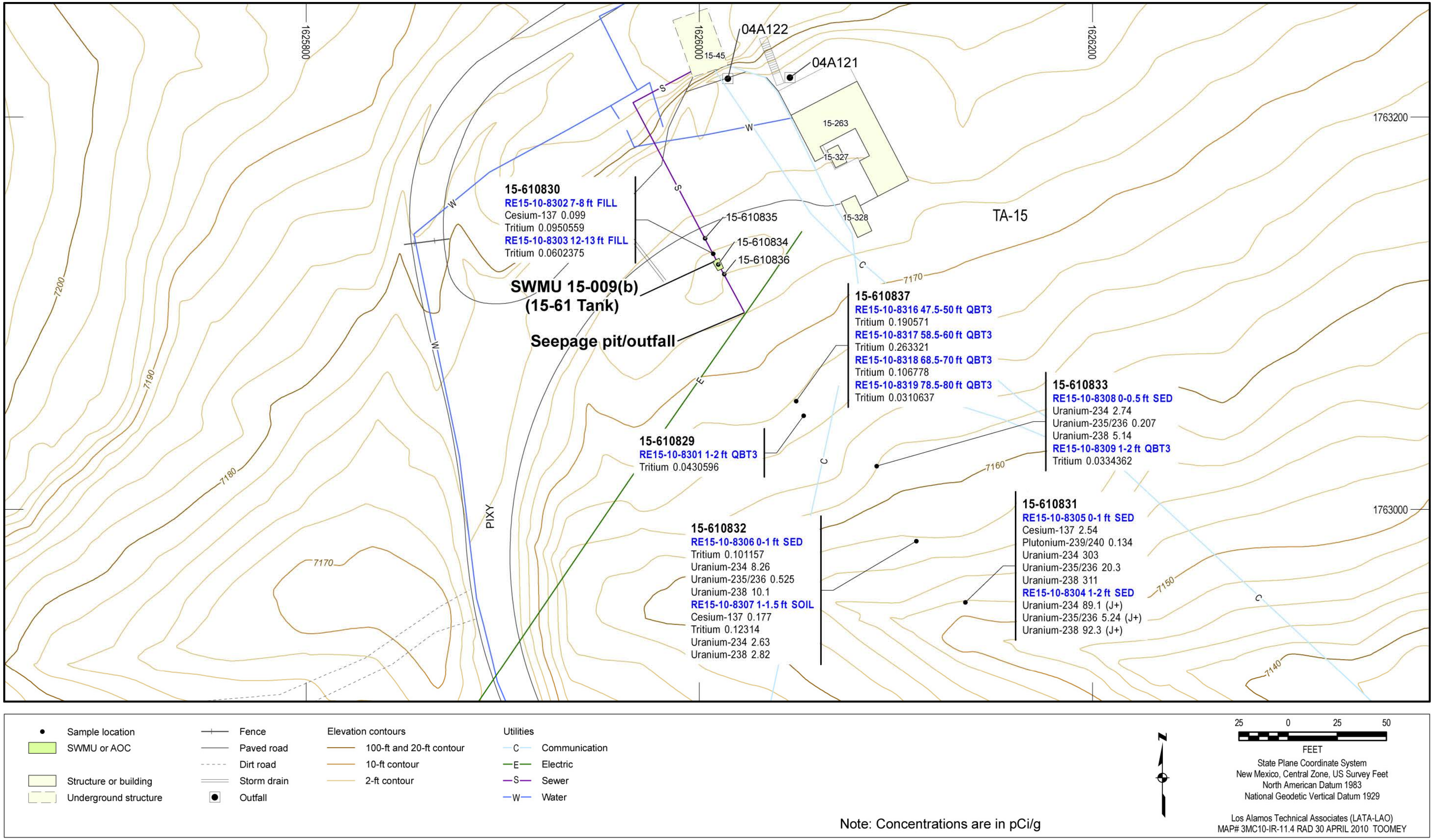


**Figure 8.7-4 Radionuclides detected or detected above BVs/FVs at SWMU 15-009(b)**

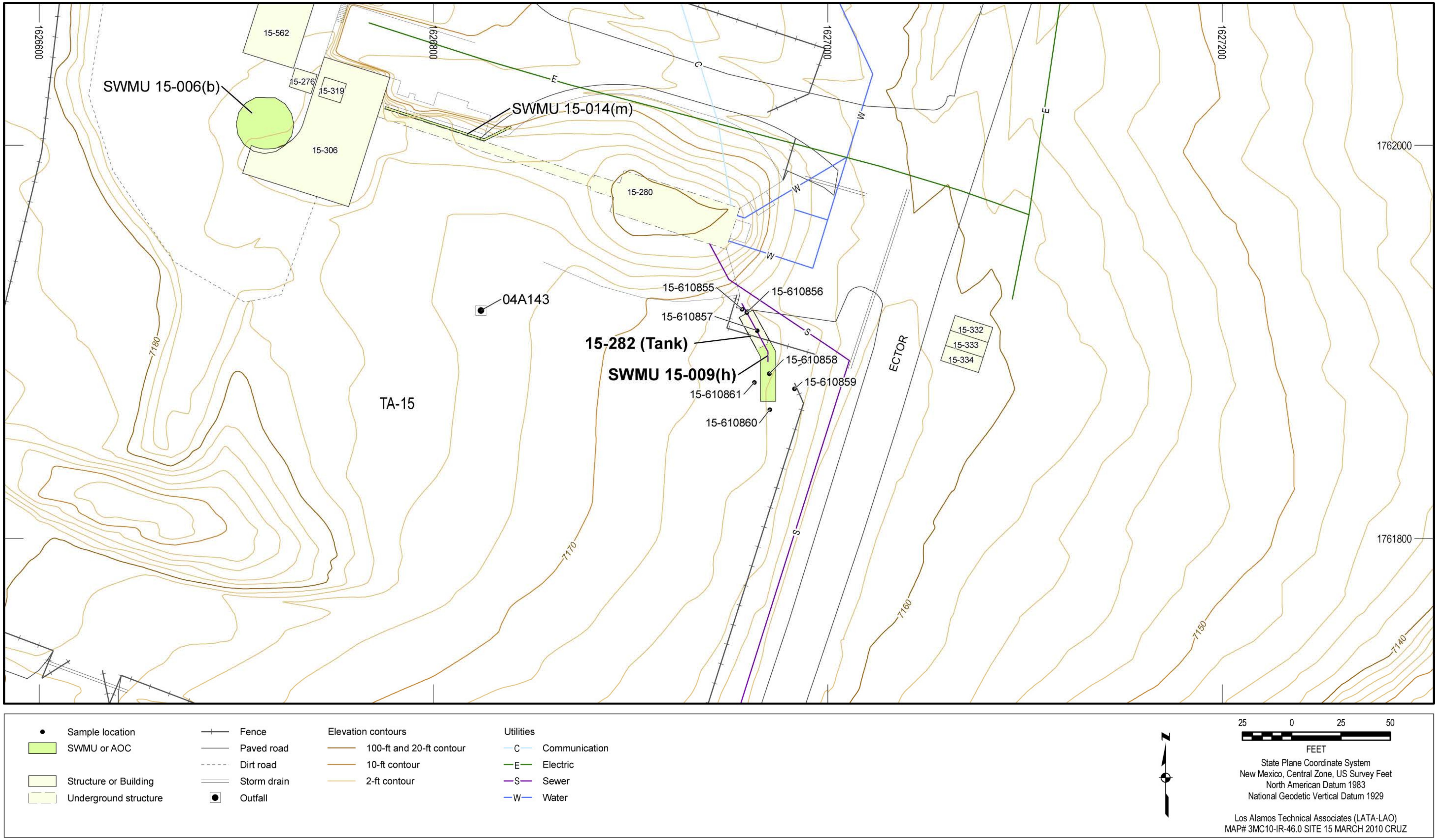


**Figure 8.9-1 SWMU 15-009(h) site map and sampling locations**

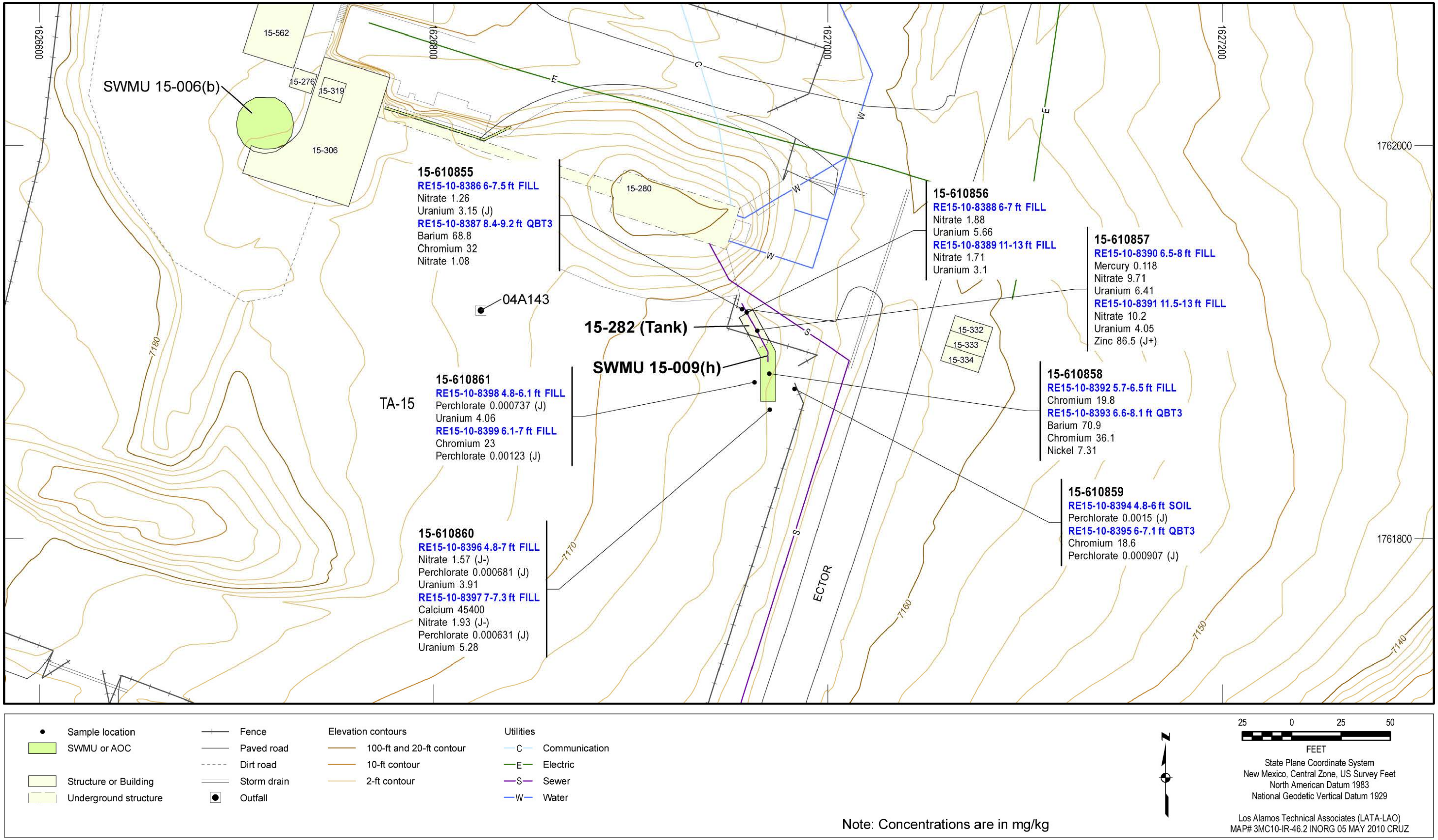


**Figure 8.9-2 Inorganic chemicals detected or detected above BVs at SWMU 15-009(h)**

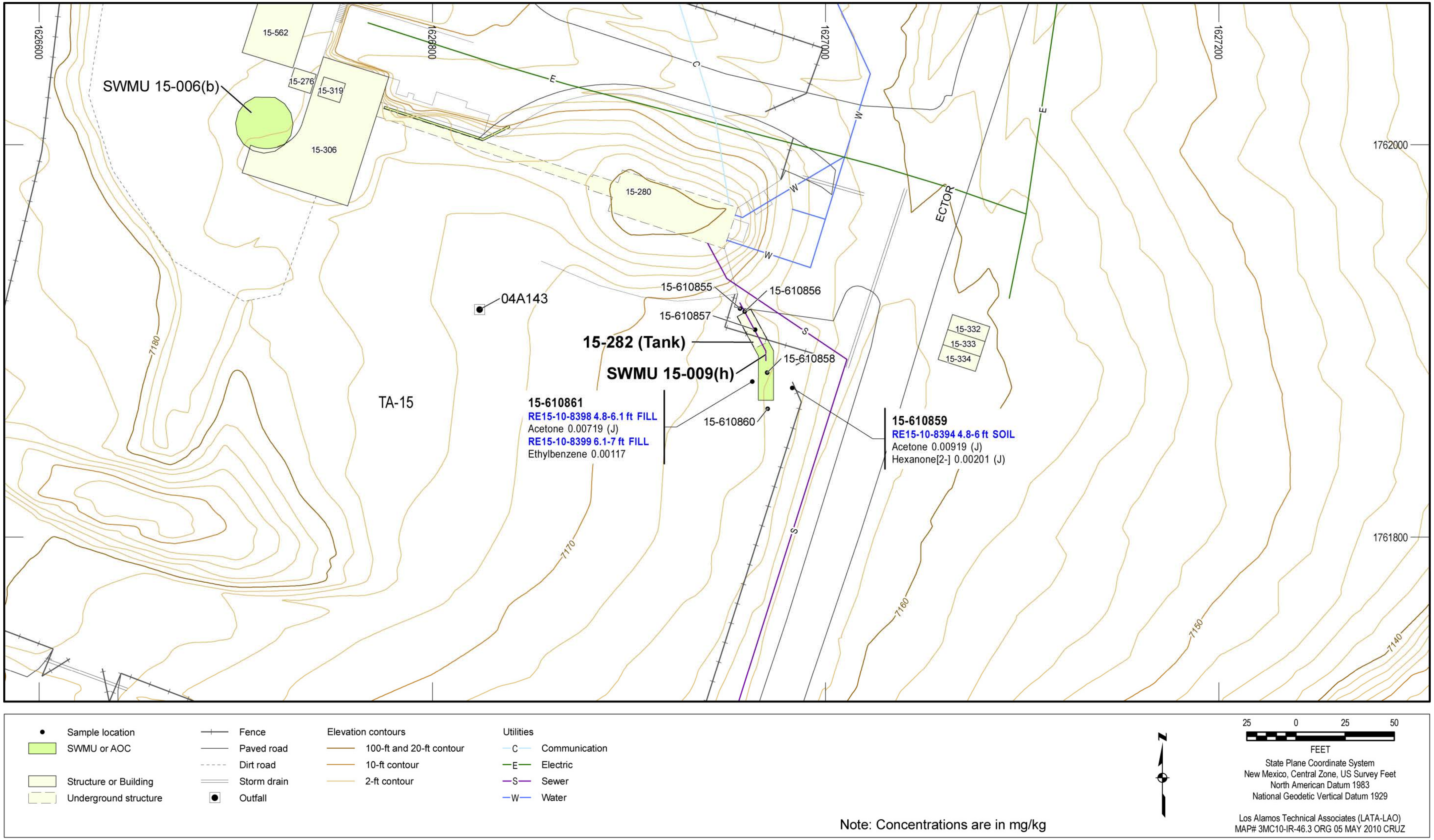


**Figure 8.9-3 Organic chemicals detected at SWMU 15-009(h)**

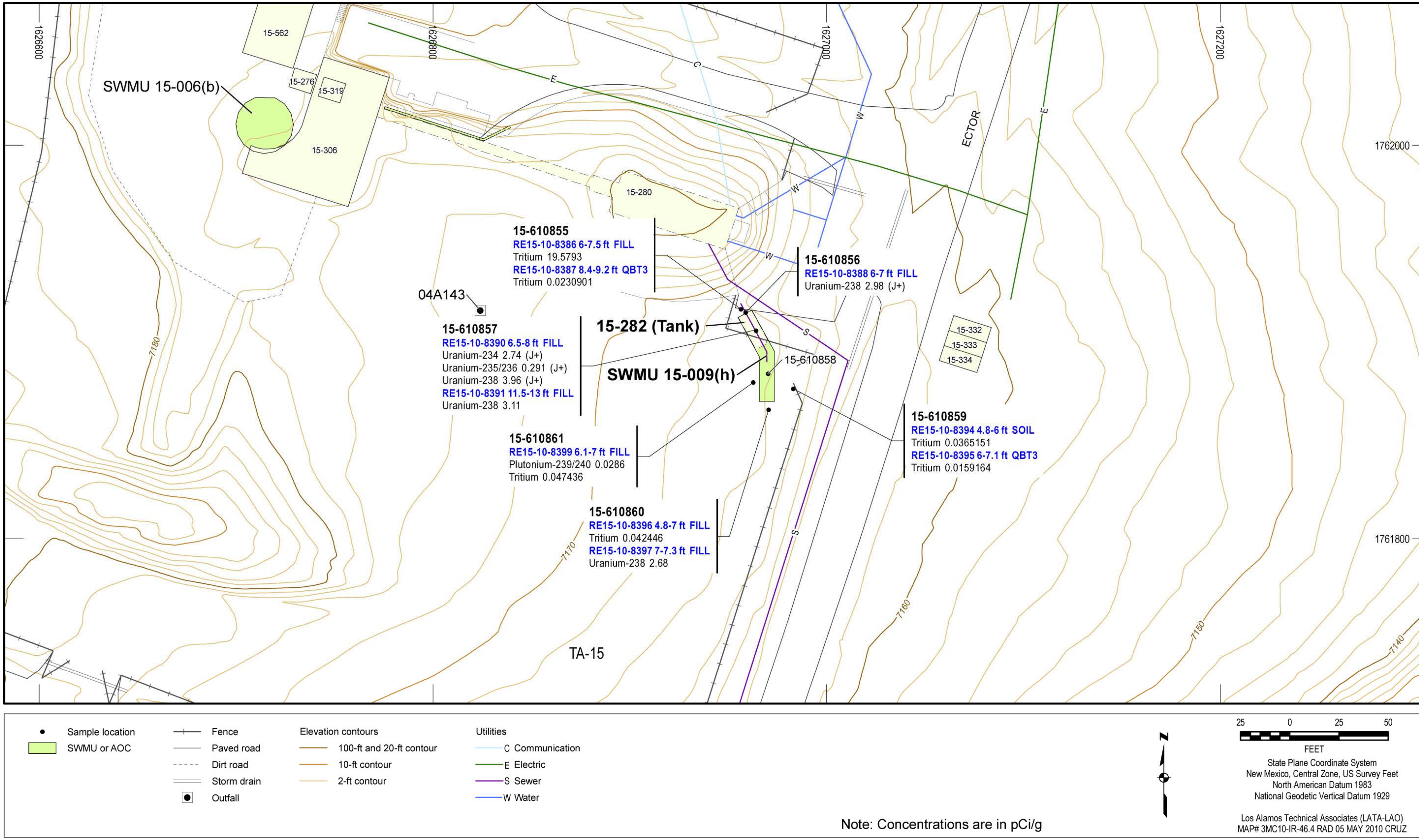


**Figure 8.9-4 Radionuclides detected or detected above BVs/FVs at SWMU 15-009(h)**

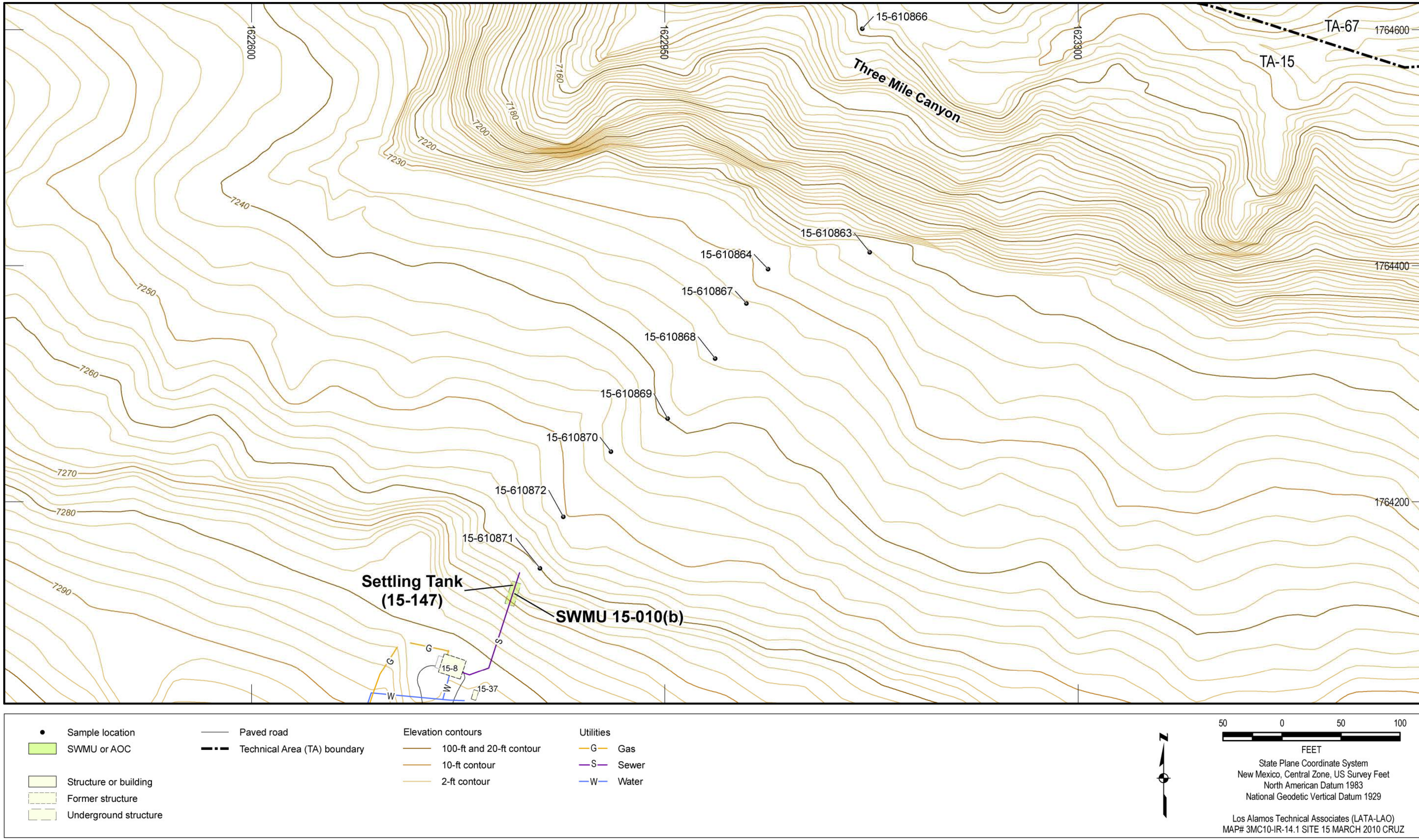


**Figure 8.10-1    SWMU 15-010(b) site map and sampling locations**

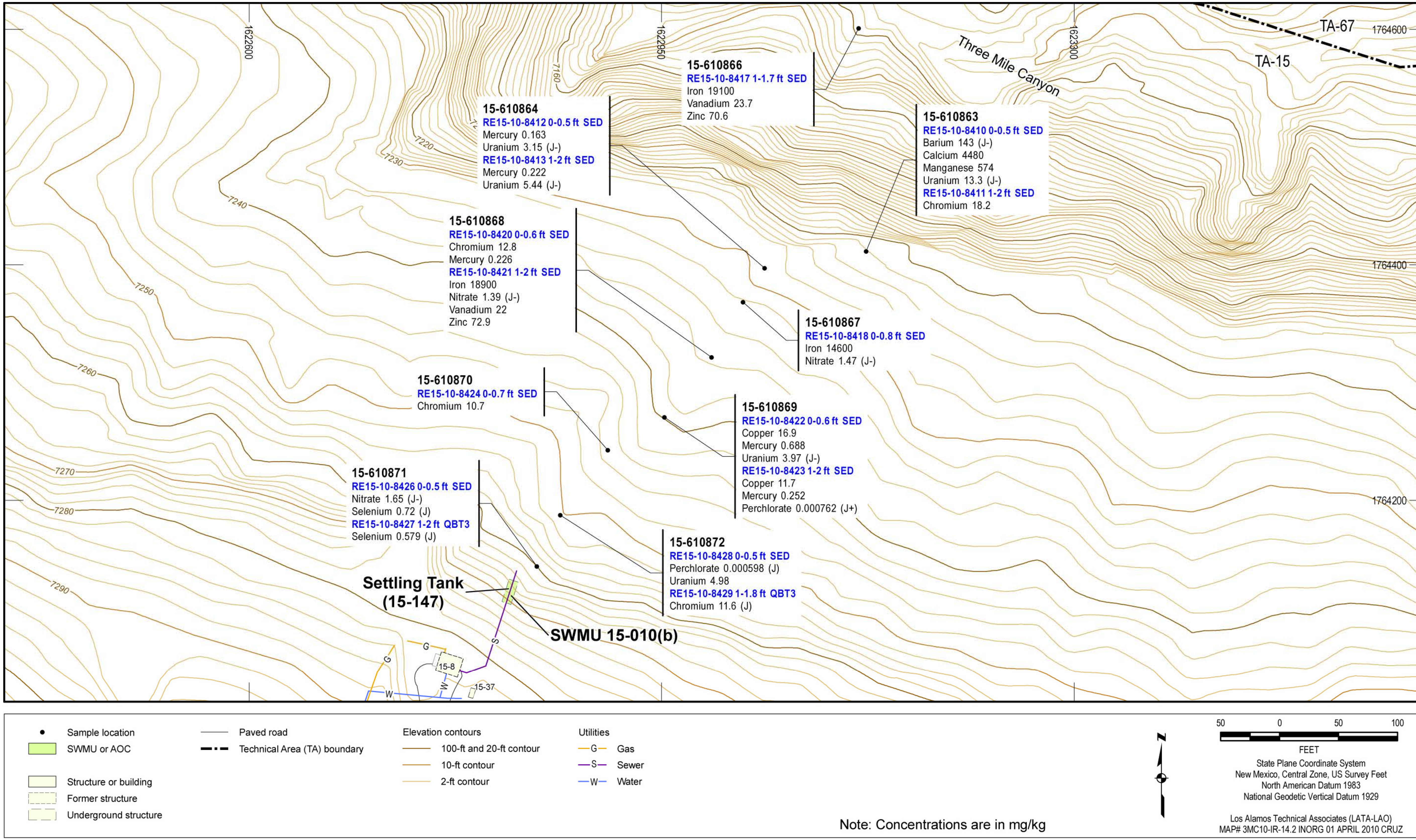


**Figure 8.10-2 Inorganic chemicals detected or detected above BVs at SWMU 15-010(b)**

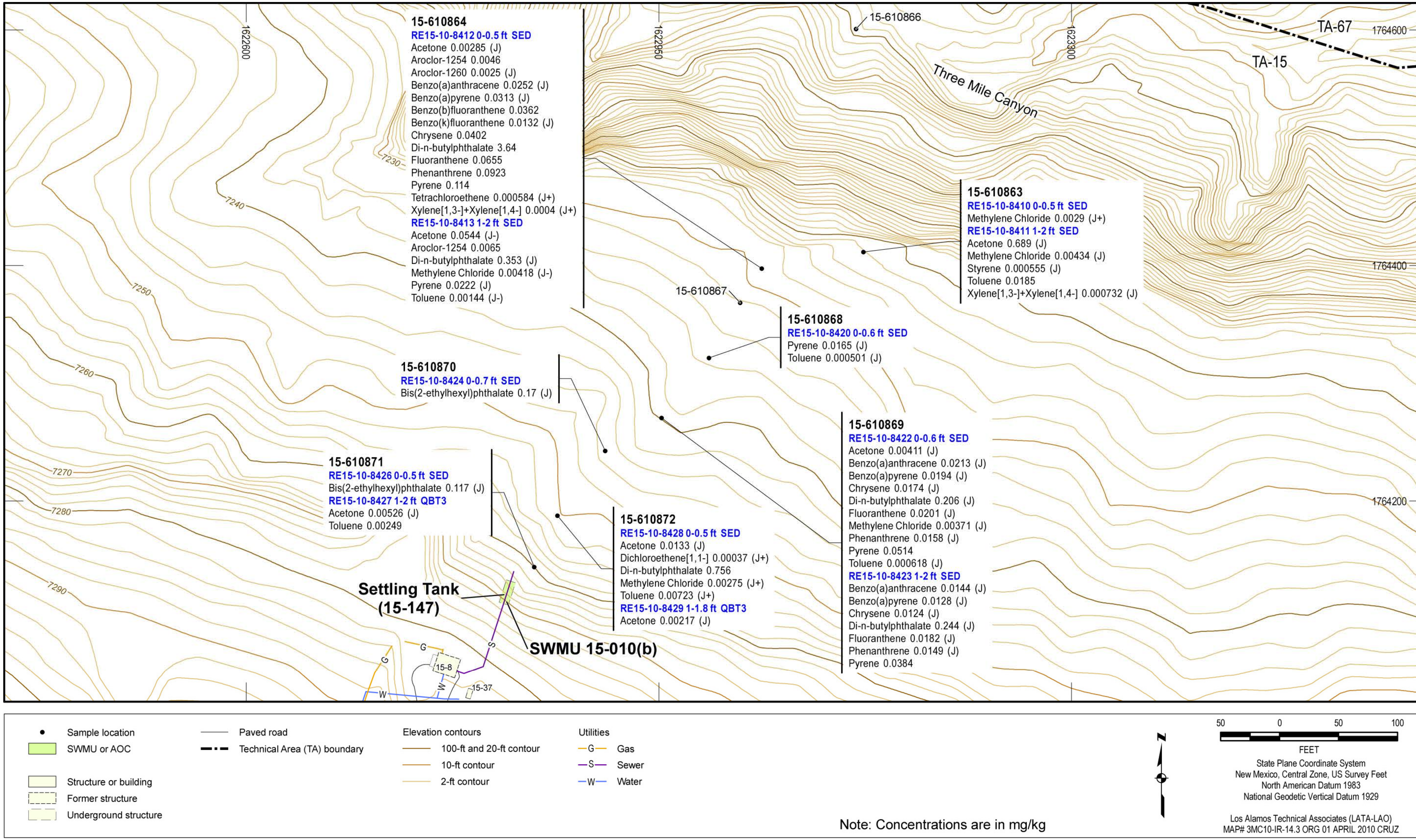


**Figure 8.10-3 Organic chemicals detected at SWMU 15-010(b)**

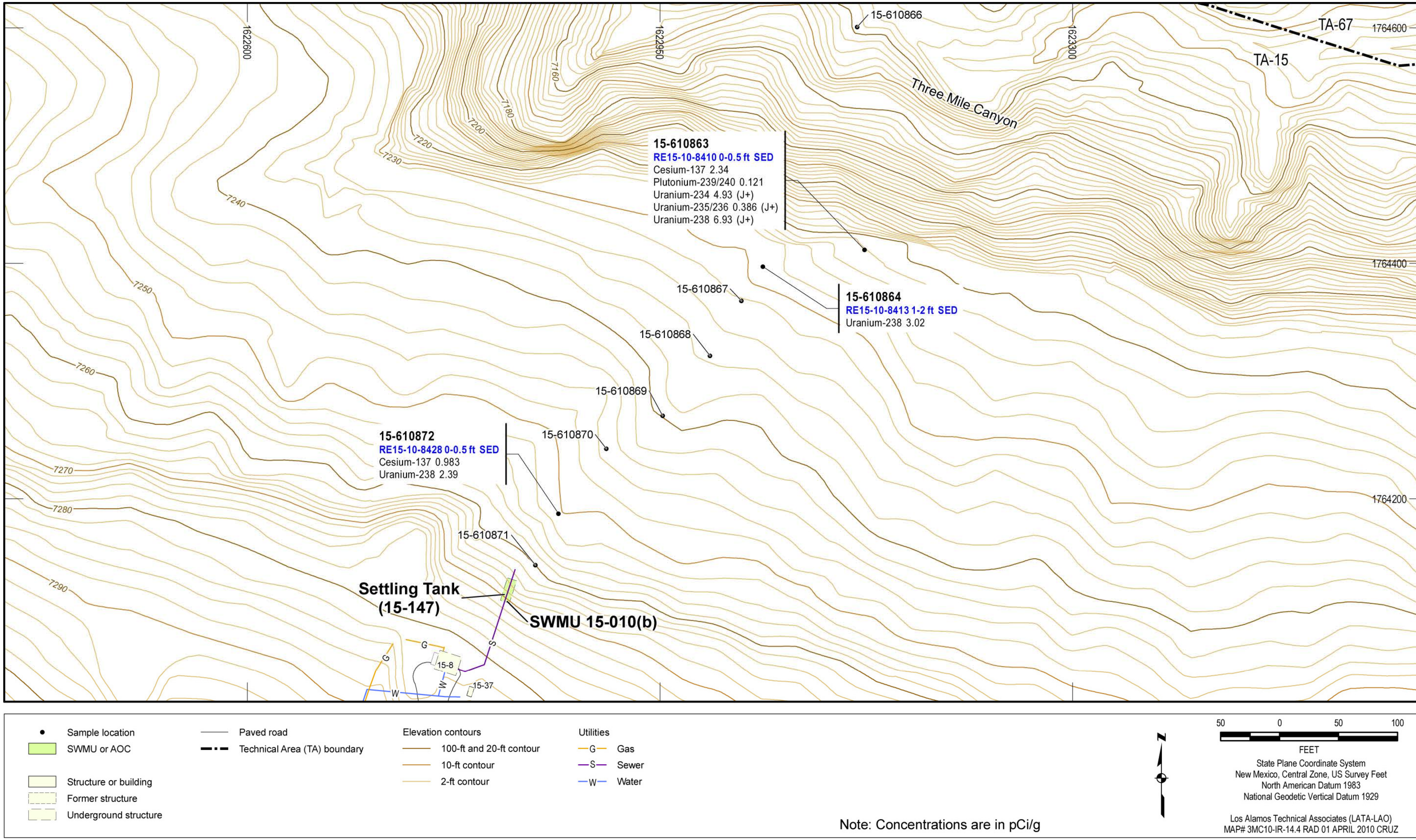


**Figure 8.10-4 Radionuclides detected or detected above BVs/FVs at SWMU 15-010(b)**

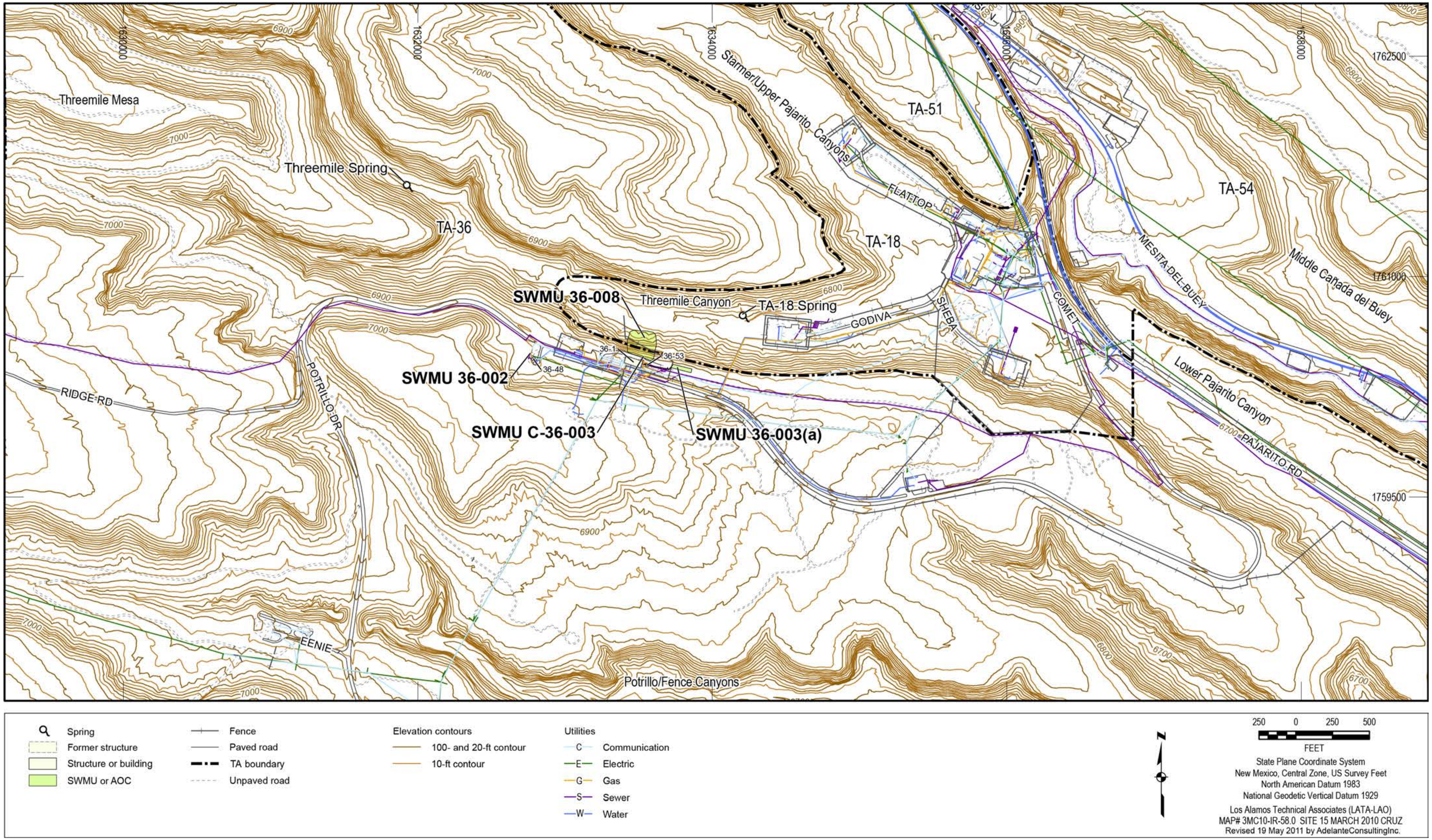


**Figure 9.1-1 Site map of TA-36**

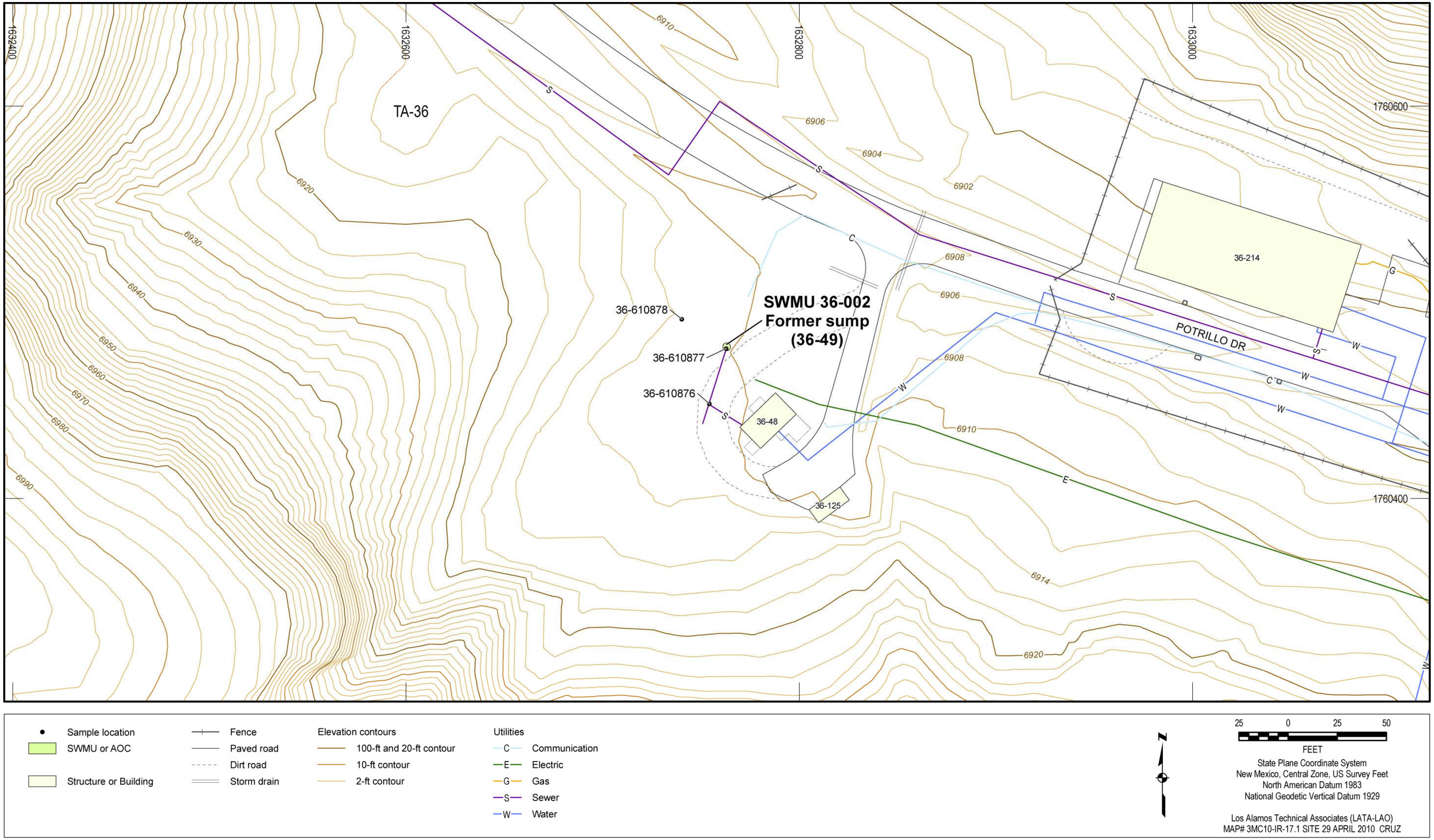


**Figure 9.2-1 SWMU 36-002 site map and sampling locations**

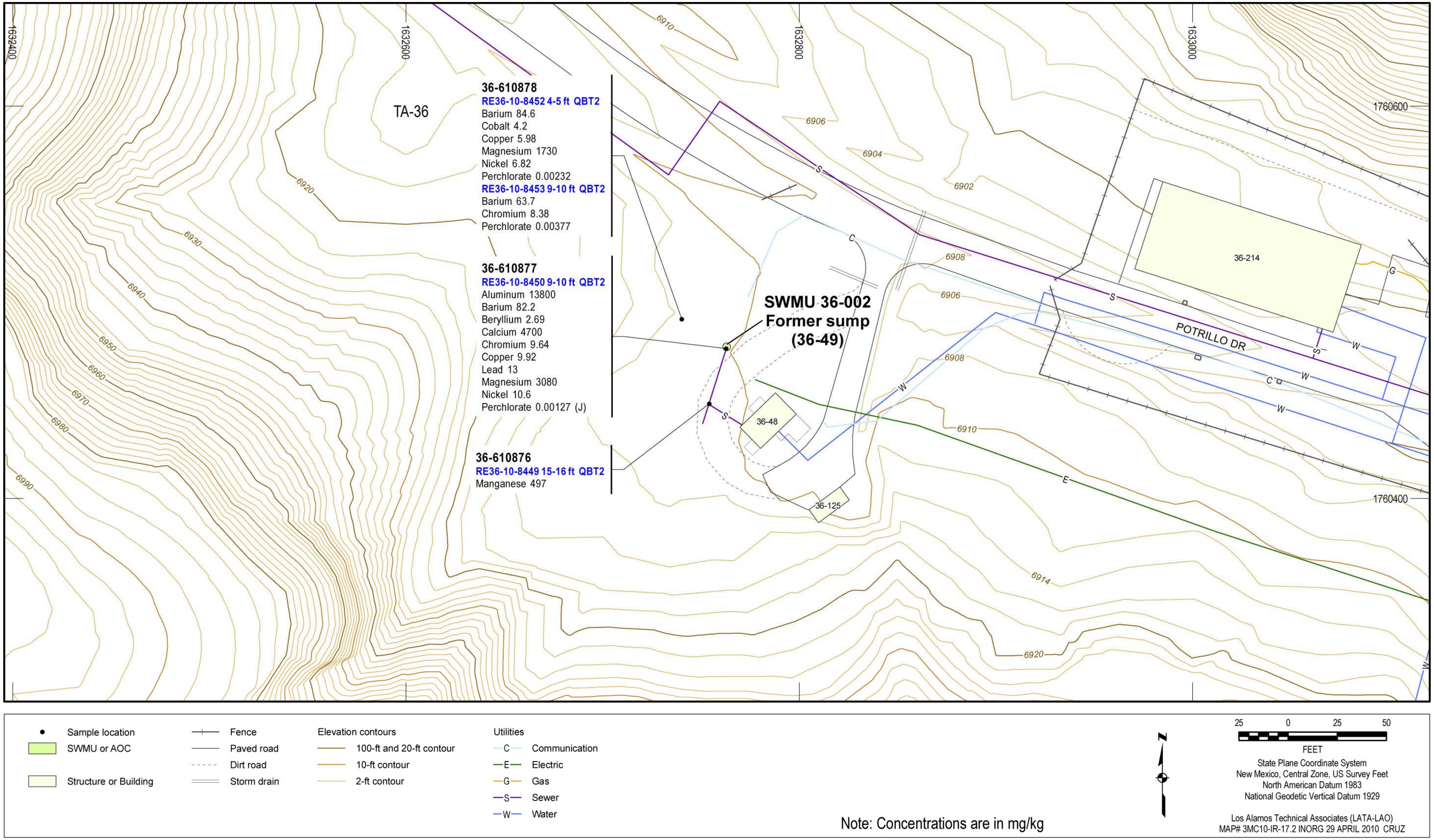


**Figure 9.2-2 Inorganic chemicals detected or detected above BVs at SWMU 36-002**

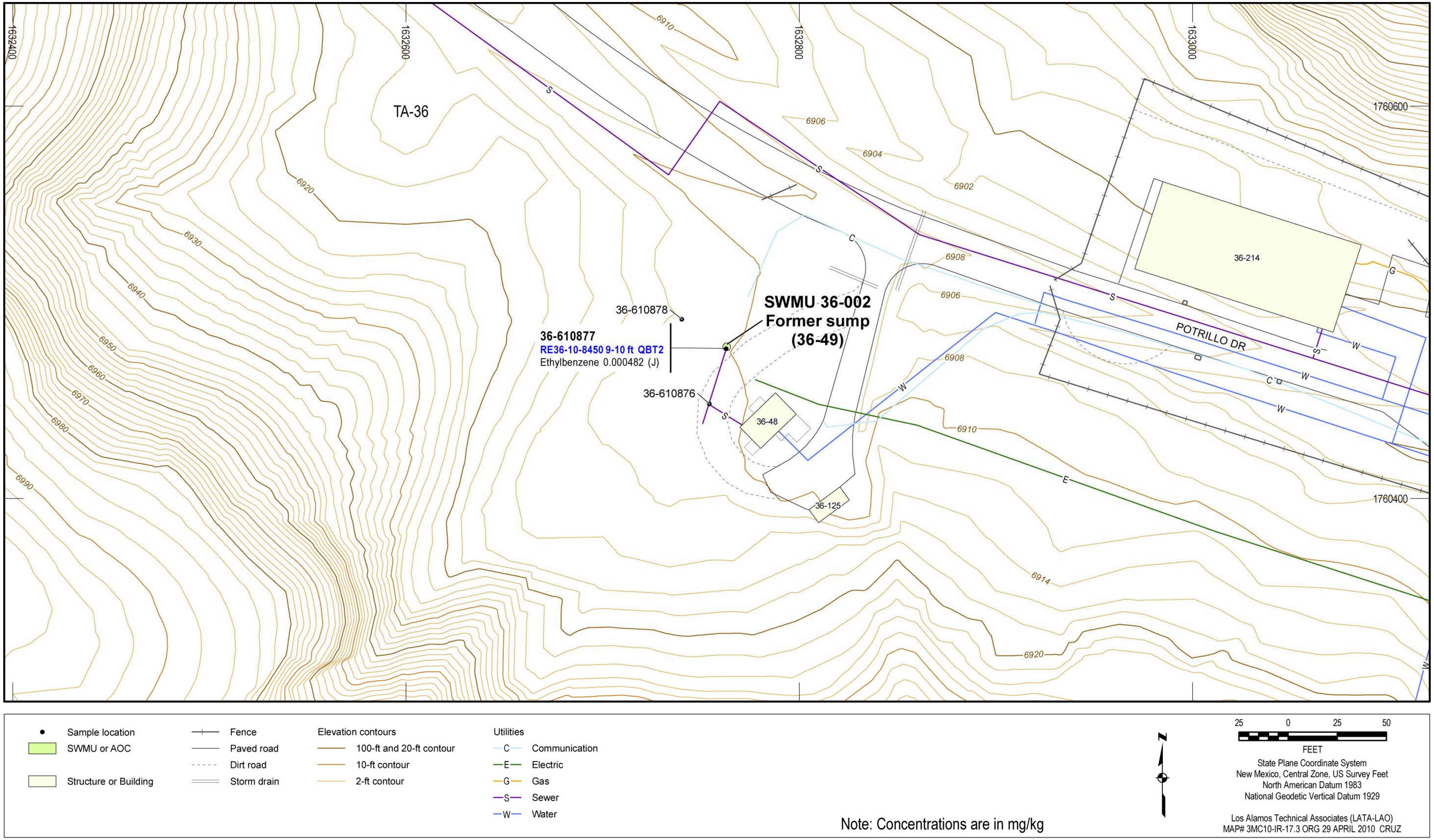


**Figure 9.2-3 Organic chemicals detected at SWMU 36-002**

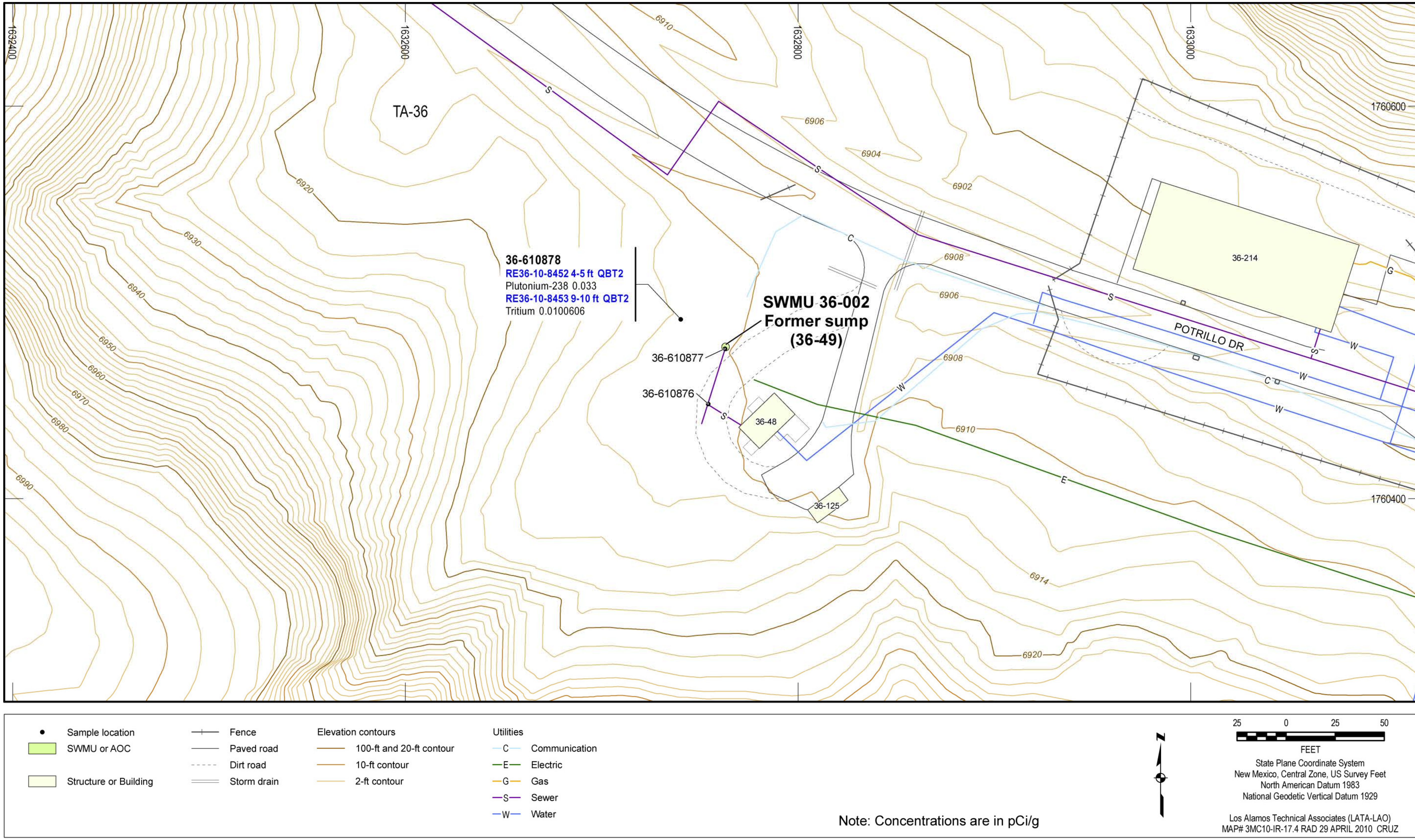


**Figure 9.2-4 Radionuclides detected or detected above BVs/FVs at SWMU 36-002**

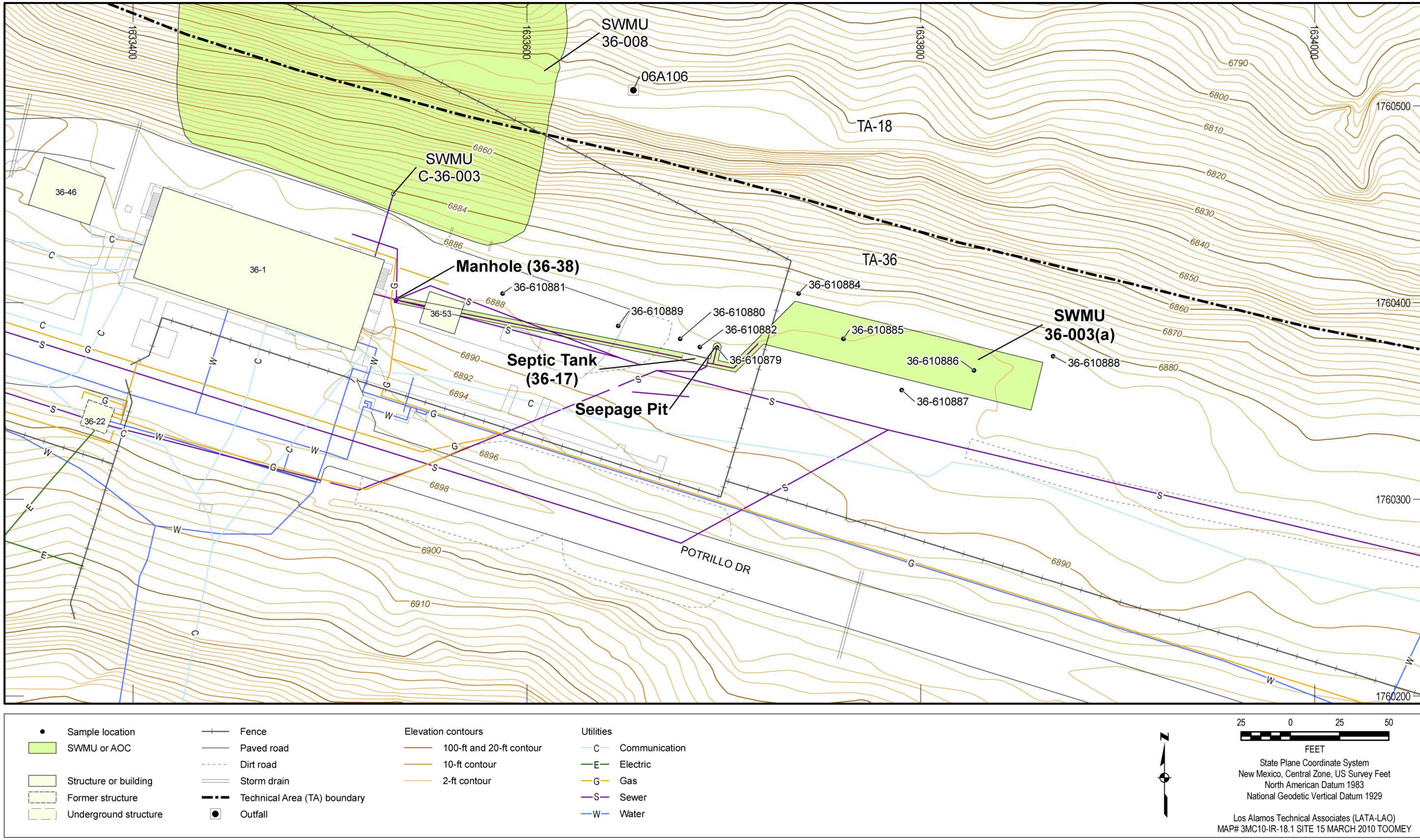


**Figure 9.3-1 SWMU 36-003(a) site map and sampling locations**

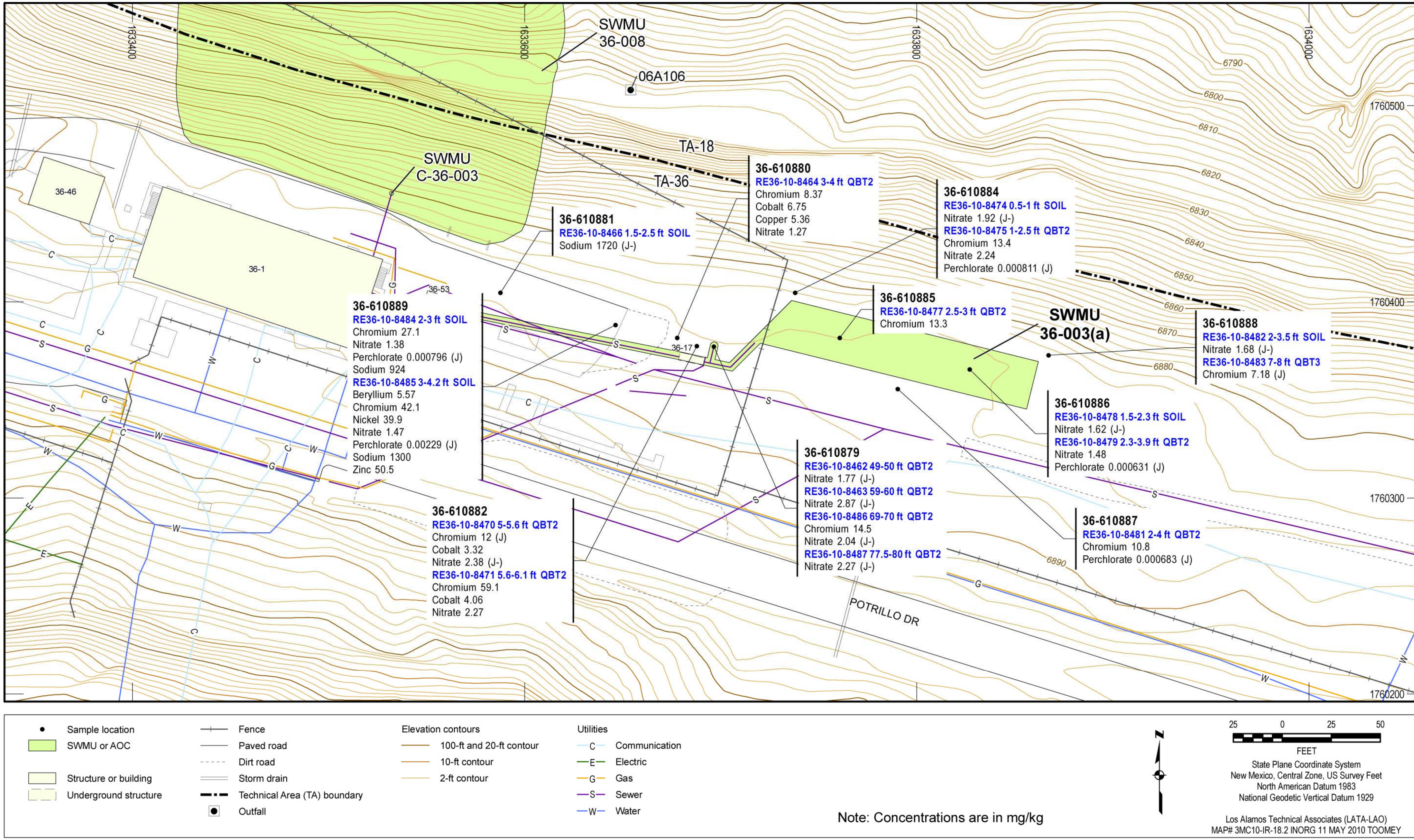


**Figure 9.3-2 Inorganic chemicals detected or detected above BVs at SWMU 36-003(a)**

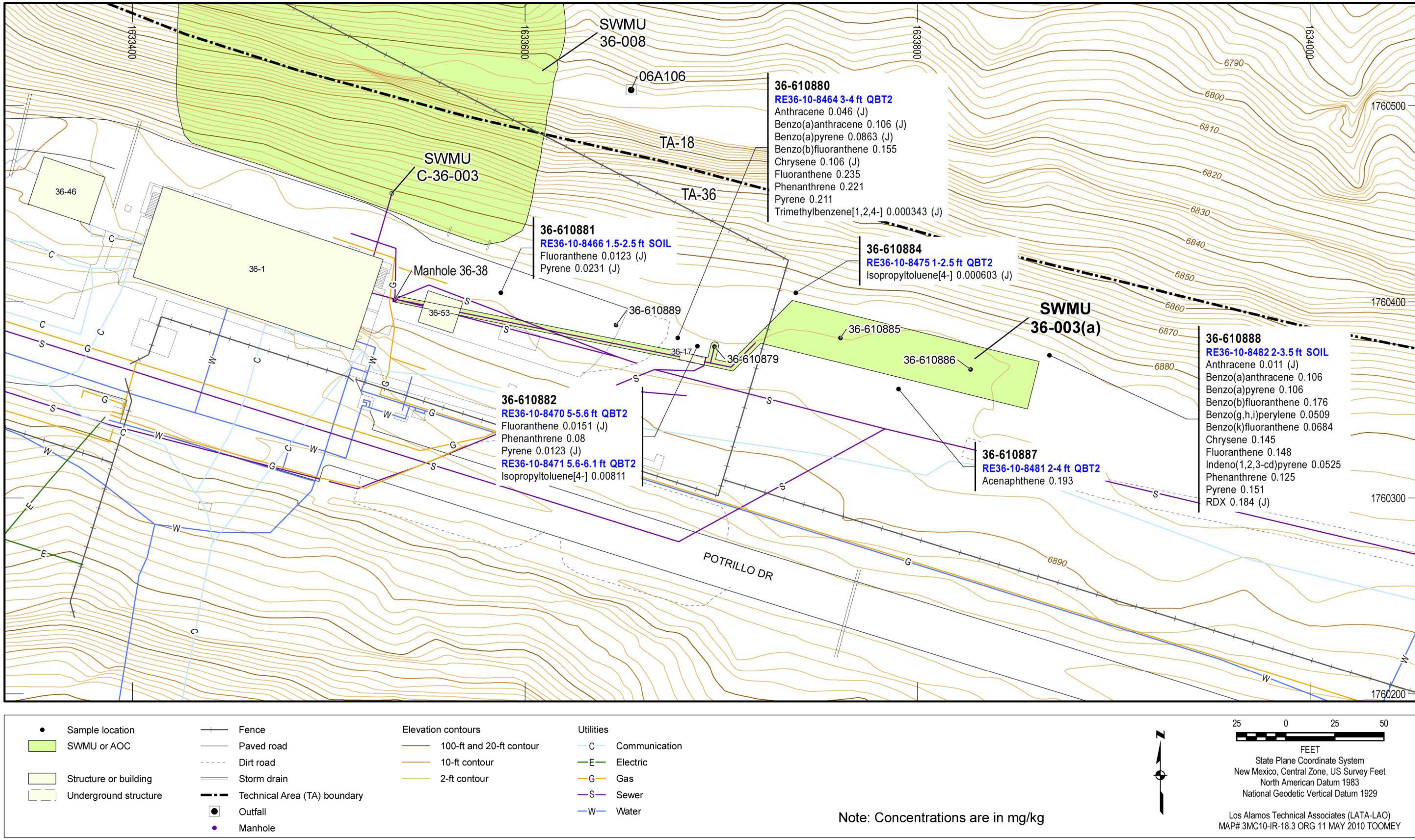


**Figure 9.3-3 Organic chemicals detected at SWMU 36-003(a)**

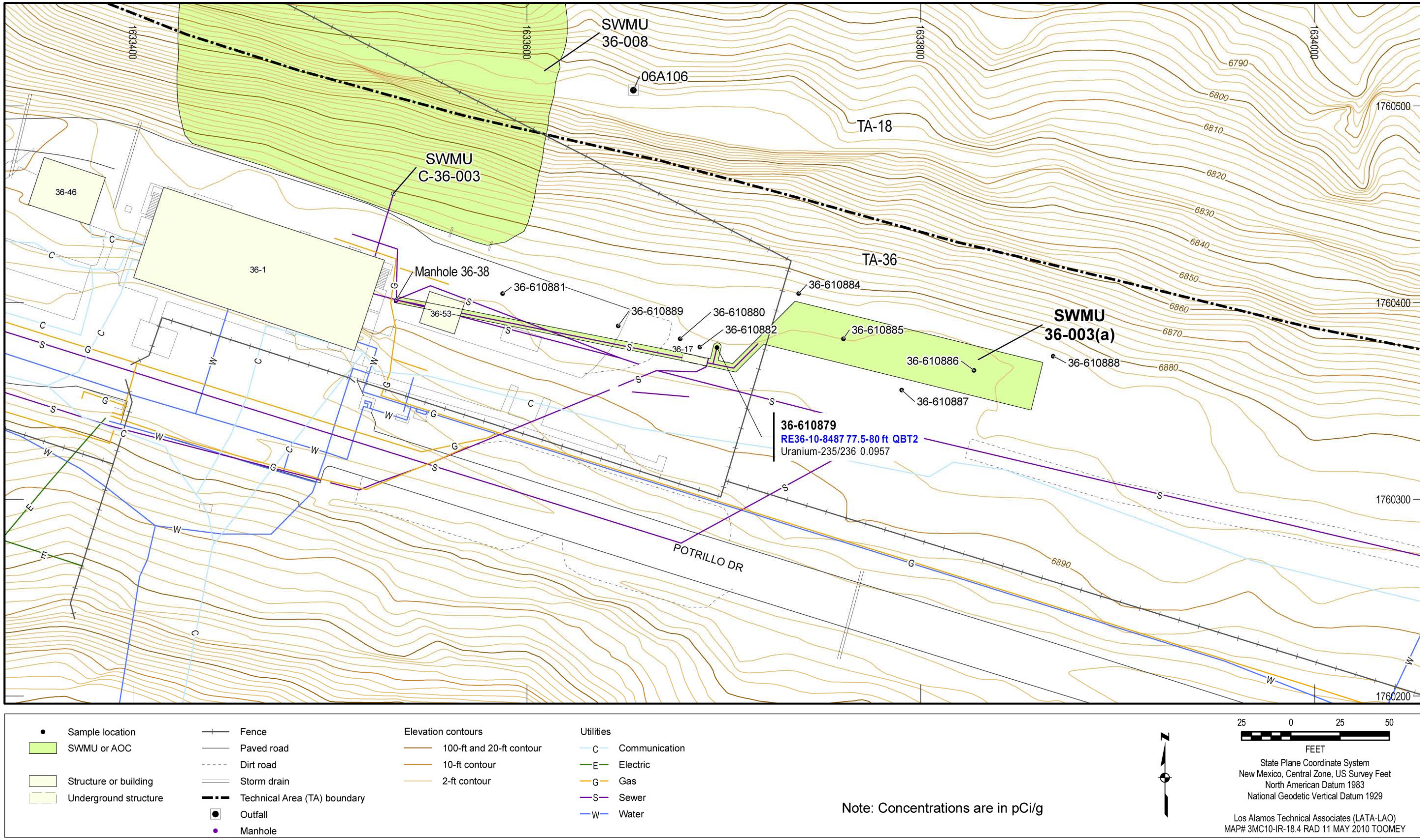


**Figure 9.3-4 Radionuclides detected or detected above BVs/FVs at SWMU 36-003(a)**

**Table 1.1-1**
**Sites under Investigation in theThreemile Canyon Aggregate Area**

| Consolidated Unit | SWMU/AOC | Brief Description | 2009–2010 Investigation | Current Status |
|---|---|---|---|---|
| **Former TA-12** | | | | |
| Consolidated Unit 12-001(a)-99 | SWMU 12-001(a) | Firing pit steel-lined chamber | Sampled | Supplemental investigation report (section 6.2) |
| | SWMU 12-001(b) | Former firing pit | Sampled | Supplemental investigation report (section 6.3) |
| | SWMU 12-002 | Potential soil contamination | Sampled | Supplemental investigation report (section 6.4) |
| | AOC C-12-005 | Potential soil contamination associated with former junction box | Sampled | Supplemental investigation report (section 6.11) |
| | AOC 12-004(a) | Radiation test site | Sampled | Supplemental investigation report (section 6.5) |
| | AOC 12-004(b) | Pipe | Sampled | Supplemental investigation report (section 6.6) |
| | AOC C-12-001 | Potential soil contamination associated with former building | Sampled | Supplemental investigation report (section 6.7) |
| | AOC C-12-002 | Potential soil contamination associated with former building | Sampled | Supplemental investigation report (section 6.8) |
| | AOC C-12-003 | Potential soil contamination associated with former building | Sampled | Supplemental investigation report (section 6.9) |
| | AOC C-12-004 | Potential soil contamination associated with former building | Sampled | Supplemental investigation report (section 6.10) |
| **TA-14** | | | | |
| | AOC C-14-006 | Potential soil contamination associated with former building | Sampled | Supplemental investigation report (section 7.2) |

**Table 1.1-1 (continued)**

| Consolidated Unit | SWMU/AOC | Brief Description | 2009–2010 Investigation | Current Status |
|---|---|---|---|---|
| **TA-15** | | | | |
| | SWMU 15-004(a) | Firing site C | None; deferred per Table IV-2 of the Consent Order | Investigation deferred until no longer within firing site testing hazard zone |
| | AOC 15-004(d) | Firing platforms | Sampled | Further investigation delayed until SWMU 15-004(a) is investigated |
| | AOC 15-005(c) | Container storage area (R-41) | Sampled | Supplemental investigation report (section 8.2) |
| | SWMU 15-006(b) | Ector firing site | None; deferred per Table IV-2 of the Consent Order | Investigation deferred until no longer within firing site testing hazard zone |
| Consolidated Unit 15-006(c)-99 | SWMU 15-006(c) | Firing site R-44 | None; deferred per Table IV-2 of the Consent Order | Investigation deferred until no longer within firing site testing hazard zone |
| | SWMU 15-008(b) | Surface disposal area | Sampled | Supplemental investigation report (section 8.5) |
| Consolidated Unit 15-006(d)-99 | SWMU 15-006(d) | Firing site R-45 | None; deferred per Table IV-2 of the Consent Order | Investigation deferred until no longer within firing site testing hazard zone |
| | AOC 15-008(g) | Surface disposal area | Sampled | Supplemental investigation report (section 8.6) |
| Consolidated Unit 15-007(c)-00 | SWMU 15-007(c) | Shaft | Sampled | Supplemental investigation report (section 8.3) |
| | SWMU 15-007(d) | Shaft | Sampled | Supplemental investigation report (section 8.4) |
| | SWMU 15-009(b) | Septic system | Sampled | Supplemental investigation report (section 8.7) |
| | SWMU 15-009(c) | Septic system | Sampled | Supplemental investigation report (section 8.8) |
| | SWMU 15-009(h) | Septic system | Sampled | Supplemental investigation report (section 8.9) |
| | SWMU 15-010(b) | Settling tank | Sampled | Supplemental investigation report (section 8.10) |
| | AOC 15-014(h) | Outfalls from building 15-40 | Sampled | Supplemental investigation report (section 8.11) |
| **TA-36** | | | | |
| | SWMU 36-002 | Former sump | Sampled | Supplemental investigation report (section 9.2) |
| | SWMU 36-003(a) | Septic system | Sampled | Supplemental investigation report (section 9.3) |
| | SWMU 36-008 | Surface disposal area located near building 36-1 | Sampled | Supplemental investigation report (section 9.4) |
| | SWMU C-36-003 | Outfall from building 36-1 | Sampled | Supplemental investigation report (section 9.5) |

Note: Shading denotes consolidated unit.

**Table 3.2-1**
**Surveyed Coordinates for Locations Sampled in 2009–2010**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| **Former TA-12** | | | |
| SWMU 12-001(a) | 12-610693 | 1623054.33 | 1765567.37 |
| | 12-610694 | 1623021.14 | 1765564.77 |
| | 12-610695 | 1623016.75 | 1765601.40 |
| | 12-610696 | 1623040.30 | 1765587.51 |
| | 12-610697 | 1623070.95 | 1765627.62 |
| | 12-610698 | 1623072.65 | 1765549.01 |
| | 12-610699 | 1623078.77 | 1765578.78 |
| | 12-610700 | 1623102.38 | 1765585.69 |
| | 12-610701 | 1623062.24 | 1765600.70 |
| | 12-610666 | 1623111.96 | 1765414.51 |
| | 12-610667 | 1623202.79 | 1765280.04 |
| | 12-610668 | 1623461.17 | 1765094.31 |
| | 12-610669 | 1623077.04 | 1765508.03 |
| | 12-610670 | 1623159.10 | 1765343.79 |
| | 12-610671 | 1623240.36 | 1765244.19 |
| | 12-610672 | 1623356.55 | 1765185.65 |
| | 12-610673 | 1623402.87 | 1765141.14 |
| | 12-610674 | 1623457.90 | 1765027.56 |
| | 12-610675 | 1623471.87 | 1764971.68 |
| | 12-610676 | 1623501.55 | 1764913.15 |
| | 12-610677 | 1623513.44 | 1764847.45 |
| | 12-610678 | 1623501.71 | 1764796.91 |
| | 12-610679 | 1623490.36 | 1764651.82 |
| | 12-610680 | 1623527.12 | 1764615.39 |
| SWMU 12-001(b) | 12-610639 | 1623139.85 | 1765618.96 |
| | 12-610640 | 1623226.47 | 1765570.70 |
| | 12-610641 | 1623215.19 | 1765555.22 |
| | 12-610642 | 1623228.26 | 1765557.01 |
| | 12-610643 | 1623176.97 | 1765572.51 |
| | 12-610644 | 1623227.10 | 1765611.26 |
| | 12-610645 | 1623228.28 | 1765543.86 |
| | 12-610646 | 1623190.79 | 1765508.19 |
| | 12-610647 | 1623129.45 | 1765501.00 |
| | 12-610648 | 1623194.06 | 1765447.62 |
| | 12-610649 | 1623266.33 | 1765501.99 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 12-001(b) (continued) | 12-610650 | 1623289.03 | 1765455.73 |
| | 12-610651 | 1623284.34 | 1765576.11 |
| | 12-610652 | 1623321.74 | 1765553.49 |
| | 12-610653 | 1623299.19 | 1765636.85 |
| | 12-610654 | 1623241.96 | 1765557.04 |
| | 12-610655 | 1623224.08 | 1765666.72 |
| SWMU 12-002 | 12-610787 | 1623266.88 | 1765520.59 |
| AOC 12-004(a) | 12-610527 | 1629060.03 | 1764359.12 |
| | 12-610528 | 1629128.95 | 1764374.77 |
| | 12-610529 | 1629131.67 | 1764334.53 |
| | 12-610530 | 1629085.29 | 1764293.57 |
| | 12-610539 | 1629069.59 | 1764320.87 |
| | 12-610540 | 1629019.87 | 1764320.93 |
| | 12-610541 | 1629045.09 | 1764294.95 |
| | 12-610542 | 1629016.37 | 1764276.54 |
| | 12-610543 | 1629029.34 | 1764248.61 |
| | 12-610544 | 1629015.06 | 1764228.80 |
| | 12-610545 | 1628919.62 | 1764172.13 |
| | 12-610546 | 1628868.89 | 1764149.08 |
| | 12-610547 | 1628849.12 | 1764121.31 |
| | 12-610548 | 1628818.01 | 1764081.02 |
| | 12-610549 | 1628776.25 | 1764004.87 |
| | 12-610550 | 1628717.61 | 1763916.27 |
| AOC 12-004(b) | 12-610553 | 1629086.65 | 1764388.42 |
| | 12-610554 | 1629062.78 | 1764391.15 |
| | 12-611939 | 1629102.25 | 1764382.74 |
| | 12-611940 | 1629099.34 | 1764384.15 |
| AOC C-12-001 | 12-610624 | 1622516.37 | 1765568.71 |
| | 12-610625 | 1622530.95 | 1765557.77 |
| | 12-610626 | 1622518.60 | 1765554.57 |
| | 12-610627 | 1622505.28 | 1765548.96 |
| | 12-610628 | 1622520.89 | 1765540.63 |
| AOC C-12-002 | 12-610629 | 1622426.31 | 1765619.36 |
| | 12-610630 | 1622443.31 | 1765605.93 |
| | 12-610631 | 1622425.86 | 1765591.17 |
| | 12-610632 | 1622411.10 | 1765605.04 |
| | 12-610633 | 1622427.71 | 1765606.87 |
| AOC C-12-003 | 12-610634 | 1622465.20 | 1765756.92 |
| | 12-610635 | 1622462.64 | 1765741.67 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| AOC C-12-003 (continued) | 12-610636 | 1622441.92 | 1765755.53 |
| | 12-610637 | 1622464.55 | 1765782.89 |
| | 12-610638 | 1622495.32 | 1765765.08 |
| AOC C-12-004 | 12-610569 | 1622410.20 | 1765646.20 |
| | 12-610570 | 1622410.20 | 1765631.88 |
| | 12-610571 | 1622410.65 | 1765619.36 |
| | 12-610572 | 1622425.41 | 1765631.88 |
| | 12-610573 | 1622394.09 | 1765630.10 |
| AOC C-12-005 | 12-610656 | 1623010.08 | 1765548.01 |
| | 12-610657 | 1623002.90 | 1765529.31 |
| | 12-610658 | 1623018.13 | 1765537.57 |
| | 12-610659 | 1622991.34 | 1765546.01 |
| | 12-610660 | 1623006.16 | 1765539.63 |
| **TA-14** | | | |
| AOC C-14-006 | 14-610661 | 1620243.82 | 1764139.17 |
| | 14-610662 | 1620232.65 | 1764150.46 |
| | 14-610663 | 1620247.55 | 1764161.31 |
| | 14-610664 | 1620261.82 | 1764153.24 |
| | 14-610665 | 1620247.27 | 1764151.11 |
| **TA-15** | | | |
| AOC 15-005(c) | 15-610558 | 1625113.94 | 1762443.66 |
| | 15-610559 | 1625093.11 | 1762447.34 |
| | 15-610560 | 1625154.78 | 1762386.49 |
| | 15-610561 | 1625046.54 | 176467.23 |
| | 15-610562 | 1625096.41 | 1762497.01 |
| | 15-610563 | 1625170.48 | 1762457.64 |
| | 15-610564 | 1625133.28 | 1762412.51 |
| | 15-610555 | 1625276.48 | 1762300.72 |
| | 15-610556 | 1625234.82 | 1762327.68 |
| | 15-610557 | 1625193.17 | 1762355.04 |
| SWMU 15-007(c) | 15-610816 | 1626281.25 | 1763382.57 |
| | 15-610817 | 1626378.95 | 1763397.73 |
| | 15-610818 | 1626363.82 | 1763300.67 |
| | 15-610792 | 1626317.09 | 1763353.73 |
| | 15-610793 | 1626364.89 | 1763371.26 |
| | 15-610794 | 1626352.35 | 1763335.13 |
| | 15-610796 | 1626328.36 | 1763345.27 |
| | 15-610797 | 1626325.18 | 1763364.98 |
| | 15-610798 | 1626333.63 | 1763376.56 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 15-007(c) (continued) | 15-610799 | 1626345.23 | 1763368.12 |
| | 15-610800 | 1626319.92 | 1763334.04 |
| | 15-610801 | 1626331.51 | 1763325.28 |
| | 15-610802 | 1626339.93 | 1763337.20 |
| | 15-610803 | 1626343.10 | 1763317.52 |
| | 15-610804 | 1626362.75 | 1763320.35 |
| | 15-610805 | 1626351.55 | 1763328.78 |
| | 15-610806 | 1626358.80 | 1763336.06 |
| | 15-610807 | 1626336.78 | 1763356.89 |
| | 15-610808 | 1626346.64 | 1763358.62 |
| | 15-610809 | 1626356.83 | 1763360.01 |
| | 15-610810 | 1626360.45 | 1763350.00 |
| | 15-610811 | 1626371.21 | 1763331.92 |
| | 15-610812 | 1626367.68 | 1763351.58 |
| | 15-610813 | 1626379.29 | 1763343.53 |
| | 15-610814 | 1626338.17 | 1763347.04 |
| SWMU 15-007(d) | 15-610819 | 1626334.42 | 1763196.54 |
| | 15-610820 | 1626441.47 | 1763238.15 |
| SWMU 15-008(b) | 15-610704 | 1628295.71 | 1762609.07 |
| | 15-610705 | 1628343.79 | 1762525.32 |
| | 15-610706 | 1628458.63 | 1762656.76 |
| | 15-610707 | 1628241.78 | 1762657.20 |
| | 15-610708 | 1628491.08 | 1762703.41 |
| | 15-610709 | 1628193.66 | 1762655.26 |
| | 15-610710 | 1628638.61 | 1762698.82 |
| | 15-610711 | 1628593.14 | 1762575.35 |
| | 15-610712 | 1628599.87 | 1762705.30 |
| | 15-610713 | 1628541.12 | 1762622.51 |
| | 15-610714 | 1628442.99 | 1762701.45 |
| | 15-610715 | 1628445.85 | 1762570.57 |
| | 15-610722 | 1628243.70 | 1762516.64 |
| | 15-610723 | 1628243.71 | 1762561.92 |
| | 15-610724 | 1628297.59 | 1762566.69 |
| | 15-610725 | 1628343.83 | 1762611.92 |
| | 15-610726 | 1628392.92 | 1762610.98 |
| | 15-610727 | 1628397.77 | 1762527.23 |
| | 15-610728 | 1628493.87 | 1762571.57 |
| | 15-610729 | 1628493.05 | 1762618.73 |
| | 15-610730 | 1628493.99 | 1762661.06 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 15-008(b) (continued) | 15-610731 | 1628294.70 | 1762657.20 |
| | 15-610732 | 1628346.72 | 1762656.21 |
| | 15-610733 | 1628240.83 | 1762696.63 |
| | 15-610734 | 1628195.98 | 1762692.89 |
| | 15-610735 | 1628593.85 | 1762487.46 |
| | 15-610736 | 1628700.92 | 1762490.69 |
| | 15-610737 | 1628494.97 | 1762533.02 |
| | 15-610738 | 1628649.90 | 1762538.84 |
| | 15-610739 | 1628544.98 | 1762537.87 |
| | 15-610740 | 1628646.06 | 1762625.37 |
| | 15-610741 | 1628693.24 | 1762671.63 |
| | 15-610742 | 1628691.52 | 1762718.90 |
| | 15-610743 | 1628585.98 | 1762667.22 |
| | 15-610744 | 1628545.00 | 1762704.39 |
| | 15-610745 | 1628694.23 | 1762582.12 |
| | 15-610746 | 1628382.00 | 1762656.98 |
| | 15-610747 | 1628389.09 | 1762699.55 |
| | 15-610748 | 1628343.84 | 1762698.56 |
| | 15-610749 | 1628296.10 | 1762698.60 |
| | 15-610750 | 1628439.09 | 1762613.89 |
| | 15-610751 | 1628443.94 | 1762529.20 |
| | 15-610752 | 1628347.69 | 1762567.68 |
| | 15-610753 | 1628393.87 | 1762569.56 |
| | 15-610754 | 1628290.33 | 1762527.97 |
| | 15-610755 | 1628243.67 | 1762609.05 |
| | 15-610756 | 1628200.41 | 1762606.18 |
| | 15-610757 | 1628147.42 | 1762691.82 |
| | 15-610758 | 1628096.44 | 1762648.54 |
| | 15-610759 | 1628142.63 | 1762607.12 |
| | 15-610760 | 1628047.34 | 1762602.31 |
| | 15-610761 | 1627952.05 | 1762596.52 |
| | 15-610762 | 1627953.94 | 1762676.45 |
| | 15-610763 | 1627998.25 | 1762644.68 |
| | 15-610764 | 1628045.01 | 1762663.89 |
| | 15-610765 | 1628095.45 | 1762686.05 |
| | 15-610716 | 1628539.22 | 1762980.64 |
| | 15-610717 | 1628441.04 | 1762867.04 |
| | 15-610718 | 1628335.15 | 1762936.33 |
| | 15-610719 | 1628012.74 | 1762966.04 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 15-008(b) (continued) | 15-610720 | 1627965.53 | 1762800.62 |
| | 15-610721 | 1628708.60 | 1762910.38 |
| | 15-610766 | 1628630.67 | 1762870.90 |
| | 15-610767 | 1628636.46 | 1762920.88 |
| | 15-610768 | 1628540.22 | 1762869.96 |
| | 15-610769 | 1628538.12 | 1762920.53 |
| | 15-610770 | 1628539.22 | 1762802.54 |
| | 15-610771 | 1628432.35 | 1762987.40 |
| | 15-610772 | 1628444.89 | 1762799.66 |
| | 15-610773 | 1628436.23 | 1762932.55 |
| | 15-610774 | 1628339.97 | 1762792.92 |
| | 15-610775 | 1628338.04 | 1762868.96 |
| | 15-610776 | 1628238.89 | 1762790.99 |
| | 15-610777 | 1628240.82 | 1762872.81 |
| | 15-610778 | 1628334.85 | 1762989.51 |
| | 15-610779 | 1628117.60 | 1762796.77 |
| | 15-610780 | 1628119.94 | 1762754.29 |
| | 15-610781 | 1628106.06 | 1762880.54 |
| | 15-610782 | 1628249.50 | 1762945.01 |
| | 15-610783 | 1627994.41 | 1762885.30 |
| | 15-610784 | 1628102.18 | 1762974.87 |
| | 15-610785 | 1628252.39 | 1763001.79 |
| AOC 15-008(g) | 15-610565 | 1625989.00 | 1763324.19 |
| | 15-610566 | 1625976.26 | 1763303.82 |
| | 15-610567 | 1625967.77 | 1763314.65 |
| | 15-610568 | 1625977.69 | 1763293.37 |
| SWMU 15-009(b) | 15-610835 | 1626002.95 | 1763138.32 |
| | 15-610830 | 1626007.05 | 1763130.37 |
| | 15-610834 | 1626009.62 | 1763124.97 |
| | 15-610836 | 1626012.71 | 1763120.09 |
| | 15-610837 | 1626049.26 | 1763055.28 |
| | 15-610829 | 1626053.10 | 1763047.84 |
| | 15-610831 | 1626135.36 | 1762952.61 |
| | 15-610832 | 1626110.44 | 1762983.85 |
| | 15-610833 | 1626090.18 | 1763022.09 |
| SWMU 15-009(c) | 15-610844 | 1628351.20 | 1762402.97 |
| | 15-610841 | 1628372.69 | 1762351.08 |
| | 15-610843 | 1628376.54 | 1762343.38 |
| | 15-610842 | 1628379.43 | 1762335.68 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 15-009(c) (continued) | 15-610838 | 1628448.09 | 1762250.85 |
| | 15-610839 | 1628606.61 | 1762120.05 |
| | 15-610840 | 1628823.21 | 1761974.73 |
| | 15-610845 | 1628473.40 | 1762225.66 |
| | 15-610846 | 1628516.99 | 1762176.81 |
| | 15-610847 | 1628563.71 | 1762146.62 |
| | 15-610848 | 1628641.23 | 1762075.76 |
| | 15-610849 | 1628682.67 | 1762042.08 |
| | 15-610850 | 1628730.80 | 1762024.78 |
| | 15-610851 | 1628776.99 | 1761995.89 |
| | 15-610852 | 1628852.07 | 1761925.67 |
| | 15-610853 | 1628889.61 | 1761896.71 |
| | 15-610854 | 1628918.13 | 1761877.84 |
| SWMU 15-009(h) | 15-610855 | 1626956.54 | 1761916.63 |
| | 15-610856 | 1626958.82 | 1761915.03 |
| | 15-610857 | 1626363.65 | 1761883.91 |
| | No sample under the tank | | |
| | 15-610858 | 1626970.29 | 1761883.91 |
| | 15-610859 | 1626983.02 | 1761876.16 |
| | 15-610860 | 1626970.5 | 1761865.51 |
| | 15-610861 | 1626962.69 | 1761879.39 |
| SWMU 15-010(b) | 15-610863 | 1623123.50 | 1764411.53 |
| | 15-610864 | 1623037.28 | 1764397.31 |
| | 15-610866 | 1623117.21 | 1764600.96 |
| | 15-610867 | 1623018.95 | 1764368.23 |
| | 15-610868 | 1622992.41 | 1764321.46 |
| | 15-610869 | 1622952.25 | 1764270.51 |
| | 15-610870 | 1622904.38 | 1764242.58 |
| | 15-610871 | 1622844.18 | 1764143.74 |
| | 15-610872 | 1622863.88 | 1764187.41 |
| AOC 15-014(h) | 15-610503 | 1623261.99 | 1763319.07 |
| | 15-610522 | 1623525.66 | 1763174.35 |
| | 15-610526 | 1623475.95 | 1763191.80 |
| | 15-610501 | 1623300.42 | 1763374.32 |
| | 15-610502 | 1623323.50 | 1763414.21 |
| | 15-610504 | 1623640.35 | 1763366.65 |
| | 15-610505 | 1623589.99 | 1763444.29 |
| | 15-610506 | 1623676.01 | 1763542.86 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| AOC 15-014(h) (continued) | 15-610507 | 1623362.64 | 1763461.79 |
| | 15-610508 | 1623379.43 | 1763512.80 |
| | 15-610509 | 1623543.81 | 1763331.72 |
| | 15-610510 | 1623559.20 | 1763389.05 |
| | 15-610511 | 1623598.36 | 1763305.79 |
| | 15-610512 | 1623646.61 | 1763500.21 |
| | 15-610513 | 1623689.33 | 1763412.80 |
| | 15-610514 | 1623717.99 | 1763603.08 |
| | 15-610515 | 1623727.10 | 1763452.66 |
| | 15-610516 | 1623766.94 | 1763497.42 |
| | 15-610517 | 1623886.54 | 1763624.75 |
| | 15-610518 | 1623818.01 | 1763537.99 |
| | 15-610519 | 1623852.23 | 1763576.46 |
| | 15-610520 | 1623455.68 | 1763591.14 |
| | 15-610521 | 1623417.25 | 1763555.48 |
| | 15-610523 | 1623529.82 | 1763291.83 |
| | 15-610524 | 1623578.77 | 1763269.40 |
| | 15-610525 | 1623557.83 | 1763231.68 |
| **TA-36** | | | |
| SWMU 36-002 | 36-610876 | 1632754.289 | 1760448.304 |
| | 36-610877 | 1632762.811 | 1760476.512 |
| | 36-610878 | 1632740.185 | 1760491.498 |
| SWMU 36-003(a) | 36-610881 | 1633587.673 | 1760404.681 |
| | 36-610889 | 1633646.36 | 1760388.19 |
| | 36-610880 | 1633677.745 | 1760381.677 |
| | 36-610882 | 1633687.825 | 1760377.428 |
| | 36-610879 | 1633696.418 | 1760377.196 |
| | 36-610884 | 1633737.96 | 1760404.67 |
| | 36-610885 | 1633760.66 | 1760381.68 |
| | 36-610886 | 1633826.982 | 1760365.524 |
| | 36-610887 | 1633790.21 | 1760355.55 |
| | 36-610888 | 1633867.186 | 1760372.78 |
| SWMU 36-008 | 36-610574 | 1633474.29 | 1760483.75 |
| | 36-610575 | 1633562.31 | 1760458.60 |
| | 36-610576 | 1633520.15 | 1760511.11 |
| | 36-610579 | 1633440.68 | 1760481.40 |
| | 36-610580 | 1633479.36 | 1760644.12 |
| | 36-610581 | 1633442.66 | 1760573.72 |
| | 36-610582 | 1633528.18 | 1760543.39 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 36-008 (continued) | 36-610583 | 1633426.94 | 1760540.70 |
| | 36-610584 | 1633640.71 | 1760608.79 |
| | 36-610585 | 1633558.96 | 1760445.62 |
| | 36-610586 | 1633683.65 | 1760608.35 |
| | 36-610587 | 1633567.86 | 1760474.87 |
| | 36-610588 | 1633505.35 | 1760478.20 |
| | 36-610589 | 1633579.60 | 1760436.75 |
| | 36-610590 | 1633579.51 | 1760524.54 |
| | 36-610591 | 1633612.42 | 1760535.00 |
| | 36-610592 | 1633639.58 | 1760504.59 |
| | 36-610593 | 1633575.99 | 1760495.95 |
| | 36-610594 | 1633628.43 | 1760564.61 |
| | 36-610595 | 1633485.75 | 1760518.88 |
| | 36-610596 | 1633605.83 | 1760569.02 |
| | 36-610597 | 1633679.59 | 1760559.71 |
| | 36-610598 | 1633603.18 | 1760618.85 |
| | 36-610599 | 1633612.20 | 1760426.75 |
| | 36-610600 | 1633622.60 | 1760462.29 |
| | 36-610601 | 1633586.72 | 1760450.46 |
| | 36-610602 | 1633590.05 | 1760466.73 |
| | 36-610603 | 1633386.21 | 1760495.64 |
| | 36-610604 | 1633394.77 | 1760528.13 |
| | 36-610605 | 1633413.95 | 1760489.34 |
| | 36-610606 | 1633422.14 | 1760521.84 |
| | 36-610607 | 1633442.11 | 1760495.58 |
| | 36-610608 | 1633472.20 | 1760472.01 |
| | 36-610609 | 1633448.77 | 1760512.96 |
| | 36-610610 | 1633501.14 | 1760465.01 |
| | 36-610611 | 1633423.28 | 1760672.41 |
| | 36-610612 | 1633462.00 | 1760663.83 |
| | 36-610613 | 1633425.47 | 1760615.78 |
| | 36-610614 | 1633415.04 | 1760582.56 |
| | 36-610615 | 1633477.06 | 1760562.71 |
| | 36-610616 | 1633455.42 | 1760605.80 |
| | 36-610617 | 1633479.15 | 1760593.51 |
| | 36-610618 | 1633512.91 | 1760589.44 |
| | 36-610619 | 1633497.83 | 1760566.15 |
| | 36-610620 | 1633540.40 | 1760581.03 |
| | 36-610621 | 1633554.33 | 1760634.87 |

**Table 3.2-1 (continued)**

| SWMU/AOC | Location ID | Easting (ft) | Northing (ft) |
|---|---|---|---|
| SWMU 36-008 (continued) | 36-610622 | 1633532.41 | 1760640.60 |
| | 36-610623 | 1633453.20 | 1760530.35 |
| SWMU C-36-003 | 36-610821 | 1633569.34 | 1760578.44 |
| | 36-610822 | 1633576.36 | 1760600.24 |
| | 36-610823 | 1633568.14 | 1760635.05 |
| | 36-610824 | 1633549.00 | 1760502.24 |
| | 36-610825 | 1633531.89 | 1760456.78 |
| | 36-610826 | 1633543.08 | 1760484.12 |
| | 36-610827 | 1633537.90 | 1760468.58 |
| | 36-610828 | 1633561.54 | 1760537.05 |

**Table 3.2-2**
**Field-Screening Results for Samples Collected at Threemile Canyon Aggregate Area**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 12-001(a) | 12-610693 | 0 | 0.5 | RE12-10-7838 | ≤16 | ≤2050 |
| 12-001(a) | 12-610693 | 2 | 2.7 | RE12-10-7839 | ≤16 | ≤2190 |
| 12-001(a) | 12-610694 | 0 | 0.7 | RE12-10-7840 | ≤11 | ≤2430 |
| 12-001(a) | 12-610694 | 3 | 3.4 | RE12-10-7841 | ≤33 | ≤1886 |
| 12-001(a) | 12-610695 | 0 | 1 | RE12-10-7842 | ≤55 | ≤2250 |
| 12-001(a) | 12-610695 | 2 | 2.4 | RE12-10-7843 | ≤11 | ≤2100 |
| 12-001(a) | 12-610696 | 0 | 0.75 | RE12-10-7844 | ≤22 | ≤2230 |
| 12-001(a) | 12-610696 | 2 | 2.6 | RE12-10-7845 | ≤77 | ≤2260 |
| 12-001(a) | 12-610697 | 0 | 0.5 | RE12-10-7846 | ≤50 | ≤2080 |
| 12-001(a) | 12-610697 | 1.4 | 1.8 | RE12-10-7847 | ≤16 | ≤1990 |
| 12-001(a) | 12-610698 | 0 | 0.75 | RE12-10-7848 | ≤22 | ≤1845 |
| 12-001(a) | 12-610698 | 2 | 3 | RE12-10-7849 | ≤16 | ≤2140 |
| 12-001(a) | 12-610699 | 0 | 0.5 | RE12-10-7850 | ≤16 | ≤1824 |
| 12-001(a) | 12-610699 | 2 | 2.5 | RE12-10-7851 | ≤71 | ≤1928 |
| 12-001(a) | 12-610700 | 0 | 0.6 | RE12-10-7852 | ≤33 | ≤1893 |
| 12-001(a) | 12-610700 | 2 | 3.5 | RE12-10-7853 | ≤55 | ≤1879 |
| 12-001(a) | 12-610701 | 0 | 0.6 | RE12-10-7854 | ≤16 | ≤2010 |
| 12-001(a) | 12-610701 | 2 | 3 | RE12-10-7855 | ≤71 | ≤2000 |
| 12-001(a) | 12-610666 | 0 | 0.5 | RE12-10-7697 | ≤22 | ≤2090 |
| 12-001(a) | 12-610666 | 1 | 2 | RE12-10-7698 | ≤38 | ≤2030 |
| 12-001(a) | 12-610667 | 0 | 0.5 | RE12-10-7699 | ≤27 | ≤2480 |
| 12-001(a) | 12-610667 | 1 | 2 | RE12-10-7700 | ≤11 | ≤2750 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 12-001(a) | 12-610668 | 0 | 1 | RE12-10-7701 | ≤11 | ≤2450 |
| 12-001(a) | 12-610668 | 1 | 1.9 | RE12-10-7702 | ≤11 | ≤2770 |
| 12-001(a) | 12-610669 | 0 | 0.7 | RE12-10-7703 | ≤33 | ≤2010 |
| 12-001(a) | 12-610669 | 1 | 2.1 | RE12-10-7704 | ≤44 | ≤2220 |
| 12-001(a) | 12-610670 | 0 | 0.7 | RE12-10-7705 | ≤38 | ≤2100 |
| 12-001(a) | 12-610670 | 1 | 2 | RE12-10-7706 | ≤22 | ≤2390 |
| 12-001(a) | 12-610671 | 0 | 0.3 | RE12-10-7707 | ≤33 | ≤2460 |
| 12-001(a) | 12-610671 | 1 | 2 | RE12-10-7708 | ≤44 | ≤2790 |
| 12-001(a) | 12-610672 | 0 | 0.8 | RE12-10-7709 | ≤27 | ≤3060 |
| 12-001(a) | 12-610672 | 1 | 2.8 | RE12-10-7710 | ≤44 | ≤2930 |
| 12-001(a) | 12-610673 | 0 | 0.9 | RE12-10-7711 | ≤22 | ≤2550 |
| 12-001(a) | 12-610673 | 1 | 1.9 | RE12-10-7712 | ≤27 | ≤2670 |
| 12-001(a) | 12-610674 | 0 | 0.1 | RE12-10-7713 | ≤33 | ≤2210 |
| 12-001(a) | 12-610674 | 1 | 2 | RE12-10-7714 | ≤44 | ≤2640 |
| 12-001(a) | 12-610675 | 0 | 0.6 | RE12-10-7715 | ≤33 | ≤2220 |
| 12-001(a) | 12-610675 | 1 | 2 | RE12-10-7716 | ≤16 | ≤2460 |
| 12-001(a) | 12-610676 | 0 | 0.3 | RE12-10-7717 | ≤22 | ≤2430 |
| 12-001(a) | 12-610676 | 1 | 1.5 | RE12-10-7718 | ≤11 | ≤3110 |
| 12-001(a) | 12-610677 | 0 | 0.7 | RE12-10-7719 | ≤27 | ≤2230 |
| 12-001(a) | 12-610678 | 0 | 0.2 | RE12-10-7721 | ≤38 | ≤2810 |
| 12-001(a) | 12-610679 | 0 | 0.5 | RE12-10-7856 | ≤33 | ≤2350 |
| 12-001(a) | 12-610679 | 1 | 1.8 | RE12-10-7857 | ≤33 | ≤2550 |
| 12-001(a) | 12-610680 | 0 | 0.5 | RE12-10-8096 | ≤5 | ≤2280 |
| 12-001(a) | 12-610680 | 1 | 2 | RE12-10-8097 | ≤55 | ≤2430 |
| 12-001(b) | 12-610639 | 0 | 0.5 | RE12-10-7617 | ≤22 | ≤1755 |
| 12-001(b) | 12-610639 | 2 | 3 | RE12-10-7618 | ≤38 | ≤7618 |
| 12-001(b) | 12-610640 | 0 | 1 | RE12-10-7619 | ≤66 | ≤2010 |
| 12-001(b) | 12-610640 | 2 | 2.8 | RE12-10-7620 | ≤38 | ≤1707 |
| 12-001(b) | 12-610641 | 0 | 1 | RE12-10-7621 | ≤38 | ≤2090 |
| 12-001(b) | 12-610641 | 2 | 3.2 | RE12-10-7622 | ≤38 | ≤1990 |
| 12-001(b) | 12-610642 | 0 | 0.5 | RE12-10-7623 | ≤66 | ≤1852 |
| 12-001(b) | 12-610642 | 2 | 2.6 | RE12-10-7624 | ≤11 | ≤2000 |
| 12-001(b) | 12-610643 | 0 | 0.6 | RE12-10-7625 | ≤44 | ≤1803 |
| 12-001(b) | 12-610643 | 2 | 3 | RE12-10-7626 | ≤27 | ≤1686 |
| 12-001(b) | 12-610644 | 0 | 0.5 | RE12-10-7627 | ≤11 | ≤1838 |
| 12-001(b) | 12-610644 | 2 | 2.5 | RE12-10-7628 | ≤60 | ≤1879 |
| 12-001(b) | 12-610645 | 0 | 0.4 | RE12-10-7629 | ≤33 | ≤2080 |
| 12-001(b) | 12-610645 | 2 | 2.7 | RE12-10-7630 | ≤88 | ≤2140 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 12-001(b) | 12-610646 | 0 | 0.6 | RE12-10-7631 | ≤16 | ≤2030 |
| 12-001(b) | 12-610646 | 2 | 3 | RE12-10-7632 | ≤27 | ≤2050 |
| 12-001(b) | 12-610647 | 0 | 0.7 | RE12-10-7633 | ≤16 | 2060 |
| 12-001(b) | 12-610647 | 2 | 3 | RE12-10-7634 | ≤27 | ≤2280 |
| 12-001(b) | 12-610648 | 0 | 0.7 | RE12-10-7635 | ≤22 | ≤2340 |
| 12-001(b) | 12-610648 | 2 | 3 | RE12-10-7636 | ≤55 | ≤2390 |
| 12-001(b) | 12-610649 | 0 | 0.6 | RE12-10-7638 | ≤22 | ≤2450 |
| 12-001(b) | 12-610649 | 2 | 3 | RE12-10-7637 | ≤33 | ≤2330 |
| 12-001(b) | 12-610650 | 0 | 0.7 | RE12-10-7639 | ≤27 | ≤2320 |
| 12-001(b) | 12-610650 | 2 | 3 | RE12-10-7640 | ≤16 | ≤2520 |
| 12-001(b) | 12-610651 | 0 | 0.9 | RE12-10-7641 | ≤38 | ≤2110 |
| 12-001(b) | 12-610651 | 2 | 3 | RE12-10-7642 | ≤55 | ≤2180 |
| 12-001(b) | 12-610652 | 0 | 0.5 | RE12-10-7643 | ≤44 | ≤2170 |
| 12-001(b) | 12-610652 | 2 | 3 | RE12-10-7644 | ≤11 | ≤2350 |
| 12-001(b) | 12-610653 | 0 | 1 | RE12-10-7645 | ≤38 | ≤1969 |
| 12-001(b) | 12-610653 | 2 | 3.6 | RE12-10-7646 | ≤16 | ≤2340 |
| 12-001(b) | 12-610654 | 0 | 1 | RE12-10-7647 | ≤33 | ≤2270 |
| 12-001(b) | 12-610654 | 2 | 3 | RE12-10-7648 | ≤22 | ≤2610 |
| 12-001(b) | 12-610655 | 0 | 0.7 | RE12-10-7649 | ≤55 | ≤2060 |
| 12-001(b) | 12-610655 | 1.5 | 2.5 | RE12-10-7650 | ≤16 | ≤1969 |
| 12-002 | 12-610787 | 0.4 | 0.8 | RE12-10-8094 | ≤33 | ≤2320 |
| 12-002 | 12-610787 | 2 | 3.3 | RE12-10-8095 | ≤33 | ≤2170 |
| 12-004(a) | 12-610527 | 0 | 0.5 | RE12-10-7236 | ≤16 | ≤2020 |
| 12-004(a) | 12-610527 | 1 | 2 | RE12-10-7237 | ≤16 | ≤2580 |
| 12-004(a) | 12-610528 | 0 | 0.5 | RE12-10-7238 | ≤11 | ≤1962 |
| 12-004(a) | 12-610528 | 1 | 2.6 | RE12-10-7239 | ≤22 | ≤2250 |
| 12-004(a) | 12-610529 | 0 | 0.6 | RE12-10-7240 | ≤27 | ≤2100 |
| 12-004(a) | 12-610529 | 1 | 2 | RE12-10-7241 | ≤55 | ≤2450 |
| 12-004(a) | 12-610530 | 0 | 1 | RE12-10-7242 | ≤5 | ≤1997 |
| 12-004(a) | 12-610530 | 1 | 2 | RE12-10-7243 | ≤49 | ≤2260 |
| 12-004(a) | 12-610539 | 0 | 0.7 | RE12-10-7252 | ≤22 | ≤2050 |
| 12-004(a) | 12-610539 | 1 | 2 | RE12-10-7253 | ≤27 | ≤2570 |
| 12-004(a) | 12-610540 | 0 | 0.6 | RE12-10-7254 | ≤27 | ≤2440 |
| 12-004(a) | 12-610540 | 1 | 1.9 | RE12-10-7255 | ≤27 | ≤2320 |
| 12-004(a) | 12-610541 | 0 | 0.6 | RE12-10-7256 | ≤11 | ≤2490 |
| 12-004(a) | 12-610541 | 1 | 2 | RE12-10-7257 | ≤33 | ≤2610 |
| 12-004(a) | 12-610542 | 0 | 0.8 | RE12-10-7258 | ≤33 | ≤2590 |
| 12-004(a) | 12-610542 | 1 | 1.7 | RE12-10-7259 | ≤27 | ≤2640 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 12-004(a) | 12-610543 | 0 | 1 | RE12-10-7260 | ≤38 | ≤2690 |
| 12-004(a) | 12-610543 | 1 | 1.8 | RE12-10-7261 | ≤22 | ≤2480 |
| 12-004(a) | 12-610544 | 0 | 0.6 | RE12-10-7262 | ≤16 | ≤2500 |
| 12-004(a) | 12-610544 | 1 | 1.7 | RE12-10-7263 | ≤16 | ≤2430 |
| 12-004(a) | 12-610545 | 0 | 0.9 | RE12-10-7264 | ≤22 | ≤2700 |
| 12-004(a) | 12-610545 | 1 | 3 | RE12-10-7265 | ≤22 | ≤3150 |
| 12-004(a) | 12-610546 | 0 | 0.5 | RE12-10-7266 | ≤16 | ≤2710 |
| 12-004(a) | 12-610546 | 1 | 2 | RE12-10-7267 | ≤38 | ≤3000 |
| 12-004(a) | 12-610547 | 0 | 0.7 | RE12-10-7268 | ≤22 | ≤3030 |
| 12-004(a) | 12-610547 | 1 | 1.9 | RE12-10-7269 | ≤22 | ≤2920 |
| 12-004(a) | 12-610548 | 0 | 0.8 | RE12-10-7270 | ≤16 | ≤2860 |
| 12-004(a) | 12-610548 | 1 | 1.8 | RE12-10-7271 | ≤27 | ≤2860 |
| 12-004(a) | 12-610549 | 0 | 0.3 | RE12-10-7272 | ≤16 | ≤2550 |
| 12-004(a) | 12-610549 | 1 | 1.3 | RE12-10-7273 | ≤44 | ≤2810 |
| 12-004(a) | 12-610550 | 0 | 0.3 | RE12-10-7274 | ≤33 | ≤2820 |
| 12-004(b) | 12-610553 | 0 | 0.75 | RE12-10-7288 | ≤16 | ≤2190 |
| 12-004(b) | 12-610553 | 2.2 | 3 | RE12-10-7289 | ≤44 | ≤2200 |
| 12-004(b) | 12-610553 | 5 | 6 | RE12-10-7290 | ≤38 | ≤2560 |
| 12-004(b) | 12-610554 | 0 | 1 | RE12-10-7291 | ≤60 | ≤2300 |
| 12-004(b) | 12-610554 | 2 | 3 | RE12-10-7292 | ≤33 | ≤2700 |
| 12-004(b) | 12-610554 | 5 | 6 | RE12-10-7293 | ≤38 | ≤2300 |
| 12-004(b) | 12-611939 | 0 | 0.5 | RE12-10-15442 | ≤25 | ≤796 |
| 12-004(b) | 12-611939 | 2 | 2.5 | RE12-10-15443 | ≤25 | ≤796 |
| 12-004(b) | 12-611939 | 5 | 5.4 | RE12-10-15444 | ≤25 | ≤796 |
| 12-004(b) | 12-611940 | 0 | 0.5 | RE12-10-15445 | ≤25 | ≤796 |
| 12-004(b) | 12-611940 | 2 | 2.5 | RE12-10-15446 | ≤25 | ≤796 |
| 12-004(b) | 12-611940 | 5 | 5.5 | RE12-10-15447 | ≤25 | ≤796 |
| C-12-001 | 12-610624 | 0 | 0.5 | RE12-10-7551 | ≤33 | ≤2190 |
| C-12-001 | 12-610624 | 2 | 3 | RE12-10-7552 | ≤22 | ≤2400 |
| C-12-001 | 12-610625 | 0 | 0.5 | RE12-10-7553 | ≤27 | ≤2050 |
| C-12-001 | 12-610625 | 2 | 3 | RE12-10-7554 | ≤44 | ≤2330 |
| C-12-001 | 12-610626 | 0 | 0.5 | RE12-10-7555 | ≤33 | ≤2470 |
| C-12-001 | 12-610626 | 2.1 | 3 | RE12-10-7556 | ≤27 | ≤2410 |
| C-12-001 | 12-610627 | 0 | 0.5 | RE12-10-7557 | ≤60 | ≤2070 |
| C-12-001 | 12-610627 | 2.4 | 3 | RE12-10-7558 | ≤33 | ≤2390 |
| C-12-001 | 12-610628 | 0 | 1 | RE12-10-7561 | ≤16 | ≤2030 |
| C-12-001 | 12-610628 | 2 | 3 | RE12-10-7562 | ≤22 | ≤3360 |
| C-12-002 | 12-610629 | 0 | 0.5 | RE12-10-7580 | ≤38 | ≤1969 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| C-12-002 | 12-610629 | 2 | 2.75 | RE12-10-7581 | ≤49 | ≤2280 |
| C-12-002 | 12-610630 | 0 | 0.75 | RE12-10-7582 | ≤22 | ≤1983 |
| C-12-002 | 12-610630 | 2 | 3 | RE12-10-7583 | ≤49 | ≤2080 |
| C-12-002 | 12-610631 | 0 | 0.5 | RE12-10-7584 | ≤33 | ≤1942 |
| C-12-002 | 12-610631 | 2 | 3 | RE12-10-7585 | ≤49 | ≤2120 |
| C-12-002 | 12-610632 | 0 | 0.75 | RE12-10-7586 | ≤22 | ≤2230 |
| C-12-002 | 12-610632 | 2 | 3 | RE12-10-7587 | ≤16 | ≤2010 |
| C-12-002 | 12-610633 | 0 | 0.5 | RE12-10-7590 | ≤22 | ≤2110 |
| C-12-002 | 12-610633 | 2 | 3 | RE12-10-7591 | ≤44 | ≤2160 |
| C-12-003 | 12-610634 | 0 | 0.6 | RE12-10-7596 | ≤49 | ≤2530 |
| C-12-003 | 12-610634 | 2.5 | 3 | RE12-10-7597 | ≤49 | ≤2160 |
| C-12-003 | 12-610635 | 0 | 0.5 | RE12-10-7598 | ≤33 | ≤2280 |
| C-12-003 | 12-610635 | 2 | 2.9 | RE12-10-7599 | ≤33 | ≤2190 |
| C-12-003 | 12-610636 | 0 | 0.5 | RE12-10-7600 | ≤22 | ≤1859 |
| C-12-003 | 12-610636 | 2 | 3.2 | RE12-10-7601 | ≤60 | ≤2700 |
| C-12-003 | 12-610637 | 0 | 0.5 | RE12-10-7602 | ≤22 | ≤2120 |
| C-12-003 | 12-610637 | 1.9 | 2.5 | RE12-10-7603 | ≤49 | ≤2730 |
| C-12-003 | 12-610638 | 0 | 0.5 | RE12-10-7606 | ≤55 | ≤2080 |
| C-12-003 | 12-610638 | 2 | 2.7 | RE12-10-7607 | ≤66 | ≤2490 |
| C-12-004 | 12-610569 | 0 | 0.5 | RE12-10-7351 | ≤16 | ≤2120 |
| C-12-004 | 12-610569 | 2 | 3 | RE12-10-7352 | ≤38 | ≤2300 |
| C-12-004 | 12-610570 | 0 | 0.75 | RE12-10-7353 | ≤22 | ≤1959 |
| C-12-004 | 12-610570 | 1.75 | 2.7 | RE12-10-7354 | ≤27 | ≤2290 |
| C-12-004 | 12-610571 | 0 | 0.75 | RE12-10-7355 | ≤22 | ≤2180 |
| C-12-004 | 12-610571 | 2 | 2.5 | RE12-10-7356 | ≤33 | ≤2220 |
| C-12-004 | 12-610572 | 0 | 0.75 | RE12-10-7357 | ≤6 | ≤1976 |
| C-12-004 | 12-610572 | 2 | 2.5 | RE12-10-7358 | ≤60 | ≤2320 |
| C-12-004 | 12-610573 | 0 | 0.5 | RE12-10-7359 | ≤38 | ≤2060 |
| C-12-004 | 12-610573 | 2 | 2.5 | RE12-10-7360 | ≤27 | ≤2220 |
| C-12-005 | 12-610656 | 0 | 0.5 | RE12-10-7663 | ≤11 | ≤1935 |
| C-12-005 | 12-610656 | 2 | 2.9 | RE12-10-7664 | ≤11 | ≤2280 |
| C-12-005 | 12-610657 | 0 | 0.5 | RE12-10-7665 | ≤60 | ≤1949 |
| C-12-005 | 12-610657 | 2 | 3.6 | RE12-10-7666 | ≤49 | ≤2050 |
| C-12-005 | 12-610658 | 0 | 0.5 | RE12-10-7667 | ≤16 | ≤2040 |
| C-12-005 | 12-610658 | 2.5 | 2.9 | RE12-10-7668 | ≤44 | ≤2260 |
| C-12-005 | 12-610659 | 0 | 0.4 | RE12-10-7669 | ≤49 | ≤1872 |
| C-12-005 | 12-610659 | 2 | 3 | RE12-10-7670 | ≤99 | ≤1949 |
| C-12-005 | 12-610660 | 0 | 0.6 | RE12-10-7671 | ≤27 | ≤1769 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| C-12-005 | 12-610660 | 2 | 2.5 | RE12-10-7672 | ≤38 | ≤2190 |
| C-14-006 | 14-610661 | 0 | 0.5 | RE14-10-7679 | ≤16 | ≤1852 |
| C-14-006 | 14-610661 | 2 | 3.1 | RE14-10-7680 | ≤11 | ≤1845 |
| C-14-006 | 14-610662 | 0 | 0.5 | RE14-10-7681 | ≤16 | ≤2080 |
| C-14-006 | 14-610662 | 2 | 4.5 | RE14-10-7682 | ≤38 | ≤2090 |
| C-14-006 | 14-610664 | 0 | 0.5 | RE14-10-7685 | ≤33 | ≤1935 |
| C-14-006 | 14-610664 | 2 | 4 | RE14-10-7686 | ≤22 | ≤2100 |
| C-14-006 | 14-610665 | 0 | 0.8 | RE14-10-7687 | ≤16 | ≤1769 |
| C-14-006 | 14-610665 | 2.4 | 3.5 | RE14-10-7688 | ≤16 | ≤2000 |
| 15-005(c) | 15-610555 | 0 | 0.5 | RE15-10-7300 | ≤27 | ≤2080 |
| 15-005(c) | 15-610555 | 1 | 2 | RE15-10-7301 | ≤27 | ≤1810 |
| 15-005(c) | 15-610556 | 0 | 0.7 | RE15-10-7302 | ≤27 | ≤2010 |
| 15-005(c) | 15-610556 | 1 | 3 | RE15-10-7303 | ≤49 | ≤1962 |
| 15-005(c) | 15-610557 | 0 | 0.5 | RE15-10-7304 | ≤27 | ≤2230 |
| 15-005(c) | 15-610557 | 1 | 2 | RE15-10-7305 | ≤16 | ≤1983 |
| 15-005(c) | 15-610558 | 0 | 0.5 | RE15-10-7306 | ≤22 | ≤2260 |
| 15-005(c) | 15-610558 | 2 | 3 | RE15-10-7307 | ≤16 | ≤1907 |
| 15-005(c) | 15-610559 | 0 | 0.5 | RE15-10-7308 | ≤11 | ≤1976 |
| 15-005(c) | 15-610559 | 2 | 3.3 | RE15-10-7309 | ≤16 | ≤1824 |
| 15-005(c) | 15-610560 | 0 | 0.5 | RE15-10-7310 | ≤16 | ≤2110 |
| 15-005(c) | 15-610560 | 2 | 4 | RE15-10-7311 | ≤38 | ≤1955 |
| 15-005(c) | 15-610561 | 0 | 0.5 | RE15-10-7312 | ≤5 | ≤1845 |
| 15-005(c) | 15-610561 | 2 | 3 | RE15-10-7313 | ≤5 | ≤1790 |
| 15-005(c) | 15-610562 | 0 | 0.5 | RE15-10-7314 | ≤11 | ≤1734 |
| 15-005(c) | 15-610562 | 2 | 3 | RE15-10-7315 | ≤27 | ≤1637 |
| 15-005(c) | 15-610563 | 0 | 0.7 | RE15-10-7316 | ≤0 | ≤1513 |
| 15-005(c) | 15-610563 | 2 | 3 | RE15-10-7317 | ≤22 | ≤1935 |
| 15-005(c) | 15-610564 | 0 | 0.7 | RE15-10-7318 | ≤5 | ≤2080 |
| 15-005(c) | 15-610564 | 2 | 3 | RE15-10-7319 | ≤5 | ≤1686 |
| 15-007(c) | 15-610792 | 0 | 0.5 | RE15-10-8126 | ≤5 | ≤1796 |
| 15-007(c) | 15-610792 | 1 | 2 | RE15-10-8127 | ≤11 | ≤1575 |
| 15-007(c) | 15-610793 | 0 | 0.5 | RE15-10-8128 | ≤16 | ≤1637 |
| 15-007(c) | 15-610793 | 1 | 2 | RE15-10-8129 | ≤11 | ≤1707 |
| 15-007(c) | 15-610794 | 0 | 0.5 | RE15-10-8130 | ≤27 | ≤1762 |
| 15-007(c) | 15-610794 | 1 | 2 | RE15-10-8131 | ≤16 | ≤1658 |
| 15-007(c) | 15-610796 | 0 | 0.5 | RE15-10-8134 | ≤27 | ≤1755 |
| 15-007(c) | 15-610796 | 1 | 2 | RE15-10-8135 | ≤0 | ≤1955 |
| 15-007(c) | 15-610797 | 0 | 0.5 | RE15-10-8136 | ≤27 | ≤1665 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-007(c) | 15-610797 | 1 | 1.5 | RE15-10-8137 | ≤22 | ≤1610 |
| 15-007(c) | 15-610798 | 0 | 0.5 | RE15-10-8138 | ≤16 | ≤1582 |
| 15-007(c) | 15-610798 | 1 | 2 | RE15-10-8139 | ≤22 | ≤1444 |
| 15-007(c) | 15-610799 | 0 | 0.5 | RE15-10-8140 | ≤11 | ≤1437 |
| 15-007(c) | 15-610799 | 1 | 2 | RE15-10-8141 | ≤27 | ≤1596 |
| 15-007(c) | 15-610800 | 0 | 0.5 | RE15-10-8142 | ≤11 | ≤1368 |
| 15-007(c) | 15-610800 | 1 | 2 | RE15-10-8143 | ≤11 | ≤1520 |
| 15-007(c) | 15-610801 | 0 | 0.5 | RE15-10-8144 | ≤5 | ≤1423 |
| 15-007(c) | 15-610801 | 1 | 2 | RE15-10-8145 | ≤16 | ≤1624 |
| 15-007(c) | 15-610802 | 0 | 0.5 | RE15-10-8147 | ≤11 | ≤1534 |
| 15-007(c) | 15-610802 | 1 | 2 | RE15-10-8146 | ≤5 | ≤1707 |
| 15-007(c) | 15-610803 | 0 | 0.5 | RE15-10-8148 | ≤11 | ≤1575 |
| 15-007(c) | 15-610803 | 1 | 2.1 | RE15-10-8149 | ≤11 | ≤1748 |
| 15-007(c) | 15-610804 | 0 | 0.5 | RE15-10-8151 | ≤16 | ≤1796 |
| 15-007(c) | 15-610804 | 1 | 2 | RE15-10-8150 | ≤11 | ≤1672 |
| 15-007(c) | 15-610805 | 0 | 0.5 | RE15-10-8153 | ≤0 | ≤1755 |
| 15-007(c) | 15-610805 | 1 | 2 | RE15-10-8152 | ≤5 | ≤1527 |
| 15-007(c) | 15-610806 | 0 | 0.5 | RE15-10-8154 | ≤5 | ≤1610 |
| 15-007(c) | 15-610806 | 1 | 2 | RE15-10-8155 | ≤27 | ≤1589 |
| 15-007(c) | 15-610807 | 0 | 0.5 | RE15-10-8156 | ≤22 | ≤1555 |
| 15-007(c) | 15-610807 | 1 | 2 | RE15-10-8157 | ≤16 | ≤1561 |
| 15-007(c) | 15-610808 | 0 | 0.5 | RE15-10-8158 | ≤11 | ≤1589 |
| 15-007(c) | 15-610808 | 1 | 2 | RE15-10-8159 | ≤22 | ≤1651 |
| 15-007(c) | 15-610809 | 0 | 0.5 | RE15-10-8160 | ≤16 | ≤1548 |
| 15-007(c) | 15-610809 | 1 | 1.5 | RE15-10-8161 | ≤11 | ≤1845 |
| 15-007(c) | 15-610810 | 0 | 0.5 | RE15-10-8162 | ≤5 | ≤1796 |
| 15-007(c) | 15-610810 | 1 | 2 | RE15-10-8163 | ≤22 | ≤1527 |
| 15-007(c) | 15-610811 | 0 | 0.5 | RE15-10-8164 | ≤11 | ≤1783 |
| 15-007(c) | 15-610811 | 1 | 2 | RE15-10-8165 | ≤11 | ≤1748 |
| 15-007(c) | 15-610812 | 0 | 0.5 | RE15-10-8166 | ≤27 | ≤1720 |
| 15-007(c) | 15-610812 | 1 | 1.5 | RE15-10-8167 | ≤33 | ≤1561 |
| 15-007(c) | 15-610813 | 0 | 0.5 | RE15-10-8168 | ≤5 | ≤1430 |
| 15-007(c) | 15-610813 | 1 | 1.5 | RE15-10-8169 | ≤5 | ≤1513 |
| 15-007(c) | 15-610814 | 0 | 0.5 | RE15-10-8170 | ≤16 | ≤1714 |
| 15-007(c) | 15-610814 | 1 | 2 | RE15-10-8171 | ≤16 | ≤1561 |
| 15-007(c) | 15-610816 | 3.5 | 5 | RE15-10-8174 | ≤33 | ≤1748 |
| 15-007(c) | 15-610816 | 17.5 | 20 | RE15-10-8175 | ≤33 | ≤2120 |
| 15-007(c) | 15-610816 | 34 | 35 | RE15-10-8176 | ≤16 | ≤1935 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-007(c) | 15-610816 | 49 | 50 | RE15-10-8177 | ≤16 | ≤1783 |
| 15-007(c) | 15-610816 | 65 | 66 | RE15-10-8178 | ≤5 | ≤1755 |
| 15-007(c) | 15-610816 | 79 | 80 | RE15-10-8179 | ≤20 | ≤643 |
| 15-007(c) | 15-610816 | 94 | 95 | RE15-10-8180 | ≤23.1 | ≤1410 |
| 15-007(c) | 15-610816 | 109 | 110 | RE15-10-8181 | ≤10 | ≤2700 |
| 15-007(c) | 15-610816 | 124 | 125 | RE15-10-8182 | ≤10 | ≤1053 |
| 15-007(c) | 15-610816 | 139 | 140 | RE15-10-8183 | ≤3 | ≤1680 |
| 15-007(c) | 15-610816 | 154 | 155 | RE15-10-8184 | ≤24 | ≤1397 |
| 15-007(c) | 15-610816 | 169 | 170 | RE15-10-8185 | ≤20 | ≤1397 |
| 15-007(c) | 15-610816 | 181.5 | 182.5 | RE15-10-8210 | ≤24 | ≤1397 |
| 15-007(c) | 15-610817 | 4 | 5 | RE15-10-8186 | ≤14 | ≤2040 |
| 15-007(c) | 15-610817 | 18 | 20 | RE15-10-8187 | ≤.009 | ≤2121 |
| 15-007(c) | 15-610817 | 34 | 35 | RE15-10-8188 | ≤33 | ≤224 |
| 15-007(c) | 15-610817 | 49 | 50 | RE15-10-8189 | ≤48 | ≤2980 |
| 15-007(c) | 15-610817 | 64 | 65 | RE15-10-8190 | ≤72 | ≤427 |
| 15-007(c) | 15-610817 | 79 | 80 | RE15-10-8191 | ≤24 | ≤2230 |
| 15-007(c) | 15-610817 | 94 | 95 | RE15-10-8192 | ≤24 | ≤2210 |
| 15-007(c) | 15-610817 | 109 | 110 | RE15-10-8193 | ≤19 | ≤2280 |
| 15-007(c) | 15-610817 | 124 | 126 | RE15-10-8194 | ≤38 | ≤2660 |
| 15-007(c) | 15-610817 | 139 | 140 | RE15-10-8195 | ≤19 | ≤2350 |
| 15-007(c) | 15-610817 | 156 | 157.5 | RE15-10-8196 | ≤24 | ≤2410 |
| 15-007(c) | 15-610817 | 171.5 | 172.5 | RE15-10-8197 | ≤38 | ≤322 |
| 15-007(c) | 15-610817 | 181.5 | 182.5 | RE15-10-8211 | ≤28 | ≤223 |
| 15-007(c) | 15-610818 | 4 | 5 | RE15-10-8198 | ≤14 | ≤330 |
| 15-007(c) | 15-610818 | 19 | 20 | RE15-10-8199 | ≤28 | ≤212 |
| 15-007(c) | 15-610818 | 34 | 35 | RE15-10-8200 | ≤9 | ≤240 |
| 15-007(c) | 15-610818 | 49 | 50 | RE15-10-8201 | ≤24 | ≤215 |
| 15-007(c) | 15-610818 | 63.5 | 65 | RE15-10-8202 | ≤19 | ≤420 |
| 15-007(c) | 15-610818 | 79 | 80 | RE15-10-8203 | ≤22 | ≤282 |
| 15-007(c) | 15-610818 | 94 | 95 | RE15-10-8204 | ≤6.5 | ≤257 |
| 15-007(c) | 15-610818 | 109 | 110 | RE15-10-8205 | ≤45 | ≤258 |
| 15-007(c) | 15-610818 | 124 | 130 | RE15-10-8206 | ≤68 | ≤280 |
| 15-007(c) | 15-610818 | 139 | 140 | RE15-10-8207 | ≤59 | ≤640 |
| 15-007(c) | 15-610818 | 154 | 155 | RE15-10-8208 | ≤32 | ≤275 |
| 15-007(c) | 15-610818 | 169 | 170 | RE15-10-8209 | ≤5.9 | ≤275 |
| 15-007(c) | 15-610818 | 180 | 182.5 | RE15-10-8212 | ≤71 | ≤264 |
| 15-007(d) | 15-610819 | 4 | 5 | RE15-10-8240 | ≤23 | ≤2280 |
| 15-007(d) | 15-610819 | 19 | 20 | RE15-10-8241 | ≤47 | ≤2600 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-007(d) | 15-610819 | 33 | 35 | RE15-10-8242 | ≤17 | ≤2400 |
| 15-007(d) | 15-610819 | 49 | 50 | RE15-10-8243 | ≤53 | ≤2510 |
| 15-007(d) | 15-610819 | 64 | 65 | RE15-10-8244 | ≤89 | ≤2370 |
| 15-007(d) | 15-610819 | 79 | 80 | RE15-10-8245 | ≤47 | ≤2450 |
| 15-007(d) | 15-610819 | 104 | 105 | RE15-10-8246 | ≤41 | ≤2230 |
| 15-007(d) | 15-610819 | 109 | 110 | RE15-10-8247 | ≤36 | ≤2112 |
| 15-007(d) | 15-610819 | 123.5 | 125 | RE15-10-8248 | ≤46 | ≤2110 |
| 15-007(d) | 15-610819 | 138.5 | 140 | RE15-10-8249 | ≤10 | ≤1989 |
| 15-007(d) | 15-610819 | 154 | 155 | RE15-10-8250 | ≤36 | ≤1963 |
| 15-007(d) | 15-610819 | 169 | 170 | RE15-10-8251 | ≤36 | ≤2140 |
| 15-007(d) | 15-610819 | 181.5 | 182.5 | RE15-10-8264 | ≤5 | ≤1956 |
| 15-007(d) | 15-610820 | 4 | 5 | RE15-10-8252 | ≤25 | ≤2070 |
| 15-007(d) | 15-610820 | 18 | 20 | RE15-10-8253 | ≤20 | ≤2040 |
| 15-007(d) | 15-610820 | 34 | 35 | RE15-10-8254 | ≤25 | ≤1845 |
| 15-007(d) | 15-610820 | 48.5 | 50 | RE15-10-8255 | ≤25 | ≤2.10 |
| 15-007(d) | 15-610820 | 63.5 | 65 | RE15-10-8256 | ≤15 | ≤1898 |
| 15-007(d) | 15-610820 | 79 | 80 | RE15-10-8257 | ≤30 | ≤2.9 |
| 15-007(d) | 15-610820 | 93.5 | 95 | RE15-10-8258 | ≤30 | ≤2.15 |
| 15-007(d) | 15-610820 | 108.5 | 110 | RE15-10-8259 | ≤15 | ≤2.9 |
| 15-007(d) | 15-610820 | 124 | 125 | RE15-10-8260 | ≤15 | ≤1898 |
| 15-007(d) | 15-610820 | 138.5 | 140 | RE15-10-8261 | ≤41 | ≤1891 |
| 15-007(d) | 15-610820 | 153.5 | 155 | RE15-10-8262 | ≤51 | ≤2100 |
| 15-007(d) | 15-610820 | 168.5 | 170 | RE15-10-8263 | ≤51 | ≤2120 |
| 15-007(d) | 15-610820 | 178 | 180 | RE15-10-8265 | ≤30 | ≤2040 |
| 15-008(b) | 15-610704 | 0 | 0.5 | RE15-10-7869 | ≤16 | ≤3000 |
| 15-008(b) | 15-610704 | 1 | 2.5 | RE15-10-7870 | ≤27 | ≤2250 |
| 15-008(b) | 15-610705 | 0 | 0.5 | RE15-10-7871 | ≤27 | ≤3210 |
| 15-008(b) | 15-610705 | 2 | 3 | RE15-10-7872 | ≤27 | ≤2380 |
| 15-008(b) | 15-610706 | 0 | 0.5 | RE15-10-7873 | ≤33 | ≤3520 |
| 15-008(b) | 15-610706 | 2 | 3.5 | RE15-10-7874 | ≤33 | ≤2680 |
| 15-008(b) | 15-610707 | 0 | 0.5 | RE15-10-7875 | ≤55 | ≤3510 |
| 15-008(b) | 15-610707 | 2.5 | 3.5 | RE15-10-7876 | ≤33 | ≤2550 |
| 15-008(b) | 15-610708 | 0 | 0.5 | RE15-10-7877 | ≤16 | ≤2730 |
| 15-008(b) | 15-610708 | 3 | 4 | RE15-10-7878 | ≤38 | ≤2670 |
| 15-008(b) | 15-610709 | 0 | 0.5 | RE15-10-7879 | ≤16 | ≤2520 |
| 15-008(b) | 15-610709 | 2.8 | 3.6 | RE15-10-7880 | ≤44 | ≤2120 |
| 15-008(b) | 15-610710 | 0 | 0.5 | RE15-10-7881 | ≤5 | ≤1990 |
| 15-008(b) | 15-610710 | 1 | 1.6 | RE15-10-7882 | ≤38 | ≤2010 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-008(b) | 15-610711 | 0 | 0.4 | RE15-10-7883 | ≤52 | ≤2120 |
| 15-008(b) | 15-610711 | 3 | 3.8 | RE15-10-7884 | ≤91 | ≤2410 |
| 15-008(b) | 15-610712 | 0 | 0.4 | RE15-10-7885 | ≤22 | ≤2260 |
| 15-008(b) | 15-610712 | 3 | 3.5 | RE15-10-7886 | ≤5 | ≤2130 |
| 15-008(b) | 15-610713 | 0 | 0.6 | RE15-10-7887 | ≤27 | ≤1534 |
| 15-008(b) | 15-610713 | 3 | 4 | RE15-10-7888 | ≤33 | ≤1928 |
| 15-008(b) | 15-610714 | 0 | 0.5 | RE15-10-7889 | ≤33 | ≤3080 |
| 15-008(b) | 15-610714 | 2.5 | 3.5 | RE15-10-7890 | ≤60 | ≤2640 |
| 15-008(b) | 15-610715 | 0 | 0.5 | RE15-10-7891 | ≤33 | ≤4490 |
| 15-008(b) | 15-610715 | 3 | 4 | RE15-10-7892 | ≤49 | ≤2430 |
| 15-008(b) | 15-610716 | 0 | 0.5 | RE15-10-7893 | ≤11 | ≤1755 |
| 15-008(b) | 15-610716 | 1 | 2 | RE15-10-7894 | ≤5 | ≤1617 |
| 15-008(b) | 15-610717 | 0 | 0.5 | RE15-10-7895 | ≤27 | ≤2130 |
| 15-008(b) | 15-610717 | 1 | 2 | RE15-10-7896 | ≤27 | ≤2280 |
| 15-008(b) | 15-610718 | 0 | 0.5 | RE15-10-7897 | ≤44 | ≤2020 |
| 15-008(b) | 15-610718 | 1 | 2 | RE15-10-7898 | ≤27 | ≤1997 |
| 15-008(b) | 15-610719 | 0 | 0.5 | RE15-10-7899 | ≤16 | ≤1955 |
| 15-008(b) | 15-610719 | 1 | 1.5 | RE15-10-7900 | ≤22 | ≤1817 |
| 15-008(b) | 15-610720 | 0 | 0.5 | RE15-10-7901 | ≤5 | ≤1776 |
| 15-008(b) | 15-610720 | 1 | 2 | RE15-10-7902 | ≤22 | ≤1962 |
| 15-008(b) | 15-610721 | 0 | 0.5 | RE15-10-7903 | ≤5 | ≤2230 |
| 15-008(b) | 15-610721 | 1 | 1.9 | RE15-10-7904 | ≤16 | ≤2050 |
| 15-008(b) | 15-610722 | 0 | 0.5 | RE15-10-7905 | ≤16 | ≤3840 |
| 15-008(b) | 15-610722 | 3 | 3.8 | RE15-10-7906 | ≤22 | ≤2590 |
| 15-008(b) | 15-610723 | 0 | 0.5 | RE15-10-7907 | ≤44 | ≤3760 |
| 15-008(b) | 15-610723 | 2.9 | 3.5 | RE15-10-7908 | ≤16 | ≤6710 |
| 15-008(b) | 15-610724 | 0 | 0.5 | RE15-10-7909 | ≤38 | ≤5730 |
| 15-008(b) | 15-610724 | 3 | 3.6 | RE15-10-7910 | ≤27 | ≤3730 |
| 15-008(b) | 15-610725 | 0 | 0.3 | RE15-10-7911 | ≤55 | ≤8130 |
| 15-008(b) | 15-610725 | 3 | 4 | RE15-10-7912 | ≤16 | ≤4810 |
| 15-008(b) | 15-610726 | 0 | 0.3 | RE15-10-7913 | ≤27 | ≤2030 |
| 15-008(b) | 15-610726 | 2 | 3 | RE15-10-7914 | ≤22 | ≤2390 |
| 15-008(b) | 15-610727 | 0 | 0.4 | RE15-10-7915 | ≤27 | ≤5480 |
| 15-008(b) | 15-610727 | 2 | 3.1 | RE15-10-7916 | ≤38 | ≤2480 |
| 15-008(b) | 15-610728 | 0 | 0.6 | RE15-10-7917 | ≤38 | ≤2350 |
| 15-008(b) | 15-610728 | 1.3 | 3.6 | RE15-10-7918 | ≤55 | ≤2260 |
| 15-008(b) | 15-610729 | 0 | 0.5 | RE15-10-7919 | ≤49 | ≤3290 |
| 15-008(b) | 15-610729 | 2 | 3.3 | RE15-10-7920 | ≤27 | ≤2680 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-008(b) | 15-610730 | 0 | 0.5 | RE15-10-7921 | ≤38 | ≤2920 |
| 15-008(b) | 15-610730 | 2 | 3 | RE15-10-7922 | ≤66 | ≤2600 |
| 15-008(b) | 15-610731 | 0 | 0.5 | RE15-10-7923 | ≤22 | ≤2830 |
| 15-008(b) | 15-610731 | 2 | 3 | RE15-10-7924 | ≤22 | ≤2470 |
| 15-008(b) | 15-610732 | 0 | 0.5 | RE15-10-7925 | ≤16 | ≤4400 |
| 15-008(b) | 15-610732 | 2 | 2.8 | RE15-10-7926 | ≤5 | ≤3700 |
| 15-008(b) | 15-610733 | 0 | 0.5 | RE15-10-7927 | ≤16 | ≤3280 |
| 15-008(b) | 15-610733 | 3 | 4 | RE15-10-7928 | ≤27 | ≤2210 |
| 15-008(b) | 15-610734 | 0 | 0.5 | RE15-10-7929 | ≤49 | ≤2030 |
| 15-008(b) | 15-610734 | 2.5 | 3.5 | RE15-10-7930 | ≤27 | ≤2240 |
| 15-008(b) | 15-610735 | 0 | 0.5 | RE15-10-7931 | ≤39 | ≤2370 |
| 15-008(b) | 15-610735 | 3 | 4 | RE15-10-7932 | ≤39 | ≤2490 |
| 15-008(b) | 15-610736 | 0 | 0.5 | RE15-10-7933 | ≤39 | ≤2440 |
| 15-008(b) | 15-610736 | 3 | 3.9 | RE15-10-7934 | ≤85 | ≤2880 |
| 15-008(b) | 15-610737 | 0 | 0.3 | RE15-10-7935 | ≤104 | ≤4540 |
| 15-008(b) | 15-610737 | 2.9 | 4 | RE15-10-7936 | ≤72 | ≤2710 |
| 15-008(b) | 15-610738 | 0 | 0.5 | RE15-10-7937 | ≤85 | ≤2330 |
| 15-008(b) | 15-610738 | 2.9 | 3.7 | RE15-10-7938 | ≤11 | ≤2060 |
| 15-008(b) | 15-610739 | 0 | 0.5 | RE15-10-7939 | ≤27 | ≤1596 |
| 15-008(b) | 15-610739 | 3 | 3.5 | RE15-10-7940 | ≤22 | ≤7940 |
| 15-008(b) | 15-610740 | 0 | 0.5 | RE15-10-7941 | ≤22 | ≤1845 |
| 15-008(b) | 15-610740 | 3 | 4 | RE15-10-7942 | ≤11 | ≤2130 |
| 15-008(b) | 15-610741 | 0 | 1 | RE15-10-7943 | ≤16 | ≤2270 |
| 15-008(b) | 15-610741 | 2.9 | 3.5 | RE15-10-7944 | ≤27 | ≤2060 |
| 15-008(b) | 15-610742 | 0 | 0.3 | RE15-10-7945 | ≤16 | ≤1783 |
| 15-008(b) | 15-610742 | 2.5 | 3.5 | RE15-10-7946 | ≤16 | ≤2070 |
| 15-008(b) | 15-610743 | 0 | 0.5 | RE15-10-7947 | ≤16 | ≤2300 |
| 15-008(b) | 15-610743 | 3 | 3.9 | RE15-10-7948 | ≤11 | ≤2050 |
| 15-008(b) | 15-610744 | 0 | 0.5 | RE15-10-7949 | ≤16 | ≤1700 |
| 15-008(b) | 15-610744 | 1.5 | 1.7 | RE15-10-7950 | ≤22 | ≤1741 |
| 15-008(b) | 15-610745 | 0 | 0.5 | RE15-10-7951 | ≤5 | ≤2030 |
| 15-008(b) | 15-610745 | 2.5 | 3.5 | RE15-10-7952 | ≤16 | ≤1997 |
| 15-008(b) | 15-610746 | 0 | 0.8 | RE15-10-7953 | ≤22 | ≤7970 |
| 15-008(b) | 15-610746 | 3 | 3.4 | RE15-10-7954 | ≤33 | ≤3340 |
| 15-008(b) | 15-610747 | 0 | 0.5 | RE15-10-7955 | ≤5 | ≤4250 |
| 15-008(b) | 15-610747 | 3 | 3.7 | RE15-10-7956 | ≤44 | 2910 |
| 15-008(b) | 15-610748 | 0 | 1 | RE15-10-7957 | ≤16 | ≤8210 |
| 15-008(b) | 15-610748 | 3 | 4 | RE15-10-7958 | ≤60 | ≤14,040 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-008(b) | 15-610749 | 0 | 0.7 | RE15-10-7959 | ≤22 | ≤7170 |
| 15-008(b) | 15-610749 | 3 | 3.6 | RE15-10-7960 | ≤49 | ≤5440 |
| 15-008(b) | 15-610750 | 0 | 0.5 | RE15-10-7961 | ≤22 | ≤3700 |
| 15-008(b) | 15-610750 | 3 | 4 | RE15-10-7962 | ≤38 | ≤2010 |
| 15-008(b) | 15-610751 | 0 | 0.5 | RE15-10-7963 | ≤55 | ≤1962 |
| 15-008(b) | 15-610751 | 3 | 4 | RE15-10-7964 | ≤55 | ≤2070 |
| 15-008(b) | 15-610752 | 0 | 0.5 | RE15-10-7965 | ≤55 | ≤2350 |
| 15-008(b) | 15-610752 | 3 | 4.2 | RE15-10-7966 | ≤44 | ≤2150 |
| 15-008(b) | 15-610753 | 0 | 0.5 | RE15-10-7967 | ≤22 | ≤6140 |
| 15-008(b) | 15-610753 | 3 | 3.5 | RE15-10-7968 | ≤38 | ≤2710 |
| 15-008(b) | 15-610754 | 0 | 0.5 | RE15-10-7969 | ≤38 | ≤2150 |
| 15-008(b) | 15-610754 | 3 | 3.3 | RE15-10-7970 | ≤44 | ≤1900 |
| 15-008(b) | 15-610755 | 0 | 0.5 | RE15-10-7971 | ≤55 | ≤6250 |
| 15-008(b) | 15-610755 | 3 | 3.6 | RE15-10-7972 | ≤88 | ≤2450 |
| 15-008(b) | 15-610756 | 0 | 0.7 | RE15-10-7973 | ≤49 | ≤2120 |
| 15-008(b) | 15-610756 | 2.7 | 3.3 | RE15-10-7974 | ≤38 | ≤2280 |
| 15-008(b) | 15-610757 | 0 | 0.3 | RE15-10-7975 | ≤44 | ≤2150 |
| 15-008(b) | 15-610757 | 3 | 3.6 | RE15-10-7976 | ≤49 | ≤2660 |
| 15-008(b) | 15-610758 | 0 | 0.6 | RE15-10-7977 | ≤27 | ≤1886 |
| 15-008(b) | 15-610758 | 1 | 2 | RE15-10-7978 | ≤49 | ≤1984 |
| 15-008(b) | 15-610759 | 0 | 0.5 | RE15-10-7979 | ≤27 | ≤2050 |
| 15-008(b) | 15-610759 | 3 | 3.7 | RE15-10-7980 | ≤49 | ≤2060 |
| 15-008(b) | 15-610760 | 0 | 0.5 | RE15-10-7981 | ≤11 | ≤1900 |
| 15-008(b) | 15-610760 | 3 | 3.5 | RE15-10-7982 | ≤27 | ≤2040 |
| 15-008(b) | 15-610761 | 0 | 0.5 | RE15-10-7983 | ≤11 | ≤1879 |
| 15-008(b) | 15-610761 | 3 | 3.7 | RE15-10-7984 | ≤33 | ≤2280 |
| 15-008(b) | 15-610762 | 0 | 0.4 | RE15-10-7985 | ≤11 | ≤1955 |
| 15-008(b) | 15-610763 | 0 | 0.3 | RE15-10-7987 | ≤5 | ≤1803 |
| 15-008(b) | 15-610763 | 2.5 | 3.5 | RE15-10-7988 | ≤16 | ≤1942 |
| 15-008(b) | 15-610764 | 0 | 0.5 | RE15-10-7989 | ≤16 | ≤1969 |
| 15-008(b) | 15-610764 | 3 | 4 | RE15-10-7990 | ≤11 | ≤2050 |
| 15-008(b) | 15-610765 | 0 | 0.5 | RE15-10-7991 | ≤22 | ≤1803 |
| 15-008(b) | 15-610765 | 3 | 4 | RE15-10-7992 | ≤5 | ≤2140 |
| 15-008(b) | 15-610766 | 0 | 0.7 | RE15-10-7993 | ≤0 | ≤2090 |
| 15-008(b) | 15-610766 | 1 | 2 | RE15-10-7994 | ≤16 | ≤1962 |
| 15-008(b) | 15-610767 | 0 | 1 | RE15-10-7995 | ≤22 | ≤2150 |
| 15-008(b) | 15-610767 | 1 | 1.8 | RE15-10-7996 | ≤16 | ≤2200 |
| 15-008(b) | 15-610768 | 0 | 0.7 | RE15-10-7997 | ≤16 | ≤2060 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-008(b) | 15-610768 | 1 | 1.5 | RE15-10-7998 | ≤11 | ≤2220 |
| 15-008(b) | 15-610769 | 0 | 0.7 | RE15-10-7999 | ≤16 | ≤1769 |
| 15-008(b) | 15-610769 | 1 | 2 | RE15-10-8000 | ≤33 | ≤2030 |
| 15-008(b) | 15-610770 | 0 | 0.8 | RE15-10-8001 | ≤22 | ≤2330 |
| 15-008(b) | 15-610770 | 1 | 2 | RE15-10-8002 | ≤38 | ≤2020 |
| 15-008(b) | 15-610771 | 0 | 0.5 | RE15-10-8003 | ≤38 | ≤2420 |
| 15-008(b) | 15-610771 | 1 | 2 | RE15-10-8004 | ≤22 | ≤1907 |
| 15-008(b) | 15-610772 | 0 | 0.5 | RE15-10-8005 | ≤5 | ≤2500 |
| 15-008(b) | 15-610772 | 1 | 2 | RE15-10-8006 | ≤11 | ≤2220 |
| 15-008(b) | 15-610773 | 0 | 0.8 | RE15-10-8007 | ≤22 | ≤2010 |
| 15-008(b) | 15-610773 | 1 | 2 | RE15-10-8008 | ≤11 | ≤2380 |
| 15-008(b) | 15-610774 | 0 | 0.5 | RE15-10-8009 | ≤11 | ≤5100 |
| 15-008(b) | 15-610774 | 1 | 2 | RE15-10-8010 | ≤27 | ≤2520 |
| 15-008(b) | 15-610775 | 0 | 0.5 | RE15-10-8011 | ≤11 | ≤2070 |
| 15-008(b) | 15-610775 | 1 | 2 | RE15-10-8012 | ≤22 | ≤2110 |
| 15-008(b) | 15-610776 | 0 | 0.5 | RE15-10-8013 | ≤5 | ≤2220 |
| 15-008(b) | 15-610776 | 1 | 2 | RE15-10-8014 | ≤33 | ≤2250 |
| 15-008(b) | 15-610777 | 0 | 0.5 | RE15-10-8015 | ≤5 | ≤1762 |
| 15-008(b) | 15-610777 | 0.5 | 2 | RE15-10-8016 | ≤22 | ≤2100 |
| 15-008(b) | 15-610778 | 0 | 0.5 | RE15-10-8017 | ≤27 | ≤3560 |
| 15-008(b) | 15-610778 | 1 | 2 | RE15-10-8018 | ≤16 | ≤3980 |
| 15-008(b) | 15-610779 | 0 | 0.5 | RE15-10-8019 | ≤19 | ≤2410 |
| 15-008(b) | 15-610779 | 1 | 2 | RE15-10-8020 | ≤44 | ≤2340 |
| 15-008(b) | 15-610780 | 0 | 0.5 | RE15-10-8021 | ≤11 | ≤2170 |
| 15-008(b) | 15-610780 | 1 | 2 | RE15-10-8022 | ≤27 | ≤2270 |
| 15-008(b) | 15-610781 | 0 | 0.5 | RE15-10-8023 | ≤11 | ≤2000 |
| 15-008(b) | 15-610781 | 1 | 2 | RE15-10-8024 | ≤22 | ≤2060 |
| 15-008(b) | 15-610782 | 0 | 0.5 | RE15-10-8025 | ≤22 | ≤1810 |
| 15-008(b) | 15-610782 | 1 | 2 | RE15-10-8026 | ≤0 | ≤2090 |
| 15-008(b) | 15-610783 | 0 | 0.5 | RE15-10-8027 | ≤22 | ≤1859 |
| 15-008(b) | 15-610783 | 1 | 2 | RE15-10-8028 | ≤16 | ≤1817 |
| 15-008(b) | 15-610784 | 0 | 0.5 | RE15-10-8029 | ≤0 | ≤1596 |
| 15-008(b) | 15-610784 | 1 | 2 | RE15-10-8030 | ≤22 | ≤1907 |
| 15-008(b) | 15-610785 | 0 | 0.5 | RE15-10-8031 | ≤5 | ≤1879 |
| 15-008(b) | 15-610785 | 1 | 2 | RE15-10-8032 | ≤16 | ≤2080 |
| 15-008(g) | 15-610565 | 0 | 0.5 | RE15-10-7332 | ≤5 | ≤1617 |
| 15-008(g) | 15-610565 | 2 | 2.5 | RE15-10-7333 | ≤11 | ≤1596 |
| 15-008(g) | 15-610566 | 0 | 0.5 | RE15-10-7334 | ≤22 | ≤1430 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-008(g) | 15-610566 | 2 | 4 | RE15-10-7335 | ≤16 | ≤2080 |
| 15-008(g) | 15-610567 | 0 | 0.5 | RE15-10-7336 | ≤11 | ≤1727 |
| 15-008(g) | 15-610567 | 2 | 3 | RE15-10-7337 | ≤11 | ≤1631 |
| 15-008(g) | 15-610568 | 0 | 0.5 | RE15-10-7338 | ≤16 | ≤1506 |
| 15-008(g) | 15-610568 | 2 | 3 | RE15-10-7339 | ≤22 | ≤1893 |
| 15-009(b) | 15-610829 | 0 | 0.3 | RE15-10-8300 | ≤5 | ≤1900 |
| 15-009(b) | 15-610829 | 1 | 2 | RE15-10-8301 | ≤33 | ≤2280 |
| 15-009(b) | 15-610830 | 7 | 8 | RE15-10-8302 | ≤5 | ≤1983 |
| 15-009(b) | 15-610830 | 12 | 13 | RE15-10-8303 | ≤11 | ≤1879 |
| 15-009(b) | 15-610831 | 0 | 1 | RE15-10-8305 | ≤22 | ≤9130 |
| 15-009(b) | 15-610831 | 1 | 2 | RE15-10-8304 | ≤11 | ≤2250 |
| 15-009(b) | 15-610832 | 0 | 1 | RE15-10-8306 | ≤11 | ≤2050 |
| 15-009(b) | 15-610832 | 1 | 1.5 | RE15-10-8307 | ≤11 | ≤1824 |
| 15-009(b) | 15-610833 | 0 | 0.5 | RE15-10-8308 | ≤11 | ≤1845 |
| 15-009(b) | 15-610833 | 1 | 2 | RE15-10-8309 | ≤27 | ≤2050 |
| 15-009(b) | 15-610834 | 15 | 16 | RE15-10-8310 | ≤27 | ≤2120 |
| 15-009(b) | 15-610834 | 17 | 18 | RE15-10-8311 | ≤11 | ≤2080 |
| 15-009(b) | 15-610835 | 7 | 8 | RE15-10-8312 | ≤16 | ≤1976 |
| 15-009(b) | 15-610835 | 12 | 13 | RE15-10-8313 | ≤22 | ≤2120 |
| 15-009(b) | 15-610836 | 7 | 8 | RE15-10-8314 | ≤22 | ≤2280 |
| 15-009(b) | 15-610836 | 12 | 13 | RE15-10-8315 | ≤11 | ≤2140 |
| 15-009(b) | 15-610837 | 47.5 | 50 | RE15-10-8316 | ≤10 | ≤2010 |
| 15-009(b) | 15-610837 | 58.5 | 60 | RE15-10-8317 | ≤25 | ≤2080 |
| 15-009(b) | 15-610837 | 68.5 | 70 | RE15-10-8318 | ≤20 | ≤1917 |
| 15-009(b) | 15-610837 | 78.5 | 80 | RE15-10-8319 | ≤36 | ≤1983 |
| 15-009(c) | 15-610838 | 0 | 0.5 | RE15-10-8336 | ≤33 | ≤1976 |
| 15-009(c) | 15-610838 | 1 | 1.5 | RE15-10-8337 | ≤11 | ≤2010 |
| 15-009(c) | 15-610839 | 0 | 0.8 | RE15-10-8338 | ≤11 | ≤2100 |
| 15-009(c) | 15-610839 | 1 | 2.5 | RE15-10-8339 | ≤11 | ≤2140 |
| 15-009(c) | 15-610840 | 0 | 1 | RE15-10-8340 | ≤11 | ≤1790 |
| 15-009(c) | 15-610840 | 1 | 1.5 | RE15-10-8341 | ≤16 | ≤2250 |
| 15-009(c) | 15-610841 | 3 | 3.5 | RE15-10-8342 | ≤11 | ≤2170 |
| 15-009(c) | 15-610841 | 8 | 8.5 | RE15-10-8343 | ≤11 | ≤2240 |
| 15-009(c) | 15-610842 | 2 | 2.5 | RE15-10-8345 | ≤22 | ≤2260 |
| 15-009(c) | 15-610842 | 7 | 7.5 | RE15-10-8344 | ≤5 | ≤2270 |
| 15-009(c) | 15-610843 | 10.5 | 11 | RE15-10-8346 | ≤5 | ≤2160 |
| 15-009(c) | 15-610843 | 15.5 | 16 | RE15-10-8347 | ≤27 | ≤2180 |
| 15-009(c) | 15-610844 | 3 | 4 | RE15-10-8348 | ≤33 | ≤2210 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-009(c) | 15-610844 | 8 | 9 | RE15-10-8349 | ≤0 | ≤2180 |
| 15-009(c) | 15-610845 | 0 | 0.7 | RE15-10-8350 | ≤0 | ≤1817 |
| 15-009(c) | 15-610845 | 1 | 1.2 | RE15-10-8351 | ≤22 | ≤2080 |
| 15-009(c) | 15-610846 | 0 | 0.5 | RE15-10-8352 | ≤16 | ≤2030 |
| 15-009(c) | 15-610846 | 1 | 2 | RE15-10-8353 | ≤0 | ≤2380 |
| 15-009(c) | 15-610847 | 0 | 0.7 | RE15-10-8354 | ≤11 | ≤2100 |
| 15-009(c) | 15-610847 | 1 | 2 | RE15-10-8355 | ≤33 | ≤2280 |
| 15-009(c) | 15-610848 | 0 | 0.8 | RE15-10-8356 | ≤11 | ≤2220 |
| 15-009(c) | 15-610848 | 1 | 2 | RE15-10-8357 | ≤27 | ≤2210 |
| 15-009(c) | 15-610849 | 0 | 0.8 | RE15-10-8358 | ≤27 | ≤2100 |
| 15-009(c) | 15-610849 | 1 | 2 | RE15-10-8359 | ≤11 | ≤1945 |
| 15-009(c) | 15-610850 | 0 | 0.9 | RE15-10-8360 | ≤22 | ≤2390 |
| 15-009(c) | 15-610850 | 1 | 2 | RE15-10-8361 | ≤33 | ≤2030 |
| 15-009(c) | 15-610851 | 0 | 0.7 | RE15-10-8362 | ≤33 | ≤2020 |
| 15-009(c) | 15-610851 | 1 | 2 | RE15-10-8363 | ≤11 | ≤2090 |
| 15-009(c) | 15-610852 | 0 | 0.5 | RE15-10-8364 | ≤11 | ≤2210 |
| 15-009(c) | 15-610852 | 1 | 1.7 | RE15-10-8365 | ≤16 | ≤2030 |
| 15-009(c) | 15-610853 | 0 | 0.5 | RE15-10-8366 | ≤11 | ≤2030 |
| 15-009(c) | 15-610853 | 1 | 1.5 | RE15-10-8367 | ≤11 | ≤1949 |
| 15-009(c) | 15-610854 | 0 | 0.5 | RE15-10-8368 | ≤22 | ≤2170 |
| 15-009(h) | 15-610855 | 6 | 7.5 | RE15-10-8386 | ≤5 | ≤2240 |
| 15-009(h) | 15-610855 | 8.4 | 9.2 | RE15-10-8387 | ≤16 | ≤2190 |
| 15-009(h) | 15-610856 | 6 | 7 | RE15-10-8388 | ≤20 | ≤1924 |
| 15-009(h) | 15-610856 | 11 | 13 | RE15-10-8389 | ≤25 | ≤2070 |
| 15-009(h) | 15-610857 | 6.5 | 8 | RE15-10-8390 | ≤15 | ≤2090 |
| 15-009(h) | 15-610857 | 11.5 | 13 | RE15-10-8391 | ≤30 | ≤2190 |
| 15-009(h) | 15-610858 | 5.7 | 6.5 | RE15-10-8392 | ≤22 | ≤1955 |
| 15-009(h) | 15-610858 | 6.6 | 8.1 | RE15-10-8393 | ≤35 | ≤2530 |
| 15-009(h) | 15-610859 | 4.8 | 6 | RE15-10-8394 | ≤23 | ≤2250 |
| 15-009(h) | 15-610859 | 6 | 7.1 | RE15-10-8395 | ≤6 | ≤2330 |
| 15-009(h) | 15-610860 | 4.8 | 7 | RE15-10-8396 | ≤41 | ≤2270 |
| 15-009(h) | 15-610860 | 7 | 7.3 | RE15-10-8397 | ≤35 | ≤1966 |
| 15-009(h) | 15-610861 | 4.8 | 6.1 | RE15-10-8398 | ≤47 | ≤2190 |
| 15-009(h) | 15-610861 | 6.1 | 7 | RE15-10-8399 | ≤35 | ≤2390 |
| 15-010(b) | 15-610863 | 0 | 0.5 | RE15-10-8410 | ≤22 | ≤2340 |
| 15-010(b) | 15-610863 | 1 | 2 | RE15-10-8411 | ≤55 | ≤2180 |
| 15-010(b) | 15-610864 | 0 | 0.5 | RE15-10-8412 | ≤16 | ≤2370 |
| 15-010(b) | 15-610864 | 1 | 2 | RE15-10-8413 | ≤22 | ≤2550 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-010(b) | 15-610866 | 0 | 0.7 | RE15-10-8416 | ≤55 | ≤2210 |
| 15-010(b) | 15-610866 | 1 | 1.7 | RE15-10-8417 | ≤33 | ≤2640 |
| 15-010(b) | 15-610867 | 0 | 0.8 | RE15-10-8418 | ≤33 | ≤2710 |
| 15-010(b) | 15-610868 | 0 | 0.6 | RE15-10-8420 | ≤16 | ≤2520 |
| 15-010(b) | 15-610868 | 1 | 2 | RE15-10-8421 | ≤11 | ≤2510 |
| 15-010(b) | 15-610869 | 0 | 0.6 | RE15-10-8422 | ≤22 | ≤2140 |
| 15-010(b) | 15-610869 | 1 | 2 | RE15-10-8423 | ≤16 | ≤2010 |
| 15-010(b) | 15-610870 | 0 | 0.7 | RE15-10-8424 | ≤22 | ≤2640 |
| 15-010(b) | 15-610870 | 1 | 1.6 | RE15-10-8425 | ≤5 | ≤2460 |
| 15-010(b) | 15-610871 | 0 | 0.5 | RE15-10-8426 | ≤27 | ≤2370 |
| 15-010(b) | 15-610871 | 1 | 2 | RE15-10-8427 | ≤27 | ≤2510 |
| 15-010(b) | 15-610872 | 0 | 0.5 | RE15-10-8428 | ≤5 | ≤1990 |
| 15-010(b) | 15-610872 | 1 | 1.8 | RE15-10-8429 | ≤27 | ≤2550 |
| 15-014(h) | 15-610501 | 0 | 0.5 | RE15-10-7160 | ≤49 | ≤2150 |
| 15-014(h) | 15-610501 | 1 | 2.2 | RE15-10-7161 | ≤38 | ≤2340 |
| 15-014(h) | 15-610502 | 0 | 0.5 | RE15-10-7162 | ≤44 | ≤2280 |
| 15-014(h) | 15-610502 | 1 | 2.5 | RE15-10-7163 | ≤11 | ≤2730 |
| 15-014(h) | 15-610503 | 2 | 3.9 | RE15-10-7164 | ≤33 | ≤2070 |
| 15-014(h) | 15-610503 | 7 | 8.8 | RE15-10-7165 | ≤27 | ≤1983 |
| 15-014(h) | 15-610504 | 0 | 1 | RE15-10-7166 | ≤22 | ≤2070 |
| 15-014(h) | 15-610504 | 1 | 2.2 | RE15-10-7167 | ≤22 | ≤2370 |
| 15-014(h) | 15-610505 | 0 | 0.5 | RE15-10-7168 | ≤22 | ≤2050 |
| 15-014(h) | 15-610505 | 1 | 2.1 | RE15-10-7169 | ≤16 | ≤2160 |
| 15-014(h) | 15-610506 | 0 | 0.7 | RE15-10-7170 | ≤38 | ≤2300 |
| 15-014(h) | 15-610506 | 1 | 2.1 | RE15-10-7171 | ≤38 | ≤2350 |
| 15-014(h) | 15-610507 | 0 | 0.7 | RE15-10-7172 | ≤16 | ≤2640 |
| 15-014(h) | 15-610507 | 1 | 2.6 | RE15-10-7173 | ≤49 | ≤2240 |
| 15-014(h) | 15-610508 | 0 | 1 | RE15-10-7174 | ≤27 | ≤2390 |
| 15-014(h) | 15-610508 | 1 | 2 | RE15-10-7175 | ≤33 | ≤2460 |
| 15-014(h) | 15-610509 | 0 | 0.6 | RE15-10-7176 | ≤33 | ≤2300 |
| 15-014(h) | 15-610509 | 1 | 2 | RE15-10-7177 | ≤38 | ≤2520 |
| 15-014(h) | 15-610510 | 0 | 0.5 | RE15-10-7178 | ≤44 | ≤2390 |
| 15-014(h) | 15-610510 | 1 | 2 | RE15-10-7179 | ≤27 | ≤2120 |
| 15-014(h) | 15-610511 | 0 | 1 | RE15-10-7180 | ≤22 | ≤2260 |
| 15-014(h) | 15-610511 | 1 | 1.9 | RE15-10-7181 | ≤33 | ≤2280 |
| 15-014(h) | 15-610512 | 0 | 0.6 | RE15-10-7182 | ≤27 | ≤2540 |
| 15-014(h) | 15-610512 | 1 | 1.8 | RE15-10-7183 | ≤27 | ≤2530 |
| 15-014(h) | 15-610513 | 0 | 0.7 | RE15-10-7184 | ≤27 | ≤2460 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 15-014(h) | 15-610513 | 1 | 2 | RE15-10-7185 | ≤33 | ≤2440 |
| 15-014(h) | 15-610514 | 0 | 0.5 | RE15-10-7186 | ≤33 | ≤2070 |
| 15-014(h) | 15-610514 | 1 | 2 | RE15-10-7187 | ≤55 | ≤2390 |
| 15-014(h) | 15-610515 | 0 | 0.8 | RE15-10-7188 | ≤33 | ≤2280 |
| 15-014(h) | 15-610515 | 1 | 2.2 | RE15-10-7189 | ≤38 | ≤2070 |
| 15-014(h) | 15-610516 | 0 | 0.7 | RE15-10-7190 | ≤22 | ≤1962 |
| 15-014(h) | 15-610516 | 1 | 2 | RE15-10-7191 | ≤22 | ≤2270 |
| 15-014(h) | 15-610517 | 0 | 0.5 | RE15-10-7192 | ≤11 | ≤1990 |
| 15-014(h) | 15-610517 | 1 | 2 | RE15-10-7193 | ≤44 | ≤2110 |
| 15-014(h) | 15-610518 | 0 | 1 | RE15-10-7194 | ≤33 | ≤2180 |
| 15-014(h) | 15-610518 | 1 | 2 | RE15-10-7195 | ≤38 | ≤2360 |
| 15-014(h) | 15-610519 | 0 | 0.5 | RE15-10-7196 | ≤16 | ≤2150 |
| 15-014(h) | 15-610519 | 1 | 2 | RE15-10-7197 | ≤33 | ≤2710 |
| 15-014(h) | 15-610520 | 0 | 0.5 | RE15-10-7198 | ≤22 | ≤2280 |
| 15-014(h) | 15-610520 | 1 | 2.4 | RE15-10-7199 | ≤44 | ≤2430 |
| 15-014(h) | 15-610521 | 0 | 0.5 | RE15-10-7200 | ≤22 | ≤1935 |
| 15-014(h) | 15-610521 | 2 | 3.7 | RE15-10-7201 | ≤88 | ≤2280 |
| 15-014(h) | 15-610522 | 2 | 3.9 | RE15-10-7202 | ≤44 | ≤2160 |
| 15-014(h) | 15-610522 | 6 | 6.7 | RE15-10-7203 | ≤16 | ≤2050 |
| 15-014(h) | 15-610523 | 0 | 0.5 | RE15-10-7204 | ≤27 | ≤2260 |
| 15-014(h) | 15-610523 | 1 | 1.5 | RE15-10-7205 | ≤27 | ≤2510 |
| 15-014(h) | 15-610524 | 0 | 0.7 | RE15-10-7206 | ≤38 | ≤1990 |
| 15-014(h) | 15-610524 | 1 | 2.1 | RE15-10-7207 | ≤11 | ≤2410 |
| 15-014(h) | 15-610525 | 0 | 0.5 | RE15-10-7208 | ≤22 | ≤1831 |
| 15-014(h) | 15-610525 | 1 | 1.4 | RE15-10-7209 | ≤38 | ≤1976 |
| 15-014(h) | 15-610526 | 2 | 2.9 | RE15-10-7210 | ≤38 | ≤1727 |
| 15-014(h) | 15-610526 | 6 | 6.7 | RE15-10-7211 | ≤16 | ≤2480 |
| 36-002 | 36-610876 | 7.5 | 10 | RE36-10-8448 | ≤36 | ≤3330 |
| 36-002 | 36-610876 | 15 | 16 | RE36-10-8449 | ≤41 | ≤2220 |
| 36-002 | 36-610877 | 9 | 10 | RE36-10-8450 | ≤41 | ≤1976 |
| 36-002 | 36-610877 | 14 | 15 | RE36-10-8451 | ≤36 | ≤2090 |
| 36-002 | 36-610878 | 4 | 5 | RE36-10-8452 | ≤56 | ≤2040 |
| 36-002 | 36-610878 | 9 | 10 | RE36-10-8453 | ≤46 | ≤2150 |
| 36-003(a) | 36-610879 | 49 | 50 | RE36-10-8462 | ≤28 | ≤3000 |
| 36-003(a) | 36-610879 | 59 | 60 | RE36-10-8463 | ≤19 | ≤758 |
| 36-003(a) | 36-610879 | 69 | 70 | RE36-10-8486 | ≤97 | ≤549 |
| 36-003(a) | 36-610879 | 77.5 | 80 | RE36-10-8487 | ≤30 | ≤681 |
| 36-003(a) | 36-610880 | 3 | 4 | RE36-10-8464 | ≤5 | ≤2010 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 36-003(a) | 36-610881 | 1.5 | 2.5 | RE36-10-8466 | ≤41 | ≤2050 |
| 36-003(a) | 36-610882 | 5 | 5.6 | RE36-10-8470 | ≤27 | ≤2220 |
| 36-003(a) | 36-610882 | 5.6 | 6.1 | RE36-10-8471 | ≤30 | ≤2290 |
| 36-003(a) | 36-610884 | 0.5 | 1 | RE36-10-8474 | ≤22 | ≤1955 |
| 36-003(a) | 36-610884 | 1 | 2.5 | RE36-10-8475 | ≤41 | ≤2270 |
| 36-003(a) | 36-610885 | 1.5 | 2.5 | RE36-10-8476 | ≤22 | ≤2270 |
| 36-003(a) | 36-610885 | 2.5 | 3 | RE36-10-8477 | ≤30 | ≤1970 |
| 36-003(a) | 36-610886 | 1.5 | 2.3 | RE36-10-8478 | ≤27 | ≤2310 |
| 36-003(a) | 36-610886 | 2.3 | 3.9 | RE36-10-8479 | ≤25 | ≤2100 |
| 36-003(a) | 36-610887 | 1.5 | 2 | RE36-10-8480 | ≤17 | ≤2090 |
| 36-003(a) | 36-610887 | 2 | 4 | RE36-10-8481 | ≤30 | ≤2010 |
| 36-003(a) | 36-610888 | 2 | 3.5 | RE36-10-8482 | ≤11 | ≤2260 |
| 36-003(a) | 36-610888 | 7 | 8 | RE36-10-8483 | ≤16 | ≤2230 |
| 36-003(a) | 36-610889 | 2 | 3 | RE36-10-8484 | ≤25 | ≤2110 |
| 36-003(a) | 36-610889 | 3 | 4.2 | RE36-10-8485 | ≤10 | ≤1734 |
| 36-008 | 36-610574 | 0 | 0.5 | RE36-10-7403 | ≤53 | ≤1966 |
| 36-008 | 36-610574 | 2 | 2.5 | RE36-10-7404 | ≤35 | ≤2180 |
| 36-008 | 36-610575 | 0 | 0.5 | RE36-10-7405 | ≤35 | ≤1858 |
| 36-008 | 36-610575 | 2 | 2.5 | RE36-10-7406 | ≤76 | ≤2260 |
| 36-008 | 36-610576 | 0 | 0.5 | RE36-10-7407 | ≤25 | ≤1538 |
| 36-008 | 36-610579 | 0 | 0.5 | RE36-10-7413 | ≤0 | ≤163 |
| 36-008 | 36-610579 | 2 | 3 | RE36-10-7414 | ≤5 | ≤386 |
| 36-008 | 36-610580 | 0 | 0.5 | RE36-10-7415 | ≤17 | ≤1556 |
| 36-008 | 36-610580 | 2 | 3 | RE36-10-7416 | ≤29 | ≤1814 |
| 36-008 | 36-610581 | 0 | 0.5 | RE36-10-7417 | ≤17 | ≤1368 |
| 36-008 | 36-610581 | 2 | 3 | RE36-10-7418 | ≤29 | ≤2080 |
| 36-008 | 36-610582 | 0 | 0.5 | RE36-10-7419 | ≤82 | ≤2146 |
| 36-008 | 36-610582 | 2 | 3 | RE36-10-7420 | ≤94 | ≤2070 |
| 36-008 | 36-610583 | 0 | 0.5 | RE36-10-7421 | ≤94 | ≤2290 |
| 36-008 | 36-610583 | 2 | 3 | RE36-10-7422 | ≤29 | ≤2160 |
| 36-008 | 36-610584 | 0 | 0.5 | RE36-10-7423 | ≤14 | ≤1377 |
| 36-008 | 36-610584 | 2 | 3 | RE36-10-7424 | ≤6 | ≤323 |
| 36-008 | 36-610585 | 0 | 1 | RE36-10-7425 | ≤29 | ≤2030 |
| 36-008 | 36-610585 | 2 | 3 | RE36-10-7426 | ≤17 | ≤2000 |
| 36-008 | 36-610586 | 0 | 0.5 | RE36-10-7427 | ≤6 | ≤9 |
| 36-008 | 36-610586 | 2 | 3 | RE36-10-7428 | ≤6 | ≤211 |
| 36-008 | 36-610587 | 0 | 0.5 | RE36-10-7429 | ≤41 | ≤1634 |
| 36-008 | 36-610588 | 0 | 0.5 | RE36-10-7431 | ≤29 | ≤1697 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 36-008 | 36-610588 | 2 | 2.5 | RE36-10-7432 | ≤23 | ≤1995 |
| 36-008 | 36-610589 | 0 | 0.5 | RE36-10-7433 | ≤23 | ≤2000 |
| 36-008 | 36-610589 | 1 | 2 | RE36-10-7434 | ≤53 | ≤2030 |
| 36-008 | 36-610590 | 0 | 0.5 | RE36-10-7435 | ≤10 | ≤1734 |
| 36-008 | 36-610590 | 2 | 3 | RE36-10-7436 | ≤47 | ≤1990 |
| 36-008 | 36-610591 | 0 | 0.5 | RE36-10-7437 | ≤58 | ≤1785 |
| 36-008 | 36-610591 | 2 | 3 | RE36-10-7438 | ≤41 | ≤2210 |
| 36-008 | 36-610592 | 0 | 0.5 | RE36-10-7439 | ≤41 | ≤1644 |
| 36-008 | 36-610592 | 2 | 3 | RE36-10-7440 | ≤72 | ≤2090 |
| 36-008 | 36-610593 | 0 | 0.5 | RE36-10-7441 | ≤64 | ≤1834 |
| 36-008 | 36-610593 | 2 | 3 | RE36-10-7442 | ≤15 | ≤1996 |
| 36-008 | 36-610594 | 0 | 0.5 | RE36-10-7443 | ≤41 | ≤1805 |
| 36-008 | 36-610594 | 2 | 3 | RE36-10-7444 | ≤61 | ≤1623 |
| 36-008 | 36-610595 | 0 | 0.5 | RE36-10-7445 | ≤25 | ≤1583 |
| 36-008 | 36-610596 | 0 | 0.5 | RE36-10-7447 | ≤29 | ≤1936 |
| 36-008 | 36-610596 | 2 | 3 | RE36-10-7448 | ≤47 | ≤2000 |
| 36-008 | 36-610597 | 0 | 0.5 | RE36-10-7449 | ≤29 | ≤1790 |
| 36-008 | 36-610597 | 2 | 3 | RE36-10-7450 | ≤51 | ≤1996 |
| 36-008 | 36-610598 | 0 | 0.5 | RE36-10-7451 | ≤10 | ≤1518 |
| 36-008 | 36-610598 | 2 | 3 | RE36-10-7452 | ≤25 | ≤1688 |
| 36-008 | 36-610599 | 0 | 0.5 | RE36-10-7453 | ≤36 | ≤2050 |
| 36-008 | 36-610599 | 0.5 | 1 | RE36-10-7454 | ≤15 | ≤2100 |
| 36-008 | 36-610600 | 0 | 0.5 | RE36-10-7455 | ≤30 | ≤1760 |
| 36-008 | 36-610600 | 1 | 2 | RE36-10-7456 | ≤36 | ≤1865 |
| 36-008 | 36-610601 | 0 | 0.5 | RE36-10-7457 | ≤10 | ≤1720 |
| 36-008 | 36-610601 | 2 | 3 | RE36-10-7458 | ≤56 | ≤1930 |
| 36-008 | 36-610602 | 0 | 0.5 | RE36-10-7459 | ≤20 | ≤2010 |
| 36-008 | 36-610602 | 1.5 | 2.6 | RE36-10-7460 | ≤41 | ≤1963 |
| 36-008 | 36-610603 | 0 | 0.5 | RE36-10-7461 | ≤0 | ≤111 |
| 36-008 | 36-610603 | 2 | 3 | RE36-10-7462 | ≤5 | ≤81 |
| 36-008 | 36-610604 | 0 | 0.5 | RE36-10-7463 | ≤26 | ≤626 |
| 36-008 | 36-610604 | 2 | 3 | RE36-10-7464 | ≤5 | ≤183 |
| 36-008 | 36-610605 | 0 | 0.5 | RE36-10-7465 | ≤0 | ≤183 |
| 36-008 | 36-610605 | 2 | 3 | RE36-10-7466 | ≤0 | ≤307 |
| 36-008 | 36-610606 | 0 | 0.5 | RE36-10-7467 | ≤15 | ≤196 |
| 36-008 | 36-610606 | 2 | 2.9 | RE36-10-7468 | ≤10 | ≤405 |
| 36-008 | 36-610607 | 0 | 0.5 | RE36-10-7469 | ≤20 | ≤510 |
| 36-008 | 36-610607 | 2 | 3 | RE36-10-7470 | ≤0 | ≤716 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| 36-008 | 36-610608 | 0 | 0.8 | RE36-10-7471 | ≤20 | ≤72 |
| 36-008 | 36-610608 | 2 | 3 | RE36-10-7472 | ≤36 | ≤484 |
| 36-008 | 36-610609 | 0 | 0.5 | RE36-10-7473 | ≤15 | ≤543 |
| 36-008 | 36-610610 | 0 | 0.5 | RE36-10-7475 | ≤5 | ≤510 |
| 36-008 | 36-610610 | 2 | 3 | RE36-10-7476 | ≤20 | ≤736 |
| 36-008 | 36-610611 | 0 | 0.5 | RE36-10-7477 | ≤53 | ≤1980 |
| 36-008 | 36-610611 | 2 | 3 | RE36-10-7478 | ≤23 | ≤2450 |
| 36-008 | 36-610612 | 0 | 0.5 | RE36-10-7479 | ≤41 | ≤1819 |
| 36-008 | 36-610612 | 2 | 3 | RE36-10-7480 | ≤5 | ≤2220 |
| 36-008 | 36-610613 | 0 | 0.5 | RE36-10-7481 | ≤41 | ≤1931 |
| 36-008 | 36-610613 | 2 | 3 | RE36-10-7482 | ≤47 | ≤1931 |
| 36-008 | 36-610614 | 0 | 0.5 | RE36-10-7483 | ≤29 | ≤1844 |
| 36-008 | 36-610614 | 2 | 3 | RE36-10-7484 | ≤17 | ≤2030 |
| 36-008 | 36-610615 | 0 | 0.5 | RE36-10-7485 | ≤58 | ≤1800 |
| 36-008 | 36-610615 | 2 | 3 | RE36-10-7486 | ≤23 | ≤1726 |
| 36-008 | 36-610616 | 0 | 0.5 | RE36-10-7487 | ≤29 | ≤1848 |
| 36-008 | 36-610616 | 2 | 3 | RE36-10-7488 | ≤41 | ≤1844 |
| 36-008 | 36-610617 | 0 | 0.5 | RE36-10-7489 | ≤11 | ≤1829 |
| 36-008 | 36-610617 | 2 | 3 | RE36-10-7490 | ≤64 | ≤1795 |
| 36-008 | 36-610618 | 0 | 0.5 | RE36-10-7491 | ≤47 | ≤1693 |
| 36-008 | 36-610618 | 2 | 3 | RE36-10-7492 | ≤41 | ≤1668 |
| 36-008 | 36-610619 | 0 | 0.5 | RE36-10-7493 | ≤47 | ≤1805 |
| 36-008 | 36-610619 | 2 | 3 | RE36-10-7494 | ≤29 | ≤1780 |
| 36-008 | 36-610620 | 0 | 0.5 | RE36-10-7495 | ≤88 | ≤1848 |
| 36-008 | 36-610620 | 2 | 3 | RE36-10-7496 | ≤58 | ≤2160 |
| 36-008 | 36-610621 | 0 | 0.5 | RE36-10-7497 | ≤82 | ≤1517 |
| 36-008 | 36-610621 | 2 | 3 | RE36-10-7498 | ≤58 | ≤1829 |
| 36-008 | 36-610622 | 0 | 0.5 | RE36-10-7499 | ≤29 | ≤1824 |
| 36-008 | 36-610622 | 2 | 3 | RE36-10-7500 | ≤53 | ≤1902 |
| 36-008 | 36-610623 | 0 | 0.5 | RE36-10-7501 | ≤23 | ≤1746 |
| C-36-003 | 36-610821 | 0 | 0.5 | RE36-10-8273 | ≤36 | ≤1873 |
| C-36-003 | 36-610821 | 2 | 3 | RE36-10-8274 | ≤82 | ≤2040 |
| C-36-003 | 36-610822 | 0 | 0.5 | RE36-10-8275 | ≤29 | ≤1887 |
| C-36-003 | 36-610822 | 2 | 3 | RE36-10-8276 | ≤36 | ≤1655 |

**Table 3.2-2 (continued)**

| SWMU/AOC | Location ID | Start Depth (ft) | End Depth (ft) | Sample ID | Alpha Reading (dpm)* | Beta/ Gamma Reading (dpm) |
|---|---|---|---|---|---|---|
| C-36-003 | 36-610823 | 0 | 0.5 | RE36-10-8277 | ≤20 | ≤1564 |
| C-36-003 | 36-610823 | 2 | 3 | RE36-10-8278 | ≤58 | ≤2200 |
| C-36-003 | 36-610824 | 0 | 0.5 | RE36-10-8279 | ≤47 | ≤1961 |
| C-36-003 | 36-610824 | 2 | 3 | RE36-10-8280 | ≤30 | ≤1793 |
| C-36-003 | 36-610825 | 0 | 1 | RE36-10-8281 | ≤35 | ≤1844 |
| C-36-003 | 36-610825 | 2 | 2.5 | RE36-10-8282 | ≤82 | ≤2140 |
| C-36-003 | 36-610826 | 0 | 0.5 | RE36-10-8283 | ≤25 | ≤2370 |
| C-36-003 | 36-610826 | 2 | 3 | RE36-10-8284 | ≤15 | ≤2130 |
| C-36-003 | 36-610827 | 0 | 0.5 | RE36-10-8285 | ≤20 | ≤1721 |
| C-36-003 | 36-610827 | 2 | 3 | RE36-10-8286 | ≤36 | ≤2130 |
| C-36-003 | 36-610828 | 0 | 0.5 | RE36-10-8287 | ≤10 | ≤1564 |
| C-36-003 | 36-610828 | 2 | 3 | RE36-10-8288 | ≤35 | ≤1873 |

* dpm = Disintegrations per minute.

**Table 6.2-1**
**Samples Collected and Analyses Requested at SWMUs 12-001(a) and 12-001(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SWMU 12-001(a)** | | | | | | | | | | | | |
| RE12-10-7838 | 12-610693 | 0–0.5 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1101 | 10-1101 |
| RE12-10-7839 | 12-610693 | 2–2.7 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1101 | 10-1101 |
| RE12-10-7840 | 12-610694 | 0–0.7 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1101 | 10-1101 |
| RE12-10-7841 | 12-610694 | 3–3.4 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | 10-1101 | 10-1101 |
| RE12-10-7842 | 12-610695 | 0–1 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | —* | 10-1101 | 10-1101 |
| RE12-10-7843 | 12-610695 | 2–2.4 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | — | 10-1101 | 10-1101 |
| RE12-10-7844 | 12-610696 | 0–0.75 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | — | 10-1101 | 10-1101 |
| RE12-10-7845 | 12-610696 | 2–2.6 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | — | 10-1101 | 10-1101 |
| RE12-10-7846 | 12-610697 | 0–0.5 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | — | 10-1101 | 10-1101 |
| RE12-10-7847 | 12-610697 | 1.4–1.8 | SOIL | 10-1100 | 10-1101 | 10-1100 | 10-1100 | 10-1100 | 10-1100 | — | 10-1101 | 10-1101 |
| RE12-10-7848 | 12-610698 | 0–0.75 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7849 | 12-610698 | 2–3 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7850 | 12-610699 | 0–0.5 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7851 | 12-610699 | 2–2.5 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7852 | 12-610700 | 0–0.6 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7853 | 12-610700 | 2–3.5 | SOIL | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | 10-1126 | — | 10-1126 | 10-1126 |
| RE12-10-7854 | 12-610701 | 0–0.6 | SOIL | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | — | 10-1263 | 10-1263 |
| RE12-10-7855 | 12-610701 | 2–3 | QBT3 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | — | 10-1263 | 10-1263 |
| RE12-10-7697 | 12-610666 | 0–0.5 | SOIL | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 |

**Table 6.2-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7698 | 12-610666 | 1–2 | SOIL | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 |
| RE12-10-7699 | 12-610667 | 0–0.5 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | 10-1160 | 10-1161 | 10-1161 |
| RE12-10-7700 | 12-610667 | 1–2 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | 10-1160 | 10-1161 | 10-1161 |
| RE12-10-7701 | 12-610668 | 0–1 | SED | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | 10-1160 | 10-1161 | 10-1161 |
| RE12-10-7702 | 12-610668 | 1–1.9 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | 10-1160 | 10-1161 | 10-1161 |
| RE12-10-7703 | 12-610669 | 0–0.7 | SOIL | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | — | 10-1130 | 10-1130 |
| RE12-10-7704 | 12-610669 | 1–2.1 | SOIL | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | 10-1130 | — | 10-1130 | 10-1130 |
| RE12-10-7705 | 12-610670 | 0–0.7 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7706 | 12-610670 | 1–2 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7707 | 12-610671 | 0–0.3 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7708 | 12-610671 | 1–2 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7709 | 12-610672 | 0–0.8 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7710 | 12-610672 | 1–2.8 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7711 | 12-610673 | 0–0.9 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7712 | 12-610673 | 1–1.9 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7713 | 12-610674 | 0–0.1 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7714 | 12-610674 | 1–2 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7715 | 12-610675 | 0–0.6 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7716 | 12-610675 | 1–2 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7717 | 12-610676 | 0–0.3 | SED | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7718 | 12-610676 | 1–1.5 | QBT3 | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |

**Table 6.2-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7719 | 12-610677 | 0–0.7 | SOIL | 10-1162 | 10-1161 | 10-1162 | 10-1160 | 10-1162 | 10-1162 | — | 10-1161 | 10-1161 |
| RE12-10-7722 | 12-610678 | 0–0.2 | SED | 10-1209 | 10-1209 | 10-1209 | 10-1209 | 10-1209 | 10-1209 | — | 10-1209 | 10-1209 |
| RE12-10-7856 | 12-610679 | 0–0.5 | SOIL | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 |
| RE12-10-7857 | 12-610679 | 1–1.8 | SOIL | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 | 10-1263 |
| RE12-10-8096 | 12-610680 | 0–0.5 | SOIL | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 |
| RE12-10-8097 | 12-610680 | 1–2 | SOIL | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 |
| **SWMU 12-001(b)** | | | | | | | | | | | | |
| RE12-10-7617 | 12-610639 | 0–0.5 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7618 | 12-610639 | 2–3 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7619 | 12-610640 | 0–1 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7620 | 12-610640 | 2–2.8 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7621 | 12-610641 | 0–1 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7622 | 12-610641 | 2–3.2 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7623 | 12-610642 | 0–0.5 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7624 | 12-610642 | 2–2.6 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | 10-1127 | 10-1128 | 10-1128 |
| RE12-10-7625 | 12-610643 | 0–0.6 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7626 | 12-610643 | 2–3 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7627 | 12-610644 | 0–0.5 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7628 | 12-610644 | 2–2.5 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7629 | 12-610645 | 0–0.4 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7630 | 12-610645 | 2–2.7 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |

**Table 6.2-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7631 | 12-610646 | 0–0.6 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7632 | 12-610646 | 2–3 | SOIL | 10-1129 | 10-1128 | 10-1127 | 10-1129 | 10-1129 | 10-1129 | — | 10-1128 | 10-1128 |
| RE12-10-7633 | 12-610647 | 0–0.7 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7634 | 12-610647 | 2–3 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7635 | 12-610648 | 0–0.7 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7636 | 12-610648 | 2–3 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7638 | 12-610649 | 0–0.6 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7637 | 12-610649 | 2–3 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7639 | 12-610650 | 0–0.7 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7640 | 12-610650 | 2–3 | QBT3 | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7641 | 12-610651 | 0–0.9 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7642 | 12-610651 | 2–3 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7643 | 12-610652 | 0–0.5 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7644 | 12-610652 | 2–3 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7645 | 12-610653 | 0–1 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7646 | 12-610653 | 2–3.6 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7647 | 12-610654 | 0–1 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7648 | 12-610654 | 2–3 | QBT3 | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7649 | 12-610655 | 0–0.7 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |
| RE12-10-7650 | 12-610655 | 1.5–2.5 | SOIL | 10-1133 | 10-1132 | 10-1131 | 10-1133 | 10-1133 | 10-1133 | — | 10-1132 | 10-1132 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 6.2-2**
**Inorganic Chemicals above BVs at SWMUs 12-001(a) and 12-001(b)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Recreational SSL[f]** | | | | **619000** | **248** | **124000** | **457** | **na** | **281[d]** | **186** | **24800** | **231** | **434000** | **1110** | **na** | **86200** | **12400** | **434** | **3100** | **3100** | **1860** | **3120** | **186000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE12-10-7617 | 12-610639 | 0–0.5 | SOIL | —[g] | 1.07 (UJ) | — | — | — | 31.3 | — | — | — | — | — | — | — | — | 0.000909 (J) | — | — | 2.59 | — | — |
| RE12-10-7618 | 12-610639 | 2–3 | SOIL | — | 1.2 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7619 | 12-610640 | 0–1 | SOIL | — | 1.16 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7620 | 12-610640 | 2–2.8 | SOIL | — | 1.1 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7621 | 12-610641 | 0–1 | SOIL | — | 1.06 (UJ) | 503 | — | — | — | — | 29 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7622 | 12-610641 | 2–3.2 | SOIL | — | 1.06 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7623 | 12-610642 | 0–0.5 | SOIL | — | 1.15 (UJ) | 346 | — | — | 20 | — | — | — | — | — | — | — | — | 0.00117 (J) | — | — | 2.5 | — | — |
| RE12-10-7624 | 12-610642 | 2–2.6 | SOIL | — | 1.08 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 0.000546 (J) | — | — | — | — | — |
| RE12-10-7625 | 12-610643 | 0–0.6 | SOIL | — | 1.19 (UJ) | — | — | — | 27.2 | — | 18.5 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7626 | 12-610643 | 2–3 | SOIL | — | 1.09 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 0.0006 (J) | — | — | — | — | — |
| RE12-10-7627 | 12-610644 | 0–0.5 | SOIL | — | 1.3 (UJ) | — | — | — | 21.4 | — | — | — | — | — | — | — | — | — | — | — | 2.92 | — | — |
| RE12-10-7628 | 12-610644 | 2–2.5 | SOIL | — | 1.07 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7629 | 12-610645 | 0–0.4 | SOIL | — | 0.886 (U) | — | — | — | 74.3 | — | — | — | — | — | — | — | — | 0.000738 (J) | — | — | 3.59 | — | — |
| RE12-10-7630 | 12-610645 | 2–2.7 | SOIL | — | 1.1 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7631 | 12-610646 | 0–0.6 | SOIL | — | 0.955 (U) | — | — | — | 56.8 | — | — | — | — | — | — | — | — | — | — | — | 1.92 | — | — |
| RE12-10-7632 | 12-610646 | 2–3 | SOIL | — | 1.08 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7633 | 12-610647 | 0–0.7 | SOIL | — | 1.18 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 0.000809 (J) | — | — | 2.24 (J+) | — | — |
| RE12-10-7634 | 12-610647 | 2–3 | SOIL | — | 1.1 (UJ) | 334 (J) | — | — | — | 15.2 (J-) | — | — | — | — | — | 1380 (J) | — | — | — | 1.11 | — | — | — |
| RE12-10-7635 | 12-610648 | 0–0.7 | SOIL | — | 1.16 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.15 | — | — |
| RE12-10-7636 | 12-610648 | 2–3 | SOIL | — | 1.06 (UJ) | — | 0.53 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.97 | — | — |
| RE12-10-7638 | 12-610649 | 0–0.6 | SOIL | — | 1.13 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.68 (J+) | — | — |
| RE12-10-7637 | 12-610649 | 2–3 | SOIL | — | 1.11 (UJ) | — | 0.553 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7639 | 12-610650 | 0–0.7 | SOIL | — | 1.16 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.9 (J+) | — | — |
| RE12-10-7640 | 12-610650 | 2–3 | QBT3 | 11700 | 1.07 (UJ) | 130 (J) | — | — | 13.2 | 5.3 (J-) | 5.81 | — | 14600 | — | 2080 | — | 7.19 | — | 1.06 (UJ) | — | — | 23.1 | — |

**Table 6.2-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Recreational SSL[f]** | | | | **619000** | **248** | **124000** | **457** | **na** | **281[d]** | **186** | **24800** | **231** | **434000** | **1110** | **na** | **86200** | **12400** | **434** | **3100** | **3100** | **1860** | **3120** | **186000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE12-10-7641 | 12-610651 | 0–0.9 | SOIL | — | 1.15 (UJ) | — | — | — | 19.6 | — | — | — | — | — | — | — | — | — | — | — | 7.42 | — | — |
| RE12-10-7642 | 12-610651 | 2–3 | SOIL | — | 1.12 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7643 | 12-610652 | 0–0.5 | SOIL | — | 1.15 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.48 | — | — |
| RE12-10-7644 | 12-610652 | 2–3 | SOIL | — | 1.11 (UJ) | — | 0.553 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7645 | 12-610653 | 0–1 | SOIL | — | 1.08 (UJ) | — | 0.542 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7646 | 12-610653 | 2–3.6 | SOIL | — | 1.12 (UJ) | — | 0.559 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7647 | 12-610654 | 0–1 | SOIL | — | 1.2 (UJ) | — | 0.598 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.58 | — | — |
| RE12-10-7648 | 12-610654 | 2–3 | QBT3 | — | 1.03 (UJ) | 140 (J) | — | 3240 | 7.26 | — | — | — | — | — | — | — | — | — | 1.01 (UJ) | — | — | — | — |
| RE12-10-7649 | 12-610655 | 0–0.7 | SOIL | — | 1.26 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.92 | — | — |
| RE12-10-7650 | 12-610655 | 1.5–2.5 | SOIL | — | 1.14 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 0.000645 (J) | — | — | — | — | — |
| RE12-10-7697 | 12-610666 | 0–0.5 | SOIL | — | — | — | 0.574 (U) | — | 20 | — | — | — | — | — | — | — | — | — | — | — | 1.84 | — | — |
| RE12-10-7698 | 12-610666 | 1–2 | SOIL | — | 1.11 (U) | — | 0.555 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7699 | 12-610667 | 0–0.5 | SOIL | — | — | — | 0.601 (U) | — | 42.9 | — | — | — | — | — | — | — | — | 0.00071 (J) | — | — | 3.59 (J) | — | — |
| RE12-10-7700 | 12-610667 | 1–2 | QBT3 | — | 1.03 (U) | 49.2 | — | — | 22.9 | — | — | — | — | — | — | — | — | — | 0.979 (U) | — | — | — | — |
| RE12-10-7701 | 12-610668 | 0–1 | SED | — | 1.28 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.29 (U) | — | 4.92 (J) | — | — |
| RE12-10-7702 | 12-610668 | 1–1.9 | QBT3 | — | 1.08 (U) | — | — | — | 11.4 | — | — | — | — | — | — | — | — | — | 1.16 (U) | — | — | — | — |
| RE12-10-7703 | 12-610669 | 0–0.7 | SOIL | — | 1.45 (U) | — | 0.599 (U) | — | 69.8 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7704 | 12-610669 | 1–2.1 | SOIL | — | — | — | 0.548 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7705 | 12-610670 | 0–0.7 | SOIL | — | 1.13 (U) | — | 0.565 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7706 | 12-610670 | 1–2 | QBT3 | 10,800 | — | 102 | — | — | 14.7 | 3.15 | 6.6 | — | 14,600 | — | 2060 (J+) | — | 6.8 | — | 1.1 (U) | — | — | 19.1 | — |
| RE12-10-7707 | 12-610671 | 0–0.3 | SOIL | — | 1.26 (U) | — | — | — | 23.9 | — | — | — | — | — | — | — | — | — | — | — | 5.55 (J) | — | — |
| RE12-10-7708 | 12-610671 | 1–2 | QBT3 | 10,800 | 0.99 (U) | 197 | — | 2780 | 12.4 | 5.7 | 6.77 | — | — | 15.4 | 1910 (J+) | — | — | — | 1.03 (U) | — | — | 27.8 | — |
| RE12-10-7709 | 12-610672 | 0–0.8 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 19.1 | — | — |
| RE12-10-7710 | 12-610672 | 1–2.8 | QBT3 | — | 1.04 (U) | — | — | — | 12.8 | — | — | 0.502 | — | — | — | — | — | — | 1.02 (U) | — | — | — | — |

**Table 6.2-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Recreational SSL[f]** | | | | **619000** | **248** | **124000** | **457** | **na** | **281[d]** | **186** | **24800** | **231** | **434000** | **1110** | **na** | **86200** | **12400** | **434** | **3100** | **3100** | **1860** | **3120** | **186000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE12-10-7711 | 12-610673 | 0–0.9 | SOIL | — | 1.2 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.41 | — | — |
| RE12-10-7712 | 12-610673 | 1–1.9 | QBT3 | — | — | — | — | — | 11.1 | — | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — | — |
| RE12-10-7713 | 12-610674 | 0–0.1 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.78 | — | — |
| RE12-10-7714 | 12-610674 | 1–2 | SOIL | — | 1.06 (U) | — | 0.532 (U) | — | — | — | — | — | — | — | — | — | — | 0.000612 (J) | — | — | — | — | — |
| RE12-10-7715 | 12-610675 | 0–0.6 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00209 (J) | — | — | 8.43 (J) | — | 55.8 |
| RE12-10-7716 | 12-610675 | 1–2 | SOIL | — | 0.999 (U) | — | — | — | — | — | — | — | 22,100 | — | — | — | — | — | — | — | — | — | 85.6 |
| RE12-10-7717 | 12-610676 | 0–0.3 | SED | — | 1.22 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.2 (U) | — | — | — | — |
| RE12-10-7718 | 12-610676 | 1–1.5 | QBT3 | — | 1.12 (U) | — | — | — | 32.1 | — | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — | — |
| RE12-10-7719 | 12-610677 | 0–0.7 | SOIL | — | 1.19 (U) | — | 0.594 (U) | — | — | — | — | — | — | — | — | — | — | 0.000621 (J) | — | — | 3.18 (J) | — | — |
| RE12-10-7722 | 12-610678 | 0–0.2 | SED | — | 1.13 (U) | — | 0.566 (U) | — | — | — | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — | — |
| RE12-10-7856 | 12-610679 | 0–0.5 | SOIL | — | 1.08 (U) | — | 0.54 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7857 | 12-610679 | 1–1.8 | SOIL | — | 1.03 (U) | — | 0.514 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-8096 | 12-610680 | 0–0.5 | SOIL | — | 1.04 (U) | — | 0.52 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-8097 | 12-610680 | 1–2 | SOIL | — | 1.04 (U) | — | 0.519 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7838 | 12-610693 | 0–0.5 | SOIL | — | 1.22 (U) | — | 0.609 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.05 | — | — |
| RE12-10-7839 | 12-610693 | 2–2.7 | SOIL | — | 1.13 (U) | — | 0.566 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7840 | 12-610694 | 0–0.7 | SOIL | — | 1.19 (U) | — | 0.597 (U) | — | — | — | — | — | — | — | — | — | — | 0.000656 (J) | — | — | 3.94 | — | — |
| RE12-10-7841 | 12-610694 | 3–3.4 | SOIL | — | 1.15 | 407 (J) | — | — | 67.6 | 22.8 (J-) | — | — | — | 22.5 | — | 2150 (J) | — | — | — | — | — | — | — |
| RE12-10-7842 | 12-610695 | 0–1 | SOIL | — | 1.14 (U) | — | 0.569 (U) | — | 24.5 | 17.3 (J-) | — | — | — | — | — | 802 (J) | — | — | — | — | 1.84 | — | — |
| RE12-10-7843 | 12-610695 | 2–2.4 | SOIL | — | 1.09 (U) | — | 0.544 (U) | — | 20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7844 | 12-610696 | 0–0.75 | SOIL | — | 1.14 (U) | — | 0.571 (U) | — | 27.1 | — | — | — | — | — | — | — | — | — | — | — | 2.79 | — | — |
| RE12-10-7845 | 12-610696 | 2–2.6 | SOIL | — | 1.06 (U) | — | - | — | — | 12.4 (J-) | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7846 | 12-610697 | 0–0.5 | SOIL | — | 1.13 (U) | — | 0.565 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7847 | 12-610697 | 1.4–1.8 | SOIL | — | 1.09 (U) | — | 0.545 (U) | — | 36.8 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7848 | 12-610698 | 0–0.75 | SOIL | — | 1.16 (UJ) | — | — | — | — | — | — | — | — | 41 | — | — | — | — | — | — | — | — | — |

**Table 6.2-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Recreational SSL[f]** | | | | **619000** | **248** | **124000** | **457** | **na** | **281[d]** | **186** | **24800** | **231** | **434000** | **1110** | **na** | **86200** | **12400** | **434** | **3100** | **3100** | **1860** | **3120** | **186000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE12-10-7849 | 12-610698 | 2–3 | SOIL | — | 1.08 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7850 | 12-610699 | 0–0.5 | SOIL | — | 1.22 (UJ) | — | — | — | 43 | — | — | — | — | — | — | — | — | — | — | — | 2.07 | — | — |
| RE12-10-7851 | 12-610699 | 2–2.5 | SOIL | — | 1.05 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7852 | 12-610700 | 0–0.6 | SOIL | — | 1.14 (UJ) | — | — | — | 31 | — | — | — | — | — | — | — | — | — | — | — | 1.84 | — | — |
| RE12-10-7853 | 12-610700 | 2–3.5 | SOIL | — | 1.08 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 0.000672 (J) | — | — | — | — | — |
| RE12-10-7854 | 12-610701 | 0–0.6 | SOIL | — | 1.15 (U) | — | 0.574 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.2 | — | — |
| RE12-10-7855 | 12-610701 | 2–3 | QBT3 | 11,400 | 1.05 (U) | 243 | — | 2400 | 11.5 | 7.08 | 7.07 | — | — | 14.7 | 2040 (J+) | — | 8.43 | — | 1.04 (U) | — | — | 28.8 | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] SSLs from LANL (2015, 600336).

[g] — = Not detected or not detected above BV.

**Table 6.2-3**
**Organic Chemicals Detected at SWMUs 12-001(a) and 12-001(b)**

| Sample ID | Location ID | Depth (ft) | Media | Amino-2,6-dinitrotoluene[4-] | HMX | PETN | RDX | Tetryl |
|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **2300**[b] | **63300** | **5700**[b] | **311** | **2590** |
| **Recreational SSL**[c] | | | | **1150** | **29400** | **657** | **399** | **1230** |
| **Residential SSL**[a] | | | | **150**[b] | **3850** | **130**[b] | **60.4** | **156** |
| RE12-10-7619 | 12-610640 | 0–1 | SOIL | —[d] | 0.217 (J) | — | 0.239 (J) | — |
| RE12-10-7620 | 12-610640 | 2–2.8 | SOIL | — | 0.765 (J) | — | 0.277 (J) | — |
| RE12-10-7621 | 12-610641 | 0–1 | SOIL | 0.127 (J) | 11.4 | 5.82 | 49.4 (J) | 0.333 (J) |
| RE12-10-7622 | 12-610641 | 2–3.2 | SOIL | — | 2.01 (J) | — | 0.413 (J) | — |
| RE12-10-7623 | 12-610642 | 0–0.5 | SOIL | — | 0.173 (J) | — | 0.246 (J) | — |
| RE12-10-7624 | 12-610642 | 2–2.6 | SOIL | — | 0.487 (J) | — | 0.419 (J) | — |
| RE12-10-7625 | 12-610643 | 0–0.6 | SOIL | — | — | — | 0.113 (J) | — |
| RE12-10-7631 | 12-610646 | 0–0.6 | SOIL | — | — | — | 0.127 (J) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] SSLs from LANL (2015, 600336).

[d] — = Not detected.

**Table 6.2-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMUs 12-001(a) and 12-001(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **na**[b] | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV**[a] | | | | **0.04** | **0.9** | **0.068** | **2.59** | **0.2** | **2.29** |
| **Soil BV**[a] | | | | **0.013** | **1.65** | **0.054** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL**[c] | | | | **1000** | **41** | **1200** | **3100** | **160** | **710** |
| **Recreational SAL**[c] | | | | **1500** | **370** | **1300** | **3900** | **1000** | **2800** |
| **Residential SAL**[c] | | | | **83** | **12** | **79** | **290** | **42** | **150** |
| RE12-10-7618 | 12-610639 | 2–3 | SOIL | —[d] | 0.345 | 0.0286 | — | — | — |
| RE12-10-7633 | 12-610647 | 0–0.7 | SOIL | — | — | — | — | — | 2.58 |
| RE12-10-7638 | 12-610649 | 0–0.6 | SOIL | — | — | — | 4.15 | — | 4.47 |
| RE12-10-7641 | 12-610651 | 0–0.9 | SOIL | — | — | — | — | — | 2.97 |
| RE12-10 -7643 | 12-610652 | 0–0.5 | SOIL | — | — | — | — | — | 2.33 |
| RE12-10-7701 | 12-610668 | 0–1 | SED | — | — | — | — | — | 2.32 |
| RE12-10-7707 | 12-610671 | 0–0.3 | SOIL | — | — | — | 2.65 | — | 3.64 |
| RE12-10-7709 | 12-610672 | 0–0.8 | SOIL | 0.0257 | — | — | — | — | 2.9 |
| RE12-10-7711 | 12-610673 | 0–0.9 | SOIL | — | — | — | — | 0.205 | 3.05 |
| RE12-10-7713 | 12-610674 | 0–0.1 | SOIL | — | — | — | — | — | 2.91 |
| RE12-10-7715 | 12-610675 | 0–0.6 | SOIL | — | — | 0.0682 | 2.86 | 0.22 | 3.68 |
| RE12-10-7718 | 12-610676 | 1–1.5 | QBT3 | — | 0.227 | — | — | — | 2.67 |
| RE12-10-7719 | 12-610677 | 0–0.7 | SOIL | — | — | — | — | — | 2.44 |
| RE12-10-7857 | 12-610679 | 1–1.8 | SOIL | — | 0.0779 | — | — | — | — |
| RE12-10-8097 | 12-610680 | 1–2 | SOIL | — | 0.331 | — | — | — | — |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 6.4-1**
**Samples Collected and Analyses Requested at SWMU 12-002**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-8094 | 12-610787 | 0.4–0.8 | QBT3 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 |
| RE12-10-8095 | 12-610787 | 2–3.3 | QBT3 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 | 10-1264 |

Note: Numbers in analyte columns are request numbers.

**Table 6.4-2**
**Inorganic Chemicals above BVs at SWMU 12-002**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Nickel | Selenium | Vanadium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **7340** | **0.5** | **46** | **2200** | **7.14** | **3.14** | **4.66** | **14500** | **11.2** | **1690** | **6.58** | **0.3** | **17** |
| **Industrial SSL**[b] | | | | **1290000** | **519** | **255000** | **32400000** | **505**[c] | **350**[d] | **51900** | **908000** | **800** | **5680000** | **25700** | **6490** | **6530** |
| **Recreational SSL**[e] | | | | **619000** | **248** | **124000** | **na**[f] | **281**[c] | **186** | **24800** | **434000** | **1110** | **na** | **12400** | **3100** | **3120** |
| **Residential SSL**[b] | | | | **78000** | **31.3** | **15600** | **13000000** | **96.6**[c] | **23**[d] | **3130** | **54800** | **400** | **339000** | **1560** | **391** | **394** |
| RE12-10-8094 | 12-610787 | 0.4–0.8 | QBT3 | —[g] | 1.03 (U) | 74.3 | — | — | 13.4 | 7.83 | — | — | — | — | 1.06 (U) | — |
| RE12-10-8095 | 12-610787 | 2–3.3 | QBT3 | 14,200 | — | 191 | 2440 | 13.5 | 14.2 | 11.1 | 18,900 | 13 | 2220 (J+) | 9.28 | 1.1 (U) | 27.1 |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2015, 600915) unless otherwise noted.

[c] SSL for total chromium.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] SSLs from LANL (2015, 600336).

f na = Not available.

[g] — = Not detected or not detected above BV.

**Table 6.5-1**
**Samples Collected and Analyses Requested at AOC 12-004(a)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7236 | 12-610527 | 0–0.5 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7237 | 12-610527 | 1–2 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7238 | 12-610528 | 0–0.5 | SOIL | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7239 | 12-610528 | 1–2.6 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7240 | 12-610529 | 0–0.6 | SOIL | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7241 | 12-610529 | 1–2 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7242 | 12-610530 | 0–1 | SOIL | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7243 | 12-610530 | 1–2 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | 10-1210 | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7252 | 12-610539 | 0–0.7 | SOIL | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | —* | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7253 | 12-610539 | 1–2 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | — | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7254 | 12-610540 | 0–0.6 | SOIL | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | — | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7255 | 12-610540 | 1–1.9 | QBT3 | 10-1211 | 10-1212 | 10-1210 | 10-1211 | 10-1211 | 10-1211 | — | 10-1212 | 10-1210 | 10-1212 |
| RE12-10-7256 | 12-610541 | 0–0.6 | SOIL | 10-1213 | 10-1213 | 10-1213 | 10-1213 | 10-1213 | 10-1213 | — | 10-1213 | 10-1213 | 10-1213 |
| RE12-10-7257 | 12-610541 | 1–2 | QBT3 | 10-1213 | 10-1213 | 10-1213 | 10-1213 | 10-1213 | 10-1213 | — | 10-1213 | 10-1213 | 10-1213 |
| RE12-10-7258 | 12-610542 | 0–0.8 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7259 | 12-610542 | 1–1.7 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7260 | 12-610543 | 0–1 | SOIL | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7261 | 12-610543 | 1–1.8 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7262 | 12-610544 | 0–0.6 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7263 | 12-610544 | 1–1.7 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |

**Table 6.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7264 | 12-610545 | 0–0.9 | SOIL | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7265 | 12-610545 | 1–3 | QBT3 | 10-1227 | 10-1226 | 10-1225 | 10-1227 | 10-1227 | 10-1227 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7266 | 12-610546 | 0–0.5 | SED | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7267 | 12-610546 | 1–2 | QBT3 | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7268 | 12-610547 | 0–0.7 | SOIL | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7269 | 12-610547 | 1–1.9 | QBT3 | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7270 | 12-610548 | 0–0.8 | SOIL | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7271 | 12-610548 | 1–1.8 | QBT3 | 10-1227 | 10-1227 | 10-1225 | 10-1227 | 10-1227 | 10-1226 | — | 10-1226 | 10-1225 | 10-1226 |
| RE12-10-7272 | 12-610549 | 0–0.3 | SED | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | — | 10-1262 | 10-1262 | 10-1262 |
| RE12-10-7273 | 12-610549 | 1–1.3 | QBT3 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | — | 10-1262 | 10-1262 | 10-1262 |
| RE12-10-7274 | 12-610550 | 0–0.3 | SED | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | 10-1262 | — | 10-1262 | 10-1262 | 10-1262 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 6.5-2**
**Inorganic Chemicals above BVs at AOC 12-004(a)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Lead | Magnesium | Nickel | Perchlorate | Selenium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **11.2** | **1690** | **6.58** | **na[b]** | **0.3** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **19.7** | **2370** | **9.38** | **na** | **0.3** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **22.3** | **4610** | **15.4** | **na** | **1.52** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **800** | **5680000** | **25700** | **908** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **400** | **339000** | **1560** | **54.8** | **391** | **234** | **394** | **23500** |
| RE12-10-7236 | 12-610527 | 0–0.5 | QBT3 | —[f] | 1.26 (U) | — | 80.8 (J-) | — | — | 14.4 (J) | 6.3 | 6.76 | 12.4 | — | — | — | 1.26 (U) | 2.51 | 17.1 | — |
| RE12-10-7237 | 12-610527 | 1–2 | QBT3 | 7700 | 1.09 (U) | — | 73.9 (J-) | — | — | 13.8 (J) | 6.96 | 5.53 | 22.6 | — | — | — | 1.09 (U) | — | — | — |
| RE12-10-7238 | 12-610528 | 0–0.5 | SOIL | — | 1.16 (U) | — | — | 0.579 (U) | — | 26.4 (J) | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7239 | 12-610528 | 1–2.6 | QBT3 | 10,600 | 1.08 (U) | — | 214 (J-) | — | 4580 | 9.3 (J) | 4.03 | 5.81 | — | 1960 (J+) | 8.94 | — | 1.1 (U) | — | 17.9 | — |
| RE12-10-7240 | 12-610529 | 0–0.6 | SOIL | — | 1.15 (U) | — | — | 0.574 (U) | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7241 | 12-610529 | 1–2 | QBT3 | 8620 | 1.09 (U) | 3.14 | 169 (J-) | — | 4600 | 8.17 (J) | 5.89 | 6.22 | — | 2170 (J+) | 10.1 | 0.000553 (J) | 1.1 (U) | — | 21.6 | — |
| RE12-10-7242 | 12-610530 | 0–1 | SOIL | — | 1.19 (U) | — | — | 0.594 (U) | — | — | — | — | — | — | — | — | — | 3.08 | — | — |
| RE12-10-7243 | 12-610530 | 1–2 | QBT3 | — | 1.05 (U) | — | 70.2 (J-) | — | — | 10.3 (J) | 5.8 | — | — | — | — | — | 1.03 (U) | — | — | — |
| RE12-10-7252 | 12-610539 | 0–0.7 | SOIL | — | 1.19 (U) | — | — | 0.595 (U) | — | — | — | — | — | — | — | — | — | 2.91 | — | — |
| RE12-10-7253 | 12-610539 | 1–2 | QBT3 | — | 1.01 (U) | — | — | — | — | 16.4 (J) | — | — | — | — | — | — | 0.996 (U) | — | — | — |
| RE12-10-7254 | 12-610540 | 0–0.6 | SOIL | — | 1.14 (U) | — | — | 0.572 (U) | — | — | — | — | — | — | — | — | — | 2.15 | — | — |
| RE12-10-7255 | 12-610540 | 1–1.9 | QBT3 | — | — | — | 56.6 (J-) | — | — | 21.3 (J) | 3.69 | — | — | — | — | — | 1.07 (U) | 4.58 | — | — |
| RE12-10-7256 | 12-610541 | 0–0.6 | SOIL | — | — | — | — | — | — | 33.8 | — | — | — | — | — | 0.00078 (J) | — | 7.12 | — | 60.6 |
| RE12-10-7257 | 12-610541 | 1–2 | QBT3 | — | 1.1 (U) | — | 48.4 | — | — | 13.2 | — | — | — | — | 7.01 (J+) | — | 1.11 (U) | — | — | — |
| RE12-10-7258 | 12-610542 | 0–0.8 | QBT3 | — | 1.36 | — | — | — | — | 60.4 | 4.83 | — | — | — | — | — | 1.15 (UJ) | — | — | — |
| RE12-10-7259 | 12-610542 | 1–1.7 | QBT3 | — | 1.05 (U) | — | — | — | — | 15.2 | — | — | — | — | — | — | 1.02 (UJ) | — | — | — |
| RE12-10-7260 | 12-610543 | 0–1 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.34 | — | — |
| RE12-10-7261 | 12-610543 | 1–1.8 | QBT3 | — | 0.926 (J) | — | 67.7 | — | 2410 | 43.8 | — | 5.31 | — | — | 7.16 | — | 1.13 (UJ) | — | — | — |
| RE12-10-7262 | 12-610544 | 0–0.6 | QBT3 | — | — | — | 55.2 | — | 2210 | 22.7 | — | — | — | — | — | — | 1.09 (UJ) | — | — | — |
| RE12-10-7263 | 12-610544 | 1–1.7 | QBT3 | — | — | — | — | — | — | 18.5 | — | — | — | — | — | — | 1.04 (UJ) | — | — | — |
| RE12-10-7264 | 12-610545 | 0–0.9 | SOIL | — | 1.1 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 2.08 | — | — |
| RE12-10-7265 | 12-610545 | 1–3 | QBT3 | — | 1.04 (U) | — | — | — | — | — | — | — | — | — | — | — | 1.02 (UJ) | — | — | — |
| RE12-10-7266 | 12-610546 | 0–0.5 | SED | — | 1.07 (J) | — | — | — | — | 38.1 | — | — | — | — | — | — | 1.22 (UJ) | 2.63 | — | — |
| RE12-10-7267 | 12-610546 | 1–2 | QBT3 | — | 1.04 (U) | — | — | — | — | — | — | — | — | — | — | — | 1.07 (UJ) | — | — | — |
| RE12-10-7268 | 12-610547 | 0–0.7 | SOIL | — | 1.08 (U) | — | — | 0.541 (U) | — | — | — | — | — | — | — | — | — | 3.89 | — | — |

**Table 6.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Lead | Magnesium | Nickel | Perchlorate | Selenium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **11.2** | **1690** | **6.58** | **na[b]** | **0.3** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **19.7** | **2370** | **9.38** | **na** | **0.3** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **22.3** | **4610** | **15.4** | **na** | **1.52** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **800** | **5680000** | **25700** | **908** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **400** | **339000** | **1560** | **54.8** | **391** | **234** | **394** | **23500** |
| RE12-10-7269 | 12-610547 | 1–1.9 | QBT3 | — | 1.06 (U) | — | — | — | — | 7.37 | — | — | — | — | — | — | 1.01 (UJ) | — | — | — |
| RE12-10-7270 | 12-610548 | 0–0.8 | SOIL | — | 1.14 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 4.76 | — | — |
| RE12-10-7271 | 12-610548 | 1–1.8 | QBT3 | — | — | — | — | — | — | 12.6 | — | 5.07 | — | — | — | — | 1.06 (UJ) | — | — | — |
| RE12-10-7272 | 12-610549 | 0–0.3 | SED | — | — | — | — | 0.562 (U) | — | 13.7 | — | — | — | — | — | — | 1.12 (U) | — | — | — |
| RE12-10-7273 | 12-610549 | 1–1.3 | QBT3 | — | 1.16 (U) | — | — | — | — | 40.6 | — | — | — | — | — | — | 1.12 (U) | — | — | — |
| RE12-10-7274 | 12-610550 | 0–0.3 | SED | — | 1.15 (U) | — | — | 0.573 (U) | — | — | — | — | — | — | — | — | 1.13 (U) | 3.23 | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.5-3**
**Organic Chemicals Detected at AOC 12-004(a)**

| Sample ID | Location ID | Depth (ft) | Media | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzoic Acid | Chrysene | Di-n-butylphthalate | Fluoranthene | Phenanthrene | Pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **32.3** | **3.23** | **32.3** | **25300[b]** | **3300000[c]** | **3230** | **91600** | **33700** | **25300** | **25300** |
| **Residential SSL[a]** | | | | **1.53** | **0.153** | **1.53** | **1740[b]** | **250000[c]** | **153** | **6160** | **2320** | **1740** | **1740** |
| RE12-10-7242 | 12-610530 | 0–1 | SOIL | 0.0192 (J) | —[d] | 0.0223 (J) | — | — | — | — | — | — | 0.012 (J) |
| RE12-10-7256 | 12-610541 | 0–0.6 | SOIL | 0.0189 (J) | 0.0272 (J) | 0.204 | 0.0151 (J) | — | 0.0522 | — | 0.0589 | 0.0148 (J) | 0.0421 (J) |
| RE12-10-7261 | 12-610543 | 1–1.8 | QBT3 | — | — | — | — | — | — | 0.121 (J) | — | — | — |
| RE12-10-7270 | 12-610548 | 0–0.8 | SOIL | — | — | — | — | 0.608 (J) | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] — = Not detected.

**Table 6.5-4**
**Radionuclides Detected or Detected above BVs/FVs at AOC 12-004(a)**

| Sample ID | Location ID | Depth (ft) | Media | Cesium-137 | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.9** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **1.65** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **41** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **12** | **290** | **42** | **150** |
| RE12-10-7236 | 12-610527 | 0–0.5 | QBT3 | 0.248 | —[d] | — | — |
| RE12-10-7252 | 12-610539 | 0–0.7 | SOIL | — | — | — | 2.31 |
| RE12-10-7254 | 12-610540 | 0–0.6 | SOIL | — | — | — | 2.41 |
| RE12-10-7255 | 12-610540 | 1–1.9 | QBT3 | 0.113 | — | — | — |
| RE12-10-7260 | 12-610543 | 0–1 | SOIL | — | — | — | 3.18 |
| RE12-10-7261 | 12-610543 | 1–1.8 | QBT3 | 0.123 | — | — | — |
| RE12-10-7265 | 12-610545 | 1–3 | QBT3 | — | — | 0.108 | — |
| RE12-10-7266 | 12-610546 | 0–0.5 | SED | — | — | — | 2.96 |
| RE12-10-7268 | 12-610547 | 0–0.7 | SOIL | — | — | — | 2.57 |
| RE12-10-7269 | 12-610547 | 1–1.9 | QBT3 | 0.126 | — | 0.105 | — |
| RE12-10-7270 | 12-610548 | 0–0.8 | SOIL | — | — | — | 3.1 |
| RE12-10-7271 | 12-610548 | 1–1.8 | QBT3 | — | — | 0.124 | 4.54 |
| RE12-10-7273 | 12-610549 | 1–1.3 | QBT3 | 0.124 | — | 0.0976 | — |
| RE12-10-7274 | 12-610550 | 0–0.3 | SED | — | 3.81 | 0.253 | 6.81 |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 6.6-1**
**Samples Collected and Analyses Requested at AOC 12-004(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7288 | 12-610553 | 0–0.75 | SOIL | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-7289 | 12-610553 | 2.2–3 | QBT3 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-7290 | 12-610553 | 5–6 | QBT3 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-7291 | 12-610554 | 0–1 | SOIL | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | —* | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-7292 | 12-610554 | 2–3 | QBT3 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | — | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-7293 | 12-610554 | 5–6 | QBT3 | 10-1037 | 10-1037 | 10-1036 | 10-1037 | 10-1037 | 10-1037 | — | 10-1037 | 10-1036 | 10-1037 |
| RE12-10-15442 | 12-611939 | 0–0.5 | SOIL | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | 10-2687 | 10-2688 | 10-2687 | 10-2688 |
| RE12-10-15443 | 12-611939 | 2–2.5 | QBT3 | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | 10-2687 | 10-2688 | 10-2687 | 10-2688 |
| RE12-10-15444 | 12-611939 | 5–5.4 | QBT3 | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | 10-2687 | 10-2688 | 10-2687 | 10-2688 |
| RE12-10-15445 | 12-611940 | 0–0.5 | SOIL | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | — | 10-2688 | 10-2687 | 10-2688 |
| RE12-10-15446 | 12-611940 | 2–2.5 | QBT3 | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | — | 10-2688 | 10-2687 | 10-2688 |
| RE12-10-15447 | 12-611940 | 5–5.5 | QBT3 | 10-2689 | 10-2688 | 10-2687 | 10-2689 | 10-2689 | 10-2689 | — | 10-2688 | 10-2687 | 10-2688 |

* — = Analysis not requested.

**Table 6.6-2**
**Inorganic Chemicals above BVs at AOC 12-004(b)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Nickel | Perchlorate | Selenium | Uranium | Vanadium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **6.58** | **na[b]** | **0.3** | **2.4** | **17** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **15.4** | **na** | **1.52** | **1.82** | **39.6** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **25700** | **908** | **6490** | **3880** | **6530** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **1560** | **54.8** | **391** | **234** | **394** |
| RE12-10-7288 | 12-610553 | 0–0.75 | SOIL | —[f] | 1.05 (U) | — | — | — | — | — | — | 9.62 | — | — | 21700 | 23.4 (J) | — | — | — | — | 2.6 | 47.5 |
| RE12-10-7289 | 12-610553 | 2.2–3 | QBT3 | 9270 | — | — | 121 | — | — | 2260 (J+) | 8.88 | 7.69 | 6.23 | — | — | 11.5 (J) | 1900 (J+) | — | 0.000832 (J) | 1.09 (U) | — | 22.5 |
| RE12-10-7290 | 12-610553 | 5–6 | QBT3 | — | 1 (U) | — | — | — | — | — | 21.3 | 7.12 | — | — | — | — | — | — | — | 1.03 (U) | — | — |
| RE12-10-7291 | 12-610554 | 0–1 | SOIL | — | 1.05 (U) | — | — | — | 0.543 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7292 | 12-610554 | 2–3 | QBT3 | — | 1.02 (U) | — | 406 | — | — | 3620 (J+) | 10.5 | 6.07 | — | — | — | — | — | — | — | 1.03 (U) | — | — |
| RE12-10-7293 | 12-610554 | 5–6 | QBT3 | — | 0.939 (U) | — | — | — | — | — | — | 4.49 | — | — | — | — | — | — | — | 1.01 (U) | — | — |
| RE12-10-15442 | 12-611939 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.58 (U) | — | 23 | — | — | — | — | 5.8 | — |
| RE12-10-15443 | 12-611939 | 2–2.5 | QBT3 | 15,200 (J+) | — | 3.5 | 190 | — | — | 2300 | 10 | 5.7 | 7.3 | 0.59 (U) | — | 16.2 | 2210 | 8.3 | — | 1.1 | — | 23.1 |
| RE12-10-15444 | 12-611939 | 5–5.4 | QBT3 | 14,400 (J+) | — | 3.8 | 79.4 | 1.6 | — | 5490 | 13.7 | 3.5 | 18 | 0.6 (U) | — | 11.9 | 3230 | 13.9 | — | 1.3 | — | 21.2 |
| RE12-10-15445 | 12-611940 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.58 (U) | — | — | — | — | — | — | — | — |
| RE12-10-15446 | 12-611940 | 2–2.5 | QBT3 | — | — | 3 | 140 | — | — | 2320 | 8.2 | 6.4 | 11.8 | 0.53 (U) | — | — | — | 8.5 | — | 0.69 | — | 17.8 |
| RE12-10-15447 | 12-611940 | 5–5.5 | QBT3 | — | — | — | — | — | — | — | 8.7 | — | 12.8 | 0.52 (U) | — | — | — | 7.5 | — | 1.2 | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.6-3**
**Organic Chemicals Detected at AOC 12-004(b)**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Chrysene | Indeno(1,2,3-cd)pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300**[b] | **3230** | **32.3** |
| **Residential SSL**[a] | | | | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740**[b] | **153** | **1.53** |
| RE12-10-7291 | 12-610554 | 0–1 | SOIL | NA[c] | NA | —[d] | 0.0126 (J) | 0.0361 (J) | 0.0182 (J) | — | 0.0163 (J) |
| RE12-10-7292 | 12-610554 | 2–3 | QBT3 | NA | NA | 0.0231 (J) | 0.0187 (J) | 0.026 (J) | — | 0.027 (J) | — |
| RE12-10-15442 | 12-611939 | 0–0.5 | SOIL | 0.015 (J) | — | — | — | — | — | — | — |
| RE12-10-15444 | 12-611939 | 5–5.4 | QBT3 | — | 0.011 (J) | — | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915).

[b] Pyrene used as a surrogate based on structural similarity.

[c] NA = Not analyzed.

[d] — = Not detected.

**Table 6.6-4**
**Radionuclides Detected or Detected above BVs/FVs at AOC 12-004(b)**

| Sample ID | Location ID | Depth (ft) | Media | Plutonium-238 |
|---|---|---|---|---|
| **Soil BV**[a] | | | | **0.023** |
| **Industrial SAL**[b] | | | | **1300** |
| **Residential SAL**[b] | | | | **84** |
| RE12-10-15445 | 12-611940 | 0–0.5 | SOIL | 0.043 |

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

**Table 6.7-1**
**Samples Collected and Analyses Requested at AOC C-12-001**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7551 | 12-610624 | 0.00–0.50 | SOIL | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 |
| RE12-10-7552 | 12-610624 | 2.00–3.00 | QBT3 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 |
| RE12-10-7553 | 12-610625 | 0.00–0.50 | SOIL | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | —* | 10-1038 | 10-1038 |
| RE12-10-7554 | 12-610625 | 2.00–3.00 | QBT3 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | 10-1038 | — | 10-1038 | 10-1038 |
| RE12-10-7555 | 12-610626 | 0.00–0.50 | SOIL | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | — | 10-1073 | 10-1073 |
| RE12-10-7556 | 12-610626 | 2.10–3.00 | QBT3 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | — | 10-1073 | 10-1073 |
| RE12-10-7557 | 12-610627 | 0.00–0.50 | SOIL | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | — | 10-1073 | 10-1073 |
| RE12-10-7558 | 12-610627 | 2.40–3.00 | QBT3 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | — | 10-1073 | 10-1073 |
| RE12-10-7561 | 12-610628 | 0.00–1.00 | SOIL | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 |
| RE12-10-7562 | 12-610628 | 2.00–3.00 | QBT3 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 | 10-1073 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 6.7-2**
**Inorganic Chemicals above BVs at AOC C-12-001**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Magnesium | Nickel | Perchlorate | Selenium | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **1690** | **6.58** | **na[b]** | **0.3** | **2.4** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **4610** | **15.4** | **na** | **1.52** | **1.82** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **5680000** | **25700** | **908** | **6490** | **3880** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **339000** | **1560** | **54.8** | **391** | **234** |
| RE12-10-7551 | 12-610624 | 0.00–0.50 | SOIL | —[f] | 1.08 (U) | — | 0.561 (U) | — | — | — | — | — | — | — | — | — |
| RE12-10-7552 | 12-610624 | 2.00–3.00 | QBT3 | — | 1.07 (U) | 66.8 | — | — | 16.9 | 3.67 | — | — | — | — | 1.06 (U) | — |
| RE12-10-7553 | 12-610625 | 0.00–0.50 | SOIL | — | 1.25 (U) | — | 0.627 (U) | — | — | — | — | — | — | — | — | 4.07 |
| RE12-10-7554 | 12-610625 | 2.00–3.00 | QBT3 | 8510 | — | 132 | — | 3670 (J+) | 27 | — | — | 1970 (J+) | 7.45 | 0.000754 (J) | 1.07 (U) | — |
| RE12-10-7555 | 12-610626 | 0.00–0.50 | SOIL | — | 1.13 (U) | — | 0.564 (U) | — | — | — | — | — | — | — | — | — |
| RE12-10-7556 | 12-610626 | 2.10–3.00 | QBT3 | 8220 | 1.08 (U) | 92.4 | — | — | — | 3.16 | — | — | — | — | 1.03 (U) | — |
| RE12-10-7557 | 12-610627 | 0.00–0.50 | SOIL | — | 1.1 (U) | — | 0.548 (U) | — | — | — | — | — | — | — | — | — |
| RE12-10-7558 | 12-610627 | 2.40–3.00 | QBT3 | 8840 | 1.04 (U) | 161 | — | 4530 | — | — | — | 1860 (J+) | — | 0.00241 | 1.04 (U) | — |
| RE12-10-7561 | 12-610628 | 0.00–1.00 | SOIL | — | 1.12 (U) | — | 0.558 (U) | — | — | — | — | — | — | — | — | 2 |
| RE12-10-7562 | 12-610628 | 2.00–3.00 | QBT3 | 10,800 | 1.09 (U) | 144 | — | 2300 | 8.05 | 3.56 | 5.36 | 2100 (J+) | 9.26 | — | 1.09 (U) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.7-3**
**Organic Chemicals Detected at AOC C-12-001**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1242 | Aroclor-1254 | Aroclor-1260 |
|---|---|---|---|---|---|---|
| **Industrial SSL*** | | | | **11.5** | **11.5** | **11.5** |
| **Residential SSL*** | | | | **2.43** | **1.14** | **2.43** |
| RE12-10-7561 | 12-610628 | 0.00–1.00 | SOIL | 0.114 | 0.109 | 0.0477 |

Notes: Results are in mg/kg.
* SSLs from NMED (2015, 600915).

**Table 6.8-1**
**Samples Collected and Analyses Requested at AOC C-12-002**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7580 | 12-610629 | 0.00–0.50 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7581 | 12-610629 | 2.00–2.75 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7582 | 12-610630 | 0.00–0.75 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7583 | 12-610630 | 2.00–3.00 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7584 | 12-610631 | 0.00–0.50 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7585 | 12-610631 | 2.00–3.00 | QBT3 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7586 | 12-610632 | 0.00–0.75 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7587 | 12-610632 | 2.00–3.00 | QBT3 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7590 | 12-610633 | 0.00–0.50 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |
| RE12-10-7591 | 12-610633 | 2.00–3.00 | SOIL | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 | 10-1032 |

Note: Numbers in analyte columns are request numbers.

**Table 6.8-2**
**Inorganic Chemicals above BVs at AOC C-12-002**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Uranium | Vanadium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **1690** | **482** | **6.58** | **na**[b] | **0.3** | **2.4** | **17** |
| **Soil BV**[a] | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **4610** | **671** | **15.4** | **na** | **1.52** | **1.82** | **39.6** |
| **Industrial SSL**[c] | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505**[d] | **350**[e] | **51900** | **5680000** | **160000** | **25700** | **908** | **6490** | **3880** | **6530** |
| **Residential SSL**[c] | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6**[d] | **23**[e] | **3130** | **339000** | **10500** | **1560** | **54.8** | **391** | **234** | **394** |
| RE12-10-7580 | 12-610629 | 0.00–0.50 | SOIL | —[f] | 1.11 (U) | — | — | — | — | — | — | — | — | — | — | — | 3.13 | — |
| RE12-10-7581 | 12-610629 | 2.00–2.75 | SOIL | — | 1.1 (U) | — | 0.55 (U) | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7582 | 12-610630 | 0.00–0.75 | SOIL | — | 1.03 (U) | — | 0.514 (U) | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7583 | 12-610630 | 2.00–3.00 | SOIL | — | 1.04 (U) | — | 0.522 (U) | — | — | — | — | — | — | — | 0.00164 (J) | — | — | — |
| RE12-10-7584 | 12-610631 | 0.00–0.50 | SOIL | — | 1.07 (U) | — | 0.535 (U) | — | — | — | — | — | — | — | — | — | 2.55 | — |
| RE12-10-7585 | 12-610631 | 2.00–3.00 | QBT3 | 11,300 | 1.08 (U) | 125 | — | — | 11.6 | 5.28 | 5.97 | 1710 (J+) | — | — | — | 1.08 (U) | — | 18.8 |
| RE12-10-7586 | 12-610632 | 0.00–0.75 | SOIL | — | 1.04 (U) | — | 0.521 (U) | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7587 | 12-610632 | 2.00–3.00 | QBT3 | 10,300 | 1.07 (U) | 275 | — | 2710 | 8.79 | 6.64 | 7.21 | 2310 (J+) | — | 7.88 | — | 1.09 (U) | — | 21.5 |
| RE12-10-7590 | 12-610633 | 0.00–0.50 | SOIL | — | 1.07 (U) | — | — | — | — | 12.1 | — | — | 1070 | — | — | — | — | — |
| RE12-10-7591 | 12-610633 | 2.00–3.00 | SOIL | — | 1.11 (U) | — | 0.554 (U) | — | 23 | — | — | — | — | — | 0.000655 (J) | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.9-1**
**Samples Collected and Analyses Requested at AOC C-12-003**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7596 | 12-610634 | 0.00–0.60 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | 10-1074 | 10-1075 | 10-1075 |
| RE12-10-7597 | 12-610634 | 2.50–3.00 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | 10-1074 | 10-1075 | 10-1075 |
| RE12-10-7598 | 12-610635 | 0.00–0.50 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | —* | 10-1075 | 10-1075 |
| RE12-10-7599 | 12-610635 | 2.00–2.90 | QBT3 | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | — | 10-1075 | 10-1075 |
| RE12-10-7600 | 12-610636 | 0.00–0.50 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | — | 10-1075 | 10-1075 |
| RE12-10-7601 | 12-610636 | 2.00–3.20 | QBT3 | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | — | 10-1075 | 10-1075 |
| RE12-10-7602 | 12-610637 | 0.00–0.50 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | — | 10-1075 | 10-1075 |
| RE12-10-7603 | 12-610637 | 1.90–2.50 | QBT3 | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | — | 10-1075 | 10-1075 |
| RE12-10-7606 | 12-610638 | 0.00–0.50 | SOIL | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | 10-1074 | 10-1075 | 10-1075 |
| RE12-10-7607 | 12-610638 | 2.00–2.70 | QBT3 | 10-1076 | 10-1075 | 10-1074 | 10-1076 | 10-1076 | 10-1076 | 10-1074 | 10-1075 | 10-1075 |

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

**Table 6.9-2**
**Inorganic Chemicals above BVs at AOC C-12-003**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Chromium | Cobalt | Perchlorate | Selenium | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **0.5** | **46** | **1.63** | **7.14** | **3.14** | **na**[b] | **0.3** | **2.4** |
| **Soil BV**[a] | | | | **0.83** | **295** | **0.4** | **19.3** | **8.64** | **na** | **1.52** | **1.82** |
| **Industrial SSL**[c] | | | | **519** | **255000** | **1110** | **505**[d] | **350**[e] | **908** | **6490** | **3880** |
| **Residential SSL**[c] | | | | **31.3** | **15600** | **70.5** | **96.6**[d] | **23**[e] | **54.8** | **391** | **234** |
| RE12-10-7596 | 12-610634 | 0.00–0.60 | SOIL | 2.37 (U) | —[f] | 0.546 (U) | — | — | — | — | — |
| RE12-10-7597 | 12-610634 | 2.50–3.00 | SOIL | 2.74 (J) | — | 0.523 (U) | — | — | 0.0019 (J) | — | — |
| RE12-10-7598 | 12-610635 | 0.00–0.50 | SOIL | 1.79 (U) | — | 0.543 (U) | 40.7 | — | — | — | — |
| RE12-10-7599 | 12-610635 | 2.00–2.90 | QBT3 | 1.02 (U) | 53.7 (J+) | — | — | — | — | 1.08 (UJ) | — |
| RE12-10-7600 | 12-610636 | 0.00–0.50 | SOIL | 2.61 (U) | — | 0.555 (U) | 104 | — | — | — | — |
| RE12-10-7601 | 12-610636 | 2.00–3.20 | QBT3 | 1.55 (U) | 57 (J+) | — | — | — | — | 1.1 (UJ) | — |
| RE12-10-7602 | 12-610637 | 0.00–0.50 | SOIL | 1.9 (U) | — | 0.535 (U) | — | — | — | — | — |
| RE12-10-7603 | 12-610637 | 1.90–2.50 | QBT3 | 1.35 (U) | — | — | 35.2 | — | — | 0.997 (UJ) | — |
| RE12-10-7606 | 12-610638 | 0.00–0.50 | SOIL | 2.24 (U) | — | 0.555 (U) | — | — | — | — | 2.35 |
| RE12-10-7607 | 12-610638 | 2.00–2.70 | QBT3 | 1.45 (U) | 111 (J+) | — | 37.2 | 3.44 | — | 1.03 (UJ) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.10-1**
**Samples Collected and Analyses Requested at AOC C-12-004**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7351 | 12-610569 | 0.00–0.50 | SOIL | 10-988 | 10-988 | 10-988 | 10-988 | 10-988 | 10-988 | 10-988 | 10-988 | 10-988 |
| RE12-10-7352 | 12-610569 | 2.00–3.00 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | 10-989 | 10-990 | 10-990 |
| RE12-10-7353 | 12-610570 | 0.00–0.75 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | —* | 10-990 | 10-990 |
| RE12-10-7354 | 12-610570 | 1.75–2.70 | QBT3 | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7355 | 12-610571 | 0.00–0.75 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7356 | 12-610571 | 2.00–2.50 | QBT3 | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7357 | 12-610572 | 0.00–0.75 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7358 | 12-610572 | 2.00–2.50 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7359 | 12-610573 | 0.00–0.50 | SOIL | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |
| RE12-10-7360 | 12-610573 | 2.00–2.50 | QBT3 | 10-989 | 10-990 | 10-989 | 10-989 | 10-989 | 10-989 | — | 10-990 | 10-990 |

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

**Table 6.10-2**
**Inorganic Chemicals above BVs at AOC C-12-004**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **46** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **14500** | **11.2** | **1690** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **295** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **4610** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **255000** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **908000** | **800** | **5680000** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **54800** | **400** | **339000** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE12-10-7351 | 12-610569 | 0.00–0.50 | SOIL | —[f] | 1.02 (UJ) | — | 0.832 | — | — | — | 28.1 | — | — | — | — | — | — | 2.56 | 3.86 | — | — |
| RE12-10-7352 | 12-610569 | 2.00–3.00 | SOIL | — | 1.1 (UJ) | — | 0.548 (U) | — | — | — | — | — | — | — | — | 0.00117 (J) | — | — | — | — | — |
| RE12-10-7353 | 12-610570 | 0.00–0.75 | SOIL | — | 1.21 (UJ) | — | 0.606 (U) | — | 33.5 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7354 | 12-610570 | 1.75–2.70 | QBT3 | 10,800 | 1.07 (UJ) | 166 (J-) | — | — | 10.1 | 5.38 | 6.8 | — | 12.4 | 1880 | — | — | 1.07 (U) | — | — | 26.7 | — |
| RE12-10-7355 | 12-610571 | 0.00–0.75 | SOIL | — | 1.11 (UJ) | — | 0.556 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE12-10-7356 | 12-610571 | 2.00–2.50 | QBT3 | 12,800 | 0.985 (UJ) | 171 (J-) | — | 3810 | 13.1 | 4.56 | 5.77 | 14,700 | — | 2500 | 7.09 | 0.0012 (J) | 1.11 (U) | — | — | 19.2 | — |
| RE12-10-7357 | 12-610572 | 0.00–0.75 | SOIL | — | — | — | 0.525 (U) | — | — | — | — | — | 58.6 | — | — | — | — | — | 1.91 (U) | — | 54.9 |
| RE12-10-7358 | 12-610572 | 2.00–2.50 | SOIL | — | 1.12 (UJ) | — | 0.562 (U) | — | — | — | — | — | 29.7 | — | — | 0.00104 (J) | — | — | — | — | — |
| RE12-10-7359 | 12-610573 | 0.00–0.50 | SOIL | — | 1.01 (UJ) | — | 0.505 (U) | — | — | — | — | — | — | — | — | — | — | — | 2.86 (U) | — | — |
| RE12-10-7360 | 12-610573 | 2.00–2.50 | QBT3 | 17,100 | 1.11 (UJ) | 143 (J-) | — | 2300 | 11.6 | 6.49 | 7.29 | 15,100 | — | 2320 | 8.43 | — | 1.12 (U) | — | — | 24.9 | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 6.11-1**
**Samples Collected and Analyses Requested at AOC C-12-005**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Gamma Spectroscopy | Explosive Compounds | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE12-10-7663 | 12-610656 | 0.00–0.50 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | 10-1103 | 10-1103 |
| RE12-10-7664 | 12-610656 | 2.00–2.90 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | 10-1103 | 10-1103 |
| RE12-10-7665 | 12-610657 | 0.00–0.50 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | —* | 10-1103 | 10-1103 |
| RE12-10-7666 | 12-610657 | 2.00–3.60 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7667 | 12-610658 | 0.00–0.50 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7668 | 12-610658 | 2.50–2.90 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7669 | 12-610659 | 0.00–0.40 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7670 | 12-610659 | 2.00–3.00 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7671 | 12-610660 | 0.00–0.60 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |
| RE12-10-7672 | 12-610660 | 2.00–2.50 | SOIL | 10-1102 | 10-1103 | 10-1102 | 10-1102 | 10-1102 | 10-1102 | — | 10-1103 | 10-1103 |

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

**Table 6.11-2**
**Inorganic Chemicals above BVs at AOC C-12-005**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Cadmium | Chromium | Lead | Perchlorate | Uranium |
|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.63** | **7.14** | **11.2** | **na[b]** | **2.4** |
| **Sediment BV[a]** | | | | **0.83** | **0.4** | **10.5** | **19.7** | **na** | **2.22** |
| **Soil BV[a]** | | | | **0.83** | **0.4** | **19.3** | **22.3** | **na** | **1.82** |
| **Industrial SSL[c]** | | | | **519** | **1110** | **505[d]** | **800** | **908** | **3880** |
| **Recreational SSL[e]** | | | | **248** | **457** | **281[d]** | **1110** | **434** | **1860** |
| **Residential SSL[c]** | | | | **31.3** | **70.5** | **96.6[d]** | **400** | **54.8** | **234** |
| RE12-10-7663 | 12-610656 | 0.00–0.50 | SOIL | 3.89 | 0.636 (U) | 196 | 48.2 | —[f] | — |
| RE12-10-7664 | 12-610656 | 2.00–2.90 | SOIL | 1.09 (U) | 0.546 (U) | — | — | — | — |
| RE12-10-7665 | 12-610657 | 0.00–0.50 | SOIL | 1.08 (U) | — | — | — | — | — |
| RE12-10-7666 | 12-610657 | 2.00–3.60 | SOIL | 1.08 (U) | — | — | — | — | — |
| RE12-10-7667 | 12-610658 | 0.00–0.50 | SOIL | 1.2 (U) | 0.502 (J) | 31 | — | — | 2.77 |
| RE12-10-7668 | 12-610658 | 2.50–2.90 | SOIL | 1.09 (U) | 0.547 (U) | — | — | — | — |
| RE12-10-7669 | 12-610659 | 0.00–0.40 | SOIL | 1.32 (U) | 0.661 (U) | 39 | — | 0.00197 (J) | 2.16 |
| RE12-10-7670 | 12-610659 | 2.00–3.00 | SOIL | 1.1 (U) | 0.552 (U) | — | — | 0.00124 (J) | — |
| RE12-10-7671 | 12-610660 | 0.00–0.60 | SOIL | 1.23 (U) | 0.613 (U) | — | — | — | — |
| RE12-10-7672 | 12-610660 | 2.00–2.50 | SOIL | 1.13 (U) | 0.564 (U) | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] SSLs from LANL (2015, 600336).

[f] — = Not detected or not detected above BV.

**Table 7.2-1**
**Samples Collected and Analyses Requested at AOC C-14-006**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE14-10-7679 | 14-610661 | 0–0.5 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | 10-1384 | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7680 | 14-610661 | 2–3.1 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | 10-1384 | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7681 | 14-610662 | 0–0.5 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | —* | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7682 | 14-610662 | 2–4.5 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7683 | 14-610663 | 0–0.3 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7684 | 14-610663 | 2–3.3 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7685 | 14-610664 | 0–0.5 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7686 | 14-610664 | 2–4 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7687 | 14-610665 | 0–0.8 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |
| RE14-10-7688 | 14-610665 | 2.4–3.5 | SOIL | 10-1385 | 10-1386 | 10-1384 | 10-1385 | 10-1385 | 10-1385 | 10-1386 | — | 10-1386 | 10-1384 | 10-1386 | 10-1384 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 7.2-2**
**Inorganic Chemicals above BVs at AOC C-14-006**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Cadmium | Chromium | Nitrate | Perchlorate | Uranium |
|---|---|---|---|---|---|---|---|---|---|
| **Soil BV**[a] | | | | **0.83** | **0.4** | **19.3** | **na**[b] | **na** | **1.82** |
| **Industrial SSL**[c] | | | | **519** | **1110** | **505**[d] | **2080000** | **908** | **3880** |
| **Residential SSL**[c] | | | | **31.3** | **70.5** | **96.6**[d] | **125000** | **54.8** | **234** |
| RE14-10-7679 | 14-610661 | 0–0.5 | SOIL | 1.27 (UJ) | 0.636 (U) | —[e] | 1.49 | — | — |
| RE14-10-7680 | 14-610661 | 2–3.1 | SOIL | 0.922 (J-) | 0.543 (U) | — | 1.3 | 0.00188 (J) | — |
| RE14-10-7681 | 14-610662 | 0–0.5 | SOIL | 1.09 (J-) | 0.645 (U) | — | — | — | — |
| RE14-10-7682 | 14-610662 | 2–4.5 | SOIL | 0.873 (J-) | 0.558 (U) | — | 1.41 | 0.00125 (J) | — |
| RE14-10-7683 | 14-610663 | 0–0.3 | SOIL | 1.1 (J-) | 0.653 (U) | — | 1.82 | 0.00135 (J) | 1.94 |
| RE14-10-7684 | 14-610663 | 2–3.3 | SOIL | — | 0.568 (U) | — | 1.56 | — | — |
| RE14-10-7685 | 14-610664 | 0–0.5 | SOIL | 1.17 (UJ) | 0.584 (U) | 20.7 | — | — | — |
| RE14-10-7686 | 14-610664 | 2–4 | SOIL | — | 0.629 (U) | — | 1.56 | 0.00135 (J) | — |
| RE14-10-7687 | 14-610665 | 0–0.8 | SOIL | — | 0.662 (U) | — | — | — | — |
| RE14-10-7688 | 14-610665 | 2.4–3.5 | SOIL | — | 0.626 (U) | — | 1.49 | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

**Table 7.2-3**
**Organic Chemicals Detected at AOC C-14-006**

| Sample ID | Location ID | Depth (ft) | Media | Acetone | Isopropyltoluene[4-] | TATB | Toluene |
|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **960000** | **14200[b]** | **32000[c, d]** | **61300** |
| **Residential SSL[a]** | | | | **66300** | **2360[b]** | **2200[c, d]** | **5230** |
| RE14-10-7679 | 14-610661 | 0–0.5 | SOIL | —[e] | — | 1.2 | — |
| RE14-10-7681 | 14-610662 | 0–0.5 | SOIL | — | — | 0.404 (J) | — |
| RE14-10-7683 | 14-610663 | 0–0.3 | SOIL | 0.00973 (J-) | 0.00075 (J-) | 11.3 | 0.00067 (J-) |
| RE14-10-7685 | 14-610664 | 0–0.5 | SOIL | — | — | 6.84 | — |
| RE14-10-7687 | 14-610665 | 0–0.8 | SOIL | 0.00363 (J-) | 0.00229 (J-) | 1.61 | 0.000887 (J-) |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Isopropylbenzene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[e] — = Not detected.

**Table 8.2-1**
**Samples Collected and Analyses Requested at AOC 15-005(c)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7300 | 15-610555 | 0–0.5 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7301 | 15-610555 | 1–2 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7302 | 15-610556 | 0–0.7 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7303 | 15-610556 | 1–3 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7304 | 15-610557 | 0–0.5 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7305 | 15-610557 | 1–2 | SED | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7306 | 15-610558 | 0–0.5 | SOIL | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7307 | 15-610558 | 2–3 | SOIL | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7308 | 15-610559 | 0–0.5 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7309 | 15-610559 | 2–3.3 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1510 | 10-1511 | 10-1510 |

**Table 8.2-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7310 | 15-610560 | 0–0.5 | SOIL | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | —* | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7311 | 15-610560 | 2–4 | SOIL | 10-1383 | 10-1383 | 10-1382 | 10-1383 | 10-1383 | 10-1383 | — | 10-1383 | 10-1382 | 10-1383 | 10-1382 |
| RE15-10-7312 | 15-610561 | 0–0.5 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7313 | 15-610561 | 2–3 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7314 | 15-610562 | 0–0.5 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7315 | 15-610562 | 2–3 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7316 | 15-610563 | 0–0.7 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7317 | 15-610563 | 2–3 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7318 | 15-610564 | 0–0.7 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |
| RE15-10-7319 | 15-610564 | 2–3 | SOIL | 10-1511 | 10-1511 | 10-1510 | 10-1511 | 10-1511 | 10-1511 | — | 10-1511 | 10-1510 | 10-1511 | 10-1510 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.2-2**
**Inorganic Chemicals above BVs at AOC 15-005(c)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead | Manganese | Perchlorate | Selenium | Uranium | Vanadium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sediment BV**[a] | | | | **0.83** | **127** | **0.4** | **10.5** | **4.73** | **11.2** | **13800** | **19.7** | **543** | **na**[b] | **0.3** | **2.22** | **19.7** |
| **Soil BV**[a] | | | | **0.83** | **295** | **0.4** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **671** | **na** | **1.52** | **1.82** | **39.6** |
| **Industrial SSL**[c] | | | | **519** | **255000** | **1110** | **505**[d] | **350**[e] | **51900** | **908000** | **800** | **160000** | **908** | **6490** | **3880** | **6530** |
| **Residential SSL**[c] | | | | **31.3** | **15600** | **70.5** | **96.6**[d] | **23**[e] | **3130** | **54800** | **400** | **10500** | **54.8** | **391** | **234** | **394** |
| RE15-10-7300 | 15-610555 | 0–0.5 | SED | 1.38 (U) | 196 | 0.69 (U) | 12.1 (J) | 5.87 | 30.6 | 14,800 | —[f] | — | — | 1.26 (U) | 4.65 | 31.8 |
| RE15-10-7301 | 15-610555 | 1–2 | SED | 1.17 (U) | 184 | 0.584 (U) | 10.9 (J) | 5.34 | 11.8 | — | — | — | — | 1.16 (U) | — | 25.2 |
| RE15-10-7302 | 15-610556 | 0–0.7 | SED | 1.29 (U) | 196 | 0.645 (U) | — | 5.37 | 14.5 | — | — | — | — | 1.28 (U) | 3.95 | 26.8 |
| RE15-10-7303 | 15-610556 | 1–3 | SED | 1.17 (U) | 214 | 0.585 (U) | 10.7 (J) | 5.88 | — | 14,200 | — | — | — | 1.19 (U) | — | 28.4 |
| RE15-10-7304 | 15-610557 | 0–0.5 | SED | 1.25 (U) | 176 | 0.624 (U) | — | 5.12 | — | — | — | — | — | 1.27 (U) | 4.62 | 26.5 |
| RE15-10-7305 | 15-610557 | 1–2 | SED | 1.41 (U) | 183 | 0.703 (U) | — | — | — | — | — | — | — | 1.28 (U) | — | 21.6 |
| RE15-10-7306 | 15-610558 | 0–0.5 | SOIL | 1.17 (U) | — | 0.585 (U) | — | — | — | — | — | — | — | — | 6.14 | — |
| RE15-10-7307 | 15-610558 | 2–3 | SOIL | 1.1 (U) | — | 0.548 (U) | — | — | — | — | — | — | — | — | — | — |

**Table 8.2-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead | Manganese | Perchlorate | Selenium | Uranium | Vanadium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sediment BV[a]** | | | | **0.83** | **127** | **0.4** | **10.5** | **4.73** | **11.2** | **13800** | **19.7** | **543** | **na[b]** | **0.3** | **2.22** | **19.7** |
| **Soil BV[a]** | | | | **0.83** | **295** | **0.4** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **671** | **na** | **1.52** | **1.82** | **39.6** |
| **Industrial SSL[c]** | | | | **519** | **255000** | **1110** | **505[d]** | **350[e]** | **51900** | **908000** | **800** | **160000** | **908** | **6490** | **3880** | **6530** |
| **Residential SSL[c]** | | | | **31.3** | **15600** | **70.5** | **96.6[d]** | **23[e]** | **3130** | **54800** | **400** | **10500** | **54.8** | **391** | **234** | **394** |
| RE15-10-7308 | 15-610559 | 0–0.5 | SOIL | — | — | 0.644 (U) | — | — | — | — | 63.8 | — | — | — | 7.73 | — |
| RE15-10-7309 | 15-610559 | 2–3.3 | SOIL | — | — | 0.536 (U) | — | — | — | — | — | — | 0.000892 (J) | — | — | — |
| RE15-10-7310 | 15-610560 | 0–0.5 | SOIL | 1.3 (U) | — | 0.651 (U) | — | — | — | — | — | — | — | — | 5.2 | — |
| RE15-10-7311 | 15-610560 | 2–4 | SOIL | 1.25 (U) | — | 0.623 (U) | — | — | — | — | — | — | — | — | 2.15 | — |
| RE15-10-7312 | 15-610561 | 0–0.5 | SOIL | — | — | 0.688 (U) | — | 9.87 | — | — | — | 693 | — | — | 17.4 | — |
| RE15-10-7313 | 15-610561 | 2–3 | SOIL | — | — | 0.552 (U) | — | — | — | — | — | — | 0.000928 (J) | — | — | — |
| RE15-10-7314 | 15-610562 | 0–0.5 | SOIL | — | — | 0.711 (U) | — | — | — | — | — | — | — | — | 8.52 | — |
| RE15-10-7315 | 15-610562 | 2–3 | SOIL | 1.22 | — | 0.539 (U) | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7316 | 15-610563 | 0–0.7 | SOIL | 0.869 (J) | — | 0.767 (U) | — | — | — | — | — | — | — | — | 6.4 | — |
| RE15-10-7317 | 15-610563 | 2–3 | SOIL | 1.08 (U) | — | 0.54 (U) | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7318 | 15-610564 | 0–0.7 | SOIL | 0.895 (J) | — | 0.56 (U) | — | — | — | — | 69.6 | — | 0.00149 (J) | — | 7.65 | — |
| RE15-10-7319 | 15-610564 | 2–3 | SOIL | 0.905 (J) | — | 0.557 (U) | — | — | — | — | — | — | 0.000618 (J) | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 8.2-3**
**Organic Chemicals Detected at AOC 15-005(c)**

| Sample ID | Location ID | Depth (ft) | Media | Acetone | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Bis(2-ethylhexyl)phthalate | Chrysene | Ethylbenzene | Fluoranthene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Methylnaphthalene[2-] | Naphthalene | Phenanthrene | Pyrene | Toluene | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **960000** | **32.3** | **25300[b]** | **323** | **1830** | **3230** | **368** | **33700** | **32.3** | **14200[c]** | **3000[d]** | **241** | **25300** | **25300** | **61300** | **4280[e]** |
| **Residential SSL[a]** | | | | **66300** | **1.53** | **1740[b]** | **15.3** | **380** | **153** | **75.1** | **2320** | **1.53** | **2360[c]** | **240[d]** | **49.7** | **1740** | **1740** | **5230** | **871[e]** |
| RE15-10-7302 | 15-610556 | 0–0.7 | SED | —[f] | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000474 (J) |
| RE15-10-7303 | 15-610556 | 1–3 | SED | — | — | — | — | — | — | 0.00063 (J) | — | — | — | — | — | — | — | — | 0.000556 (J) |
| RE15-10-7306 | 15-610558 | 0–0.5 | SOIL | 0.0144 (J) | — | — | — | — | — | 0.000395 (J+) | — | — | 0.00049 (J+) | — | — | — | — | 0.000754 (J+) | 0.000984 (J+) |
| RE15-10-7308 | 15-610559 | 0–0.5 | SOIL | — | — | — | — | 0.0995 (J) | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7310 | 15-610560 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000642 (J) |
| RE15-10-7312 | 15-610561 | 0–0.5 | SOIL | 0.0188 (J) | — | — | — | — | — | — | — | — | 0.00151 | — | — | — | — | — | 0.000406 (J) |
| RE15-10-7314 | 15-610562 | 0–0.5 | SOIL | — | 0.12 | 0.0254 (J) | 0.0463 (J) | — | 0.0919 | — | 0.311 | 0.173 | — | 0.0123 (J) | 0.0208 (J) | 0.235 | 0.205 | — | — |
| RE15-10-7315 | 15-610562 | 2–3 | SOIL | — | — | — | — | — | — | — | 0.0123 (J) | — | — | — | — | — | — | — | — |
| RE15-10-7316 | 15-610563 | 0–0.7 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000538 (J) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] Xylenes used as a surrogate based on structural similarity.

[f] — = Not detected.

**Table 8.2-4**
**Radionuclides Detected or Detected above BVs/FVs at AOC 15-005(c)**

| Sample ID | Location ID | Depth (ft) | Media | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|
| **Sediment BV**[a] | | | | **2.59** | **0.2** | **2.29** |
| **Soil BV**[a] | | | | **2.59** | **0.2** | **2.29** |
| **Industrial SAL**[b] | | | | **3100** | **160** | **710** |
| **Residential SAL**[b] | | | | **290** | **42** | **150** |
| RE15-10-7300 | 15-610555 | 0–0.5 | SED | 3.1 | —[c] | 3.85 |
| RE15-10-7302 | 15-610556 | 0–0.7 | SED | 4.08 | 0.223 | 4.84 |
| RE15-10-7304 | 15-610557 | 0–0.5 | SED | — | — | 3.03 |
| RE15-10-7306 | 15-610558 | 0–0.5 | SOIL | 2.92 | 0.231 | 3.57 |
| RE15-10-7308 | 15-610559 | 0–0.5 | SOIL | 3.62 | 0.215 | 4.59 |
| RE15-10-7310 | 15-610560 | 0–0.5 | SOIL | 3.54 | — | 4.37 |
| RE15-10-7312 | 15-610561 | 0–0.5 | SOIL | 7.59 | 0.405 | 7.64 |
| RE15-10-7314 | 15-610562 | 0–0.5 | SOIL | — | — | 2.99 |
| RE15-10-7316 | 15-610563 | 0–0.7 | SOIL | — | — | 2.95 |
| RE15-10-7318 | 15-610564 | 0–0.7 | SOIL | 4.65 | 0.252 | 7.77 |

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

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

**Table 8.3-1**
**Samples Collected and Analyses Requested at SWMU 15-007(c)**

| Sample ID | Location ID | Depth (ft) | Media | Cyanide (Total) | Explosive Compounds | Tritium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8126 | 15-610792 | 0–0.5 | SOIL | 10-1543 | 10-1543 | —* | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8127 | 15-610792 | 1–2 | SOIL | 10-1543 | 10-1543 | — | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8128 | 15-610793 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8129 | 15-610793 | 1–2 | SOIL | 10-1543 | 10-1543 | — | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8130 | 15-610794 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8131 | 15-610794 | 1–2 | QBT3 | 10-1543 | 10-1543 | — | 10-1543 | 10-1543 | 10-1543 |
| RE15-10-8134 | 15-610796 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8135 | 15-610796 | 1–2 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8136 | 15-610797 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8137 | 15-610797 | 1–1.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8138 | 15-610798 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8139 | 15-610798 | 1–2 | QBT3 | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8140 | 15-610799 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8141 | 15-610799 | 1–2 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8142 | 15-610800 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8143 | 15-610800 | 1–2 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8144 | 15-610801 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8145 | 15-610801 | 1–2 | QBT3 | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8147 | 15-610802 | 0–0.5 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8146 | 15-610802 | 1–2 | SOIL | 10-1543 | 10-1543 | — | — | 10-1543 | 10-1543 |
| RE15-10-8148 | 15-610803 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8149 | 15-610803 | 1–2.1 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8151 | 15-610804 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8150 | 15-610804 | 1–2 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8153 | 15-610805 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8152 | 15-610805 | 1–2 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8154 | 15-610806 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8155 | 15-610806 | 1–2 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8156 | 15-610807 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |

**Table 8.3-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Cyanide (Total) | Explosive Compounds | Tritium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8157 | 15-610807 | 1–2 | QBT3 | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8158 | 15-610808 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8159 | 15-610808 | 1–2 | QBT3 | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8160 | 15-610809 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8161 | 15-610809 | 1–1.5 | QBT3 | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8162 | 15-610810 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8163 | 15-610810 | 1–2 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8164 | 15-610811 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8165 | 15-610811 | 1–2 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8166 | 15-610812 | 0–0.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8167 | 15-610812 | 1–1.5 | SOIL | 10-1544 | 10-1544 | — | — | 10-1544 | 10-1544 |
| RE15-10-8168 | 15-610813 | 0–0.5 | SOIL | 10-1545 | 10-1545 | — | — | 10-1545 | 10-1545 |
| RE15-10-8169 | 15-610813 | 1–1.5 | SOIL | 10-1545 | 10-1545 | — | — | 10-1545 | 10-1545 |
| RE15-10-8170 | 15-610814 | 0–0.5 | SOIL | 10-1545 | 10-1545 | — | — | 10-1545 | 10-1545 |
| RE15-10-8171 | 15-610814 | 1–2 | QBT3 | 10-1545 | 10-1545 | — | — | 10-1545 | 10-1545 |
| RE15-10-8174 | 15-610816 | 3.5–5 | QBT3 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 |
| RE15-10-8175 | 15-610816 | 17.5–20 | QBT3 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 |
| RE15-10-8176 | 15-610816 | 34–35 | QBT3 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 |
| RE15-10-8177 | 15-610816 | 49–50 | QBT3 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 |
| RE15-10-8178 | 15-610816 | 65–66 | QBT3 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 | 10-1665 |
| RE15-10-8179 | 15-610816 | 79–80 | QBT3 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8180 | 15-610816 | 94–95 | QBT3 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8181 | 15-610816 | 109–110 | QBT3 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8182 | 15-610816 | 124–125 | QBT2 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8183 | 15-610816 | 139–140 | QBT2 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8184 | 15-610816 | 154–155 | QBT2 | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8185 | 15-610816 | 169–170 | QBT1G | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8210 | 15-610816 | 181.5–182.5 | QBT1G | 10-1704 | 10-1703 | 10-1705 | 10-1703 | 10-1704 | 10-1704 |
| RE15-10-8186 | 15-610817 | 4–5 | QBT3 | 10-1863 | 10-1864 | 10-1864 | 10-1864 | 10-1863 | 10-1863 |
| RE15-10-8187 | 15-610817 | 18–20 | QBT3 | 10-1863 | 10-1864 | 10-1864 | 10-1864 | 10-1863 | 10-1863 |
| RE15-10-8188 | 15-610817 | 34–35 | QBT3 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8189 | 15-610817 | 49–50 | QBT3 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8190 | 15-610817 | 64–65 | QBT3 | 10-1863 | 10-1864 | 10-1864 | 10-1864 | 10-1863 | 10-1863 |
| RE15-10-8191 | 15-610817 | 79–80 | QBT3 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |

**Table 8.3-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Cyanide (Total) | Explosive Compounds | Tritium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8192 | 15-610817 | 94–95 | QBT3 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8193 | 15-610817 | 109–110 | QBT3 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8194 | 15-610817 | 124–126 | QBT2 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8195 | 15-610817 | 139–140 | QBT2 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8196 | 15-610817 | 156–157.5 | QBT2 | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8197 | 15-610817 | 171.5–172.5 | QBT1G | 10-1863 | 10-1864 | 10-1864 | — | 10-1863 | 10-1863 |
| RE15-10-8211 | 15-610817 | 181.5–182.5 | QBT1G | 10-1863 | 10-1864 | 10-1864 | 10-1864 | 10-1863 | 10-1863 |
| RE15-10-8198 | 15-610818 | 4–5 | QBT3 | 10-1848 | 10-1848 | 10-1848 | 10-1848 | 10-1848 | 10-1848 |
| RE15-10-8199 | 15-610818 | 19–20 | QBT3 | 10-1848 | 10-1848 | 10-1848 | — | 10-1848 | 10-1848 |
| RE15-10-8200 | 15-610818 | 34–35 | QBT3 | 10-1848 | 10-1848 | 10-1848 | — | 10-1848 | 10-1848 |
| RE15-10-8201 | 15-610818 | 49–50 | QBT3 | 10-1848 | 10-1848 | 10-1848 | — | 10-1848 | 10-1848 |
| RE15-10-8202 | 15-610818 | 63.5–65 | QBT3 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8203 | 15-610818 | 79–80 | QBT3 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8204 | 15-610818 | 94–95 | QBT3 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8205 | 15-610818 | 109–110 | QBT3 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8206 | 15-610818 | 124–130 | QBT2 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8207 | 15-610818 | 139–140 | QBT2 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8208 | 15-610818 | 154–155 | QBT2 | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8209 | 15-610818 | 169–170 | QBT1G | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |
| RE15-10-8212 | 15-610818 | 180–182.5 | QBT1G | 10-1909 | 10-1908 | 10-1910 | 10-1908 | 10-1909 | 10-1909 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.3-2**
**Inorganic Chemicals above BVs at SWMU 15-007(c)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **3560** | **0.5** | **0.56** | **25.7** | **1.44** | **0.4** | **1900** | **2.6** | **8.89** | **3.96** | **3700** | **13.5** | **739** | **189** | **2** | **na[b]** | **0.3** | **1** | **4.59** | **40** |
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na** | **0.3** | **1** | **17** | **63.5** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.9[d]** | **23[e]** | **3130** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **394** | **23500** |
| RE15-10-8126 | 15-610792 | 0–0.5 | SOIL | —[f] | 1.24 (U) | — | — | — | 0.595 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8127 | 15-610792 | 1–2 | SOIL | — | — | — | — | — | 0.543 (U) | — | 23.4 | — | — | — | — | — | — | — | — | — | — | — | 54.5 |
| RE15-10-8128 | 15-610793 | 0–0.5 | SOIL | — | — | — | — | — | 0.579 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8129 | 15-610793 | 1–2 | SOIL | — | 0.898 (U) | — | — | — | 0.573 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8130 | 15-610794 | 0–0.5 | SOIL | — | 0.987 (U) | — | — | — | 0.578 (U) | — | — | — | — | — | 44.7 | — | — | — | — | — | 14.7 | — | — |
| RE15-10-8131 | 15-610794 | 1–2 | QBT3 | 10,800 | 0.846 (U) | 3.2 (J) | 158 | — | — | 3510 | 13.1 | 5.39 (J) | 6.48 (J) | — | 12.6 | 2120 | — | 9.69 (J) | — | 1.11 (UJ) | — | 24.7 | — |
| RE15-10-8134 | 15-610796 | 0–0.5 | SOIL | — | 0.976 (U) | — | — | — | 0.531 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8135 | 15-610796 | 1–2 | SOIL | — | 1.12 (UJ) | — | — | — | 0.559 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8136 | 15-610797 | 0–0.5 | SOIL | — | 1.02 (U) | — | — | — | 0.527 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8137 | 15-610797 | 1–1.5 | SOIL | — | 1.85 (U) | — | — | — | 0.55 (U) | — | 151 | — | — | — | — | — | — | 16.8 | — | — | — | — | 54.3 |
| RE15-10-8138 | 15-610798 | 0–0.5 | SOIL | — | — | — | — | — | 0.529 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8139 | 15-610798 | 1–2 | QBT3 | 13,400 | 1.18 (U) | — | 150 | — | — | — | 14.4 | 4.62 (J) | 6.81 (J) | — | 12.1 | 2060 | — | 8.06 (J) | — | 1.02 (UJ) | — | 23.9 | — |
| RE15-10-8140 | 15-610799 | 0–0.5 | SOIL | — | — | — | — | — | 0.557 (U) | — | 22.5 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8141 | 15-610799 | 1–2 | SOIL | — | — | — | — | — | 0.538 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8142 | 15-610800 | 0–0.5 | SOIL | — | 0.903 (U) | — | — | — | 0.623 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8143 | 15-610800 | 1–2 | SOIL | — | 1.09 (U) | — | — | — | 0.552 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8144 | 15-610801 | 0–0.5 | SOIL | — | 1.45 (UJ) | — | — | — | 0.727 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8145 | 15-610801 | 1–2 | QBT3 | 7630 | 0.919 (U) | — | 125 | — | — | — | 10.1 | 5.83 (J) | 6.57 (J) | — | — | 1860 | — | 6.92 (J) | — | 1.04 (UJ) | — | 24.3 | — |
| RE15-10-8147 | 15-610802 | 0–0.5 | SOIL | — | 1.17 (U) | — | — | — | 0.779 (U) | — | 23.2 | — | — | — | 150 | — | — | — | — | — | — | — | 108 |
| RE15-10-8146 | 15-610802 | 1–2 | SOIL | — | 1.29 (U) | — | — | — | 0.568 (U) | — | — | — | — | — | 200 | — | — | — | — | — | — | — | 77.5 |
| RE15-10-8148 | 15-610803 | 0–0.5 | SOIL | — | 1.51 (U) | — | — | — | — | — | 21.7 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8149 | 15-610803 | 1–2.1 | SOIL | — | 1.08 (U) | — | — | — | — | — | 42.5 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8151 | 15-610804 | 0–0.5 | SOIL | — | 1.32 (U) | — | — | — | — | — | 41.4 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8150 | 15-610804 | 1–2 | SOIL | — | 1.11 (U) | — | — | — | — | — | 22.7 | — | — | — | — | — | — | — | 0.000619 (J) | — | — | — | — |
| RE15-10-8153 | 15-610805 | 0–0.5 | SOIL | — | 1.27 (U) | — | — | — | — | — | 23.2 | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8152 | 15-610805 | 1–2 | SOIL | — | 1.24 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8154 | 15-610806 | 0–0.5 | SOIL | — | 1.29 (U) | — | — | — | 0.635 (J) | — | — | — | — | — | 35.7 (J+) | — | — | — | — | — | — | — | — |

**Table 8.3-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **3560** | **0.5** | **0.56** | **25.7** | **1.44** | **0.4** | **1900** | **2.6** | **8.89** | **3.96** | **3700** | **13.5** | **739** | **189** | **2** | **na[b]** | **0.3** | **1** | **4.59** | **40** |
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na** | **0.3** | **1** | **17** | **63.5** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.9[d]** | **23[e]** | **3130** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **394** | **23500** |
| RE15-10-8155 | 15-610806 | 1–2 | SOIL | — | 1.15 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8156 | 15-610807 | 0–0.5 | SOIL | — | 1.24 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8157 | 15-610807 | 1–2 | QBT3 | 20,800 | 1.1 (U) | — | 223 (J+) | — | — | 2790 | 14 | 7.48 (J) | 10.2 (J) | 17,300 | 15.7 (J+) | 3080 (J+) | — | 9.82 | 0.000579 (J) | 1.08 (U) | — | 33.1 | — |
| RE15-10-8158 | 15-610808 | 0–0.5 | SOIL | — | 1.16 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8159 | 15-610808 | 1–2 | QBT3 | 16,600 | 1.08 (U) | 3.01 | 174 (J+) | — | — | 2710 | 13.6 | 5.64 (J) | 8.26 (J) | 15,900 | 13.3 (J) | 2660 (J+) | — | 9.31 | — | 1.1 (U) | — | 30.1 | — |
| RE15-10-8160 | 15-610809 | 0–0.5 | SOIL | — | 1.16 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8161 | 15-610809 | 1–1.5 | QBT3 | — | 1.08 (U) | — | 106 (J+) | — | — | 3390 | 11.1 | 4.61 (J) | 7.78 (J) | — | — | 1830 (J+) | — | — | — | 1.13 (U) | — | — | — |
| RE15-10-8162 | 15-610810 | 0–0.5 | SOIL | — | 1.3 (U) | — | — | — | — | — | — | — | — | — | 28.3 (J+) | — | — | — | — | — | — | — | — |
| RE15-10-8163 | 15-610810 | 1–2 | SOIL | — | 1.14 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8164 | 15-610811 | 0–0.5 | SOIL | — | 1.21 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8165 | 15-610811 | 1–2 | SOIL | — | 1.08 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8166 | 15-610812 | 0–0.5 | SOIL | — | 1.22 (U) | — | — | — | 0.609 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8167 | 15-610812 | 1–1.5 | SOIL | — | 1.13 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8168 | 15-610813 | 0–0.5 | SOIL | — | 1.16 (UJ) | — | — | — | — | — | — | — | — | — | 45.9 (J) | — | — | — | — | — | — | — | — |
| RE15-10-8169 | 15-610813 | 1–1.5 | SOIL | — | 1.76 | — | — | — | — | — | — | — | — | — | 180 (J) | — | — | — | — | 2.11 (U) | — | — | — |
| RE15-10-8170 | 15-610814 | 0–0.5 | SOIL | — | 243 | — | — | — | — | — | — | — | — | — | 63700 (J) | — | — | — | 0.000831 (J) | — | — | — | 206 (J+) |
| RE15-10-8171 | 15-610814 | 1–2 | QBT3 | 15,100 | — | — | 180 (J+) | — | — | 2240 (J+) | 15.5 | 6.75 | 8.99 | 14,700 | 90.6 (J) | 2400 (J+) | — | 9.15 | 0.0017 (J) | 1.05 (U) | — | 30.9 (J) | — |
| RE15-10-8174 | 15-610816 | 3.5–5 | QBT3 | — | 1.05 (UJ) | — | 173 (J+) | — | — | 2930 | — | 4.72 | 5.26 | — | 11.6 | — | 614 | — | 0.000576 (J) | 1.03 (U) | — | — | — |
| RE15-10-8175 | 15-610816 | 17.5–20 | QBT3 | — | 0.993 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000838 (J) | 0.977 (U) | — | — | — |
| RE15-10-8176 | 15-610816 | 34–35 | QBT3 | — | 1.05 (UJ) | — | — | 1.37 | — | — | — | — | — | — | — | — | — | — | 0.00462 | 1.05 (U) | — | — | — |
| RE15-10-8177 | 15-610816 | 49–50 | QBT3 | — | 5 (UJ) | — | — | 1.36 | — | — | — | — | — | — | — | — | — | — | 0.00141 (J) | 0.933 (U) | — | — | — |
| RE15-10-8178 | 15-610816 | 65–66 | QBT3 | — | 4.87 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000587 (J) | 0.975 (U) | — | — | — |
| RE15-10-8179 | 15-610816 | 79–80 | QBT3 | — | 0.99 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.01 (UJ) | — | — | — |
| RE15-10-8180 | 15-610816 | 94–95 | QBT3 | — | 0.95 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.985 (UJ) | — | — | — |
| RE15-10-8181 | 15-610816 | 109–110 | QBT3 | — | 1.01 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.02 (UJ) | — | — | — |
| RE15-10-8182 | 15-610816 | 124–125 | QBT2 | — | 1.01 (U) | — | — | — | — | — | 24.8 | — | — | — | — | — | — | — | — | 0.944 (UJ) | — | — | — |
| RE15-10-8183 | 15-610816 | 139–140 | QBT2 | — | 0.947 (U) | — | — | 1.54 (J-) | — | — | 11.3 | — | 5.13 | — | — | — | — | — | — | 1 (UJ) | — | — | — |
| RE15-10-8184 | 15-610816 | 154–155 | QBT2 | — | 1.03 (U) | — | — | 8.68 (J-) | — | — | — | — | — | — | — | — | — | — | — | 1.03 (UJ) | — | — | — |
| RE15-10-8185 | 15-610816 | 169–170 | QBT1G | 4670 | 1.07 (U) | 0.728 (J-) | — | 3.14 (J-) | — | — | 4.04 | — | — | 6590 | — | — | 243 | 2.5 (J-) | — | 1.05 (UJ) | — | 4.98 | 44.4 |
| RE15-10-8210 | 15-610816 | 181.5–182.5 | QBT1G | 3990 | 1.01 (U) | 0.714 (J-) | — | 2.46 (J-) | — | — | 4.61 | — | — | 7600 | — | 777 (J+) | 297 | 2.43 (J-) | — | 1.07 (UJ) | — | 5.7 | 50.3 |
| RE15-10-8186 | 15-610817 | 4–5 | QBT3 | — | 0.996 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.01 (U) | — | — | — |

**Table 8.3-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium | Silver | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **3560** | **0.5** | **0.56** | **25.7** | **1.44** | **0.4** | **1900** | **2.6** | **8.89** | **3.96** | **3700** | **13.5** | **739** | **189** | **2** | **na[b]** | **0.3** | **1** | **4.59** | **40** |
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **14500** | **11.2** | **1690** | **482** | **6.58** | **na** | **0.3** | **1** | **17** | **63.5** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **21500** | **22.3** | **4610** | **671** | **15.4** | **na** | **1.52** | **1** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **908000** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** | **6490** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.9[d]** | **23[e]** | **3130** | **54800** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** | **391** | **394** | **23500** |
| RE15-10-8187 | 15-610817 | 18–20 | QBT3 | — | 5.13 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.998 (U) | — | — | — |
| RE15-10-8188 | 15-610817 | 34–35 | QBT3 | — | 0.997 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00213 | 0.961 (U) | — | — | — |
| RE15-10-8189 | 15-610817 | 49–50 | QBT3 | — | 4.67 (UJ) | — | — | — | — | — | 15.4 (J-) | — | — | — | — | — | — | — | 0.000533 (J) | 0.939 (U) | — | — | — |
| RE15-10-8190 | 15-610817 | 64–65 | QBT3 | — | 4.71 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.965 (U) | — | — | — |
| RE15-10-8191 | 15-610817 | 79–80 | QBT3 | — | 4.53 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 (U) | — | — | — |
| RE15-10-8192 | 15-610817 | 94–95 | QBT3 | — | 4.88 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.955 (U) | — | — | — |
| RE15-10-8193 | 15-610817 | 109–110 | QBT3 | — | 0.941 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.997 (U) | — | — | — |
| RE15-10-8194 | 15-610817 | 124–126 | QBT2 | — | 0.993 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.979 (U) | — | — | — |
| RE15-10-8195 | 15-610817 | 139–140 | QBT2 | — | 4.87 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.96 (U) | — | — | — |
| RE15-10-8196 | 15-610817 | 156–157.5 | QBT2 | — | 0.953 (UJ) | — | — | — | — | — | 16.1 (J-) | — | — | — | — | — | — | — | — | 0.986 (U) | — | — | — |
| RE15-10-8197 | 15-610817 | 171.5–172.5 | QBT1G | — | 4.79 (UJ) | — | — | — | 0.479 (U) | — | — | — | — | 5970 | — | — | 266 | — | — | 0.987 (U) | — | — | 46 |
| RE15-10-8211 | 15-610817 | 181.5–182.5 | QBT1G | — | 4.69 (UJ) | — | — | — | 0.469 (U) | — | — | — | — | 6270 | — | — | 317 | — | — | 0.941 (U) | — | — | 52.4 |
| RE15-10-8198 | 15-610818 | 4–5 | QBT3 | — | 0.903 (U) | — | — | — | — | — | — | — | — | — | 25.7 | — | — | — | — | 0.946 (U) | — | — | — |
| RE15-10-8199 | 15-610818 | 19–20 | QBT3 | — | 0.934 (U) | — | — | — | — | — | — | — | — | — | 17.9 | — | — | — | — | 0.965 (U) | — | — | — |
| RE15-10-8200 | 15-610818 | 34–35 | QBT3 | — | 0.91 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.988 (U) | — | — | — |
| RE15-10-8201 | 15-610818 | 49–50 | QBT3 | — | 0.936 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.99 (U) | — | — | — |
| RE15-10-8202 | 15-610818 | 63.5–65 | QBT3 | — | 1 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.918 (U) | — | — | — |
| RE15-10-8203 | 15-610818 | 79–80 | QBT3 | — | 0.976 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.982 (U) | — | — | — |
| RE15-10-8204 | 15-610818 | 94–95 | QBT3 | — | 1.01 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.985 (U) | — | — | — |
| RE15-10-8205 | 15-610818 | 109–110 | QBT3 | — | 1 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.962 (U) | — | — | — |
| RE15-10-8206 | 15-610818 | 124–130 | QBT2 | — | 1.01 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.982 (U) | — | — | — |
| RE15-10-8207 | 15-610818 | 139–140 | QBT2 | — | 0.964 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.01 (U) | — | — | — |
| RE15-10-8208 | 15-610818 | 154–155 | QBT2 | — | 1.02 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.993 (U) | — | — | — |
| RE15-10-8209 | 15-610818 | 169–170 | QBT1G | — | 1.01 (U) | — | — | — | 0.505 (U) | — | 10.6 (J) | — | — | 5950 | — | — | 334 | — | — | 0.957 (U) | — | — | 41 |
| RE15-10-8212 | 15-610818 | 180–182.5 | QBT1G | — | 0.988 (U) | — | — | — | 0.494 (U) | — | — | — | — | 5980 | — | — | 322 | — | — | 0.986 (U) | — | — | 46.8 |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 8.3-3**
**Organic Chemicals Detected at SWMU 15-007(c)**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1242 | Aroclor-1254 | TATB |
|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **11.5** | **11.5** | **32000**[b, c] |
| **Residential SSL**[a] | | | | **2.43** | **1.14** | **2200**[b, c] |
| RE15-10-8128 | 15-610793 | 0–0.5 | SOIL | —[d] | — | 0.496 (J+) |
| RE15-10-8130 | 15-610794 | 0–0.5 | SOIL | — | 0.0055 | — |
| RE15-10-8166 | 15-610812 | 0–0.5 | SOIL | NA[e] | NA | 0.443 (J) |
| RE15-10-8168 | 15-610813 | 0–0.5 | SOIL | NA | NA | 0.36 (J) |
| RE15-10-8198 | 15-610818 | 4–5 | QBT3 | 0.0034 | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] SSLs from NMED (2015, 600915) unless otherwise noted.
[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).
[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[d] — = Not detected.
[e] NA = Not analyzed.

**Table 8.3-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-007(c)**

| Sample ID | Location ID | Depth (ft) | Media | Tritium |
|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **na[b]** |
| **Qbt 2,3,4 BV[a]** | | | | **na** |
| **Industrial SAL[c]** | | | | **2400000** |
| **Residential SAL[c]** | | | | **1700** |
| RE15-10-8174 | 15-610816 | 3.5–5 | QBT3 | 1.42153 |
| RE15-10-8176 | 15-610816 | 34–35 | QBT3 | 37.5957 |
| RE15-10-8177 | 15-610816 | 49–50 | QBT3 | 132.751 |
| RE15-10-8178 | 15-610816 | 65–66 | QBT3 | 53.8462 |
| RE15-10-8179 | 15-610816 | 79–80 | QBT3 | 5.73469 |
| RE15-10-8180 | 15-610816 | 94–95 | QBT3 | 3.72098 |
| RE15-10-8181 | 15-610816 | 109–110 | QBT3 | 4.37589 |
| RE15-10-8182 | 15-610816 | 124–125 | QBT2 | 3.8736 |
| RE15-10-8183 | 15-610816 | 139–140 | QBT2 | 5.39193 |
| RE15-10-8184 | 15-610816 | 154–155 | QBT2 | 6.26272 |
| RE15-10-8185 | 15-610816 | 169–170 | QBT1G | 10.2611 |
| RE15-10-8210 | 15-610816 | 181.5–182.5 | QBT1G | 46.7033 |
| RE15-10-8187 | 15-610817 | 18–20 | QBT3 | 2.2829 |
| RE15-10-8188 | 15-610817 | 34–35 | QBT3 | 3.01576 |
| RE15-10-8189 | 15-610817 | 49–50 | QBT3 | 38.6 |
| RE15-10-8190 | 15-610817 | 64–65 | QBT3 | 127 |
| RE15-10-8191 | 15-610817 | 79–80 | QBT3 | 14.7 |
| RE15-10-8195 | 15-610817 | 139–140 | QBT2 | 0.440833 |
| RE15-10-8197 | 15-610817 | 171.5–172.5 | QBT1G | 0.327441 |
| RE15-10-8198 | 15-610818 | 4–5 | QBT3 | 7.45 |
| RE15-10-8199 | 15-610818 | 19–20 | QBT3 | 476 |
| RE15-10-8200 | 15-610818 | 34–35 | QBT3 | 180 |
| RE15-10-8201 | 15-610818 | 49–50 | QBT3 | 80.6 |
| RE15-10-8202 | 15-610818 | 63.5–65 | QBT3 | 17.6327 |
| RE15-10-8203 | 15-610818 | 79–80 | QBT3 | 6.02 |
| RE15-10-8204 | 15-610818 | 94–95 | QBT3 | 5.16904 |
| RE15-10-8205 | 15-610818 | 109–110 | QBT3 | 5.62055 |
| RE15-10-8206 | 15-610818 | 124–130 | QBT2 | 2.18858 |
| RE15-10-8207 | 15-610818 | 139–140 | QBT2 | 0.842784 |
| RE15-10-8208 | 15-610818 | 154–155 | QBT2 | 1.1485 |
| RE15-10-8209 | 15-610818 | 169–170 | QBT1G | 2.59531 |
| RE15-10-8212 | 15-610818 | 180–182.5 | QBT1G | 1.93401 |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

**Table 8.4-1**
**Samples Collected and Analyses**

| Sample ID | Location ID | Depth (ft) | Media | Cyanide (Total) | Explosive Compounds | Tritium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8240 | 15-610819 | 4–5 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8241 | 15-610819 | 19–20 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8242 | 15-610819 | 33–35 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8243 | 15-610819 | 49–50 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8244 | 15-610819 | 64–65 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8245 | 15-610819 | 79–80 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8246 | 15-610819 | 104–105 | QBT3 | 10-1912 | 10-1911 | 10-1913 | 10-1911 | 10-1912 | 10-1912 |
| RE15-10-8247 | 15-610819 | 109–110 | QBT3 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8248 | 15-610819 | 123.5–125 | QBT2 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8249 | 15-610819 | 138.5–140 | QBT2 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8250 | 15-610819 | 154–155 | QBT2 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8251 | 15-610819 | 169–170 | QBT1G | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8264 | 15-610819 | 181.5–182.5 | QBT1G | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8252 | 15-610820 | 4–5 | QBT3 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8253 | 15-610820 | 18–20 | QBT3 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8254 | 15-610820 | 34–35 | QBT3 | 10-1957 | 10-1956 | 10-1958 | 10-1956 | 10-1957 | 10-1957 |
| RE15-10-8255 | 15-610820 | 48.5–50 | QBT3 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8256 | 15-610820 | 63.5–65 | QBT3 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8257 | 15-610820 | 79–80 | QBT3 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8258 | 15-610820 | 93.5–95 | QBT3 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8259 | 15-610820 | 108.5–110 | QBT3 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8260 | 15-610820 | 124–125 | QBT2 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8261 | 15-610820 | 138.5–140 | QBT2 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8262 | 15-610820 | 153.5–155 | QBT2 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8263 | 15-610820 | 168.5–170 | QBT2 | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |
| RE15-10-8265 | 15-610820 | 178–180 | QBT1V | 10-1973 | 10-1972 | 10-1974 | 10-1972 | 10-1973 | 10-1973 |

Note: Numbers in analyte columns are request numbers.

**Table 8.4-2**
**Inorganic Chemicals above BVs at SWMU 15-007(d)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Beryllium | Cadmium | Chromium | Iron | Manganese | Perchlorate | Selenium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **0.5** | **1.44** | **0.4** | **2.6** | **3700** | **189** | **na[b]** | **0.3** | **40** |
| **Qbt 1v BV[a]** | | | | **0.5** | **1.7** | **0.4** | **2.24** | **9900** | **408** | **na** | **0.3** | **84.6** |
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.21** | **1.63** | **7.14** | **14500** | **482** | **na** | **0.3** | **63.5** |
| **Industrial SSL[c]** | | | | **519** | **2580** | **1110** | **505[d]** | **908000** | **160000** | **908** | **6490** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **156** | **70.5** | **96.6[d]** | **54800** | **10500** | **54.8** | **391** | **23500** |
| RE15-10-8240 | 15-610819 | 4–5 | QBT3 | 0.991 (UJ) | —[e] | — | — | — | — | — | 0.965 (U) | — |
| RE15-10-8241 | 15-610819 | 19–20 | QBT3 | 1 (UJ) | — | — | — | — | — | — | 1.01 (U) | — |
| RE15-10-8242 | 15-610819 | 33–35 | QBT3 | 0.98 (UJ) | — | — | — | — | — | — | 0.992 (U) | — |
| RE15-10-8243 | 15-610819 | 49–50 | QBT3 | 0.99 (UJ) | — | — | — | — | — | — | 0.99 (U) | — |
| RE15-10-8244 | 15-610819 | 64–65 | QBT3 | 1.02 (UJ) | — | — | — | — | — | — | 1.01 (U) | — |
| RE15-10-8245 | 15-610819 | 79–80 | QBT3 | 0.958 (UJ) | — | — | — | — | — | — | 0.96 (U) | — |
| RE15-10-8246 | 15-610819 | 104–105 | QBT3 | 4.69 (UJ) | — | — | — | — | — | — | 0.964 (U) | — |
| RE15-10-8247 | 15-610819 | 109–110 | QBT3 | 1.01 (U) | — | — | — | — | — | — | 0.961 (U) | — |
| RE15-10-8248 | 15-610819 | 123.5–125 | QBT2 | 0.95 (U) | — | — | — | — | — | — | 0.968 (U) | — |
| RE15-10-8249 | 15-610819 | 138.5–140 | QBT2 | 0.963 (U) | — | — | 9.27 | — | — | — | 0.549 (J) | — |
| RE15-10-8250 | 15-610819 | 154–155 | QBT2 | 0.968 (U) | — | — | — | — | — | — | 0.928 (U) | — |
| RE15-10-8251 | 15-610819 | 169–170 | QBT1G | 1.02 (U) | — | 0.512 (U) | — | 5910 | 268 (J) | — | 1 (U) | 40.8 |
| RE15-10-8264 | 15-610819 | 181.5–182.5 | QBT1G | 1.01 (U) | — | 0.504 (U) | — | 5890 | 282 (J) | — | 0.513 (J) | 42.4 |
| RE15-10-8252 | 15-610820 | 4–5 | QBT3 | 0.998 (U) | — | — | — | — | — | — | 1 (U) | — |
| RE15-10-8253 | 15-610820 | 18–20 | QBT3 | 0.947 (U) | — | — | — | — | — | 0.00212 | 1.01 (U) | — |
| RE15-10-8254 | 15-610820 | 34–35 | QBT3 | 0.964 (U) | 1.67 | — | — | — | — | 0.00237 | 1.02 (U) | — |
| RE15-10-8255 | 15-610820 | 48.5–50 | QBT3 | 0.998 (U) | — | — | — | — | — | — | 1 (U) | — |
| RE15-10-8256 | 15-610820 | 63.5–65 | QBT3 | 1 (U) | — | — | — | — | — | — | 0.972 (U) | — |
| RE15-10-8257 | 15-610820 | 79–80 | QBT3 | 0.963 (U) | — | — | — | — | — | — | 0.989 (U) | — |
| RE15-10-8258 | 15-610820 | 93.5–95 | QBT3 | 0.978 (U) | — | — | — | — | — | — | 0.98 (U) | — |
| RE15-10-8259 | 15-610820 | 108.5–110 | QBT3 | 0.992 (U) | — | — | — | — | — | — | 1 (U) | — |

**Table 8.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Beryllium | Cadmium | Chromium | Iron | Manganese | Perchlorate | Selenium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **0.5** | **1.44** | **0.4** | **2.6** | **3700** | **189** | **na[b]** | **0.3** | **40** |
| **Qbt 1v BV[a]** | | | | **0.5** | **1.7** | **0.4** | **2.24** | **9900** | **408** | **na** | **0.3** | **84.6** |
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.21** | **1.63** | **7.14** | **14500** | **482** | **na** | **0.3** | **63.5** |
| **Industrial SSL[c]** | | | | **519** | **2580** | **1110** | **505[d]** | **908000** | **160000** | **908** | **6490** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **156** | **70.5** | **96.6[d]** | **54800** | **10500** | **54.8** | **391** | **23500** |
| RE15-10-8260 | 15-610820 | 124–125 | QBT2 | 1 (U) | — | — | 18.7 | — | — | — | 0.935 (U) | — |
| RE15-10-8261 | 15-610820 | 138.5–140 | QBT2 | 0.985 (U) | — | — | 12 | — | — | — | 1.02 (U) | — |
| RE15-10-8262 | 15-610820 | 153.5–155 | QBT2 | 0.968 (U) | — | — | — | — | — | — | 1.01 (U) | — |
| RE15-10-8263 | 15-610820 | 168.5–170 | QBT2 | 0.965 (U) | — | — | — | — | — | — | 0.961 (U) | — |
| RE15-10-8265 | 15-610820 | 178–180 | QBT1V | 1 (U) | — | 0.501 (U) | 3 | — | — | — | 0.989 (U) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

**Table 8.4-3**
**Organic Chemicals Detected at SWMU 15-007(d)**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1242 | Aroclor-1254 |
|---|---|---|---|---|---|
| **Industrial SSL*** | | | | **11.5** | **11.5** |
| **Residential SSL*** | | | | **2.43** | **1.14** |
| RE15-10-8245 | 15-610819 | 79–80 | QBT3 | 0.0032 (J) | 0.0018 (J) |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

* SSLs from NMED (2015, 600915).

**Table 8.4-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-007(d)**

| Sample ID | Location ID | Depth (ft) | Media | Tritium |
|---|---|---|---|---|
| **Qbt 1g, Qct, Qbo BV[a]** | | | | **na[b]** |
| **Qbt 1v BV[a]** | | | | **na** |
| **Qbt 2,3,4 BV[a]** | | | | **na** |
| **Industrial SAL[c]** | | | | **2400000** |
| **Residential SAL[c]** | | | | **1700** |
| RE15-10-8240 | 15-610819 | 4–5 | QBT3 | 6.11064 |
| RE15-10-8241 | 15-610819 | 19–20 | QBT3 | 50.7 |
| RE15-10-8242 | 15-610819 | 33–35 | QBT3 | 60.2 |
| RE15-10-8243 | 15-610819 | 49–50 | QBT3 | 53.4918 |
| RE15-10-8244 | 15-610819 | 64–65 | QBT3 | 16.3538 |
| RE15-10-8245 | 15-610819 | 79–80 | QBT3 | 13.1 |
| RE15-10-8246 | 15-610819 | 104–105 | QBT3 | 5.13604 |
| RE15-10-8247 | 15-610819 | 109–110 | QBT3 | 5.97586 |
| RE15-10-8248 | 15-610819 | 123.5–125 | QBT2 | 4.67582 |
| RE15-10-8249 | 15-610819 | 138.5–140 | QBT2 | 4.5686 |
| RE15-10-8250 | 15-610819 | 154–155 | QBT2 | 7.37832 |
| RE15-10-8251 | 15-610819 | 169–170 | QBT1G | 9.99733 |
| RE15-10-8264 | 15-610819 | 181.5–182.5 | QBT1G | 15.2175 |
| RE15-10-8252 | 15-610820 | 4–5 | QBT3 | 1.6434 |
| RE15-10-8253 | 15-610820 | 18–20 | QBT3 | 113.984 |
| RE15-10-8254 | 15-610820 | 34–35 | QBT3 | 82.1367 |
| RE15-10-8255 | 15-610820 | 48.5–50 | QBT3 | 6.17004 |
| RE15-10-8256 | 15-610820 | 63.5–65 | QBT3 | 59.6296 |
| RE15-10-8257 | 15-610820 | 79–80 | QBT3 | 13.7 |
| RE15-10-8258 | 15-610820 | 93.5–95 | QBT3 | 5.12277 |
| RE15-10-8259 | 15-610820 | 108.5–110 | QBT3 | 7.26974 |
| RE15-10-8260 | 15-610820 | 124–125 | QBT2 | 0.0134701 |
| RE15-10-8261 | 15-610820 | 138.5–140 | QBT2 | 4.56329 |
| RE15-10-8262 | 15-610820 | 153.5–155 | QBT2 | 14.2806 |
| RE15-10-8263 | 15-610820 | 168.5–170 | QBT2 | 6.38971 |
| RE15-10-8265 | 15-610820 | 178–180 | QBT1V | 4.76578 |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

**Table 8.5-1**
**Samples Collected and Analyses Requested at SWMU 15-008(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AAB3503 | 15-02500 | 0–0.5 | SOIL | —* | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3504 | 15-02500 | 1.5–2 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3398 | 15-02501 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3530 | 15-02501 | 1.5–2 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3355 | 15-02502 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3401 | 15-02502 | 1.5–2 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3353 | 15-02503 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| AAB3352 | 15-02503 | 1.5–2 | SOIL | — | — | — | — | — | — | — | — | — | 18681 | 19509 |
| RE15-10-7869 | 15-610704 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7870 | 15-610704 | 1–2.5 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7871 | 15-610705 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7872 | 15-610705 | 2–3 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7873 | 15-610706 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7874 | 15-610706 | 2–3.5 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | 10-1392 | 10-1392 | 10-1392 | — |
| RE15-10-7875 | 15-610707 | 0–0.5 | SOIL | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7876 | 15-610707 | 2.5–3.5 | QBT3 | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7877 | 15-610708 | 0–0.5 | SOIL | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |

## Table 8.5-1 (continued)

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7878 | 15-610708 | 3–4 | QBT3 | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7879 | 15-610709 | 0–0.5 | SOIL | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7880 | 15-610709 | 2.8–3.6 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | 10-1512 | 10-1512 | 10-1512 | — |
| RE15-10-7881 | 15-610710 | 0–0.5 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7882 | 15-610710 | 1–1.6 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7883 | 15-610711 | 0–0.4 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | 10-1432 | 10-1433 | 10-1433 | — |
| RE15-10-7884 | 15-610711 | 3–3.8 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | 10-1432 | 10-1433 | 10-1433 | — |
| RE15-10-7885 | 15-610712 | 0–0.4 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7886 | 15-610712 | 3–3.5 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7887 | 15-610713 | 0–0.6 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7888 | 15-610713 | 3–4 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7889 | 15-610714 | 0–0.5 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7890 | 15-610714 | 2.5–3.5 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | 10-1470 | 10-1471 | 10-1471 | — |
| RE15-10-7891 | 15-610715 | 0–0.5 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | 10-1512 | 10-1512 | 10-1512 | — |
| RE15-10-7892 | 15-610715 | 3–4 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | 10-1512 | 10-1512 | 10-1512 | — |
| RE15-10-7893 | 15-610716 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7894 | 15-610716 | 1–2 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7895 | 15-610717 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7896 | 15-610717 | 1–2 | QBT3 | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7897 | 15-610718 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7898 | 15-610718 | 1–2 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7899 | 15-610719 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7900 | 15-610719 | 1–1.5 | QBT3 | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | 10-2009 | 10-2010 | 10-2010 | — |
| RE15-10-7901 | 15-610720 | 0–0.5 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | 10-2071 | 10-2072 | 10-2072 | — |
| RE15-10-7902 | 15-610720 | 1–2 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | 10-2071 | 10-2072 | 10-2072 | — |
| RE15-10-7903 | 15-610721 | 0–0.5 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | 10-1861 | 10-1861 | 10-1861 | — |
| RE15-10-7904 | 15-610721 | 1–1.9 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | 10-1861 | 10-1861 | 10-1861 | — |
| RE15-10-7905 | 15-610722 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7906 | 15-610722 | 3–3.8 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7907 | 15-610723 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7908 | 15-610723 | 2.9–3.5 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7909 | 15-610724 | 0–0.5 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7910 | 15-610724 | 3–3.6 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7911 | 15-610725 | 0–0.3 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7912 | 15-610725 | 3–4 | QBT3 | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7913 | 15-610726 | 0–0.3 | SOIL | 10-1393 | 10-1392 | 10-1392 | 10-1393 | 10-1393 | 10-1393 | 10-1393 | — | 10-1392 | 10-1392 | — |
| RE15-10-7914 | 15-610726 | 2–3 | QBT3 | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7915 | 15-610727 | 0–0.4 | SOIL | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7916 | 15-610727 | 2–3.1 | QBT3 | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7917 | 15-610728 | 0–0.6 | SOIL | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7918 | 15-610728 | 1.3–3.6 | QBT3 | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7919 | 15-610729 | 0–0.5 | SOIL | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7920 | 15-610729 | 2–3.3 | QBT3 | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7921 | 15-610730 | 0–0.5 | SOIL | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |

## Table 8.5-1 (continued)

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7922 | 15-610730 | 2–3 | QBT3 | 10-1391 | 10-1390 | 10-1390 | 10-1391 | 10-1391 | 10-1391 | 10-1391 | — | 10-1390 | 10-1390 | — |
| RE15-10-7923 | 15-610731 | 0–0.5 | QBT3 | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7924 | 15-610731 | 2–3 | QBT3 | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7925 | 15-610732 | 0–0.5 | SOIL | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7926 | 15-610732 | 2–2.8 | QBT3 | 10-1379 | 10-1378 | 10-1378 | 10-1379 | 10-1379 | 10-1379 | 10-1379 | 10-1378 | 10-1378 | 10-1378 | — |
| RE15-10-7927 | 15-610733 | 0–0.5 | SOIL | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | — | 10-1394 | 10-1394 | — |
| RE15-10-7928 | 15-610733 | 3–4 | QBT3 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | — | 10-1394 | 10-1394 | — |
| RE15-10-7929 | 15-610734 | 0–0.5 | SOIL | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | — | 10-1394 | 10-1394 | — |
| RE15-10-7930 | 15-610734 | 2.5–3.5 | QBT3 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | 10-1394 | — | 10-1394 | 10-1394 | — |
| RE15-10-7931 | 15-610735 | 0–0.5 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7932 | 15-610735 | 3–4 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7933 | 15-610736 | 0–0.5 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7934 | 15-610736 | 3–3.9 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7935 | 15-610737 | 0–0.3 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7936 | 15-610737 | 2.9–4 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7937 | 15-610738 | 0–0.5 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7938 | 15-610738 | 2.9–3.7 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7939 | 15-610739 | 0–0.5 | SOIL | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7940 | 15-610739 | 3–3.5 | QBT3 | 10-1434 | 10-1433 | 10-1432 | 10-1434 | 10-1434 | 10-1434 | 10-1434 | — | 10-1433 | 10-1433 | — |
| RE15-10-7941 | 15-610740 | 0–0.5 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7942 | 15-610740 | 3–4 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7943 | 15-610741 | 0–1 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7944 | 15-610741 | 2.9–3.5 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7945 | 15-610742 | 0–0.3 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7946 | 15-610742 | 2.5–3.5 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7947 | 15-610743 | 0–0.5 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7948 | 15-610743 | 3–3.9 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7949 | 15-610744 | 0–0.5 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7950 | 15-610744 | 1.5–1.7 | SOIL | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7951 | 15-610745 | 0–0.5 | QBT3 | 10-1472 | 10-1471 | 10-1470 | 10-1472 | 10-1472 | 10-1472 | 10-1472 | — | 10-1471 | 10-1471 | — |
| RE15-10-7952 | 15-610745 | 2.5–3.5 | QBT3 | 10-1475 | 10-1474 | 10-1473 | 10-1475 | 10-1475 | 10-1475 | 10-1475 | — | 10-1474 | 10-1474 | — |
| RE15-10-7953 | 15-610746 | 0–0.8 | SOIL | 10-1475 | 10-1474 | 10-1473 | 10-1475 | 10-1475 | 10-1475 | 10-1475 | — | 10-1474 | 10-1474 | — |
| RE15-10-7954 | 15-610746 | 3–3.4 | QBT3 | 10-1475 | 10-1474 | 10-1473 | 10-1475 | 10-1475 | 10-1475 | 10-1475 | — | 10-1474 | 10-1474 | — |
| RE15-10-7955 | 15-610747 | 0–0.5 | SOIL | 10-1475 | 10-1474 | 10-1473 | 10-1475 | 10-1475 | 10-1475 | 10-1475 | — | 10-1474 | 10-1474 | — |
| RE15-10-7956 | 15-610747 | 3–3.7 | QBT3 | 10-1475 | 10-1474 | 10-1473 | 10-1475 | 10-1475 | 10-1475 | 10-1475 | — | 10-1474 | 10-1474 | — |
| RE15-10-7957 | 15-610748 | 0–1 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7958 | 15-610748 | 3–4 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7959 | 15-610749 | 0–0.7 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7960 | 15-610749 | 3–3.6 | QBT3 | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7961 | 15-610750 | 0–0.5 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7962 | 15-610750 | 3–4 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7963 | 15-610751 | 0–0.5 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7964 | 15-610751 | 3–4 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7965 | 15-610752 | 0–0.5 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7966 | 15-610752 | 3–4.2 | QBT3 | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7967 | 15-610753 | 0–0.5 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7968 | 15-610753 | 3–3.5 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7969 | 15-610754 | 0–0.5 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7970 | 15-610754 | 3–3.3 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7971 | 15-610755 | 0–0.5 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7972 | 15-610755 | 3–3.6 | QBT3 | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7973 | 15-610756 | 0–0.7 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7974 | 15-610756 | 2.7–3.3 | QBT3 | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7975 | 15-610757 | 0–0.3 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7976 | 15-610757 | 3–3.6 | QBT3 | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7977 | 15-610758 | 0–0.6 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7978 | 15-610758 | 1–2 | SOIL | 10-1513 | 10-1512 | 10-1512 | 10-1513 | 10-1513 | 10-1513 | 10-1513 | — | 10-1512 | 10-1512 | — |
| RE15-10-7979 | 15-610759 | 0–0.5 | SOIL | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7980 | 15-610759 | 3–3.7 | QBT3 | 10-1515 | 10-1514 | 10-1514 | 10-1515 | 10-1515 | 10-1515 | 10-1515 | — | 10-1514 | 10-1514 | — |
| RE15-10-7981 | 15-610760 | 0–0.5 | SOIL | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | — | 10-1570 | 10-1570 | — |
| RE15-10-7982 | 15-610760 | 3–3.5 | QBT3 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | — | 10-1570 | 10-1570 | — |
| RE15-10-7983 | 15-610761 | 0–0.5 | SOIL | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | — | 10-1570 | 10-1570 | — |
| RE15-10-7984 | 15-610761 | 3–3.7 | QBT3 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | — | 10-1570 | 10-1570 | — |
| RE15-10-7985 | 15-610762 | 0–0.4 | SOIL | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | 10-1570 | — | 10-1570 | 10-1570 | — |
| RE15-10-7987 | 15-610763 | 0–0.3 | SOIL | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |
| RE15-10-7988 | 15-610763 | 2.5–3.5 | QBT3 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7989 | 15-610764 | 0–0.5 | SOIL | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |
| RE15-10-7990 | 15-610764 | 3–4 | QBT3 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |
| RE15-10-7991 | 15-610765 | 0–0.5 | SOIL | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |
| RE15-10-7992 | 15-610765 | 3–4 | QBT3 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | 10-1747 | — | 10-1747 | 10-1747 | — |
| RE15-10-7993 | 15-610766 | 0–0.7 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7994 | 15-610766 | 1–2 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7995 | 15-610767 | 0–1 | SED | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7996 | 15-610767 | 1–1.8 | SED | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7997 | 15-610768 | 0–0.7 | SED | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7998 | 15-610768 | 1–1.5 | SED | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-7999 | 15-610769 | 0–0.7 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-8000 | 15-610769 | 1–2 | SOIL | 10-1862 | 10-1861 | 10-1861 | 10-1862 | 10-1862 | 10-1862 | 10-1862 | — | 10-1861 | 10-1861 | — |
| RE15-10-8001 | 15-610770 | 0–0.8 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8002 | 15-610770 | 1–2 | QBT3 | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8003 | 15-610771 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8004 | 15-610771 | 1–2 | SOIL | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8005 | 15-610772 | 0–0.5 | SOIL | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8006 | 15-610772 | 1–2 | SOIL | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8007 | 15-610773 | 0–0.8 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8008 | 15-610773 | 1–2 | SOIL | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8009 | 15-610774 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8010 | 15-610774 | 1–2 | QBT3 | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8011 | 15-610775 | 0–0.5 | SED | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8012 | 15-610775 | 1–2 | QBT3 | 10-2011 | 10-2010 | 10-2009 | 10-2011 | 10-2011 | 10-2011 | 10-2011 | — | 10-2010 | 10-2010 | — |
| RE15-10-8013 | 15-610776 | 0–0.5 | SED | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8014 | 15-610776 | 1–2 | QBT3 | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8015 | 15-610777 | 0–0.5 | SED | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8016 | 15-610777 | 0.5–2 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8017 | 15-610778 | 0–0.5 | SED | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8018 | 15-610778 | 1–2 | SED | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8019 | 15-610779 | 0–0.5 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8020 | 15-610779 | 1–2 | QBT3 | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8021 | 15-610780 | 0–0.5 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8022 | 15-610780 | 1–2 | QBT3 | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8023 | 15-610781 | 0–0.5 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8024 | 15-610781 | 1–2 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8025 | 15-610782 | 0–0.5 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8026 | 15-610782 | 1–2 | SOIL | 10-2014 | 10-2013 | 10-2012 | 10-2014 | 10-2014 | 10-2014 | 10-2014 | — | 10-2013 | 10-2013 | — |
| RE15-10-8027 | 15-610783 | 0–0.5 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |

**Table 8.5-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8028 | 15-610783 | 1–2 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |
| RE15-10-8029 | 15-610784 | 0–0.5 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |
| RE15-10-8030 | 15-610784 | 1–2 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |
| RE15-10-8031 | 15-610785 | 0–0.5 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |
| RE15-10-8032 | 15-610785 | 1–2 | SOIL | 10-2073 | 10-2072 | 10-2071 | 10-2073 | 10-2073 | 10-2073 | 10-2073 | — | 10-2072 | 10-2072 | — |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.5-2**
**Inorganic Chemicals above BVs at SWMU 15-008(b)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| AAB3503 | 15-02500 | 0–0.5 | SOIL | —[f] | 4.5 (U) | — | — | 3.3 | 0.43 (U) | — | — | — | 900 | NA[g] | — | 413 | — | — | 0.11 (U) | — | NA | — | — | 310 | — | 77.6 |
| AAB3504 | 15-02500 | 1.5–2 | SOIL | — | 3.9 (U) | — | — | — | 0.43 (U) | — | — | — | — | NA | — | — | — | — | 0.11 (U) | — | NA | — | — | 19.4 | — | — |
| AAB3398 | 15-02501 | 0–0.5 | SOIL | — | 3.9 (U) | — | — | 10.6 | 0.43 (U) | — | — | — | 1040 | NA | — | 77.9 | — | — | 0.11 (U) | — | NA | — | — | 282 | — | 71.7 |
| AAB3530 | 15-02501 | 1.5–2 | SOIL | — | 3.9 (U) | — | — | — | 0.44 (U) | — | — | — | — | NA | — | — | — | — | 0.11 (U) | — | NA | — | — | 93 | — | — |
| AAB3355 | 15-02502 | 0–0.5 | SOIL | — | 3.7 (U) | — | — | 35.5 | 0.41 (U) | — | 20.2 | — | 550 | NA | — | 175 | — | — | — | 15.9 | NA | — | — | 659 | — | 60.1 |
| AAB3401 | 15-02502 | 1.5–2 | SOIL | — | 4 (U) | — | — | 11.9 | 0.45 (U) | — | — | — | 784 | NA | — | 67 | — | — | 1.1 (J) | — | NA | — | 1.1 (U) | 303 | — | — |
| AAB3353 | 15-02503 | 0–0.5 | SOIL | — | 8.6 (U) | — | — | 17.1 | 0.59 (U) | — | — | — | 4110 | NA | — | 1250 | — | — | 0.12 (J) | — | NA | — | — | 400 | — | 71.2 |
| AAB3352 | 15-02503 | 1.5–2 | SOIL | — | 4 (U) | — | — | — | 0.44 (U) | — | — | — | — | NA | — | — | — | — | 0.11 (U) | — | NA | — | — | 31.8 | — | — |
| RE15-10-7869 | 15-610704 | 0–0.5 | SOIL | — | 1.31 (UJ) | — | — | 3.07 (J+) | 0.654 (U) | — | — | — | — | — | — | 64.2 (J-) | — | — | — | — | — | — | — | 69.6 (J) | — | — |
| RE15-10-7870 | 15-610704 | 1–2.5 | QBT3 | — | 1.14 (UJ) | — | — | — | — | — | — | 9.38 | — | — | — | — | — | — | — | — | — | 1.15 (U) | — | 3.75 (J) | — | — |
| RE15-10-7871 | 15-610705 | 0–0.5 | SOIL | — | 2.07 (J-) | — | — | 4.12 (J+) | 0.547 (U) | — | — | — | — | — | — | 147 (J-) | — | — | — | 21 (J-) | — | — | — | 66.9 (J) | — | — |
| RE15-10-7872 | 15-610705 | 2–3 | QBT3 | — | 1.66 (J-) | — | 117 | 4.55 (J+) | — | — | — | — | — | — | — | 157 (J-) | — | — | — | — | — | 1.07 (U) | — | 82.3 (J) | — | — |
| RE15-10-7873 | 15-610706 | 0–0.5 | SOIL | — | 1.13 (J-) | — | — | 3.56 (J+) | — | — | — | — | — | — | — | 95.1 (J-) | — | — | — | — | — | — | — | 71.1 (J) | — | 53.3 |
| RE15-10-7874 | 15-610706 | 2–3.5 | QBT3 | — | 1 (UJ) | — | — | — | — | — | — | 4.66 | — | — | — | 17.1 (J-) | — | — | — | — | — | 1.01 (U) | — | 13.3 (J) | — | — |
| RE15-10-7875 | 15-610707 | 0–0.5 | SOIL | — | — | — | — | 2.12 | 0.59 (U) | — | — | — | 225 (J+) | — | — | 63.5 | — | — | — | — | — | — | — | 87.7 | — | — |
| RE15-10-7876 | 15-610707 | 2.5–3.5 | QBT3 | — | 0.997 (U) | — | — | — | — | — | 8.96 | 3.6 | 15.7 (J+) | — | — | 26.1 | — | — | — | — | — | 0.975 (UJ) | — | 3.88 | — | — |
| RE15-10-7877 | 15-610708 | 0–0.5 | SOIL | — | 1.49 | — | — | 2.57 | 0.537 (U) | — | — | — | 131 (J+) | — | — | 85.4 | — | — | — | — | — | — | — | 46.4 | — | — |
| RE15-10-7878 | 15-610708 | 3–4 | QBT3 | — | 1.01 (U) | — | — | — | — | — | 21.4 | 3.85 | — | — | — | — | — | — | — | — | — | 1.02 (UJ) | — | — | — | — |
| RE15-10-7879 | 15-610709 | 0–0.5 | SOIL | — | 4.33 | — | — | — | 0.752 (U) | — | — | — | 110 (J+) | — | — | 977 | — | — | — | — | — | — | — | 14.8 | — | — |
| RE15-10-7880 | 15-610709 | 2.8–3.6 | QBT3 | — | 1.07 (U) | — | — | — | — | — | 8.57 (J) | 4.77 (J) | — | — | — | 34.4 (J-) | — | — | — | — | — | 1.04 (U) | — | — | — | — |
| RE15-10-7881 | 15-610710 | 0–0.5 | SOIL | — | 1.25 (U) | — | — | 2.82 | 0.731 (U) | — | — | — | 16.7 | — | — | — | — | — | — | — | — | 1.53 (U) | — | 29.5 | — | 51.6 |
| RE15-10-7882 | 15-610710 | 1–1.6 | QBT3 | — | 0.968 (U) | — | — | — | — | — | 25.7 | 6.65 | 4.87 | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — | — |
| RE15-10-7883 | 15-610711 | 0–0.4 | SOIL | — | 1.58 (U) | — | — | — | 0.717 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.58 | — | — |
| RE15-10-7884 | 15-610711 | 3–3.8 | QBT3 | — | — | — | 46.2 (J) | — | — | — | 11.1 | 3.49 | — | — | — | — | — | — | — | — | — | 0.992 (UJ) | — | — | — | — |
| RE15-10-7885 | 15-610712 | 0–0.4 | SOIL | — | 1.76 (U) | — | — | — | 7.98 | — | — | 10.1 | 118 | — | — | 43.8 | — | — | — | — | — | — | — | 39.8 | — | 72.4 |
| RE15-10-7886 | 15-610712 | 3–3.5 | QBT3 | — | 0.694 (U) | — | — | — | — | — | 10.1 | 14.8 | 5.92 | — | — | — | — | — | — | — | — | 1.03 (U) | — | — | — | — |
| RE15-10-7887 | 15-610713 | 0–0.6 | SOIL | — | 1.09 (U) | — | — | — | 0.725 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.54 | — | — |

**Table 8.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[a]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7888 | 15-610713 | 3–4 | QBT3 | 7810 | 0.878 (U) | — | 118 (J-) | — | — | 4570 | 7.42 | 8.4 | 7.27 | — | — | — | 1710 (J+) | — | — | 7.47 (J-) | 0.00123 (J) | 0.67 (J) | — | — | — | — |
| RE15-10-7889 | 15-610714 | 0–0.5 | SOIL | — | 5.16 (J) | — | — | 4.94 | 0.768 (U) | — | — | — | 813 | — | — | 128 | — | — | — | — | — | 1.59 (U) | — | 104 | — | 57.5 |
| RE15-10-7890 | 15-610714 | 2.5–3.5 | QBT3 | — | 1.84 (U) | — | 80.1 (J-) | 1.29 | — | — | 14.8 | 6.97 | 54.6 | — | — | 24.5 | — | — | — | 6.99 (J-) | — | 0.573 (J) | — | 17.1 | — | — |
| RE15-10-7891 | 15-610715 | 0–0.5 | SOIL | — | 1.31 | — | — | 2.95 | — | 27,600 | — | — | 280 | — | — | 117 (J-) | — | — | — | — | — | — | — | 213 (J+) | — | — |
| RE15-10-7892 | 15-610715 | 3–4 | QBT3 | — | 0.974 (U) | — | — | — | — | 2880 | 23.8 (J) | 3.53 (J) | 7.36 | — | — | — | — | — | — | — | 0.000571 (J) | 0.984 (U) | — | 6.79 (J+) | — | — |
| RE15-10-7893 | 15-610716 | 0–0.5 | SED | — | 1.26 (UJ) | — | — | — | 0.629 (U) | — | 34.2 | — | — | — | — | 31.3 | — | — | — | — | — | 1.37 (U) | — | 16.2 | — | — |
| RE15-10-7894 | 15-610716 | 1–2 | SED | — | 1.16 (UJ) | — | — | — | — | — | 22 | — | — | — | — | — | — | — | — | — | — | 1.35 (U) | — | 14.9 | — | — |
| RE15-10-7895 | 15-610717 | 0–0.5 | SED | — | 1.05 (UJ) | — | — | 1.32 | 0.523 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.03 (U) | — | 2.38 | — | — |
| RE15-10-7896 | 15-610717 | 1–2 | QBT3 | — | 1.02 (UJ) | — | — | 1.33 | — | — | 10.4 | — | 5.68 | — | — | — | — | — | — | — | — | 1.05 (U) | — | — | — | — |
| RE15-10-7897 | 15-610718 | 0–0.5 | SED | — | 1.09 (UJ) | — | — | 2.65 | 0.544 (U) | — | 14.5 | — | 33.3 | — | 14,300 | 32.5 | — | — | — | 11.9 | — | 1.07 (U) | — | 36.5 | 20.8 | — |
| RE15-10-7898 | 15-610718 | 1–2 | SED | — | 1 (UJ) | 4.96 | — | 2.91 | 0.5 (U) | — | 23.3 | — | 18.1 | — | 15,600 | — | — | — | — | 16.9 | 0.000616 (J) | 1.11 (U) | — | 15.5 | 23.1 | — |
| RE15-10-7899 | 15-610719 | 0–0.5 | SED | — | 1.22 (UJ) | — | — | — | 0.611 (U) | — | 15.6 | — | — | — | 22,300 | — | 2870 (J+) | — | — | — | — | 1.04 (U) | — | 4.21 | 34.8 | 90 |
| RE15-10-7900 | 15-610719 | 1–1.5 | QBT3 | — | 1.05 (UJ) | — | — | — | — | — | 17.8 | 3.47 | 6.27 | — | 15,300 | — | — | — | — | 7.1 | — | 0.999 (U) | — | — | 23.8 | — |
| RE15-10-7901 | 15-610720 | 0–0.5 | SOIL | — | 1.48 (U) | — | — | — | 0.581 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 17.2 | — | — |
| RE15-10-7902 | 15-610720 | 1–2 | SOIL | — | 1.07 (U) | — | — | — | 0.535 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.07 | — | — |
| RE15-10-7903 | 15-610721 | 0–0.5 | SOIL | — | 1.18 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.11 | — | 65 (J) |
| RE15-10-7904 | 15-610721 | 1–1.9 | SOIL | — | 1.06 (U) | — | — | — | — | — | 26.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 53.7 (J) |
| RE15-10-7905 | 15-610722 | 0–0.5 | SOIL | — | 5.43 (J-) | — | — | 2.75 (J+) | 0.615 (U) | 7200 (J+) | — | — | — | — | — | 644 (J-) | — | — | — | — | — | — | — | 30.9 (J) | — | — |
| RE15-10-7906 | 15-610722 | 3–3.8 | QBT3 | — | 1.11 (UJ) | — | — | — | — | — | — | — | — | — | — | 15.4 (J-) | — | — | — | — | — | 1.07 (U) | — | 5.34 (J) | — | — |
| RE15-10-7907 | 15-610723 | 0–0.5 | SOIL | — | 1.16 (J-) | — | — | 4.84 (J+) | 0.618 (U) | — | — | — | — | — | — | 179 (J-) | — | — | — | — | — | — | — | 118 (J) | — | — |
| RE15-10-7908 | 15-610723 | 2.9–3.5 | QBT3 | — | 1.96 (J-) | 5.91 | 48.2 | 3.17 (J+) | — | — | — | 5.93 | — | — | — | 170 (J-) | — | — | — | — | — | 1.07 (U) | — | 403 (J) | — | — |
| RE15-10-7909 | 15-610724 | 0–0.5 | SOIL | — | 0.93 (J-) | — | — | 6.73 (J+) | — | — | — | — | — | — | — | 266 (J-) | — | — | — | — | — | — | — | 132 (J) | — | — |
| RE15-10-7910 | 15-610724 | 3–3.6 | QBT3 | — | 1.19 (J-) | — | — | 3.27 (J+) | — | — | — | 3.17 | — | — | — | 75.4 (J-) | — | — | — | — | — | 1.1 (U) | — | 62.6 (J) | — | — |
| RE15-10-7911 | 15-610725 | 0–0.3 | SOIL | — | 5.54 (J-) | — | — | 16.5 (J+) | 0.569 | — | — | — | — | — | — | 274 (J-) | — | — | — | — | — | — | 2 | 348 (J) | — | 54.8 |
| RE15-10-7912 | 15-610725 | 3–4 | QBT3 | — | 2.27 (J-) | — | 85.5 | 2.15 (J+) | — | 8790 (J+) | — | — | — | — | — | 79.1 (J-) | — | — | — | — | — | 1.12 (U) | — | 163 (J) | — | — |
| RE15-10-7913 | 15-610726 | 0–0.3 | SOIL | — | 1.21 (UJ) | — | — | — | 0.605 (U) | — | — | — | — | — | — | — | — | — | — | 16.2 (J-) | — | — | — | 27.2 (J) | — | — |
| RE15-10-7914 | 15-610726 | 2–3 | QBT3 | — | 1.07 (U) | — | 93.6 (J-) | — | — | 2250 | 7.79 (J) | 8.49 (J) | 6.43 | — | 15,000 | — | — | — | — | — | — | 1.05 (UJ) | — | 5.45 | — | — |
| RE15-10-7915 | 15-610727 | 0–0.4 | SOIL | — | 2.16 (U) | — | — | 5.87 | — | — | — | — | 451 | — | — | 125 | — | — | — | — | — | — | 1.15 | 73.1 | — | 56.1 (J) |
| RE15-10-7916 | 15-610727 | 2–3.1 | QBT3 | — | 1.03 (U) | — | — | — | — | — | — | — | 7.13 | — | — | — | — | — | — | — | — | 0.977 (UJ) | — | 8.75 | — | — |
| RE15-10-7917 | 15-610728 | 0–0.6 | SOIL | — | 1.2 (U) | — | — | — | 0.6 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.5 | — | — |

**Table 8.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[a]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7918 | 15-610728 | 1.3–3.6 | QBT3 | — | 1.08 (U) | — | 88.2 (J-) | — | — | 2480 | 19.6 (J) | — | — | — | — | — | — | — | — | 7.97 (J-) | 0.00181 (J) | 1.07 (UJ) | — | — | — | — |
| RE15-10-7919 | 15-610729 | 0–0.5 | SOIL | — | 1.15 (U) | — | — | 2.95 | 0.577 (U) | — | — | — | 156 | — | — | 36.1 | — | — | — | — | — | — | — | 38.2 | — | — |
| RE15-10-7920 | 15-610729 | 2–3.3 | QBT3 | — | — | — | — | 1.29 | — | — | 7.83 (J) | — | 47.6 | — | — | 25.8 | — | — | — | — | — | 1.04 (UJ) | 1.23 | 26.1 | — | — |
| RE15-10-7921 | 15-610730 | 0–0.5 | SOIL | — | 2.2 (U) | — | — | 2.32 | — | — | — | — | 260 | — | — | 91.8 | — | — | — | — | — | — | — | 30.9 | — | — |
| RE15-10-7922 | 15-610730 | 2–3 | QBT3 | 7490 | 0.836 (U) | — | 71.8 (J-) | 1.6 | — | — | 9.58 (J) | 5.92 (J) | 726 | — | 19,900 | 65.8 | — | — | — | 7.35 (J-) | 0.000587 (J) | 1.04 (UJ) | 1.26 | 23.5 | — | — |
| RE15-10-7923 | 15-610731 | 0–0.5 | QBT3 | — | 2.45 | — | 48.9 (J) | 1.68 | — | — | — | — | 307 (J+) | — | — | 71.7 | — | — | — | — | — | 1.03 (UJ) | — | 81.3 | — | — |
| RE15-10-7924 | 15-610731 | 2–3 | QBT3 | — | 0.575 (J) | — | — | — | — | — | 12.7 | 5.43 | 6.51 (J+) | — | — | — | — | — | — | — | — | 0.951 (UJ) | — | 10.5 | — | — |
| RE15-10-7925 | 15-610732 | 0–0.5 | SOIL | — | 3.53 | — | — | 47.5 | 0.583 (U) | — | — | — | 289 (J+) | — | — | 241 | — | — | — | — | — | — | — | 276 | — | 52.4 |
| RE15-10-7926 | 15-610732 | 2–2.8 | QBT3 | — | 0.947 (J) | — | — | — | — | — | 14.7 | 4.1 | 8.38 (J+) | — | — | — | — | — | — | — | — | 0.961 (UJ) | — | 54.5 | — | — |
| RE15-10-7927 | 15-610733 | 0–0.5 | SOIL | — | — | — | — | 5.83 | 1.17 | — | — | — | 526 | — | — | 102 | — | — | — | — | — | — | — | 84.6 | — | 56.8 |
| RE15-10-7928 | 15-610733 | 3–4 | QBT3 | — | 1.01 (U) | — | — | — | — | — | 8.03 (J) | — | 5.69 | — | — | — | — | — | — | — | — | 1.04 (U) | — | — | — | — |
| RE15-10-7929 | 15-610734 | 0–0.5 | SOIL | — | 1.37 (U) | — | — | 2.06 | 1.6 | — | — | — | 73.3 | — | — | 102 | — | — | — | — | — | — | — | 31.8 | — | — |
| RE15-10-7930 | 15-610734 | 2.5–3.5 | QBT3 | — | 1.13 (U) | — | 47.3 | — | — | — | 14.1 (J) | 6.48 | 44.7 | — | 15,900 | 15.8 | — | — | — | — | — | 1.07 (U) | — | 8.68 | — | — |
| RE15-10-7931 | 15-610735 | 0–0.5 | SOIL | — | 0.959 (U) | — | — | — | 0.603 (U) | — | 19.9 | — | — | — | — | — | — | — | — | — | — | — | — | 2.26 | — | — |
| RE15-10-7932 | 15-610735 | 3–4 | QBT3 | — | 0.868 (U) | — | 77.7 (J) | — | — | — | 18.4 | 3.52 | — | — | — | — | — | — | — | — | — | 0.963 (UJ) | — | — | — | — |
| RE15-10-7933 | 15-610736 | 0–0.5 | SOIL | — | — | — | — | — | 0.563 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 13.8 | — | — |
| RE15-10-7934 | 15-610736 | 3–3.9 | QBT3 | 8850 | 0.894 (U) | — | 123 (J) | — | — | 2620 (J) | 28.3 | 4.42 | 5.24 | — | — | — | 1740 (J+) | — | — | 7.26 | 0.00243 | 1.05 (UJ) | — | — | — | — |
| RE15-10-7935 | 15-610737 | 0–0.3 | SOIL | — | 2.52 (J) | — | — | 2.47 | 0.633 (U) | — | 25.2 | — | 552 | — | — | 123 (J) | — | — | — | — | — | — | 1.68 | 141 | — | 52.9 |
| RE15-10-7936 | 15-610737 | 2.9–4 | QBT3 | — | 1.04 (U) | — | — | — | — | — | 14.1 | — | 6.48 | — | — | — | — | — | — | — | — | 0.911 (UJ) | — | — | — | — |
| RE15-10-7937 | 15-610738 | 0–0.5 | SOIL | — | 1.09 (U) | — | — | — | 0.653 (U) | — | — | 9.4 | 33 | — | — | 30.5 (J) | — | 738 | — | — | — | — | — | 27.7 | — | — |
| RE15-10-7938 | 15-610738 | 2.9–3.7 | QBT3 | — | — | — | — | — | — | — | 41.3 | — | — | — | — | — | — | — | — | — | — | 0.966 (UJ) | — | — | — | — |
| RE15-10-7939 | 15-610739 | 0–0.5 | SOIL | — | 0.884 (U) | — | — | — | 0.618 (U) | — | 21.1 | — | 23.1 | — | — | — | — | — | — | — | — | — | — | 16.5 | — | — |
| RE15-10-7940 | 15-610739 | 3–3.5 | QBT3 | — | 0.927 (U) | — | 55.2 (J) | — | — | 3040 (J) | 27.7 | — | — | — | — | — | — | — | — | 7.31 | 0.00081 (J) | 1 (UJ) | — | — | — | — |
| RE15-10-7941 | 15-610740 | 0–0.5 | SOIL | — | 0.893 (U) | — | — | — | — | — | — | — | 16.6 | — | — | 24.3 | — | — | — | — | — | — | — | 26.5 | — | — |
| RE15-10-7942 | 15-610740 | 3–4 | QBT3 | — | 0.578 (U) | — | 63.4 (J-) | — | — | — | 8.83 | 4.28 | — | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — | — |
| RE15-10-7943 | 15-610741 | 0–1 | QBT3 | — | 0.797 (U) | — | — | — | — | — | 20 | 4.12 | — | — | — | — | — | — | — | — | — | 1.05 (U) | — | — | — | — |
| RE15-10-7944 | 15-610741 | 2.9–3.5 | QBT3 | — | 0.825 (U) | — | 59.1 (J-) | — | — | — | 25.8 | 9.43 | 6.02 | — | — | — | — | — | — | 7.46 (J-) | — | 1.05 (U) | — | — | — | — |
| RE15-10-7945 | 15-610742 | 0–0.3 | SOIL | — | 1.5 (U) | — | — | — | — | — | — | — | 37 | — | — | 26.3 | — | — | — | — | — | 1.63 (U) | — | 46.3 | — | — |
| RE15-10-7946 | 15-610742 | 2.5–3.5 | QBT3 | — | — | — | — | — | — | — | 15.8 | 17.1 | 5.87 | — | — | — | — | — | — | — | — | 1.05 (U) | — | — | — | — |
| RE15-10-7947 | 15-610743 | 0–0.5 | SOIL | — | 3.82 (U) | — | — | 3.22 | 0.614 (J) | — | — | — | 143 | — | — | 121 | — | — | — | — | — | 1.55 (U) | — | 71.5 | — | 68.7 |

**Table 8.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[a]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7948 | 15-610743 | 3–3.9 | QBT3 | — | 1.97 (U) | — | 67.5 (J-) | — | — | — | 15.3 | 3.61 | 29.4 | — | — | 22.6 | — | — | — | — | — | 1 (U) | — | 11.8 | — | — |
| RE15-10-7949 | 15-610744 | 0–0.5 | SOIL | — | 2.25 (U) | — | — | — | 0.419 (J) | — | — | — | 88.6 | — | — | 55.2 | — | — | — | — | — | 1.54 (U) | — | 48.8 | — | 63.6 |
| RE15-10-7950 | 15-610744 | 1.5–1.7 | SOIL | — | — | — | — | — | 0.619 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.41 | — | — |
| RE15-10-7951 | 15-610745 | 0–0.5 | QBT3 | — | 0.902 (U) | — | — | — | — | — | — | 11.9 | 5.03 | — | — | — | — | — | — | — | — | 1.17 (U) | — | — | — | — |
| RE15-10-7952 | 15-610745 | 2.5–3.5 | QBT3 | — | 1.04 (U) | — | 48.8 | — | — | — | 24 (J) | 5.01 | — | — | — | — | — | — | — | — | — | 1.01 (U) | — | — | — | — |
| RE15-10-7953 | 15-610746 | 0–0.8 | SOIL | — | 256 | — | — | 12.2 (J) | 0.448 (J) | — | — | — | 686 (J+) | — | — | 138000 (J) | — | — | — | — | — | — | 2.52 | 362 | — | 125 |
| RE15-10-7954 | 15-610746 | 3–3.4 | QBT3 | — | 5.04 | — | 48.8 | 1.37 (J) | — | — | 13.4 (J) | — | 115 (J+) | — | — | 578 (J) | — | — | — | 7.19 (J) | — | 1.05 (U) | — | 84.4 | — | — |
| RE15-10-7955 | 15-610747 | 0–0.5 | SOIL | — | 5.53 | — | — | 6.85 (J) | — | — | — | — | 1200 (J+) | — | — | 203 (J) | — | — | — | — | — | — | 1.06 | 183 | — | 64.7 |
| RE15-10-7956 | 15-610747 | 3–3.7 | QBT3 | — | 0.528 (J) | 2.82 | 54.6 | 29.1 (J) | — | 2290 | 11.2 (J) | — | 73.9 (J+) | — | — | 23.9 (J) | — | — | — | 7.17 (J) | 0.000923 (J) | 0.64 (J) | — | 69.8 | — | — |
| RE15-10-7957 | 15-610748 | 0–1 | SOIL | — | 7.9 | — | — | 7.22 | 0.636 (U) | — | — | — | 36400 | — | — | 473 | — | — | — | — | — | — | 6.95 | 364 | — | 13,300 |
| RE15-10-7958 | 15-610748 | 3–4 | SOIL | — | 6.77 | — | — | 4.31 | 0.574 (U) | — | — | — | 622 | — | — | 283 | — | — | — | — | — | — | — | 515 | — | 91.3 |
| RE15-10-7959 | 15-610749 | 0–0.7 | SOIL | — | 9.56 | — | — | 7.52 | 0.568 (U) | — | — | — | 618 | — | — | 777 | — | — | — | — | — | — | 1.05 | 249 | — | 90.6 |
| RE15-10-7960 | 15-610749 | 3–3.6 | QBT3 | — | 4.1 | — | — | 4.02 | — | — | 11.5 (J) | 16.5 | 187 | — | — | 257 | — | — | — | — | — | 1.03 (UJ) | — | 143 | — | — |
| RE15-10-7961 | 15-610750 | 0–0.5 | SOIL | — | 1.91 | — | — | — | 0.538 (U) | — | — | — | 531 | — | — | 166 | — | — | — | — | — | — | — | 49.3 | — | — |
| RE15-10-7962 | 15-610750 | 3–4 | QBT3 | — | 0.95 (U) | — | 47.8 | — | — | — | — | 8.03 (J) | 30 | — | — | 32.9 (J-) | — | — | — | — | 0.000689 (J) | 1.02 (UJ) | — | 17 (J+) | — | — |
| RE15-10-7963 | 15-610751 | 0–0.5 | SOIL | — | 1.2 (U) | — | — | — | — | — | — | — | 29 | — | — | — | — | — | — | — | — | — | — | 7.41 (J+) | — | — |
| RE15-10-7964 | 15-610751 | 3–4 | QBT3 | 8080 (J+) | 1.03 (U) | — | 78.8 | — | — | — | 13.5 (J) | 5.37 (J) | 4.95 | — | — | — | — | — | — | 7.05 (J) | — | 1.05 (UJ) | — | — | 17.5 | — |
| RE15-10-7965 | 15-610752 | 0–0.5 | SOIL | — | 1.05 (J) | — | — | — | — | — | — | — | 49.2 | — | — | 113 (J-) | — | — | — | — | — | — | — | 71.2 (J+) | — | — |
| RE15-10-7966 | 15-610752 | 3–4.2 | QBT3 | — | — | — | — | 1.59 | — | — | 8.43 (J) | 4.86 | 1410 | — | — | — | — | — | — | — | — | 1.07 (UJ) | — | 11.2 | — | — |
| RE15-10-7967 | 15-610753 | 0–0.5 | SOIL | — | 4.62 | — | — | 11.9 | 0.438 (J) | — | 31.7 (J) | — | 2200 | — | — | 363 (J-) | — | — | — | — | — | — | 1.87 | 295 (J+) | — | 75.1 |
| RE15-10-7968 | 15-610753 | 3–3.5 | QBT3 | — | 1.34 | — | — | 1.23 (J) | — | — | 33.9 (J) | 3.43 (J) | 116 | — | — | 25.3 (J-) | — | — | — | — | — | 1.03 (UJ) | — | 37.7 (J+) | — | — |
| RE15-10-7969 | 15-610754 | 0–0.5 | SOIL | — | 1.63 | — | — | — | 0.543 (U) | — | 55.8 (J) | — | 103 | — | — | 406 | — | — | — | — | — | — | — | 5.37 | — | — |
| RE15-10-7970 | 15-610754 | 3–3.3 | SOIL | — | 1.05 (U) | — | — | — | 0.525 (U) | — | — | — | 22.1 | — | — | 33.3 (J-) | — | — | — | — | — | — | — | 4.23 (J+) | — | 56.9 |
| RE15-10-7971 | 15-610755 | 0–0.5 | SOIL | — | 1.49 | — | — | — | 0.647 (U) | — | — | — | 1010 | — | — | 155 | — | — | — | — | — | — | — | 45.9 | — | — |
| RE15-10-7972 | 15-610755 | 3–3.6 | QBT3 | — | 1.06 (U) | — | 52.6 | — | — | — | 9.12 (J) | 7.2 | 6.67 | — | — | — | — | — | — | — | — | 1.07 (UJ) | — | 8.19 | — | — |
| RE15-10-7973 | 15-610756 | 0–0.7 | SOIL | — | — | — | — | — | 0.549 (U) | — | 20.1 (J) | — | 19.5 | — | — | 145 (J-) | — | — | — | — | — | — | — | 9.61 (J+) | — | — |
| RE15-10-7974 | 15-610756 | 2.7–3.3 | QBT3 | — | 0.987 (U) | — | — | — | — | — | 15 (J) | 3.33 | — | — | — | — | — | — | — | — | — | 1 (UJ) | — | — | — | — |
| RE15-10-7975 | 15-610757 | 0–0.3 | SOIL | — | 1.21 (U) | — | — | 1.84 (J) | 1.17 | — | — | — | 45.6 | — | — | 46.4 (J-) | — | — | — | — | — | — | — | 45.7 (J+) | — | — |
| RE15-10-7976 | 15-610757 | 3–3.6 | QBT3 | — | 1 (U) | — | — | — | — | — | 7.19 (J) | 10.1 (J) | 21 | — | — | 16.4 (J) | — | — | — | — | — | 1.02 (UJ) | — | 5.33 (J+) | — | — |
| RE15-10-7977 | 15-610758 | 0–0.6 | SOIL | — | 1.53 (U) | — | — | 5.26 (J) | — | — | — | — | — | — | — | 33.1 (J-) | — | — | — | — | — | — | — | 16.6 (J+) | — | — |

**Table 8.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[a]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7978 | 15-610758 | 1–2 | SOIL | — | 1.15 (U) | — | — | — | 0.575 (U) | — | — | 9.04 (J) | — | — | — | — | — | — | — | — | — | — | — | 2.68 (J+) | — | — |
| RE15-10-7979 | 15-610759 | 0–0.5 | SOIL | — | — | — | — | — | 0.595 (U) | — | — | — | 20.3 | — | — | 64.2 | — | — | — | — | — | — | — | 11.4 | — | — |
| RE15-10-7980 | 15-610759 | 3–3.7 | QBT3 | — | 0.729 (J) | — | — | — | — | — | 16 (J) | 3.59 | — | — | — | — | — | — | — | — | 0.00138 (J) | 0.973 (UJ) | — | — | — | — |
| RE15-10-7981 | 15-610760 | 0–0.5 | SOIL | — | 1.37 (U) | — | — | — | 0.631 (U) | — | — | 8.87 | — | — | — | 26.4 | — | — | — | — | — | — | — | 9.1 | — | — |
| RE15-10-7982 | 15-610760 | 3–3.5 | QBT3 | 10,200 | 0.811 (U) | 3.38 | 171 | 1.26 | — | 3370 | 9.79 | 5 | 7.77 | — | — | 11.5 | 2170 (J+) | — | — | 9.25 | 0.000859 (J) | 1.19 (UJ) | — | — | — | — |
| RE15-10-7983 | 15-610761 | 0–0.5 | SOIL | — | 1.27 (UJ) | — | — | — | 0.635 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.12 | — | — |
| RE15-10-7984 | 15-610761 | 3–3.7 | QBT3 | — | 1 (UJ) | — | — | — | — | — | — | 4.67 | — | — | — | — | — | — | — | — | — | 1 (UJ) | — | — | — | — |
| RE15-10-7985 | 15-610762 | 0–0.4 | SOIL | — | 1.43 (U) | — | — | — | — | 9490 | — | — | 25.4 | 0.555 | — | 42.8 | — | — | — | — | — | 1.86 (UJ) | — | 57.8 | — | 63.7 |
| RE15-10-7987 | 15-610763 | 0–0.3 | SOIL | — | 1.37 (U) | — | — | — | 0.425 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 13.7 | — | — |
| RE15-10-7988 | 15-610763 | 2.5–3.5 | QBT3 | — | 1.1 (U) | — | 52.2 | — | — | — | 10.5 | 4.41 | 5.56 | — | — | — | — | — | — | 12.3 (J+) | — | 1.1 (U) | — | — | — | — |
| RE15-10-7989 | 15-610764 | 0–0.5 | SOIL | — | 1.22 (U) | — | — | — | 0.402 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.09 | — | — |
| RE15-10-7990 | 15-610764 | 3–4 | QBT3 | — | 1.08 (U) | — | — | — | — | — | — | 4.04 | — | — | — | — | — | — | — | 11.3 (J+) | — | 1.08 (U) | — | — | — | — |
| RE15-10-7991 | 15-610765 | 0–0.5 | SOIL | — | 1.29 (U) | — | — | — | 0.436 (U) | — | — | 12.9 | — | — | — | — | — | — | — | — | — | — | — | 2.8 | — | — |
| RE15-10-7992 | 15-610765 | 3–4 | QBT3 | — | 1.29 (U) | — | — | — | — | — | 8.69 | 5.19 | 6.08 | — | — | — | — | — | — | 17 (J+) | — | 1.08 (U) | — | — | — | — |
| RE15-10-7993 | 15-610766 | 0–0.7 | SOIL | — | 1.14 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.08 | — | — |
| RE15-10-7994 | 15-610766 | 1–2 | SOIL | — | 1.07 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7995 | 15-610767 | 0–1 | SED | — | 1.23 (U) | — | — | — | — | — | — | — | 15.6 | — | — | — | — | — | — | — | — | 1.34 (U) | — | 19.3 | — | — |
| RE15-10-7996 | 15-610767 | 1–1.8 | SED | — | 1.08 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.02 (U) | — | 6.46 | — | — |
| RE15-10-7997 | 15-610768 | 0–0.7 | SED | — | 1.24 (U) | — | — | — | — | — | — | — | 15.9 | — | — | — | — | — | — | — | — | 1.19 (U) | — | 27.3 | — | — |
| RE15-10-7998 | 15-610768 | 1–1.5 | SED | — | 1.11 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.1 (U) | — | 4.02 | — | — |
| RE15-10-7999 | 15-610769 | 0–0.7 | SOIL | — | 1.03 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 15.5 | — | — |
| RE15-10-8000 | 15-610769 | 1–2 | SOIL | — | 1.05 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000589 (J) | — | — | — | — | — |
| RE15-10-8001 | 15-610770 | 0–0.8 | SED | — | — | — | — | 2.2 | — | — | 31.6 | — | 43.8 | — | — | 27.1 | — | — | — | — | — | 1.31 (U) | — | 47.9 | — | — |
| RE15-10-8002 | 15-610770 | 1–2 | QBT3 | — | 1.02 (UJ) | — | — | — | — | — | 11.8 | — | 5.27 | — | — | — | — | — | — | — | — | 1.06 (U) | — | — | — | — |
| RE15-10-8003 | 15-610771 | 0–0.5 | SED | — | 1.24 (UJ) | — | — | 7.96 | 0.62 (U) | — | 10.6 | — | 20.9 | — | — | — | — | — | — | 9.93 | — | 1.24 (U) | — | 103 | — | — |
| RE15-10-8004 | 15-610771 | 1–2 | SOIL | — | 1.12 (UJ) | — | — | — | 0.562 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.82 | — | — |
| RE15-10-8005 | 15-610772 | 0–0.5 | SOIL | — | 1.02 (J-) | — | — | 3.81 | 0.824 | — | — | — | 88.9 | — | — | 57.3 | — | — | — | — | — | — | — | 59 | — | 54.8 |
| RE15-10-8006 | 15-610772 | 1–2 | SOIL | — | 0.968 (UJ) | — | — | — | 0.484 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8007 | 15-610773 | 0–0.8 | SED | — | 1.28 (UJ) | — | — | — | — | — | 17.6 | 9.34 | 47.3 | — | 20,300 | 48.4 | — | 765 | — | — | — | 1.14 (U) | — | 28.4 | 27.6 | 83.9 |
| RE15-10-8008 | 15-610773 | 1–2 | SOIL | — | 1.03 (UJ) | — | — | — | 0.513 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**Table 8.5-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[a]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-8009 | 15-610774 | 0–0.5 | SED | — | 3.45 (J-) | — | — | 7.37 | 0.422 (J) | — | — | — | 175 | — | — | 97.7 | — | — | — | — | — | 1.26 (U) | — | 348 | — | — |
| RE15-10-8010 | 15-610774 | 1–2 | QBT3 | — | 1 (UJ) | — | 82 (J) | — | — | — | 7.4 (J) | — | 17.2 | — | — | 12.4 | — | — | — | — | — | 1.09 (U) | — | 13.7 | — | — |
| RE15-10-8011 | 15-610775 | 0–0.5 | SED | — | 1.02 (UJ) | — | — | 1.7 | 0.511 (U) | — | — | — | 20.1 | — | — | — | — | — | — | — | — | 1.05 (U) | 3.27 | 39.3 | — | — |
| RE15-10-8012 | 15-610775 | 1–2 | QBT3 | — | 0.894 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.913 (U) | — | — | — | — |
| RE15-10-8013 | 15-610776 | 0–0.5 | SED | — | 1.08 (UJ) | — | — | 6.27 | — | — | — | — | 64.4 (J) | — | — | 23 (J) | — | — | — | — | — | 1.07 (UJ) | — | 33.7 | — | — |
| RE15-10-8014 | 15-610776 | 1–2 | QBT3 | — | 0.953 (UJ) | — | 50.5 | 1.56 | — | — | — | — | 6.83 (J) | — | — | — | — | — | — | — | — | 0.728 (U) | — | — | — | — |
| RE15-10-8015 | 15-610777 | 0–0.5 | SED | — | 1.46 (UJ) | — | — | 1.68 | 0.949 | — | — | — | 91.4 (J) | — | — | 27.6 (J) | — | — | — | — | — | 1.45 (UJ) | — | 32.6 | — | — |
| RE15-10-8016 | 15-610777 | 0.5–2 | SOIL | — | 0.932 (UJ) | — | — | — | 0.466 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8017 | 15-610778 | 0–0.5 | SED | — | — | — | — | 4.41 | — | — | — | — | 50.2 (J) | — | — | 34.8 (J) | — | — | — | — | — | 1.2 (UJ) | — | 126 | — | — |
| RE15-10-8018 | 15-610778 | 1–2 | SED | — | 1.06 (UJ) | — | — | 1.35 | 0.528 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.07 (UJ) | — | 189 | — | — |
| RE15-10-8019 | 15-610779 | 0–0.5 | SOIL | — | 1.06 (UJ) | — | — | — | — | — | — | — | 16.3 (J) | — | — | — | — | — | — | — | 0.000629 (J) | — | — | 9.2 | — | — |
| RE15-10-8020 | 15-610779 | 1–2 | QBT3 | — | 1 (UJ) | — | — | — | — | — | 7.2 (J) | — | 5.2 (J) | — | — | — | — | — | — | — | 0.000569 (J) | 1.01 (UJ) | — | — | — | — |
| RE15-10-8021 | 15-610780 | 0–0.5 | SOIL | — | 1.1 (UJ) | — | — | — | 0.401 (J) | — | — | — | 16.3 (J) | — | — | — | — | — | — | — | — | — | — | 11.3 | — | — |
| RE15-10-8022 | 15-610780 | 1–2 | QBT3 | — | 0.944 (UJ) | — | — | — | — | — | 9.69 (J) | — | — | — | — | — | — | — | — | — | — | 0.937 (UJ) | — | — | — | — |
| RE15-10-8023 | 15-610781 | 0–0.5 | SOIL | — | 1.11 (UJ) | — | — | — | 0.555 (U) | — | 25.5 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8024 | 15-610781 | 1–2 | SOIL | — | 1.09 (UJ) | — | 344 | 1.9 | 0.544 (U) | — | 35.2 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8025 | 15-610782 | 0–0.5 | SOIL | — | 1.31 (UJ) | — | — | — | — | — | 24.4 (J) | — | — | — | — | — | — | — | — | — | — | — | — | 2.09 | — | 66.5 (J+) |
| RE15-10-8026 | 15-610782 | 1–2 | SOIL | — | 0.968 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00213 (J) | — | — | — | — | — |
| RE15-10-8027 | 15-610783 | 0–0.5 | SOIL | — | 1.21 (U) | — | — | — | 0.411 (J) | — | 36.4 | — | — | — | — | — | — | — | — | — | — | — | — | 2.22 | — | — |
| RE15-10-8028 | 15-610783 | 1–2 | SOIL | — | 1.04 (U) | — | — | — | 0.521 (U) | — | 20.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8029 | 15-610784 | 0–0.5 | SOIL | — | 1.25 (U) | — | — | — | 0.626 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.57 | — | — |
| RE15-10-8030 | 15-610784 | 1–2 | SOIL | — | 1.05 (U) | — | — | — | 0.523 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.44 | — | — |
| RE15-10-8031 | 15-610785 | 0–0.5 | SOIL | — | 1.16 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 18.5 | — | — |
| RE15-10-8032 | 15-610785 | 1–2 | SOIL | — | 1.08 (U) | — | — | — | 0.538 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

**Table 8.5-3**
**Organic Chemicals Detected at SWMU 15-008(b)**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1242 | Aroclor-1254 | Aroclor-1260 | Aroclor-1268 | HMX | RDX | TATB | Trinitrotoluene[2,4,6-] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **11.5** | **11.5** | **11.5** | **11.5[b]** | **63300** | **311** | **32000[c, d]** | **573** |
| **Residential SSL[a]** | | | | **2.43** | **1.14** | **2.43** | **2.43[b]** | **3850** | **60.4** | **2200[c, d]** | **36** |
| RE15-10-7869 | 15-610704 | 0–0.5 | SOIL | —[e] | 0.007 | 0.0068 | NA[f] | — | — | — | — |
| RE15-10-7871 | 15-610705 | 0–0.5 | SOIL | — | 0.0231 | 0.0163 | NA | 15.4 (J) | 7.72 (J) | 28.6 | 0.185 (J) |
| RE15-10-7872 | 15-610705 | 2–3 | QBT3 | — | 0.0043 | 0.0024 (J) | NA | 0.182 (J) | — | 4.78 | — |
| RE15-10-7873 | 15-610706 | 0–0.5 | SOIL | 0.282 | 0.143 | 0.0608 | NA | — | — | — | — |
| RE15-10-7874 | 15-610706 | 2–3.5 | QBT3 | — | 0.0029 (J) | 0.0032 (J) | NA | — | — | — | — |
| RE15-10-7875 | 15-610707 | 0–0.5 | SOIL | — | 0.0071 | 0.0054 | NA | — | — | — | — |
| RE15-10-7876 | 15-610707 | 2.5–3.5 | QBT3 | — | 0.0021 (J) | — | NA | — | — | — | — |
| RE15-10-7877 | 15-610708 | 0–0.5 | SOIL | — | 0.0332 | 0.0515 | NA | 2.3 (J-) | — | 0.782 (J-) | — |
| RE15-10-7879 | 15-610709 | 0–0.5 | SOIL | — | 0.0129 | 0.0076 | NA | — | — | — | — |
| RE15-10-7883 | 15-610711 | 0–0.4 | SOIL | — | 0.0039 (J) | — | NA | — | — | — | — |
| RE15-10-7885 | 15-610712 | 0–0.4 | SOIL | — | 0.0034 (J) | — | NA | — | — | — | — |
| RE15-10-7889 | 15-610714 | 0–0.5 | SOIL | — | 0.0368 | 0.0233 | 0.0205 | 9.53 | — | — | — |
| RE15-10-7890 | 15-610714 | 2.5–3.5 | QBT3 | — | 0.0029 (J) | 0.0031 (J) | 0.0045 | — | — | — | — |
| RE15-10-7891 | 15-610715 | 0–0.5 | SOIL | — | 0.0111 | 0.0083 | 0.0079 | — | — | — | — |
| RE15-10-7894 | 15-610716 | 1–2 | SED | — | 0.0022 (J) | — | NA | — | — | — | — |
| RE15-10-7897 | 15-610718 | 0–0.5 | SED | — | 0.0093 | 0.0072 | NA | — | — | — | — |
| RE15-10-7898 | 15-610718 | 1–2 | SED | — | 0.0035 (J) | 0.0026 (J) | NA | — | — | — | — |
| RE15-10-7902 | 15-610720 | 1–2 | SOIL | — | 0.0083 | 0.0053 | NA | — | — | — | — |
| RE15-10-7905 | 15-610722 | 0–0.5 | SOIL | NA | NA | NA | NA | 1.22 (J) | — | 6.06 | — |

**Table 8.5-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aroclor-1242 | Aroclor-1254 | Aroclor-1260 | Aroclor-1268 | HMX | RDX | TATB | Trinitrotoluene[2,4,6-] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **11.5** | **11.5** | **11.5** | **11.5**[b] | **63300** | **311** | **32000**[c, d] | **573** |
| **Residential SSL**[a] | | | | **2.43** | **1.14** | **2.43** | **2.43**[b] | **3850** | **60.4** | **2200**[c, d] | **36** |
| RE15-10-7909 | 15-610724 | 0–0.5 | SOIL | NA | NA | NA | NA | — | — | 12.9 | — |
| RE15-10-7911 | 15-610725 | 0–0.3 | SOIL | NA | NA | NA | NA | 0.315 (J) | — | — | — |
| RE15-10-7912 | 15-610725 | 3–4 | QBT3 | NA | NA | NA | NA | 0.198 (J) | — | — | — |
| RE15-10-7915 | 15-610727 | 0–0.4 | SOIL | NA | NA | NA | NA | 16.1 (J) | 0.242 (J) | 7.39 | — |
| RE15-10-7923 | 15-610731 | 0–0.5 | QBT3 | — | 0.0089 | 0.0066 | NA | — | — | — | — |
| RE15-10-7925 | 15-610732 | 0–0.5 | SOIL | — | 0.0126 | 0.0101 | NA | 0.279 (J-) | — | — | — |
| RE15-10-7935 | 15-610737 | 0–0.3 | SOIL | NA | NA | NA | NA | 0.576 | — | — | — |
| RE15-10-7953 | 15-610746 | 0–0.8 | SOIL | NA | NA | NA | NA | 0.193 (J) | — | 0.5 (J+) | — |
| RE15-10-7961 | 15-610750 | 0–0.5 | SOIL | NA | NA | NA | NA | 0.263 (J) | — | 0.625 (J) | — |
| RE15-10-7965 | 15-610752 | 0–0.5 | SOIL | NA | NA | NA | NA | 35.3 (J) | 0.423 (J) | 5.31 | — |
| RE15-10-7966 | 15-610752 | 3–4.2 | QBT3 | NA | NA | NA | NA | 1.43 | 0.135 (J) | 0.331 (J) | — |
| RE15-10-7967 | 15-610753 | 0–0.5 | SOIL | NA | NA | NA | NA | 0.205 (J) | — | 3.77 | — |
| RE15-10-7969 | 15-610754 | 0–0.5 | SOIL | NA | NA | NA | NA | 10.9 | 2.16 | 8.49 | 0.205 (J) |
| RE15-10-7970 | 15-610754 | 3–3.3 | SOIL | NA | NA | NA | NA | 0.158 (J) | 0.559 | 0.812 (J) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Aroclor-1260 used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[e] — = Not detected.

[f] NA = Not analyzed.

**Table 8.5-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-008(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7869 | 15-610704 | 0–0.5 | SOIL | —[d] | — | — | 2.64713 | 7.18 (J) | 0.933 | 43.7 (J) |
| RE15-10-7870 | 15-610704 | 1–2.5 | QBT3 | — | — | — | 1.13664 | — | 0.0952 | 3.8 (J) |
| RE15-10-7871 | 15-610705 | 0–0.5 | SOIL | 0.0314 | — | — | 3.31526 | 6.1 (J) | 0.799 | 42.1 (J) |
| RE15-10-7872 | 15-610705 | 2–3 | QBT3 | — | — | — | 1.08595 | — | 0.117 | 5.04 (J) |
| RE15-10-7873 | 15-610706 | 0–0.5 | SOIL | — | — | — | 2.85446 | 5.39 (J) | 1.11 | 36.8 (J) |
| RE15-10-7874 | 15-610706 | 2–3.5 | QBT3 | — | — | — | 1.35357 | — | 0.15 | 7.18 (J) |
| RE15-10-7875 | 15-610707 | 0–0.5 | SOIL | — | — | — | 0.127207 | 6.17 | 0.831 | 34.9 |
| RE15-10-7876 | 15-610707 | 2.5–3.5 | QBT3 | — | — | — | 0.0757801 | — | — | — |
| RE15-10-7877 | 15-610708 | 0–0.5 | SOIL | — | — | — | 1.2608 | 6.55 | 0.594 | 25.2 |
| RE15-10-7879 | 15-610709 | 0–0.5 | SOIL | — | — | — | — | 3.87 | 0.318 | 13.8 |
| RE15-10-7880 | 15-610709 | 2.8–3.6 | QBT3 | — | — | — | 0.0163784 | — | — | — |
| RE15-10-7881 | 15-610710 | 0–0.5 | SOIL | 0.0258 | — | — | — | 2.98 | 0.305 | 11.3 |
| RE15-10-7882 | 15-610710 | 1–1.6 | QBT3 | — | — | — | 0.0295714 | — | — | — |
| RE15-10-7883 | 15-610711 | 0–0.4 | SOIL | — | — | — | — | — | — | 2.73 |
| RE15-10-7885 | 15-610712 | 0–0.4 | SOIL | — | — | 0.056 | 0.895531 | 3.43 | 0.345 | 15.3 |
| RE15-10-7886 | 15-610712 | 3–3.5 | QBT3 | — | — | — | 0.0282941 | — | — | — |
| RE15-10-7888 | 15-610713 | 3–4 | QBT3 | — | — | — | 0.0629007 | — | — | — |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **na**[b] | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV**[a] | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV**[a] | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL**[c] | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL**[c] | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7889 | 15-610714 | 0–0.5 | SOIL | — | — | — | 3.85746 | 7.77 | 0.978 | 44.6 |
| RE15-10-7890 | 15-610714 | 2.5–3.5 | QBT3 | — | — | — | 1.079 | — | 0.199 | 9.16 |
| RE15-10-7891 | 15-610715 | 0–0.5 | SOIL | — | — | — | 7.55405 | 19.6 | 1.83 | 77 |
| RE15-10-7892 | 15-610715 | 3–4 | QBT3 | — | — | — | 0.276036 | — | — | 2.42 |
| RE15-10-7893 | 15-610716 | 0–0.5 | SED | — | — | — | 0.321611 | — | — | 6.21 |
| RE15-10-7894 | 15-610716 | 1–2 | SED | — | — | — | 0.1207 | — | — | — |
| RE15-10-7895 | 15-610717 | 0–0.5 | SED | — | — | — | 0.0957122 | — | — | — |
| RE15-10-7896 | 15-610717 | 1–2 | QBT3 | — | — | — | 0.0329059 | — | — | — |
| RE15-10-7897 | 15-610718 | 0–0.5 | SED | — | — | — | 29.7709 | 5 | 0.669 | 30 |
| RE15-10-7898 | 15-610718 | 1–2 | SED | — | — | — | 4.15035 | — | 0.205 | 10.5 |
| RE15-10-7899 | 15-610719 | 0–0.5 | SED | — | — | — | 0.146794 | 3.26 | 0.245 | 7.13 |
| RE15-10-7900 | 15-610719 | 1–1.5 | QBT3 | — | — | — | 0.0346088 | — | — | — |
| RE15-10-7901 | 15-610720 | 0–0.5 | SOIL | — | — | — | 0.27473 | 4.43 | 0.253 | 9.08 |
| RE15-10-7902 | 15-610720 | 1–2 | SOIL | — | 0.183 | 0.0191 | 0.0476872 | — | — | 2.32 |
| RE15-10-7903 | 15-610721 | 0–0.5 | SOIL | — | — | — | 0.144417 | — | — | 4.89 |
| RE15-10-7904 | 15-610721 | 1–1.9 | SOIL | — | — | — | 0.0253408 | — | — | — |
| RE15-10-7905 | 15-610722 | 0–0.5 | SOIL | — | — | — | 3.15013 | 2.6 (J) | 0.391 | 16.9 (J) |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7906 | 15-610722 | 3–3.8 | QBT3 | — | — | — | 0.543235 | — | 0.114 | 3.35 (J) |
| RE15-10-7907 | 15-610723 | 0–0.5 | SOIL | — | — | 0.0921 | 17.707 | 18.1 (J) | 1.91 | 108 (J) |
| RE15-10-7908 | 15-610723 | 2.9–3.5 | QBT3 | — | — | — | 9.53183 | 18.4 (J) | 3.25 | 188 (J) |
| RE15-10-7909 | 15-610724 | 0–0.5 | SOIL | — | — | — | 19.8907 | 15.2 (J) | 2.16 | 112 (J) |
| RE15-10-7910 | 15-610724 | 3–3.6 | QBT3 | — | — | — | 13.1706 | 4.55 (J) | 0.741 | 32.6 (J) |
| RE15-10-7911 | 15-610725 | 0–0.3 | SOIL | 0.0611 | — | 0.268 | 26.8636 | 35.2 (J) | 4.89 | 245 (J) |
| RE15-10-7912 | 15-610725 | 3–4 | QBT3 | — | — | — | 12.704 | 9.61 (J) | 1.23 | 80 (J) |
| RE15-10-7913 | 15-610726 | 0–0.3 | SOIL | — | — | — | 0.925616 | — | — | 2.5 (J) |
| RE15-10-7914 | 15-610726 | 2–3 | QBT3 | — | — | — | 0.62019 | — | — | 2.63 |
| RE15-10-7915 | 15-610727 | 0–0.4 | SOIL | — | — | — | 1.51193 | 8.54 | 1.28 | 68 |
| RE15-10-7916 | 15-610727 | 2–3.1 | QBT3 | — | — | — | 0.220343 | — | — | 3.46 |
| RE15-10-7918 | 15-610728 | 1.3–3.6 | QBT3 | — | — | — | 0.084591 | — | — | — |
| RE15-10-7919 | 15-610729 | 0–0.5 | SOIL | — | — | — | 5.5186 | 4.81 | 0.65 | 29.4 |
| RE15-10-7920 | 15-610729 | 2–3.3 | QBT3 | — | — | — | 1.25496 | 2.07 | 0.207 | 10.3 |
| RE15-10-7921 | 15-610730 | 0–0.5 | SOIL | — | — | — | 4.17932 | 4.94 | 0.606 | 29.2 |
| RE15-10-7922 | 15-610730 | 2–3 | QBT3 | — | 0.091 | — | 2.27522 | 3.27 | 0.471 | 16.6 |
| RE15-10-7923 | 15-610731 | 0–0.5 | QBT3 | — | 0.125 | — | 1.81737 | 11 (J+) | 1.47 (J+) | 73.1 (J+) |
| RE15-10-7924 | 15-610731 | 2–3 | QBT3 | — | — | — | 0.0910139 | — | 0.131 | 4.16 |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7925 | 15-610732 | 0–0.5 | SOIL | — | — | — | 10.275 | 17.1 (J+) | 2.12 (J+) | 110 (J+) |
| RE15-10-7926 | 15-610732 | 2–2.8 | QBT3 | — | — | — | 1.9 | 4.51 | 0.485 | 28.2 |
| RE15-10-7927 | 15-610733 | 0–0.5 | SOIL | — | — | — | 0.596842 | 8.62 | 1.01 | 43.6 |
| RE15-10-7928 | 15-610733 | 3–4 | QBT3 | — | — | — | 0.110539 | — | — | — |
| RE15-10-7929 | 15-610734 | 0–0.5 | SOIL | — | — | — | 0.361356 | 3.02 | — | 11.1 |
| RE15-10-7930 | 15-610734 | 2.5–3.5 | QBT3 | — | — | — | 0.334944 | — | — | 4.97 |
| RE15-10-7931 | 15-610735 | 0–0.5 | SOIL | — | — | — | 0.0573438 | — | — | — |
| RE15-10-7932 | 15-610735 | 3–4 | QBT3 | — | — | — | 0.0214802 | — | — | — |
| RE15-10-7933 | 15-610736 | 0–0.5 | SOIL | — | — | — | 0.047738 | 2.72 | — | 4.68 |
| RE15-10-7934 | 15-610736 | 3–3.9 | QBT3 | — | — | — | 0.0902448 | — | — | — |
| RE15-10-7935 | 15-610737 | 0–0.3 | SOIL | — | — | — | 4.23194 | 16.8 | 1.44 | 72.1 |
| RE15-10-7936 | 15-610737 | 2.9–4 | QBT3 | — | — | — | 0.198873 | — | — | — |
| RE15-10-7937 | 15-610738 | 0–0.5 | SOIL | — | — | — | 0.0580945 | — | — | 4.53 |
| RE15-10-7940 | 15-610739 | 3–3.5 | QBT3 | — | — | — | 0.0404719 | — | — | — |
| RE15-10-7941 | 15-610740 | 0–0.5 | SOIL | — | — | — | 0.50941 | 3.95 | 0.242 | 9.59 |
| RE15-10-7942 | 15-610740 | 3–4 | QBT3 | — | — | — | 0.0447744 | — | — | — |
| RE15-10-7944 | 15-610741 | 2.9–3.5 | QBT3 | — | — | — | 0.0398613 | — | — | — |
| RE15-10-7945 | 15-610742 | 0–0.3 | SOIL | 0.0211 | 1.69 | 0.0773 | 0.956634 | 4.14 | 0.343 | 15.9 |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7946 | 15-610742 | 2.5–3.5 | QBT3 | — | — | — | 0.0290305 | — | — | — |
| RE15-10-7947 | 15-610743 | 0–0.5 | SOIL | — | — | — | 0.817053 | 5.17 | 0.547 | 23.6 |
| RE15-10-7948 | 15-610743 | 3–3.9 | QBT3 | — | 0.484 | — | 0.442245 | 2.28 | 0.19 | 7.11 |
| RE15-10-7949 | 15-610744 | 0–0.5 | SOIL | — | — | — | 2.35703 | 6.41 | 0.594 | 28.1 |
| RE15-10-7950 | 15-610744 | 1.5–1.7 | SOIL | — | — | — | 0.0678928 | — | — | — |
| RE15-10-7951 | 15-610745 | 0–0.5 | QBT3 | — | — | — | 0.124362 | — | — | — |
| RE15-10-7952 | 15-610745 | 2.5–3.5 | QBT3 | — | — | — | 0.0240183 | — | — | — |
| RE15-10-7953 | 15-610746 | 0–0.8 | SOIL | — | — | 0.0576 | 73.2084 | 43.4 | 6.57 | 291 |
| RE15-10-7954 | 15-610746 | 3–3.4 | QBT3 | — | — | — | 4.95556 | 5.1 | 0.499 | 27.9 |
| RE15-10-7955 | 15-610747 | 0–0.5 | SOIL | — | — | — | 41.4878 | 7.34 | 0.822 | 31.6 |
| RE15-10-7956 | 15-610747 | 3–3.7 | QBT3 | — | — | — | 7.98082 | 7.74 | 0.736 | 35 |
| RE15-10-7957 | 15-610748 | 0–1 | SOIL | 0.0769 | — | 0.333 | 70.5855 | 36.4 | 4.95 | 269 |
| RE15-10-7958 | 15-610748 | 3–4 | SOIL | — | 0.155 | — | 199.169 | — | — | — |
| RE15-10-7959 | 15-610749 | 0–0.7 | SOIL | — | — | 0.113 | 4.57105 | 24.5 | 3.67 | 181 |
| RE15-10-7960 | 15-610749 | 3–3.6 | QBT3 | 0.0731 | — | 0.303 | 12.4035 | 11 | 1.08 | 57.7 |
| RE15-10-7961 | 15-610750 | 0–0.5 | SOIL | — | — | — | 4.58406 | 4.46 | 0.551 | 23.1 |
| RE15-10-7962 | 15-610750 | 3–4 | QBT3 | — | — | — | 0.583208 | — | — | — |
| RE15-10-7963 | 15-610751 | 0–0.5 | SOIL | — | — | — | 0.359798 | — | — | 2.99 |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **na**[b] | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV**[a] | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV**[a] | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL**[c] | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL**[c] | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7964 | 15-610751 | 3–4 | QBT3 | — | — | — | 0.0714132 | — | — | — |
| RE15-10-7965 | 15-610752 | 0–0.5 | SOIL | — | — | — | 1.78913 | 8.51 | 0.83 | 35.3 |
| RE15-10-7966 | 15-610752 | 3–4.2 | QBT3 | — | — | — | 0.688142 | — | — | — |
| RE15-10-7967 | 15-610753 | 0–0.5 | SOIL | — | — | 0.0723 | 24.2958 | 21.5 | 2.75 | 150 |
| RE15-10-7968 | 15-610753 | 3–3.5 | QBT3 | — | — | — | 8.53587 | 3.24 | 0.363 | 19.4 |
| RE15-10-7969 | 15-610754 | 0–0.5 | SOIL | — | — | — | 3.62124 | — | 0.305 | 14.7 |
| RE15-10-7970 | 15-610754 | 3–3.3 | SOIL | — | — | — | 0.473684 | — | — | — |
| RE15-10-7971 | 15-610755 | 0–0.5 | SOIL | — | — | — | 0.353023 | — | 0.278 | 13.1 |
| RE15-10-7972 | 15-610755 | 3–3.6 | QBT3 | — | — | — | 0.321233 | — | — | — |
| RE15-10-7973 | 15-610756 | 0–0.7 | SOIL | — | — | — | 0.245153 | — | — | — |
| RE15-10-7974 | 15-610756 | 2.7–3.3 | QBT3 | — | — | — | 0.0275802 | — | — | — |
| RE15-10-7975 | 15-610757 | 0–0.3 | SOIL | — | — | 0.0549 | 0.362819 | — | — | 6.11 |
| RE15-10-7976 | 15-610757 | 3–3.6 | QBT3 | — | 0.099 | — | 0.304299 | — | — | 2.16 |
| RE15-10-7977 | 15-610758 | 0–0.6 | SOIL | — | — | — | 0.169085 | — | — | — |
| RE15-10-7978 | 15-610758 | 1–2 | SOIL | — | 0.142 | — | — | — | — | — |
| RE15-10-7979 | 15-610759 | 0–0.5 | SOIL | — | — | — | 0.412443 | — | — | 4.15 |
| RE15-10-7980 | 15-610759 | 3–3.7 | QBT3 | — | — | — | 0.0274642 | — | — | — |
| RE15-10-7981 | 15-610760 | 0–0.5 | SOIL | — | — | — | 0.112 | — | — | 3.75 |

## Table 8.5-4 (continued)

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7982 | 15-610760 | 3–3.5 | QBT3 | — | — | — | 0.0388571 | — | — | — |
| RE15-10-7983 | 15-610761 | 0–0.5 | SOIL | — | — | — | 0.0663333 | — | — | — |
| RE15-10-7985 | 15-610762 | 0–0.4 | SOIL | 0.0271 | 1.96 | 0.0789 | 0.219692 | 6.18 | 0.591 | 22.6 |
| RE15-10-7987 | 15-610763 | 0–0.3 | SOIL | — | — | — | 0.126212 | 4.53 | 0.34 | 13.3 |
| RE15-10-7988 | 15-610763 | 2.5–3.5 | QBT3 | — | — | — | 0.0344493 | — | — | — |
| RE15-10-7989 | 15-610764 | 0–0.5 | SOIL | — | — | — | 0.162 | — | — | 3.68 |
| RE15-10-7990 | 15-610764 | 3–4 | QBT3 | — | — | — | 0.112174 | — | 0.0915 | — |
| RE15-10-7992 | 15-610765 | 3–4 | QBT3 | — | — | — | 0.0377415 | — | — | — |
| RE15-10-7993 | 15-610766 | 0–0.7 | SOIL | — | — | — | 0.0955436 | — | — | 3.9 |
| RE15-10-7995 | 15-610767 | 0–1 | SED | — | — | — | 0.211407 | 3.58 | 0.397 | 12.3 |
| RE15-10-7996 | 15-610767 | 1–1.8 | SED | — | — | — | 0.118137 | — | 0.223 | 7.39 |
| RE15-10-7997 | 15-610768 | 0–0.7 | SED | — | — | — | 0.155026 | 4.65 | 0.426 | 15.8 |
| RE15-10-7998 | 15-610768 | 1–1.5 | SED | — | — | — | — | — | — | 2.69 |
| RE15-10-7999 | 15-610769 | 0–0.7 | SOIL | — | — | — | 0.0766796 | — | — | 7.29 |
| RE15-10-8001 | 15-610770 | 0–0.8 | SED | — | — | — | 2.19042 | 4.84 | 0.42 | 20.3 |
| RE15-10-8002 | 15-610770 | 1–2 | QBT3 | — | — | — | 0.082883 | — | — | — |
| RE15-10-8003 | 15-610771 | 0–0.5 | SED | — | — | — | 1.73851 | 4.37 | 0.488 | 25.1 |
| RE15-10-8004 | 15-610771 | 1–2 | SOIL | — | — | — | 0.275601 | — | — | 2.48 (J-) |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-8005 | 15-610772 | 0–0.5 | SOIL | — | — | — | 1.00074 | 6.82 | 0.756 | 32.8 |
| RE15-10-8006 | 15-610772 | 1–2 | SOIL | — | — | — | 0.0375447 | — | — | — |
| RE15-10-8007 | 15-610773 | 0–0.8 | SED | — | — | — | 0.492653 | 21.1 (J+) | 1.72 (J+) | 87.6 (J+) |
| RE15-10-8008 | 15-610773 | 1–2 | SOIL | — | — | — | 0.033275 | — | — | — |
| RE15-10-8009 | 15-610774 | 0–0.5 | SED | — | — | — | 22.3941 | 18.1 (J+) | 1.94 (J+) | 92 (J+) |
| RE15-10-8010 | 15-610774 | 1–2 | QBT3 | — | — | — | 1.44653 | 4.09 | 0.268 | 11.2 |
| RE15-10-8011 | 15-610775 | 0–0.5 | SED | — | — | — | 4.84256 | 2.79 | 0.355 | 15.5 |
| RE15-10-8012 | 15-610775 | 1–2 | QBT3 | — | — | — | 0.52867 | — | — | — |
| RE15-10-8013 | 15-610776 | 0–0.5 | SED | — | — | — | 0.759361 | 4.71 | 0.479 | 19.4 |
| RE15-10-8014 | 15-610776 | 1–2 | QBT3 | — | — | — | 0.0674197 | — | — | — |
| RE15-10-8015 | 15-610777 | 0–0.5 | SED | — | — | — | 0.618692 | 3.18 | 0.375 | 15.5 |
| RE15-10-8016 | 15-610777 | 0.5–2 | SOIL | — | — | — | 0.0527688 | — | — | — |
| RE15-10-8017 | 15-610778 | 0–0.5 | SED | — | — | — | 11.7372 | 13.8 (J+) | 1.72 (J+) | 91.1 (J+) |
| RE15-10-8018 | 15-610778 | 1–2 | SED | — | — | — | 1.68869 | 11.1 (J+) | 1.61 (J+) | 70.8 (J+) |
| RE15-10-8019 | 15-610779 | 0–0.5 | SOIL | — | — | — | 0.112951 | — | — | 5.53 |
| RE15-10-8020 | 15-610779 | 1–2 | QBT3 | — | — | — | 0.0121905 | — | — | — |
| RE15-10-8021 | 15-610780 | 0–0.5 | SOIL | — | — | — | 0.313516 | — | — | 5.45 |
| RE15-10-8022 | 15-610780 | 1–2 | QBT3 | — | — | — | 0.0564152 | — | — | — |

**Table 8.5-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-8025 | 15-610782 | 0–0.5 | SOIL | — | — | — | 0.13013 | — | — | 2.4 |
| RE15-10-8026 | 15-610782 | 1–2 | SOIL | — | — | — | 0.0242091 | — | — | — |
| RE15-10-8027 | 15-610783 | 0–0.5 | SOIL | — | — | — | 0.084643 | — | — | 4.73 |
| RE15-10-8029 | 15-610784 | 0–0.5 | SOIL | — | — | — | — | — | — | 3.39 |
| RE15-10-8030 | 15-610784 | 1–2 | SOIL | — | 0.352 | — | 0.296453 | 2.75 | — | 5.3 |
| RE15-10-8031 | 15-610785 | 0–0.5 | SOIL | — | — | — | 0.0830276 | — | — | 5.16 |

Note: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 8.6-1**
**Samples Collected and Analyses Requested at AOC 15-008(g)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | TAL Metals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7332 | 15-610565 | 0–0.5 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | 10-1564 | 10-1565 | 10-1565 |
| RE15-10-7333 | 15-610565 | 2–2.5 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | 10-1564 | 10-1565 | 10-1565 |
| RE15-10-7334 | 15-610566 | 0–0.5 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | —* | 10-1565 | 10-1565 |
| RE15-10-7335 | 15-610566 | 2–4 | QBT3 | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | — | 10-1565 | 10-1565 |
| RE15-10-7336 | 15-610567 | 0–0.5 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | — | 10-1565 | 10-1565 |
| RE15-10-7337 | 15-610567 | 2–3 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | — | 10-1565 | 10-1565 |
| RE15-10-7338 | 15-610568 | 0–0.5 | SOIL | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | — | 10-1565 | 10-1565 |
| RE15-10-7339 | 15-610568 | 2–3 | QBT3 | 10-1566 | 10-1565 | 10-1564 | 10-1566 | 10-1566 | 10-1566 | 10-1566 | — | 10-1565 | 10-1565 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.6-2**
**Inorganic Chemicals above BVs at AOC 15-008(g)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Cadmium | Calcium | Chromium | Cobalt | Copper | Lead | Selenium | Uranium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **0.5** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **11.2** | **0.3** | **2.4** |
| **Soil BV**[a] | | | | **0.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **22.3** | **1.52** | **1.82** |
| **Industrial SSL**[b] | | | | **519** | **1110** | **32400000** | **505**[c] | **350**[d] | **51900** | **800** | **6490** | **3880** |
| **Residential SSL**[b] | | | | **31.3** | **70.5** | **13000000** | **96.6**[c] | **23**[d] | **3130** | **400** | **391** | **234** |
| RE15-10-7332 | 15-610565 | 0–0.5 | SOIL | 1.02 (U) | 0.508 (U) | —[e] | — | — | 34.6 (J) | 32.7 | — | — |
| RE15-10-7333 | 15-610565 | 2–2.5 | SOIL | 1.06 (U) | 0.528 (U) | — | — | — | — | — | — | 7.77 |
| RE15-10-7334 | 15-610566 | 0–0.5 | SOIL | 1.24 (U) | 0.621 (U) | — | 25.4 | — | 41.3 (J) | — | — | 3.7 |
| RE15-10-7335 | 15-610566 | 2–4 | QBT3 | 1.27 | — | 2810 (J) | — | — | — | — | 1.13 (U) | 4.26 |
| RE15-10-7336 | 15-610567 | 0–0.5 | SOIL | 1.08 (U) | 0.539 (U) | — | — | — | — | — | — | 2.39 |
| RE15-10-7337 | 15-610567 | 2–3 | SOIL | 1.01 (U) | 0.505 (U) | — | — | — | — | — | — | — |
| RE15-10-7338 | 15-610568 | 0–0.5 | SOIL | 3.77 | 0.618 (U) | — | — | 14 | 21.7 (J) | 370 | — | 3.8 |
| RE15-10-7339 | 15-610568 | 2–3 | QBT3 | 1.15 (U) | — | — | — | — | — | — | 1.13 (U) | 4.03 |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2015, 600915) unless otherwise noted.

[c] SSL for total chromium.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] — = Not detected or not detected above BV.

**Table 8.6-3**
**Organic Chemicals Detected at AOC 15-008(g)**

| Sample ID | Location ID | Depth (ft) | Media | TATB |
|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **32000**[b, c] |
| **Residential SSL**[a] | | | | **2200**[b, c] |
| RE15-10-7332 | 15-610565 | 0–0.5 | SOIL | 20.8 |
| RE15-10-7333 | 15-610565 | 2–2.5 | SOIL | 0.554 (J) |
| RE15-10-7334 | 15-610566 | 0–0.5 | SOIL | 0.327 (J) |
| RE15-10-7335 | 15-610566 | 2–4 | QBT3 | 5.28 |
| RE15-10-7337 | 15-610567 | 2–3 | SOIL | 27.3 |
| RE15-10-7339 | 15-610568 | 2–3 | QBT3 | 16.6 |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table 8.6-4**
**Radionuclides Detected or Detected above BVs/FVs at AOC 15-008(g)**

| Sample ID | Location ID | Depth (ft) | Media | Tritium | Uranium-238 |
|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **na**[b] | **1.93** |
| **Soil BV**[a] | | | | **na** | **2.29** |
| **Industrial SAL**[c] | | | | **2400000** | **710** |
| **Residential SAL**[c] | | | | **1700** | **150** |
| RE15-10-7332 | 15-610565 | 0–0.5 | SOIL | 0.0162294 | —[d] |
| RE15-10-7333 | 15-610565 | 2–2.5 | SOIL | — | 2.48 |
| RE15-10-7334 | 15-610566 | 0–0.5 | SOIL | — | 4.14 |
| RE15-10-7335 | 15-610566 | 2–4 | QBT3 | 0.0373636 | — |
| RE15-10-7338 | 15-610568 | 0–0.5 | SOIL | — | 2.95 |
| RE15-10-7339 | 15-610568 | 2–3 | QBT3 | 0.025925 | — |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 8.7-1**
**Samples Collected and Analyses Requested at SWMU 15-009(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8300 | 15-610829 | 0-0.3 | SED | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | 10-1567 | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8301 | 15-610829 | 1-2 | QBT3 | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | 10-1567 | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8302 | 15-610830 | 7-8 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | 10-1950 | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8303 | 15-610830 | 12-13 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | 10-1950 | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8305 | 15-610831 | 0-1 | SED | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | —* | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8304 | 15-610831 | 1-2 | SED | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | — | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8306 | 15-610832 | 0-1 | SED | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | — | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8307 | 15-610832 | 1-1.5 | SOIL | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | — | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8308 | 15-610833 | 0-0.5 | SED | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | — | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8309 | 15-610833 | 1-2 | QBT3 | 10-1569 | 10-1568 | 10-1567 | 10-1569 | 10-1569 | 10-1569 | 10-1569 | 10-1568 | — | 10-1568 | 10-1567 | 10-1568 | 10-1567 |
| RE15-10-8310 | 15-610834 | 15-16 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8311 | 15-610834 | 17-18 | QBT3 | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8312 | 15-610835 | 7-8 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8313 | 15-610835 | 12-13 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8314 | 15-610836 | 7-8 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8315 | 15-610836 | 12-13 | FILL | 10-1952 | 10-1951 | 10-1950 | 10-1952 | 10-1952 | 10-1952 | 10-1952 | 10-1951 | — | 10-1951 | 10-1950 | 10-1951 | 10-1950 |
| RE15-10-8316 | 15-610837 | 47.5-50 | QBT3 | 10-1984 | 10-1983 | 10-1982 | 10-1984 | 10-1984 | 10-1984 | 10-1984 | 10-1983 | 10-1982 | 10-1983 | 10-1982 | 10-1983 | 10-1982 |
| RE15-10-8317 | 15-610837 | 58.5-60 | QBT3 | 10-1984 | 10-1983 | 10-1982 | 10-1984 | 10-1984 | 10-1984 | 10-1984 | 10-1983 | 10-1982 | 10-1983 | 10-1982 | 10-1983 | 10-1982 |
| RE15-10-8318 | 15-610837 | 68.5-70 | QBT3 | 10-1984 | 10-1983 | 10-1982 | 10-1984 | 10-1984 | 10-1984 | 10-1984 | 10-1983 | 10-1982 | 10-1983 | 10-1982 | 10-1983 | 10-1982 |
| RE15-10-8319 | 15-610837 | 78.5-80 | QBT3 | 10-1984 | 10-1983 | 10-1982 | 10-1984 | 10-1984 | 10-1984 | 10-1984 | 10-1983 | 10-1982 | 10-1983 | 10-1982 | 10-1983 | 10-1982 |

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

**Table 8.7-2**
**Inorganic Chemicals above BVs at SWMU 15-009(b)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Calcium | Chromium | Copper | Cyanide (Total) | Lead | Nitrate | Perchlorate | Selenium | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **46** | **1.63** | **2200** | **7.14** | **4.66** | **0.5** | **11.2** | **na[b]** | **na** | **0.3** | **2.4** | **63.5** |
| **Sediment BV[a]** | | | | **0.83** | **127** | **0.4** | **4420** | **10.5** | **11.2** | **0.82** | **19.7** | **na** | **na** | **0.3** | **2.22** | **60.2** |
| **Soil BV[a]** | | | | **0.83** | **295** | **0.4** | **6120** | **19.3** | **14.7** | **0.5** | **22.3** | **na** | **na** | **1.52** | **1.82** | **48.8** |
| **Industrial SSL[c]** | | | | **519** | **255000** | **1110** | **32400000** | **505[d]** | **51900** | **63.3** | **800** | **2080000** | **908** | **6490** | **3880** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **3130** | **11.2** | **400** | **125000** | **54.8** | **391** | **234** | **23500** |
| RE15-10-8300 | 15-610829 | 0–0.3 | SED | 1.44 (UJ) | —[e] | 0.721 (U) | — | — | — | — | — | — | — | 1.27 (U) | — | — |
| RE15-10-8301 | 15-610829 | 1–2 | QBT3 | 0.787 (U) | — | — | — | 8.69 (J) | — | — | — | 1.3 (J-) | 0.000892 (J) | 1.06 (U) | 2.62 (J) | — |
| RE15-10-8302 | 15-610830 | 7–8 | FILL | — | — | — | 6640 (J+) | — | — | — | — | — | — | — | 1.95 (J) | 114 |
| RE15-10-8303 | 15-610830 | 12–13 | FILL | 1 (U) | — | — | — | — | — | — | — | — | — | — | — | 53.1 |
| RE15-10-8305 | 15-610831 | 0–1 | SED | 1.34 (U) | 134 | 0.757 (U) | — | — | 17.8 | 1.22 | 28.2 | — | — | 1.59 (U) | 615 (J) | — |
| RE15-10-8304 | 15-610831 | 1–2 | SED | 1.17 (UJ) | — | 0.584 (U) | — | — | — | — | — | 1.75 (J-) | — | 0.669 (U) | 52 (J) | — |
| RE15-10-8306 | 15-610832 | 0–1 | SED | 1.12 (U) | — | 0.621 (U) | — | — | — | — | — | 2.76 (J-) | — | 1.26 (U) | 13.7 (J) | — |
| RE15-10-8307 | 15-610832 | 1–1.5 | SOIL | — | — | 0.556 (U) | — | — | — | — | — | — | — | — | 3.62 (J) | — |
| RE15-10-8308 | 15-610833 | 0–0.5 | SED | — | — | 0.644 (U) | — | 14 (J) | — | — | — | — | — | 1.38 (U) | 10.6 (J) | — |
| RE15-10-8309 | 15-610833 | 1–2 | QBT3 | 0.813 (U) | 83.6 | — | — | 19.1 (J) | 5.52 | — | — | — | — | 1.12 (U) | 3.07 (J) | — |
| RE15-10-8310 | 15-610834 | 15–16 | FILL | — | — | — | — | — | — | — | — | — | 0.000621 (J) | — | 2.32 (J) | 54.4 |
| RE15-10-8311 | 15-610834 | 17–18 | QBT3 | 0.994 (U) | — | — | — | — | — | — | — | — | — | 0.996 (UJ) | — | — |
| RE15-10-8312 | 15-610835 | 7–8 | FILL | — | — | — | — | — | — | — | — | — | — | — | 2.48 (J) | 76.4 |
| RE15-10-8313 | 15-610835 | 12–13 | FILL | — | — | — | — | — | — | — | — | — | — | — | 4.7 (J) | — |
| RE15-10-8314 | 15-610836 | 7–8 | FILL | 0.981 (U) | — | — | — | — | — | — | — | — | 0.00247 | — | — | — |
| RE15-10-8315 | 15-610836 | 12–13 | FILL | 0.972 (U) | — | — | — | — | — | — | — | — | 0.00106 (J) | — | — | — |
| RE15-10-8316 | 15-610837 | 47.5–50 | QBT3 | 1.01 (UJ) | — | — | — | — | — | — | — | — | — | 1 (U) | — | — |
| RE15-10-8317 | 15-610837 | 58.5–60 | QBT3 | 1.06 (UJ) | — | — | — | — | — | — | — | — | — | 1.05 (U) | — | — |
| RE15-10-8318 | 15-610837 | 68.5–70 | QBT3 | 1.02 (UJ) | — | — | — | — | — | — | — | — | — | 1.02 (U) | — | — |
| RE15-10-8319 | 15-610837 | 78.5–80 | QBT3 | 0.998 (UJ) | — | — | — | — | — | — | — | — | — | 0.985 (U) | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

**Table 8.7-3**
**Organic Chemicals Detected at SWMU 15-009(b)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acenaphthylene | Acetone | Anthracene | Aroclor-1242 | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Butanone[2-] | Chrysene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **25300[b]** | **960000** | **253000** | **11.5** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **411000** | **3230** |
| **Residential SSL[a]** | | | | **3480** | **1740[b]** | **66300** | **17400** | **2.43** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **37400** | **153** |
| RE15-10-8300 | 15-610829 | 0–0.3 | SED | —[c] | — | 0.00798 (J) | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8302 | 15-610830 | 7–8 | FILL | — | 0.0203 (J) | 0.131 | 0.0406 | 0.0272 | 0.0312 | 0.0131 | 0.128 | 0.136 | 0.269 | 0.0637 | 0.0024 (J) | 0.122 |
| RE15-10-8303 | 15-610830 | 12–13 | FILL | — | — | — | 0.0119 (J) | — | — | — | 0.0512 | 0.05 | 0.0993 | 0.0246 (J) | — | 0.0463 |
| RE15-10-8305 | 15-610831 | 0–1 | SED | — | — | 0.0141 (J) | — | NA[d] | NA | NA | — | — | — | — | — | — |
| RE15-10-8308 | 15-610833 | 0–0.5 | SED | — | — | — | — | NA | NA | NA | — | — | — | — | — | — |
| RE15-10-8310 | 15-610834 | 15–16 | FILL | 0.0389 | — | 0.0226 | 0.0937 | NA | NA | NA | 0.211 | 0.227 | 0.419 | 0.0903 | — | 0.21 |
| RE15-10-8311 | 15-610834 | 17–18 | QBT3 | — | — | 0.00428 (J) | — | NA | NA | NA | 0.0227 (J) | 0.0189 (J) | 0.0386 | — | — | 0.0153 (J) |
| RE15-10-8312 | 15-610835 | 7–8 | FILL | — | 0.022 (J) | 0.036 | 0.0475 | NA | NA | NA | 0.133 | 0.134 | 0.269 | 0.0571 | — | 0.154 |
| RE15-10-8313 | 15-610835 | 12–13 | FILL | — | 0.0163 (J) | 0.0221 | 0.0299 (J) | NA | NA | NA | 0.103 | 0.106 | 0.217 | 0.0507 | — | 0.104 |
| RE15-10-8314 | 15-610836 | 7–8 | FILL | — | — | — | — | NA | NA | NA | — | — | — | — | — | — |
| RE15-10-8315 | 15-610836 | 12–13 | FILL | — | — | — | — | NA | NA | NA | — | 0.0202 (J) | 0.0421 | — | — | — |

**Table 8.7-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Methylene Chloride | Methylnaphthalene[2-] | Naphthalene | Phenanthrene | Pyrene | Toluene | Trimethylbenzene[1,2,4-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **33700** | **33700** | **32.3** | **14200[e]** | **5130** | **3000[f]** | **241** | **25300** | **25300** | **61300** | **240[f]** | **3940** | **4280[g]** |
| **Residential SSL[a]** | | | | **2320** | **2320** | **1.53** | **2360[e]** | **409** | **240[f]** | **49.7** | **1740** | **1740** | **5230** | **58[f]** | **805** | **871[g]** |
| RE15-10-8300 | 15-610829 | 0–0.3 | SED | — | — | — | 0.0167 | — | — | — | — | — | — | — | — | — |
| RE15-10-8302 | 15-610830 | 7–8 | FILL | 0.299 | 0.0164 (J) | 0.0652 | 0.00316 | 0.0024 (J) | — | — | 0.182 | 0.256 | 0.0102 | 0.000538 (J) | 0.000574 (J) | 0.000702 (J) |
| RE15-10-8303 | 15-610830 | 12–13 | FILL | 0.119 | — | 0.0252 (J) | 0.000314 (J) | — | — | — | 0.0617 | 0.0926 | 0.000504 (J) | — | — | — |
| RE15-10-8305 | 15-610831 | 0–1 | SED | — | — | — | 0.00855 (J+) | — | — | — | — | — | 0.00112 (J+) | — | — | — |
| RE15-10-8308 | 15-610833 | 0–0.5 | SED | — | — | — | 0.000942 (J) | — | — | — | — | — | — | — | — | — |
| RE15-10-8310 | 15-610834 | 15–16 | FILL | 0.456 | 0.0362 | 0.0867 | 0.00109 | — | 0.00864 (J) | 0.0337 (J) | 0.302 | 0.43 | 0.000704 (J) | — | — | — |
| RE15-10-8311 | 15-610834 | 17–18 | QBT3 | 0.0365 | — | — | — | — | — | — | — | 0.0301 (J) | 0.000321 (J) | — | — | — |
| RE15-10-8312 | 15-610835 | 7–8 | FILL | 0.368 | 0.0243 (J) | 0.0567 | 0.0061 | — | — | — | 0.238 | 0.286 | 0.00445 | 0.000651 (J) | 0.000349 (J) | 0.00047 (J) |
| RE15-10-8313 | 15-610835 | 12–13 | FILL | 0.244 | 0.0105 (J) | 0.0504 | 0.00159 | — | — | — | 0.13 | 0.201 | 0.00276 | — | — | — |
| RE15-10-8314 | 15-610836 | 7–8 | FILL | — | — | — | 0.000427 (J) | — | — | — | — | — | — | — | — | — |
| RE15-10-8315 | 15-610836 | 12–13 | FILL | 0.039 | — | — | — | — | — | — | — | 0.0315 (J) | 0.000323 (J) | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] Isopropylbenzene used as a surrogate based on structural similarity.

[f] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[g] Xylenes used as a surrogate based on structural similarity.

**Table 8.7-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-009(b)**

| Sample ID | Location ID | Depth (ft) | Media | Cesium-137 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **na**[b] | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV**[a] | | | | **0.9** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV**[a] | | | | **1.65** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL**[c] | | | | **41** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL**[c] | | | | **12** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-8301 | 15-610829 | 1–2 | QBT3 | —[d] | — | 0.0430596 | — | — | — |
| RE15-10-8302 | 15-610830 | 7–8 | FILL | 0.099 | — | 0.0950559 | — | — | — |
| RE15-10-8303 | 15-610830 | 12–13 | FILL | — | — | 0.0602375 | — | — | — |
| RE15-10-8305 | 15-610831 | 0–1 | SED | 2.54 | 0.134 | — | 303 | 20.3 | 311 |
| RE15-10-8304 | 15-610831 | 1–2 | SED | — | — | — | 89.1 (J+) | 5.24 (J+) | 92.3 (J+) |
| RE15-10-8306 | 15-610832 | 0–1 | SED | — | — | 0.101157 | 8.26 | 0.525 | 10.1 |
| RE15-10-8307 | 15-610832 | 1–1.5 | SOIL | 0.177 | — | 0.12314 | 2.63 | — | 2.82 |
| RE15-10-8308 | 15-610833 | 0–0.5 | SED | — | — | — | 2.74 | 0.207 | 5.14 |
| RE15-10-8309 | 15-610833 | 1–2 | QBT3 | — | — | 0.0334362 | — | — | — |
| RE15-10-8310 | 15-610834 | 15–16 | FILL | — | — | 0.117058 | — | — | — |
| RE15-10-8311 | 15-610834 | 17–18 | QBT3 | — | — | 0.0557807 | — | — | — |
| RE15-10-8312 | 15-610835 | 7–8 | FILL | 0.14 | — | 0.103374 | — | — | — |
| RE15-10-8313 | 15-610835 | 12–13 | FILL | — | — | 0.0804315 | — | — | — |
| RE15-10-8314 | 15-610836 | 7–8 | FILL | — | — | 0.151001 | — | — | — |
| RE15-10-8315 | 15-610836 | 12–13 | FILL | — | — | 0.144884 | — | — | — |
| RE15-10-8316 | 15-610837 | 47.5–50 | QBT3 | — | — | 0.190571 | — | — | — |
| RE15-10-8317 | 15-610837 | 58.5–60 | QBT3 | — | — | 0.263321 | — | — | — |
| RE15-10-8318 | 15-610837 | 68.5–70 | QBT3 | — | — | 0.106778 | — | — | — |
| RE15-10-8319 | 15-610837 | 78.5–80 | QBT3 | — | — | 0.0310637 | — | — | — |

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 8.8-1**
**Samples Collected and Analyses Requested at SWMU 15-009(c)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | PEST | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-98-0029 | 15-03458 | 0–0.5 | SOIL | —* | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0030 | 15-03458 | 1–1.33 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0031 | 15-03458 | 2–2.5 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0032 | 15-03459 | 0–0.5 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | — | 4660R | 4659R |
| RE15-98-0033 | 15-03459 | 1.17–1.67 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0034 | 15-03459 | 2.33–2.83 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0035 | 15-03460 | 0–0.5 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0036 | 15-03460 | 1.33–1.83 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-98-0037 | 15-03471 | 0–0.5 | SOIL | — | — | 4661R | 4662R | 4662R | — | 4662R | — | 4659R | — | 4659R | 4659R | 4660R | 4659R |
| RE15-10-8336 | 15-610838 | 0–0.5 | SED | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | 10-1620 | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8337 | 15-610838 | 1–1.5 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | 10-1620 | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8338 | 15-610839 | 0–0.8 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | 10-1620 | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8339 | 15-610839 | 1–2.5 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | 10-1620 | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8340 | 15-610840 | 0–1 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | 10-1758 | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8341 | 15-610840 | 1–1.5 | QBT3 | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | 10-1758 | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8342 | 15-610841 | 3–3.5 | FILL | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | 10-1905 | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8343 | 15-610841 | 8–8.5 | FILL | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | 10-1905 | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8345 | 15-610842 | 2–2.5 | FILL | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | — | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8344 | 15-610842 | 7–7.5 | FILL | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | — | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8346 | 15-610843 | 10.5–11 | FILL | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | — | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8347 | 15-610843 | 15.5–16 | QBT3 | 10-1907 | 10-1906 | 10-1905 | 10-1907 | 10-1907 | 10-1907 | 10-1907 | 10-1906 | — | 10-1906 | — | 10-1905 | 10-1906 | 10-1905 |
| RE15-10-8348 | 15-610844 | 3–4 | FILL | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | — | 10-1969 | — | 10-1969 | 10-1969 | 10-1969 |
| RE15-10-8349 | 15-610844 | 8–9 | QBT3 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | 10-1969 | — | 10-1969 | — | 10-1969 | 10-1969 | 10-1969 |
| RE15-10-8350 | 15-610845 | 0–0.7 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8351 | 15-610845 | 1–1.2 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8352 | 15-610846 | 0–0.5 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8353 | 15-610846 | 1–2 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8354 | 15-610847 | 0–0.7 | SED | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8355 | 15-610847 | 1–2 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8356 | 15-610848 | 0–0.8 | SOIL | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8357 | 15-610848 | 1–2 | QBT3 | 10-1622 | 10-1621 | 10-1620 | 10-1622 | 10-1622 | 10-1622 | 10-1622 | 10-1621 | — | 10-1621 | — | 10-1620 | 10-1621 | 10-1620 |
| RE15-10-8358 | 15-610849 | 0–0.8 | SED | 10-1625 | 10-1624 | 10-1623 | 10-1625 | 10-1625 | 10-1625 | 10-1625 | 10-1624 | — | 10-1624 | — | 10-1623 | 10-1624 | 10-1623 |

**Table 8.8-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | PEST | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8359 | 15-610849 | 1–2 | SOIL | 10-1625 | 10-1624 | 10-1623 | 10-1625 | 10-1625 | 10-1625 | 10-1625 | 10-1624 | — | 10-1624 | — | 10-1623 | 10-1624 | 10-1623 |
| RE15-10-8360 | 15-610850 | 0–0.9 | SED | 10-1625 | 10-1624 | 10-1623 | 10-1625 | 10-1625 | 10-1625 | 10-1625 | 10-1624 | — | 10-1624 | — | 10-1623 | 10-1624 | 10-1623 |
| RE15-10-8361 | 15-610850 | 1–2 | SED | 10-1625 | 10-1624 | 10-1623 | 10-1625 | 10-1625 | 10-1625 | 10-1625 | 10-1624 | — | 10-1624 | — | 10-1623 | 10-1624 | 10-1623 |
| RE15-10-8362 | 15-610851 | 0–0.7 | SED | 10-1625 | 10-1624 | 10-1623 | 10-1625 | 10-1625 | 10-1625 | 10-1625 | 10-1624 | — | 10-1624 | — | 10-1623 | 10-1624 | 10-1623 |
| RE15-10-8363 | 15-610851 | 1–2 | SOIL | 10-1666 | 10-1666 | 10-1666 | 10-1666 | 10-1666 | 10-1666 | 10-1666 | 10-1666 | — | 10-1666 | — | 10-1666 | 10-1666 | 10-1666 |
| RE15-10-8364 | 15-610852 | 0–0.5 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | — | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8365 | 15-610852 | 1–1.7 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | — | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8366 | 15-610853 | 0–0.5 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | — | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8367 | 15-610853 | 1–1.5 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | — | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |
| RE15-10-8368 | 15-610854 | 0–0.5 | SED | 10-1760 | 10-1759 | 10-1758 | 10-1760 | 10-1760 | 10-1760 | 10-1760 | 10-1759 | — | 10-1759 | — | 10-1758 | 10-1759 | 10-1758 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.8-2**
**Inorganic Chemicals above BVs at SWMU 15-009(c)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Beryllium | Cadmium | Calcium | Chromium | Cyanide (Total) | Lead | Mercury | Nitrate | Perchlorate | Selenium | Silver | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.21** | **1.63** | **2200** | **7.14** | **0.5** | **11.2** | **0.1** | **na[b]** | **na** | **0.3** | **1** | **2.4** | **63.5** |
| **Sediment BV[a]** | | | | **0.83** | **1.31** | **0.4** | **4420** | **10.5** | **0.82** | **19.7** | **0.1** | **na** | **na** | **0.3** | **1** | **2.22** | **60.2** |
| **Soil BV[a]** | | | | **0.83** | **1.83** | **0.4** | **6120** | **19.3** | **0.5** | **22.3** | **0.1** | **na** | **na** | **1.52** | **1** | **1.82** | **48.8** |
| **Industrial SSL[c]** | | | | **519** | **2580** | **1110** | **32400000** | **505[d]** | **63.3** | **800** | **389** | **2080000** | **908** | **6490** | **6490** | **3880** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **156** | **70.5** | **13000000** | **96.6[d]** | **11.2** | **400** | **23.5** | **125000** | **54.8** | **391** | **391** | **234** | **23500** |
| RE15-98-0029 | 15-03458 | 0–0.5 | SOIL | 10 (U) | —[e] | 0.51 (U) | — | — | NA[f] | — | — | NA | NA | — | 2 (U) | NA | — |
| RE15-98-0030 | 15-03458 | 1–1.33 | SOIL | 11 (U) | — | 0.54 (U) | — | — | NA | — | 0.11 (U) | NA | NA | — | 2.2 (U) | NA | — |
| RE15-98-0031 | 15-03458 | 2–2.5 | SOIL | 11 (U) | — | 0.54 (U) | — | — | NA | — | 0.11 (U) | NA | NA | — | 2.2 (U) | NA | — |
| RE15-98-0032 | 15-03459 | 0–0.5 | SOIL | 10 (U) | — | 0.52 (U) | — | — | NA | — | — | NA | NA | — | 2.1 (U) | NA | — |
| RE15-98-0033 | 15-03459 | 1.17–1.67 | SOIL | 10 (U) | — | 0.51 (U) | — | — | NA | — | — | NA | NA | — | 2 (U) | NA | — |
| RE15-98-0034 | 15-03459 | 2.33–2.83 | SOIL | 10 (U) | — | 0.52 (U) | — | — | NA | — | — | NA | NA | — | 2.1 (U) | NA | — |
| RE15-98-0035 | 15-03460 | 0–0.5 | SOIL | 11 (U) | — | 0.53 (U) | — | — | NA | — | 0.11 (U) | NA | NA | — | 2.1 (U) | NA | — |
| RE15-98-0036 | 15-03460 | 1.33–1.83 | SOIL | 11 (U) | — | 0.53 (U) | — | — | NA | — | 0.11 (U) | NA | NA | — | 2.1 (U) | NA | — |
| RE15-98-0037 | 15-03471 | 0–0.5 | SOIL | 10 (U) | 2.4 | 0.5 (U) | — | — | NA | — | — | NA | NA | — | 2 (U) | NA | — |
| RE15-10-8336 | 15-610838 | 0–0.5 | SED | — | — | 0.566 (U) | — | — | — | — | — | — | — | 1.13 (U) | — | — | — |
| RE15-10-8337 | 15-610838 | 1–1.5 | QBT3 | 0.751 (U) | — | — | — | 23.6 | — | — | — | 1.3 | — | 1.03 (U) | — | 3.3 | — |
| RE15-10-8338 | 15-610839 | 0–0.8 | QBT3 | 0.69 (U) | — | — | — | 14.5 | — | — | — | — | — | 1.22 (U) | — | 4 | — |
| RE15-10-8339 | 15-610839 | 1–2.5 | QBT3 | — | — | — | — | 9.12 | — | — | — | — | — | 1.01 (U) | — | — | — |
| RE15-10-8340 | 15-610840 | 0–1 | SED | 1.27 (U) | — | — | — | 15.7 | — | — | — | — | — | 1.3 (U) | — | — | — |
| RE15-10-8341 | 15-610840 | 1–1.5 | QBT3 | 1.04 (U) | — | — | — | 14.2 | — | — | — | — | — | 1.07 (U) | — | — | — |
| RE15-10-8342 | 15-610841 | 3–3.5 | FILL | 1.05 (UJ) | — | — | — | — | — | — | — | — | — | — | — | — | 53.8 (J+) |
| RE15-10-8343 | 15-610841 | 8–8.5 | FILL | 1 (UJ) | — | — | — | — | — | — | — | 1.64 | 0.000645 (J) | — | — | — | 49.4 (J+) |
| RE15-10-8345 | 15-610842 | 2–2.5 | FILL | 1.04 (UJ) | — | — | 6730 | — | 1.69 | — | — | 2.24 | 0.00136 (J) | — | — | 8.19 | — |
| RE15-10-8344 | 15-610842 | 7–7.5 | FILL | 1.01 (UJ) | — | — | — | — | — | — | — | 2.14 | 0.0011 (J) | — | — | — | — |
| RE15-10-8346 | 15-610843 | 10.5–11 | FILL | 1.08 (UJ) | — | — | — | — | — | 130 | — | 1.22 | 0.000598 (J) | — | — | 3.27 | 56.3 (J+) |
| RE15-10-8347 | 15-610843 | 15.5–16 | QBT3 | 0.998 (UJ) | — | — | — | — | — | — | — | — | — | 1.02 (UJ) | — | — | — |
| RE15-10-8348 | 15-610844 | 3–4 | FILL | — | — | — | — | — | — | — | — | 1.1 | 0.000599 (J) | — | — | — | — |
| RE15-10-8349 | 15-610844 | 8–9 | QBT3 | 0.602 (J) | — | — | — | — | — | — | — | 1.21 | 0.000562 (J) | 1.05 (UJ) | — | — | — |
| RE15-10-8350 | 15-610845 | 0–0.7 | QBT3 | 1.2 (U) | — | — | — | 12.8 | — | — | — | — | — | 1.25 (U) | — | — | — |
| RE15-10-8351 | 15-610845 | 1–1.2 | QBT3 | 0.677 (U) | — | — | — | 13.8 | — | — | — | — | — | 1.1 (U) | — | 3.22 | — |
| RE15-10-8352 | 15-610846 | 0–0.5 | QBT3 | 1.06 (U) | — | — | — | 13.6 | — | — | — | — | — | 1.23 (U) | — | — | — |
| RE15-10-8353 | 15-610846 | 1–2 | QBT3 | 0.577 (U) | — | — | — | 7.3 | — | — | — | — | — | 1.11 (U) | — | 3.53 | — |
| RE15-10-8354 | 15-610847 | 0–0.7 | SED | — | — | 0.581 (U) | — | — | — | — | — | — | — | 1.19 (U) | — | 2.82 | — |
| RE15-10-8355 | 15-610847 | 1–2 | QBT3 | 0.852 (U) | — | — | — | — | — | — | — | — | — | 1.11 (U) | — | — | — |

**Table 8.8-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Beryllium | Cadmium | Calcium | Chromium | Cyanide (Total) | Lead | Mercury | Nitrate | Perchlorate | Selenium | Silver | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.21** | **1.63** | **2200** | **7.14** | **0.5** | **11.2** | **0.1** | **na[b]** | **na** | **0.3** | **1** | **2.4** | **63.5** |
| **Sediment BV[a]** | | | | **0.83** | **1.31** | **0.4** | **4420** | **10.5** | **0.82** | **19.7** | **0.1** | **na** | **na** | **0.3** | **1** | **2.22** | **60.2** |
| **Soil BV[a]** | | | | **0.83** | **1.83** | **0.4** | **6120** | **19.3** | **0.5** | **22.3** | **0.1** | **na** | **na** | **1.52** | **1** | **1.82** | **48.8** |
| **Industrial SSL[c]** | | | | **519** | **2580** | **1110** | **32400000** | **505[d]** | **63.3** | **800** | **389** | **2080000** | **908** | **6490** | **6490** | **3880** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **156** | **70.5** | **13000000** | **96.6[d]** | **11.2** | **400** | **23.5** | **125000** | **54.8** | **391** | **391** | **234** | **23500** |
| RE15-10-8356 | 15-610848 | 0–0.8 | SOIL | — | — | 0.574 (U) | — | — | — | — | — | — | 0.000642 (J) | — | — | 3.62 | — |
| RE15-10-8357 | 15-610848 | 1–2 | QBT3 | 0.763 (U) | — | — | — | 10.5 | — | — | — | — | — | 0.97 (U) | — | — | — |
| RE15-10-8358 | 15-610849 | 0–0.8 | SED | 1.18 (U) | — | 0.59 (U) | — | — | — | — | — | — | — | 1.09 (U) | — | 2.61 | — |
| RE15-10-8359 | 15-610849 | 1–2 | SOIL | 1.03 (U) | — | 0.513 (U) | — | — | — | — | — | — | — | — | — | 3.58 | — |
| RE15-10-8360 | 15-610850 | 0–0.9 | SED | 1.27 (U) | — | 0.635 (U) | — | 21.9 | — | — | — | — | — | 1.28 (U) | — | 3.99 | — |
| RE15-10-8361 | 15-610850 | 1–2 | SED | 1.17 (U) | — | 0.587 (U) | — | 12.6 | — | — | — | — | — | 1.16 (U) | — | 4.08 | — |
| RE15-10-8362 | 15-610851 | 0–0.7 | SED | 1.26 (U) | — | 0.63 (U) | — | — | — | — | — | — | — | 1.27 (U) | — | — | — |
| RE15-10-8363 | 15-610851 | 1–2 | SOIL | 1.19 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8364 | 15-610852 | 0–0.5 | SED | 1.25 (U) | — | — | — | — | — | — | — | — | — | 1.24 (U) | — | 4.29 | — |
| RE15-10-8365 | 15-610852 | 1–1.7 | SED | 1.19 (U) | — | — | — | 12.6 | — | — | — | — | — | 1.17 (U) | — | 3.55 | — |
| RE15-10-8366 | 15-610853 | 0–0.5 | SED | 1.16 (U) | — | — | — | — | — | — | — | — | — | 1.17 (U) | — | 4.11 | — |
| RE15-10-8367 | 15-610853 | 1–1.5 | SED | 1.24 (U) | — | — | — | — | — | — | — | — | — | 1.24 (U) | — | 2.83 | — |
| RE15-10-8368 | 15-610854 | 0–0.5 | SED | 1.28 (U) | — | — | — | 13 | — | — | — | — | — | 1.29 (U) | — | 8.8 | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

**Table 8.8-3**
**Organic Chemicals Detected at SWMU 15-009(c)**

| Sample ID | Location ID | Depth (ft) | Media | Acetone | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Bis(2-ethylhexyl)phthalate | Chrysene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Phenanthrene | Pyrene | Toluene | Trimethylbenzene[1,2,4-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **960000** | **253000** | **32.3** | **3.23** | **32.3** | **25300**[b] | **1830** | **3230** | **33700** | **33700** | **32.3** | **14200**[c] | **25300** | **25300** | **61300** | **240**[d] | **4280**[e] |
| **Residential SSL**[a] | | | | **66300** | **17400** | **1.53** | **0.153** | **1.53** | **1740**[b] | **380** | **153** | **2320** | **2320** | **1.53** | **2360**[c] | **1740** | **1740** | **5230** | **58**[d] | **871**[e] |
| RE15-10-8338 | 15-610839 | 0–0.8 | QBT3 | —[f] | — | — | — | — | — | — | — | — | — | — | 0.000477 (J) | — | — | — | — | — |
| RE15-10-8339 | 15-610839 | 1–2.5 | QBT3 | 0.0208 | — | — | — | — | — | — | — | — | — | — | 0.000553 (J) | — | — | 0.000362 (J) | — | — |
| RE15-10-8341 | 15-610840 | 1–1.5 | QBT3 | 0.00574 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8342 | 15-610841 | 3–3.5 | FILL | — | 0.0128 (J) | 0.0626 | 0.0384 | 0.072 | 0.0226 (J) | — | 0.0527 | 0.127 | — | 0.0208 (J) | — | 0.0812 | 0.0783 | — | — | — |
| RE15-10-8343 | 15-610841 | 8–8.5 | FILL | — | — | 0.0183 (J) | — | 0.0153 (J) | — | — | — | 0.0249 (J) | — | — | — | 0.0165 (J) | 0.0169 (J) | — | — | — |
| RE15-10-8345 | 15-610842 | 2–2.5 | FILL | — | — | 0.0292 (J) | 0.0149 (J) | 0.0286 (J) | — | — | 0.0202 (J) | 0.0508 | — | — | — | 0.0346 (J) | 0.0359 | — | — | — |
| RE15-10-8346 | 15-610843 | 10.5–11 | FILL | — | 0.031 (J) | 0.101 | 0.0596 | 0.111 | 0.0346 (J) | — | 0.0814 | 0.226 | 0.0154 (J) | 0.0324 (J) | — | 0.189 | 0.152 | — | — | — |
| RE15-10-8349 | 15-610844 | 8–9 | QBT3 | — | — | — | 0.0117 (J) | 0.0222 (J) | — | — | — | 0.023 (J) | — | — | — | — | 0.0198 (J) | — | — | — |
| RE15-10-8356 | 15-610848 | 0–0.8 | SOIL | — | — | — | — | — | — | — | — | — | — | — | 0.00295 | — | — | 0.00383 | — | 0.000422 (J) |
| RE15-10-8359 | 15-610849 | 1–2 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000328 (J) | — | — |
| RE15-10-8361 | 15-610850 | 1–2 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000393 (J) | — | — |
| RE15-10-8362 | 15-610851 | 0–0.7 | SED | 0.0527 | — | — | — | — | — | 0.105 (J) | — | — | — | — | 0.00428 | — | — | 0.0122 | 0.00049 (J) | 0.000572 (J) |
| RE15-10-8363 | 15-610851 | 1–2 | SOIL | — | — | — | — | — | — | — | — | — | — | — | 0.00128 | — | — | 0.00206 | — | — |
| RE15-10-8364 | 15-610852 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000438 (J) | — | — |
| RE15-10-8365 | 15-610852 | 1–1.7 | SED | 0.00406 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8367 | 15-610853 | 1–1.5 | SED | 0.00213 (J) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] Xylenes used as a surrogate based on structural similarity.

[f] — = Not detected.

**Table 8.8-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-009(c)**

| Sample ID | Location ID | Depth (ft) | Media | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **1700** | **290** | **42** | **150** |
| RE15-10-8337 | 15-610838 | 1–1.5 | QBT3 | 0.026377 | —[d] | — | — |
| RE15-10-8339 | 15-610839 | 1–2.5 | QBT3 | 0.0634763 | — | — | 3.33 |
| RE15-10-8341 | 15-610840 | 1–1.5 | QBT3 | 0.173379 | — | — | — |
| RE15-10-8342 | 15-610841 | 3–3.5 | FILL | 0.0177526 | — | — | — |
| RE15-10-8343 | 15-610841 | 8–8.5 | FILL | 0.010856 | — | — | — |
| RE15-10-8345 | 15-610842 | 2–2.5 | FILL | 0.011553 | — | — | — |
| RE15-10-8344 | 15-610842 | 7–7.5 | FILL | 0.0200962 | — | — | — |
| RE15-10-8346 | 15-610843 | 10.5–11 | FILL | 0.0353128 | — | — | — |
| RE15-10-8347 | 15-610843 | 15.5–16 | QBT3 | 0.00701481 | — | — | — |
| RE15-10-8348 | 15-610844 | 3–4 | FILL | 0.0123333 | — | — | — |
| RE15-10-8349 | 15-610844 | 8–9 | QBT3 | 0.018232 | — | — | — |
| RE15-10-8350 | 15-610845 | 0–0.7 | QBT3 | 0.168519 | — | — | — |
| RE15-10-8353 | 15-610846 | 1–2 | QBT3 | 0.0407931 | 2.33 | 0.221 | 7.96 |
| RE15-10-8354 | 15-610847 | 0–0.7 | SED | — | — | — | 2.94 |
| RE15-10-8355 | 15-610847 | 1–2 | QBT3 | 0.0599359 | — | — | — |
| RE15-10-8356 | 15-610848 | 0–0.8 | SOIL | 0.0654865 | — | — | 2.7 |
| RE15-10-8357 | 15-610848 | 1–2 | QBT3 | 0.0456768 | — | — | — |
| RE15-10-8358 | 15-610849 | 0–0.8 | SED | — | — | — | 2.56 |
| RE15-10-8359 | 15-610849 | 1–2 | SOIL | 0.0557413 | — | — | — |
| RE15-10-8361 | 15-610850 | 1–2 | SED | — | 13.9 | 0.78 | 15.1 |
| RE15-10-8364 | 15-610852 | 0–0.5 | SED | — | — | — | 2.93 |
| RE15-10-8366 | 15-610853 | 0–0.5 | SED | — | 2.75 | — | 3.93 |
| RE15-10-8367 | 15-610853 | 1–1.5 | SED | — | — | — | 3.43 |
| RE15-10-8368 | 15-610854 | 0–0.5 | SED | 0.10734 | — | — | 3.45 |

Note: Results are in pCi/g.

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

[b] na= Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 8.9-1**
**Samples Collected and Analyses Requested at SWMU 15-009(h)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8386 | 15-610855 | 6–7.5 | FILL | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 |
| RE15-10-8387 | 15-610855 | 8.4–9.2 | QBT3 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 | 10-1981 |
| RE15-10-8388 | 15-610856 | 6–7 | FILL | 10-2070 | 10-2069 | 10-2068 | 10-2070 | 10-2070 | 10-2070 | 10-2070 | 10-2069 | 10-2068 | 10-2069 | 10-2068 | 10-2069 | 10-2068 |
| RE15-10-8389 | 15-610856 | 11–13 | FILL | 10-2070 | 10-2069 | 10-2068 | 10-2070 | 10-2070 | 10-2070 | 10-2070 | 10-2069 | 10-2068 | 10-2069 | 10-2068 | 10-2069 | 10-2068 |
| RE15-10-8390 | 15-610857 | 6.5–8 | FILL | 10-2070 | 10-2069 | 10-2068 | 10-2070 | 10-2070 | 10-2070 | 10-2070 | 10-2069 | —* | 10-2069 | 10-2068 | 10-2069 | 10-2068 |
| RE15-10-8391 | 15-610857 | 11.5–13 | FILL | 10-2070 | 10-2069 | 10-2068 | 10-2070 | 10-2070 | 10-2070 | 10-2070 | 10-2069 | — | 10-2069 | 10-2068 | 10-2069 | 10-2068 |
| RE15-10-8392 | 15-610858 | 5.7–6.5 | FILL | 10-2070 | 10-2069 | 10-2068 | 10-2070 | 10-2070 | 10-2070 | 10-2070 | 10-2069 | — | 10-2069 | 10-2068 | 10-2069 | 10-2068 |
| RE15-10-8393 | 15-610858 | 6.6–8.1 | QBT3 | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8394 | 15-610859 | 4.8–6 | SOIL | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8395 | 15-610859 | 6–7.1 | QBT3 | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8396 | 15-610860 | 4.8–7 | FILL | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8397 | 15-610860 | 7–7.3 | FILL | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8398 | 15-610861 | 4.8–6.1 | FILL | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |
| RE15-10-8399 | 15-610861 | 6.1–7 | FILL | 10-2091 | 10-2090 | 10-2089 | 10-2091 | 10-2091 | 10-2091 | 10-2091 | 10-2090 | — | 10-2090 | 10-2089 | 10-2090 | 10-2089 |

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

**Table 8.9-2**
**Inorganic Chemicals above BVs at SWMU 15-009(h)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Calcium | Chromium | Mercury | Nickel | Nitrate | Perchlorate | Selenium | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **46** | **1.63** | **2200** | **7.14** | **0.1** | **6.58** | **na[b]** | **na** | **0.3** | **2.4** | **63.5** |
| **Soil BV[a]** | | | | **0.83** | **295** | **0.4** | **6120** | **19.3** | **0.1** | **15.4** | **na** | **na** | **1.52** | **1.82** | **48.8** |
| **Industrial SSL[c]** | | | | **519** | **255000** | **1110** | **32400000** | **505[d]** | **389** | **25700** | **2080000** | **908** | **6490** | **3880** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **23.5** | **1560** | **125000** | **54.8** | **391** | **234** | **23500** |
| RE15-10-8386 | 15-610855 | 6–7.5 | FILL | 1.04 (UJ) | —[e] | 0.518 (U) | — | — | — | — | 1.26 | — | — | 3.15 (J) | — |
| RE15-10-8387 | 15-610855 | 8.4–9.2 | QBT3 | 1.03 (UJ) | 68.8 | — | — | 32 | — | — | 1.08 | — | 1.05 (U) | — | — |
| RE15-10-8388 | 15-610856 | 6–7 | FILL | 1 (U) | — | 0.5 (U) | — | — | — | — | 1.88 | — | — | 5.66 | — |
| RE15-10-8389 | 15-610856 | 11–13 | FILL | 1 (U) | — | — | — | — | — | — | 1.71 | — | — | 3.1 | — |
| RE15-10-8390 | 15-610857 | 6.5–8 | FILL | 1.06 (U) | — | — | — | — | 0.118 | — | 9.71 | — | — | 6.41 | — |
| RE15-10-8391 | 15-610857 | 11.5–13 | FILL | 1.12 (U) | — | — | — | — | — | — | 10.2 | — | — | 4.05 | 86.5 (J+) |
| RE15-10-8392 | 15-610858 | 5.7–6.5 | FILL | 1.1 (U) | — | 0.551 (U) | — | 19.8 | — | — | — | — | — | — | — |
| RE15-10-8393 | 15-610858 | 6.6–8.1 | QBT3 | 1.11 (UJ) | 70.9 | — | — | 36.1 | — | 7.31 | — | — | 1.23 (UJ) | — | — |
| RE15-10-8394 | 15-610859 | 4.8–6 | SOIL | 1.09 (UJ) | — | 0.546 (U) | — | — | — | — | — | 0.0015 (J) | — | — | — |
| RE15-10-8395 | 15-610859 | 6–7.1 | QBT3 | 0.992 (UJ) | — | — | — | 18.6 | — | — | — | 0.000907 (J) | 0.919 (UJ) | — | — |
| RE15-10-8396 | 15-610860 | 4.8–7 | FILL | 1.03 (UJ) | — | 0.514 (U) | — | — | — | — | 1.57 (J-) | 0.000681 (J) | — | 3.91 | — |
| RE15-10-8397 | 15-610860 | 7–7.3 | FILL | 0.994 (UJ) | — | 0.497 (U) | 45,400 | — | — | — | 1.93 (J-) | 0.000631 (J) | — | 5.28 | — |
| RE15-10-8398 | 15-610861 | 4.8–6.1 | FILL | 1.08 (UJ) | — | 0.538 (U) | — | — | — | — | — | 0.000737 (J) | — | 4.06 | — |
| RE15-10-8399 | 15-610861 | 6.1–7 | FILL | 1.1 (UJ) | — | 0.55 (U) | — | 23 | — | — | — | 0.00123 (J) | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

**Table 8.9-3**
**Organic Chemicals Detected at SWMU 15-009(h)**

| Sample ID | Location ID | Depth (ft) | Media | Acetone | Ethylbenzene | Hexanone[2-] |
|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **960000** | **368** | **1300[b]** |
| **Residential SSL[a]** | | | | **66300** | **75.1** | **200[b]** |
| RE15-10-8394 | 15-610859 | 4.8–6 | SOIL | 0.00919 (J) | —[c] | 0.00201 (J) |
| RE15-10-8398 | 15-610861 | 4.8–6.1 | FILL | 0.00719 (J) | — | — |
| RE15-10-8399 | 15-610861 | 6.1–7 | FILL | — | 0.00117 | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] — = Not detected.

**Table 8.9-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-009(h)**

| Sample ID | Location ID | Depth (ft) | Media | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **1.98** | **0.09** | **1.93** |
| **Soil BV[a]** | | | | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-8386 | 15-610855 | 6–7.5 | FILL | —[d] | 19.5793 | — | — | — |
| RE15-10-8387 | 15-610855 | 8.4–9.2 | QBT3 | — | 0.0230901 | — | — | — |
| RE15-10-8388 | 15-610856 | 6–7 | FILL | — | — | — | — | 2.98 (J+) |
| RE15-10-8390 | 15-610857 | 6.5–8 | FILL | — | — | 2.74 (J+) | 0.291 (J+) | 3.96 (J+) |
| RE15-10-8391 | 15-610857 | 11.5–13 | FILL | — | — | — | — | 3.11 |
| RE15-10-8394 | 15-610859 | 4.8–6 | SOIL | — | 0.0365151 | — | — | — |
| RE15-10-8395 | 15-610859 | 6–7.1 | QBT3 | — | 0.0159164 | — | — | — |
| RE15-10-8396 | 15-610860 | 4.8–7 | FILL | — | 0.042446 | — | — | — |
| RE15-10-8397 | 15-610860 | 7–7.3 | FILL | — | — | — | — | 2.68 |
| RE15-10-8399 | 15-610861 | 6.1–7 | FILL | 0.0286 | 0.047436 | — | — | — |

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 8.10-1**
**Samples Collected and Analyses Requested at SWMU 15-010(b)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-8410 | 15-610863 | 0–0.5 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | 10-1324 | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8411 | 15-610863 | 1–2 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | 10-1324 | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8412 | 15-610864 | 0–0.5 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | 10-1324 | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8413 | 15-610864 | 1–2 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | 10-1324 | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8416 | 15-610866 | 0–0.7 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | —* | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8417 | 15-610866 | 1–1.7 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8418 | 15-610867 | 0–0.8 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8420 | 15-610868 | 0–0.6 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8421 | 15-610868 | 1–2 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8422 | 15-610869 | 0–0.6 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8423 | 15-610869 | 1–2 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8424 | 15-610870 | 0–0.7 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8425 | 15-610870 | 1–1.6 | SED | 10-1326 | 10-1325 | 10-1324 | 10-1326 | 10-1326 | 10-1326 | 10-1326 | 10-1325 | — | 10-1325 | 10-1324 | 10-1325 | 10-1324 |
| RE15-10-8426 | 15-610871 | 0–0.5 | SED | 10-1380 | 10-1381 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1381 | — | 10-1381 | 10-1380 | 10-1381 | 10-1380 |
| RE15-10-8427 | 15-610871 | 1–2 | QBT3 | 10-1380 | 10-1381 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1381 | — | 10-1381 | 10-1380 | 10-1381 | 10-1380 |
| RE15-10-8428 | 15-610872 | 0–0.5 | SED | 10-1380 | 10-1381 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1381 | — | 10-1381 | 10-1380 | 10-1381 | 10-1380 |
| RE15-10-8429 | 15-610872 | 1–1.8 | QBT3 | 10-1380 | 10-1381 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1380 | 10-1381 | — | 10-1381 | 10-1380 | 10-1381 | 10-1380 |

Note: Numbers in analyte columns are request numbers.
*— = Analysis not requested.

**Table 8.10-2**
**Inorganic Chemicals above BVs at SWMU 15-010(b)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Barium | Cadmium | Calcium | Chromium | Copper | Iron | Manganese | Mercury | Nitrate | Perchlorate | Selenium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **46** | **1.63** | **2200** | **7.14** | **4.66** | **14500** | **482** | **0.1** | **na[b]** | **na** | **0.3** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **0.83** | **127** | **0.4** | **4420** | **10.5** | **11.2** | **13800** | **543** | **0.1** | **na** | **na** | **0.3** | **2.22** | **19.7** | **60.2** |
| **Industrial SSL[c]** | | | | **519** | **255000** | **1110** | **32400000** | **505[d]** | **51900** | **908000** | **160000** | **389** | **2080000** | **908** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **15600** | **70.5** | **13000000** | **96.6[d]** | **3130** | **54800** | **10500** | **23.5** | **125000** | **54.8** | **391** | **234** | **394** | **23500** |
| RE15-10-8410 | 15-610863 | 0–0.5 | SED | 1.33 (U) | 143 (J-) | 0.666 (U) | 4480 | —[e] | — | — | 574 | — | — | — | 1.33 (U) | 13.3 (J-) | — | — |
| RE15-10-8411 | 15-610863 | 1–2 | SED | 1.16 (U) | — | 0.581 (U) | — | 18.2 | — | — | — | — | — | — | 1.13 (U) | — | — | — |
| RE15-10-8412 | 15-610864 | 0–0.5 | SED | 1.07 (U) | — | 0.534 (U) | — | — | — | — | — | 0.163 | — | — | 1.08 (U) | 3.15 (J-) | — | — |
| RE15-10-8413 | 15-610864 | 1–2 | SED | 1.12 (U) | — | 0.559 (U) | — | — | — | — | — | 0.222 | — | — | 1.09 (U) | 5.44 (J-) | — | — |
| RE15-10-8416 | 15-610866 | 0–0.7 | SED | 1.07 (U) | — | 0.536 (U) | — | — | — | — | — | — | — | — | 1.09 (U) | — | — | — |
| RE15-10-8417 | 15-610866 | 1–1.7 | SED | 1.06 (U) | — | 0.528 (U) | — | — | — | 19,100 | — | — | — | — | 1.05 (U) | — | 23.7 | 70.6 |
| RE15-10-8418 | 15-610867 | 0–0.8 | SED | 1.07 (U) | — | 0.537 (U) | — | — | — | 14,600 | — | — | 1.47 (J-) | — | 1.09 (U) | — | — | — |
| RE15-10-8420 | 15-610868 | 0–0.6 | SED | 1.35 (U) | — | 0.673 (U) | — | 12.8 | — | — | — | 0.226 | — | — | 1.38 (U) | — | — | — |
| RE15-10-8421 | 15-610868 | 1–2 | SED | 1.1 (U) | — | 0.552 (U) | — | — | — | 18,900 | — | — | 1.39 (J-) | — | 1.12 (U) | — | 22 | 72.9 |
| RE15-10-8422 | 15-610869 | 0–0.6 | SED | 1.09 (U) | — | 0.543 (U) | — | — | 16.9 | — | — | 0.688 | — | — | 1.1 (U) | 3.97 (J-) | — | — |
| RE15-10-8423 | 15-610869 | 1–2 | SED | 1.09 (U) | — | 0.547 (U) | — | — | 11.7 | — | — | 0.252 | — | 0.000762 (J+) | 1.07 (U) | — | — | — |
| RE15-10-8424 | 15-610870 | 0–0.7 | SED | 1.1 (U) | — | 0.549 (U) | — | 10.7 | — | — | — | — | — | — | 1.1 (U) | — | — | — |
| RE15-10-8425 | 15-610870 | 1–1.6 | SED | 1.07 (U) | — | 0.534 (U) | — | — | — | — | — | — | — | — | 1.08 (U) | — | — | — |
| RE15-10-8426 | 15-610871 | 0–0.5 | SED | 1.13 (U) | — | 0.566 (U) | — | — | — | — | — | — | 1.65 (J-) | — | 0.72 (J) | — | — | — |
| RE15-10-8427 | 15-610871 | 1–2 | QBT3 | 1.01 (U) | — | — | — | — | — | — | — | — | — | — | 0.579 (J) | — | — | — |
| RE15-10-8428 | 15-610872 | 0–0.5 | SED | 1.18 (U) | — | 0.589 (U) | — | — | — | — | — | — | — | 0.000598 (J) | 1.11 (U) | 4.98 | — | — |
| RE15-10-8429 | 15-610872 | 1–1.8 | QBT3 | 1.02 (U) | — | — | — | 11.6 (J) | — | — | — | — | — | — | 0.971 (U) | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

**Table 8.10-3**
**Organic Chemicals Detected at SWMU 15-010(b)**

| Sample ID | Location ID | Depth (ft) | Media | Acetone | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Bis(2-ethylhexyl)phthalate | Chrysene | Dichloroethene[1,1-] | Di-n-butylphthalate | Fluoranthene | Methylene Chloride | Phenanthrene | Pyrene | Styrene | Tetrachloroethene | Toluene | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **960000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **323** | **1830** | **3230** | **2260** | **91600** | **33700** | **5130** | **25300** | **25300** | **51300** | **629** | **61300** | **4280**[b] |
| **Residential SSL**[a] | | | | **66300** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **15.3** | **380** | **153** | **440** | **6160** | **2320** | **409** | **1740** | **1740** | **7260** | **111** | **5230** | **871**[b] |
| RE15-10-8410 | 15-610863 | 0–0.5 | SED | —[c] | — | — | — | — | — | — | — | — | — | — | — | 0.0029 (J+) | — | — | — | — | — | — |
| RE15-10-8411 | 15-610863 | 1–2 | SED | 0.689 (J) | — | — | — | — | — | — | — | — | — | — | — | 0.00434 (J) | — | — | 0.000555 (J) | — | 0.0185 | 0.000732 (J) |
| RE15-10-8412 | 15-610864 | 0–0.5 | SED | 0.00285 (J) | 0.0046 | 0.0025 (J) | 0.0252 (J) | 0.0313 (J) | 0.0362 | 0.0132 (J) | — | 0.0402 | — | 3.64 | 0.0655 | — | 0.0923 | 0.114 | — | 0.000584 (J+) | — | 0.0004 (J+) |
| RE15-10-8413 | 15-610864 | 1–2 | SED | 0.0544 (J-) | 0.0065 | — | — | — | — | — | — | — | — | 0.353 (J) | — | 0.00418 (J-) | — | 0.0222 (J) | — | — | 0.00144 (J-) | — |
| RE15-10-8420 | 15-610868 | 0–0.6 | SED | — | NA[d] | NA | — | — | — | — | — | — | — | — | — | — | — | 0.0165 (J) | — | — | 0.000501 (J) | — |
| RE15-10-8422 | 15-610869 | 0–0.6 | SED | 0.00411 (J) | NA | NA | 0.0213 (J) | 0.0194 (J) | — | — | — | 0.0174 (J) | — | 0.206 (J) | 0.0201 (J) | 0.00371 (J) | 0.0158 (J) | 0.0514 | — | — | 0.000618 (J) | — |
| RE15-10-8423 | 15-610869 | 1–2 | SED | — | NA | NA | 0.0144 (J) | 0.0128 (J) | — | — | — | 0.0124 (J) | — | 0.244 (J) | 0.0182 (J) | — | 0.0149 (J) | 0.0384 | — | — | — | — |
| RE15-10-8424 | 15-610870 | 0–0.7 | SED | — | NA | NA | — | — | — | — | 0.17 (J) | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8426 | 15-610871 | 0–0.5 | SED | — | NA | NA | — | — | — | — | 0.117 (J) | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-8427 | 15-610871 | 1–2 | QBT3 | 0.00526 (J) | NA | NA | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00249 | — |
| RE15-10-8428 | 15-610872 | 0–0.5 | SED | 0.0133 (J) | NA | NA | — | — | — | — | — | — | 0.00037 (J+) | 0.756 | — | 0.00275 (J+) | — | — | — | — | 0.00723 (J+) | — |
| RE15-10-8429 | 15-610872 | 1–1.8 | QBT3 | 0.00217 (J) | NA | NA | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915).

[b] Xylenes used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

**Table 8.10-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 15-010(b)**

| Sample ID | Location ID | Depth (ft) | Media | Cesium-137 | Plutonium-239/240 | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|
| **Sediment BV[a]** | | | | **0.9** | **0.068** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[b]** | | | | **41** | **1200** | **3100** | **160** | **710** |
| **Residential SAL[b]** | | | | **12** | **79** | **290** | **42** | **150** |
| RE15-10-8410 | 15-610863 | 0–0.5 | SED | 2.34 | 0.121 | 4.93 (J+) | 0.386 (J+) | 6.93 (J+) |
| RE15-10-8413 | 15-610864 | 1–2 | SED | —[c] | — | — | — | 3.02 |
| RE15-10-8428 | 15-610872 | 0–0.5 | SED | 0.983 | — | — | — | 2.39 |

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] SALs from LANL (2015, 600929).

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

**Table 8.11-1**
**Samples Collected and Analyses Requested at AOC 15-014(h)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7160 | 15-610501 | 0–0.5 | SED | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7161 | 15-610501 | 1–2.2 | SED | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7162 | 15-610502 | 0–0.5 | SED | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7163 | 15-610502 | 1–2.5 | QBT3 | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7164 | 15-610503 | 2–3.9 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7165 | 15-610503 | 7–8.8 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7166 | 15-610504 | 0–1 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7167 | 15-610504 | 1–2.2 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7168 | 15-610505 | 0–0.5 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7169 | 15-610505 | 1–2.1 | QBT3 | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7170 | 15-610506 | 0–0.7 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7171 | 15-610506 | 1–2.1 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | 10-1304 | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7172 | 15-610507 | 0–0.7 | SOIL | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7173 | 15-610507 | 1–2.6 | SOIL | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7174 | 15-610508 | 0–1 | SOIL | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7175 | 15-610508 | 1–2 | QBT3 | 10-1289 | 10-1288 | 10-1287 | 10-1289 | 10-1289 | 10-1289 | 10-1289 | 10-1287 | 10-1288 | 10-1287 | 10-1288 | 10-1287 |
| RE15-10-7176 | 15-610509 | 0–0.6 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | —* | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7177 | 15-610509 | 1–2 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7178 | 15-610510 | 0–0.5 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7179 | 15-610510 | 1–2 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7180 | 15-610511 | 0–1 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7181 | 15-610511 | 1–1.9 | SOIL | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7182 | 15-610512 | 0–0.6 | SED | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7183 | 15-610512 | 1–1.8 | QBT3 | 10-1305 | 10-1306 | 10-1304 | 10-1305 | 10-1305 | 10-1305 | 10-1305 | — | 10-1306 | 10-1304 | 10-1306 | 10-1304 |
| RE15-10-7184 | 15-610513 | 0–0.7 | SED | 10-1302 | 10-1306 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1306 | 10-1301 | 10-1306 | 10-1301 |
| RE15-10-7185 | 15-610513 | 1–2 | SOIL | 10-1302 | 10-1306 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1306 | 10-1301 | 10-1306 | 10-1301 |
| RE15-10-7186 | 15-610514 | 0–0.5 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7187 | 15-610514 | 1–2 | SOIL | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7188 | 15-610515 | 0–0.8 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7189 | 15-610515 | 1–2.2 | SOIL | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |

**Table 8.11-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE15-10-7190 | 15-610516 | 0–0.7 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7191 | 15-610516 | 1–2 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7192 | 15-610517 | 0–0.5 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7193 | 15-610517 | 1–2 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7194 | 15-610518 | 0–1 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7195 | 15-610518 | 1–2 | SOIL | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7196 | 15-610519 | 0–0.5 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7197 | 15-610519 | 1–2 | SED | 10-1302 | 10-1303 | 10-1301 | 10-1302 | 10-1302 | 10-1302 | 10-1302 | — | 10-1303 | 10-1301 | 10-1303 | 10-1301 |
| RE15-10-7198 | 15-610520 | 0–0.5 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7199 | 15-610520 | 1–2.4 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7200 | 15-610521 | 0–0.5 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7201 | 15-610521 | 2–3.7 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7202 | 15-610522 | 2–3.9 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7203 | 15-610522 | 6–6.7 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7204 | 15-610523 | 0–0.5 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7205 | 15-610523 | 1–1.5 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7206 | 15-610524 | 0–0.7 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7207 | 15-610524 | 1–2.1 | QBT3 | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7208 | 15-610525 | 0–0.5 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7209 | 15-610525 | 1–1.4 | SED | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7210 | 15-610526 | 2–2.9 | SOIL | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |
| RE15-10-7211 | 15-610526 | 6–6.7 | QBT3 | 10-1329 | 10-1328 | 10-1327 | 10-1329 | 10-1329 | 10-1329 | 10-1329 | — | 10-1328 | 10-1327 | 10-1328 | 10-1327 |

Note: Numbers in analyte columns are request numbers.
*— = Analysis not requested.

**Table 8.11-2**
**Inorganic Chemicals above BVs at AOC 15-014(h)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7160 | 15-610501 | 0–0.5 | SED | —[f] | 1.25 (U) | — | 180 | — | — | — | 15.1 (J-) | 4.96 | 26.6 | — | — | 25.9 | — | — | 0.644 | 9.94 | 0.000831 (J) | 1.23 (U) | 8.47 | — | 25.8 | 68.4 |
| RE15-10-7161 | 15-610501 | 1–2.2 | SED | — | 1.07 (U) | — | 152 | — | — | — | 20.7 (J-) | 4.92 | 15 | — | — | — | — | — | 0.106 | 10.5 | — | 1.1 (U) | 3.67 | — | 26 | — |
| RE15-10-7162 | 15-610502 | 0–0.5 | SED | — | — | — | 138 | — | 0.463 (J) | — | 25.3 (J-) | 6.1 | 24.3 | — | 15,300 | 25.1 | — | — | 1.54 | 9.5 | — | 1.06 (U) | 21 | 3.57 | 29.1 | 60.6 |
| RE15-10-7163 | 15-610502 | 1–2.5 | QBT3 | — | — | — | 55.4 | — | — | — | 48.9 (J-) | — | 7.8 | — | — | 12.2 | — | — | 0.542 | 9.61 | — | 1.06 (U) | 4.12 | — | — | — |
| RE15-10-7164 | 15-610503 | 2–3.9 | SOIL | — | 1.2 (U) | — | — | — | 0.597 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.63 | — | — | — |
| RE15-10-7165 | 15-610503 | 7–8.8 | SOIL | — | 1.11 (U) | — | — | — | 0.592 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.9 | — | — | — |
| RE15-10-7166 | 15-610504 | 0–1 | SED | — | 1.57 (U) | — | 180 | — | 0.715 (U) | — | 29.6 | — | — | — | — | — | — | — | — | — | 0.00158 (J) | 1.36 (UJ) | — | 2.81 | 21.6 | — |
| RE15-10-7167 | 15-610504 | 1–2.2 | SED | — | 0.963 (U) | — | 163 | — | 0.641 (U) | — | 12.4 | 6.69 | — | — | 14,800 | — | — | — | — | — | — | 1.24 (UJ) | — | — | 28.4 | — |
| RE15-10-7168 | 15-610505 | 0–0.5 | SED | — | 0.987 (U) | — | 195 | — | 0.616 (U) | — | 13.1 | 4.87 | — | — | — | — | — | — | — | — | 0.000895 (J) | 1.2 (UJ) | — | 4.86 | 25.2 | — |
| RE15-10-7169 | 15-610505 | 1–2.1 | QBT3 | 10,700 | 0.817 (U) | — | 193 | — | — | — | 11.2 | 8.24 | 7.2 | — | — | 14.7 | 1830 (J+) | 574 | — | 6.66 | — | 1.05 (UJ) | — | — | 30.8 | — |
| RE15-10-7170 | 15-610506 | 0–0.7 | SED | — | 0.836 (U) | — | 169 | — | 0.64 (U) | — | — | 4.89 | 11.9 | — | — | 22.4 | — | — | — | — | 0.000686 (J) | 1.26 (UJ) | — | 11 | 24.7 | — |
| RE15-10-7171 | 15-610506 | 1–2.1 | SOIL | — | — | — | — | — | 0.519 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7172 | 15-610507 | 0–0.7 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00065 (J) | — | — | 3.51 | — | — |
| RE15-10-7173 | 15-610507 | 1–2.6 | SOIL | — | 1.1 (U) | — | — | — | 0.552 (U) | — | — | — | — | — | — | — | — | — | — | — | 0.0011 (J) | — | — | — | — | — |
| RE15-10-7174 | 15-610508 | 0–1 | SOIL | — | 1.18 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0012 (J) | — | — | 4.81 | — | — |
| RE15-10-7175 | 15-610508 | 1–2 | QBT3 | 9680 | 1.1 (U) | — | 106 | — | — | — | 24.2 (J-) | 5.91 | 6.2 | — | — | 12.5 | 1730 | — | — | 8.81 | 0.00284 | 1.1 (U) | — | — | 21.4 | — |
| RE15-10-7176 | 15-610509 | 0–0.6 | SOIL | — | 1 (U) | — | — | — | 0.524 (U) | — | — | — | — | — | — | — | — | — | — | — | 0.00119 (J) | — | — | 3.28 | — | — |
| RE15-10-7177 | 15-610509 | 1–2 | SOIL | — | 1.12 (U) | — | — | — | 0.538 (U) | — | — | — | — | — | — | — | — | — | — | — | 0.00116 (J) | — | — | — | — | — |
| RE15-10-7178 | 15-610510 | 0–0.5 | SED | — | — | — | 138 | — | 0.613 (U) | — | 12.2 | 4.74 | — | — | — | 22.9 | — | — | 0.119 | — | 0.00127 (J) | 1.25 (UJ) | — | 3.47 | 23.3 | — |
| RE15-10-7179 | 15-610510 | 1–2 | SOIL | — | 0.848 (U) | — | — | — | 0.6 (U) | — | 23.2 | — | — | — | — | 22.8 | — | — | 0.171 | — | 0.000752 (J) | — | — | 3.8 | — | — |
| RE15-10-7180 | 15-610511 | 0–1 | SED | — | 0.912 (U) | — | — | — | 0.576 (U) | — | 10.6 | — | — | — | — | — | — | — | — | — | — | 1.13 (UJ) | — | — | 24.1 | — |
| RE15-10-7181 | 15-610511 | 1–1.9 | SOIL | — | — | — | — | — | 0.563 (U) | — | 21.6 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7182 | 15-610512 | 0–0.6 | SED | — | 1.17 (U) | — | 144 | — | 0.583 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.2 (UJ) | — | 2.38 | — | — |
| RE15-10-7183 | 15-610512 | 1–1.8 | QBT3 | — | 1.18 (U) | — | 89.4 | — | — | — | 21.1 | 3.19 | — | — | — | — | — | — | — | — | — | 1.13 (UJ) | — | — | — | — |
| RE15-10-7184 | 15-610513 | 0–0.7 | SED | — | — | — | 150 | — | 0.594 (U) | — | 15.3 | 5.06 | — | — | — | 30.5 | — | — | 0.185 | — | 0.000616 (J) | 1.17 (UJ) | — | 2.8 | 25.5 | — |
| RE15-10-7185 | 15-610513 | 1–2 | SOIL | — | 0.967 (U) | — | — | — | 0.545 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7186 | 15-610514 | 0–0.5 | SED | — | 1.13 (U) | — | — | — | 0.564 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.15 (U) | — | — | — | — |

**Table 8.11-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Iron | Lead | Magnesium | Manganese | Mercury | Nickel | Perchlorate | Selenium | Silver | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **14500** | **11.2** | **1690** | **482** | **0.1** | **6.58** | **na[b]** | **0.3** | **1** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **13800** | **19.7** | **2370** | **543** | **0.1** | **9.38** | **na** | **0.3** | **1** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **21500** | **22.3** | **4610** | **671** | **0.1** | **15.4** | **na** | **1.52** | **1** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[c]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[d]** | **350[e]** | **51900** | **63.3** | **908000** | **800** | **5680000** | **160000** | **389** | **25700** | **908** | **6490** | **6490** | **3880** | **6530** | **389000** |
| **Residential SSL[c]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[d]** | **23[e]** | **3130** | **11.2** | **54800** | **400** | **339000** | **10500** | **23.5** | **1560** | **54.8** | **391** | **391** | **234** | **394** | **23500** |
| RE15-10-7187 | 15-610514 | 1–2 | SOIL | — | 1.09 (U) | — | — | — | 0.543 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.08 | 3.2 | — | — |
| RE15-10-7188 | 15-610515 | 0–0.8 | SED | — | 1.09 (U) | — | 162 | — | 0.544 (U) | — | 12.5 | 5.21 | — | — | 15,000 | 32.4 | — | — | 0.692 | 9.67 | 0.000889 (J) | 1.1 (U) | — | 4.11 | 29.5 | — |
| RE15-10-7189 | 15-610515 | 1–2.2 | SOIL | — | 1.09 (U) | — | — | — | 0.546 (U) | — | — | — | — | — | — | — | — | — | — | — | 0.000646 (J) | — | — | — | — | — |
| RE15-10-7190 | 15-610516 | 0–0.7 | SED | — | 1.33 (U) | — | 149 | — | 0.666 (U) | — | 22.2 | 4.82 | — | — | — | — | — | — | — | — | — | 1.33 (U) | — | 4.85 | 20 | — |
| RE15-10-7191 | 15-610516 | 1–2 | SED | — | 1.12 (U) | — | — | 1.33 | 0.559 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.15 (U) | — | — | — | — |
| RE15-10-7192 | 15-610517 | 0–0.5 | SED | — | 1.43 (U) | — | — | — | 0.716 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.5 (U) | 1.68 | 5.93 | — | — |
| RE15-10-7193 | 15-610517 | 1–2 | SED | — | — | — | — | — | 0.59 (U) | — | 27.9 | — | — | — | — | — | — | — | — | — | — | 1.18 (U) | 1.83 | 2.67 | 22.3 | — |
| RE15-10-7194 | 15-610518 | 0–1 | SED | — | 1.2 (U) | — | — | — | 0.598 (U) | — | — | — | — | — | — | — | — | — | — | — | — | 1.23 (U) | — | 6.67 | — | — |
| RE15-10-7195 | 15-610518 | 1–2 | SOIL | — | 1.07 (U) | — | — | — | 0.533 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7196 | 15-610519 | 0–0.5 | SED | — | 1.2 (U) | — | — | — | 0.598 (U) | — | — | 6.83 | — | — | — | — | — | 610 | — | — | — | 1.18 (U) | — | 3.42 | 20.5 | — |
| RE15-10-7197 | 15-610519 | 1–2 | SED | — | 0.939 (U) | — | — | — | 0.581 (U) | — | 43.3 | — | — | — | — | — | — | — | — | — | — | 1.12 (U) | — | — | — | — |
| RE15-10-7198 | 15-610520 | 0–0.5 | SED | — | 1.28 (U) | — | 140 | — | — | — | — | — | — | 2.84 (J-) | — | 27.4 | — | — | — | — | — | 1.28 (U) | — | 13.9 | 20.4 | — |
| RE15-10-7199 | 15-610520 | 1–2.4 | SOIL | — | 1.09 (U) | — | — | — | 0.545 (U) | — | 21.4 | — | — | — | — | — | — | — | — | — | 0.000829 (J) | — | 1.02 | — | — | — |
| RE15-10-7200 | 15-610521 | 0–0.5 | SED | — | 1.32 (U) | — | 157 | — | 0.658 (U) | — | 16.1 | 5.69 | — | — | — | — | — | — | — | — | — | 1.32 (U) | — | 3.76 | 25.7 | — |
| RE15-10-7201 | 15-610521 | 2–3.7 | SOIL | — | 1.05 (U) | — | — | — | 0.523 (U) | — | — | — | — | — | — | — | — | — | — | — | 0.000617 (J) | — | — | — | — | — |
| RE15-10-7202 | 15-610522 | 2–3.9 | SOIL | — | 1.17 (U) | — | — | — | 0.586 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7203 | 15-610522 | 6–6.7 | SOIL | — | 1.2 (U) | — | — | — | 0.601 (U) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7204 | 15-610523 | 0–0.5 | SED | — | 1.18 (U) | — | 137 | — | 0.928 | — | 15.2 | 5.1 | 34.5 | — | — | 48.9 | — | — | 0.678 | — | — | 1.19 (U) | 3.2 | 7.55 | 25 | 126 |
| RE15-10-7205 | 15-610523 | 1–1.5 | SOIL | — | 1.1 (U) | — | — | — | 1.54 | — | 26.3 | — | 53.6 | 3.25 (J-) | — | 80.2 | — | — | 1.34 | — | — | — | 5.42 | 9.66 | — | 125 |
| RE15-10-7206 | 15-610524 | 0–0.7 | SED | — | 1.25 (U) | 4.45 | 150 | — | 0.625 (U) | — | — | — | — | — | — | — | — | — | — | 10.8 (J) | — | 1.25 (U) | — | — | 23.5 | — |
| RE15-10-7207 | 15-610524 | 1–2.1 | QBT3 | 9540 | 1.04 (U) | — | 111 | — | — | — | 10.3 | — | 5.45 | — | — | — | 1730 (J+) | — | — | 7.58 (J) | — | 1.06 (U) | — | — | 17.8 | — |
| RE15-10-7208 | 15-610525 | 0–0.5 | SED | — | 1.27 (U) | — | — | — | 0.637 (U) | — | — | — | 13.8 | — | — | — | — | — | — | — | 0.00138 (J) | 1.29 (U) | — | — | — | — |
| RE15-10-7209 | 15-610525 | 1–1.4 | SED | — | 1.14 (U) | — | 158 | — | 0.568 (U) | — | 36 | 6.07 | — | — | 16,900 | — | — | — | — | 12.1 (J) | — | 1.14 (U) | 1.14 | — | 29.1 | — |
| RE15-10-7210 | 15-610526 | 2–2.9 | SOIL | — | 1.11 (U) | — | — | — | 0.554 (U) | 8490 (J) | — | 9.41 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7211 | 15-610526 | 6–6.7 | QBT3 | — | 1.19 (U) | — | 49.4 | — | — | 2240 (J) | 12.4 | — | — | — | — | — | — | — | — | — | — | 1.2 (U) | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 8.11-3**
**Organic Chemicals Detected at AOC 15-014(h)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acetone | Anthracene | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzoic Acid | Bis(2-ethylhexyl)phthalate | Chloroform | Chrysene | Dichloroethene[1,1-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **960000** | **253000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **3300000[c]** | **1830** | **28.7** | **3230** | **2260** |
| **Residential SSL[a]** | | | | **3480** | **66300** | **17400** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **250000[c]** | **380** | **5.9** | **153** | **440** |
| RE15-10-7160 | 15-610501 | 0–0.5 | SED | —[d] | — | — | 0.114 | 0.0385 | 0.0216 (J) | 0.0144 (J) | 0.0312 (J) | — | — | — | — | 0.0172 (J) | — |
| RE15-10-7161 | 15-610501 | 1–2.2 | SED | — | — | — | 0.0052 | 0.0033 (J) | — | — | — | — | — | — | — | — | — |
| RE15-10-7162 | 15-610502 | 0–0.5 | SED | — | — | — | 0.704 | 0.258 | — | — | — | — | — | — | — | 0.0112 (J) | — |
| RE15-10-7163 | 15-610502 | 1–2.5 | QBT3 | — | — | — | 0.114 | 0.0369 | — | — | — | — | — | — | — | — | — |
| RE15-10-7166 | 15-610504 | 0–1 | SED | — | 0.0295 (J) | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7168 | 15-610505 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7169 | 15-610505 | 1–2.1 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7170 | 15-610506 | 0–0.7 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7171 | 15-610506 | 1–2.1 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7172 | 15-610507 | 0–0.7 | SOIL | — | — | — | — | — | — | — | — | — | 1.01 (J) | — | — | — | — |
| RE15-10-7173 | 15-610507 | 1–2.6 | SOIL | — | 0.00535 (J) | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7174 | 15-610508 | 0–1 | SOIL | 0.232 | — | — | — | — | — | — | — | — | — | 0.343 (J) | — | — | — |
| RE15-10-7175 | 15-610508 | 1–2 | QBT3 | 0.121 | 0.00839 (J) | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7179 | 15-610510 | 1–2 | SOIL | — | — | — | NA[e] | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7184 | 15-610513 | 0–0.7 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7185 | 15-610513 | 1–2 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7187 | 15-610514 | 1–2 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7188 | 15-610515 | 0–0.8 | SED | — | — | — | NA | NA | — | — | — | — | — | 0.0959 (J) | — | — | — |
| RE15-10-7189 | 15-610515 | 1–2.2 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | 0.000687 (J) | — | — |
| RE15-10-7190 | 15-610516 | 0–0.7 | SED | — | 0.0037 (J) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7191 | 15-610516 | 1–2 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7193 | 15-610517 | 1–2 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7194 | 15-610518 | 0–1 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7195 | 15-610518 | 1–2 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7196 | 15-610519 | 0–0.5 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7197 | 15-610519 | 1–2 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |

**Table 8.11-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acetone | Anthracene | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzoic Acid | Bis(2-ethylhexyl)phthalate | Chloroform | Chrysene | Dichloroethene[1,1-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **960000** | **253000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **3300000[c]** | **1830** | **28.7** | **3230** | **2260** |
| **Residential SSL[a]** | | | | **3480** | **66300** | **17400** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **250000[c]** | **380** | **5.9** | **153** | **440** |
| RE15-10-7198 | 15-610520 | 0–0.5 | SED | 0.0373 (J) | — | — | NA | NA | — | — | — | — | 0.401 (J) | — | — | — | 0.000772 (J+) |
| RE15-10-7199 | 15-610520 | 1–2.4 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7200 | 15-610521 | 0–0.5 | SED | — | — | — | NA | NA | — | — | — | — | 0.392 (J) | — | — | — | — |
| RE15-10-7202 | 15-610522 | 2–3.9 | SOIL | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7204 | 15-610523 | 0–0.5 | SED | 0.0388 (J) | 0.00335 (J) | 0.011 (J) | NA | NA | 0.0625 | 0.0905 | 0.255 | 0.0652 (J) | — | — | — | 0.107 | — |
| RE15-10-7205 | 15-610523 | 1–1.5 | SOIL | 0.0268 (J) | — | — | NA | NA | 0.0155 (J) | — | 0.0473 | — | — | 0.0793 (J) | — | 0.0279 (J) | — |
| RE15-10-7208 | 15-610525 | 0–0.5 | SED | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7209 | 15-610525 | 1–1.4 | SED | 0.053 | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE15-10-7210 | 15-610526 | 2–2.9 | SOIL | — | 0.00531 (J) | — | NA | NA | — | 0.0196 (J) | 0.0373 (J) | 0.0269 (J) | — | — | — | 0.0299 (J) | — |

**Table 8.11-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Di-n-butylphthalate | Di-n-octylphthalate | Ethylbenzene | Fluoranthene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Methylene Chloride | Phenanthrene | Pyrene | Tetrachloroethene | Toluene | Trimethylbenzene[1,2,4-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **91600** | **8200**[c] | **368** | **33700** | **32.3** | **14200**[f] | **5130** | **25300** | **25300** | **629** | **61300** | **240**[c] | **3940** | **4280**[g] |
| **Residential SSL** | | | | **6160** | **630**[c] | **75.1** | **2320** | **1.53** | **2360**[f] | **409** | **1740** | **1740** | **111** | **5230** | **58**[c] | **805** | **871**[g] |
| RE15-10-7160 | 15-610501 | 0–0.5 | SED | — | — | — | 0.0183 (J) | 0.13 | — | — | — | 0.0179 (J) | — | — | — | — | — |
| RE15-10-7161 | 15-610501 | 1–2.2 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7162 | 15-610502 | 0–0.5 | SED | 0.129 (J) | — | — | 0.0231 (J) | — | — | — | 0.014 (J) | 0.0164 (J) | — | — | — | — | — |
| RE15-10-7163 | 15-610502 | 1–2.5 | QBT3 | 0.093 (J) | — | — | — | — | — | — | — | — | — | — | — | — | 0.000375 (J) |
| RE15-10-7166 | 15-610504 | 0–1 | SED | — | — | — | — | — | 0.0425 | 0.00587 (J) | — | — | — | 0.00145 (J) | — | — | 0.00107 (J) |
| RE15-10-7168 | 15-610505 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | 0.00104 (J+) | — | — | — | — |
| RE15-10-7169 | 15-610505 | 1–2.1 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000483 (J) |
| RE15-10-7170 | 15-610506 | 0–0.7 | SED | — | — | — | — | — | — | 0.00341 (J) | — | — | — | — | — | — | — |
| RE15-10-7171 | 15-610506 | 1–2.1 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000369 (J) |
| RE15-10-7172 | 15-610507 | 0–0.7 | SOIL | — | — | — | — | — | — | 0.00443 (J) | — | — | — | 0.000546 (J) | — | — | — |
| RE15-10-7173 | 15-610507 | 1–2.6 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000599 (J) |
| RE15-10-7174 | 15-610508 | 0–1 | SOIL | — | — | — | — | — | — | 0.00319 (J) | — | — | — | — | — | — | — |
| RE15-10-7175 | 15-610508 | 1–2 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7179 | 15-610510 | 1–2 | SOIL | — | — | — | — | — | — | 0.00472 (J) | — | — | — | 0.000464 (J) | — | — | — |
| RE15-10-7184 | 15-610513 | 0–0.7 | SED | — | — | — | — | — | — | — | — | — | 0.000905 (J+) | — | — | — | 0.00046 (J+) |
| RE15-10-7185 | 15-610513 | 1–2 | SOIL | — | — | — | — | — | — | — | — | — | 0.000453 (J) | — | — | — | 0.000635 (J) |
| RE15-10-7187 | 15-610514 | 1–2 | SOIL | — | — | — | — | — | — | — | — | — | 0.000505 (J+) | — | — | — | — |
| RE15-10-7188 | 15-610515 | 0–0.8 | SED | — | 1.43 | 0.00076 (J+) | — | — | — | — | — | — | 0.000733 (J+) | — | — | — | 0.000962 (J+) |
| RE15-10-7189 | 15-610515 | 1–2.2 | SOIL | — | — | — | — | — | — | — | — | — | 0.000578 (J) | 0.00153 | — | — | 0.000761 (J) |
| RE15-10-7190 | 15-610516 | 0–0.7 | SED | — | — | — | — | — | 0.00079 (J) | 0.00941 (J+) | — | — | 0.00155 (J+) | 0.00117 (J+) | — | — | 0.00114 (J+) |
| RE15-10-7191 | 15-610516 | 1–2 | SED | — | — | — | — | — | — | — | — | — | 0.000458 (J) | — | — | — | 0.00043 (J) |
| RE15-10-7193 | 15-610517 | 1–2 | SED | — | — | 0.000489 (J) | — | — | — | — | — | — | 0.000415 (J) | 0.000796 (J) | — | — | 0.000406 (J) |
| RE15-10-7194 | 15-610518 | 0–1 | SED | — | — | — | — | — | — | — | — | — | 0.000799 (J) | — | — | — | — |
| RE15-10-7195 | 15-610518 | 1–2 | SOIL | — | — | — | — | — | — | — | — | — | 0.000404 (J) | — | — | — | 0.000783 (J) |
| RE15-10-7196 | 15-610519 | 0–0.5 | SED | — | — | — | — | — | 0.000447 (J) | — | — | — | — | 0.000685 (J) | — | — | 0.000574 (J) |
| RE15-10-7197 | 15-610519 | 1–2 | SED | — | — | — | — | — | — | — | — | — | 0.00042 (J) | 0.000405 (J) | — | — | 0.000789 (J) |
| RE15-10-7198 | 15-610520 | 0–0.5 | SED | — | — | — | — | — | 0.000812 (J+) | 0.00462 (J+) | — | — | 0.000668 (J+) | 0.000524 (J+) | — | — | — |

**Table 8.11-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Di-n-butylphthalate | Di-n-octylphthalate | Ethylbenzene | Fluoranthene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Methylene Chloride | Phenanthrene | Pyrene | Tetrachloroethene | Toluene | Trimethylbenzene[1,2,4-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **91600** | **8200[c]** | **368** | **33700** | **32.3** | **14200[f]** | **5130** | **25300** | **25300** | **629** | **61300** | **240[c]** | **3940** | **4280[g]** |
| **Residential SSL** | | | | **6160** | **630[c]** | **75.1** | **2320** | **1.53** | **2360[f]** | **409** | **1740** | **1740** | **111** | **5230** | **58[c]** | **805** | **871[g]** |
| RE15-10-7199 | 15-610520 | 1–2.4 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.000394 (J) | 0.000383 (J) | 0.000371 (J) | 0.000743 (J) |
| RE15-10-7200 | 15-610521 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | 0.000466 (J-) | — | — | — |
| RE15-10-7202 | 15-610522 | 2–3.9 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.000421 (J) | — | — | 0.000397 (J) |
| RE15-10-7204 | 15-610523 | 0–0.5 | SED | — | — | — | 0.0468 | 0.0633 (J) | — | — | 0.0164 (J) | 0.0733 | 0.000452 (J) | 0.000635 (J) | — | — | — |
| RE15-10-7205 | 15-610523 | 1–1.5 | SOIL | — | — | — | 0.0185 (J) | — | 0.000741 (J-) | — | 0.0112 (J) | 0.0266 (J) | — | 0.00244 (J-) | — | — | 0.000619 (J-) |
| RE15-10-7208 | 15-610525 | 0–0.5 | SED | — | — | — | 0.0139 (J) | — | 0.00362 | — | — | — | — | — | — | — | — |
| RE15-10-7209 | 15-610525 | 1–1.4 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE15-10-7210 | 15-610526 | 2–2.9 | SOIL | — | — | — | 0.025 (J) | — | — | — | 0.0182 (J) | 0.0328 (J) | — | 0.000929 (J) | — | 0.00036 (J) | 0.000883 (J) |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as a surrogate based on structural similarity.

[g] Xylenes used as a surrogate based on structural similarity.

**Table 8.11-4**
**Radionuclides Detected or Detected above BVs/FVs at AOC 15-014(h)**

| Sample ID | Location ID | Depth (ft) | Media | Cesium-137 | Plutonium-238 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.9** | **0.006** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **1.65** | **0.023** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **41** | **1300** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **12** | **84** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7162 | 15-610502 | 0–0.5 | SED | —[d] | — | — | — | — | — | 2.69 |
| RE15-10-7163 | 15-610502 | 1–2.5 | QBT3 | — | — | — | 0.020885 | — | — | — |
| RE15-10-7168 | 15-610505 | 0–0.5 | SED | — | — | — | — | 3.56 | 0.219 | 4.44 |
| RE15-10-7170 | 15-610506 | 0–0.7 | SED | — | — | — | — | 2.8 | — | 3.58 |
| RE15-10-7172 | 15-610507 | 0–0.7 | SOIL | — | — | 0.0622 | — | — | — | 2.72 |
| RE15-10-7174 | 15-610508 | 0–1 | SOIL | — | — | — | — | — | — | 2.6 |
| RE15-10-7176 | 15-610509 | 0–0.6 | SOIL | — | — | — | 0.0123661 | — | — | — |
| RE15-10-7177 | 15-610509 | 1–2 | SOIL | 0.339 | — | 0.0194 | — | — | — | — |
| RE15-10-7178 | 15-610510 | 0–0.5 | SED | — | — | — | — | — | — | 2.73 |
| RE15-10-7179 | 15-610510 | 1–2 | SOIL | 0.45 | — | — | — | — | — | 2.86 |
| RE15-10-7180 | 15-610511 | 0–1 | SED | — | 0.0599 | — | — | — | — | — |
| RE15-10-7185 | 15-610513 | 1–2 | SOIL | 0.288 | — | — | — | — | — | — |
| RE15-10-7187 | 15-610514 | 1–2 | SOIL | 0.334 | — | — | — | — | — | — |
| RE15-10-7189 | 15-610515 | 1–2.2 | SOIL | 0.13 | — | — | — | — | — | — |
| RE15-10-7190 | 15-610516 | 0–0.7 | SED | — | — | — | — | — | — | 3.05 |
| RE15-10-7192 | 15-610517 | 0–0.5 | SED | — | — | — | — | — | — | 3.22 |
| RE15-10-7196 | 15-610519 | 0–0.5 | SED | — | — | — | — | — | — | 3.32 |
| RE15-10-7198 | 15-610520 | 0–0.5 | SED | 1.53 | — | — | — | 4.17 | — | 5.21 |
| RE15-10-7199 | 15-610520 | 1–2.4 | SOIL | — | — | — | 0.0364505 | — | — | — |
| RE15-10-7201 | 15-610521 | 2–3.7 | SOIL | — | — | — | 0.0274285 | — | — | — |

**Table 8.11-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Cesium-137 | Plutonium-238 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.9** | **0.006** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **1.65** | **0.023** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **41** | **1300** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **12** | **84** | **79** | **1700** | **290** | **42** | **150** |
| RE15-10-7204 | 15-610523 | 0–0.5 | SED | — | — | — | — | — | — | 3.58 |
| RE15-10-7205 | 15-610523 | 1–1.5 | SOIL | 0.514 | — | 0.029 | 0.100017 | 2.98 | 0.23 | 4.21 |
| RE15-10-7207 | 15-610524 | 1–2.1 | QBT3 | — | — | — | 0.0280974 | — | — | — |
| RE15-10-7210 | 15-610526 | 2–2.9 | SOIL | — | — | — | 0.0445575 | — | — | — |
| RE15-10-7211 | 15-610526 | 6–6.7 | QBT3 | — | — | — | 0.883301 | — | — | — |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 9.2-1**
**Samples Collected and Analyses Requested at SWMU 36-002**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE36-10-8448 | 36-610876 | 7.5–10 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | 10-2092 | 10-2093 | 10-2092 | 10-2093 | 10-2092 |
| RE36-10-8449 | 36-610876 | 15–16 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | 10-2092 | 10-2093 | 10-2092 | 10-2093 | 10-2092 |
| RE36-10-8450 | 36-610877 | 9–10 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | 10-2092 | 10-2093 | 10-2092 | 10-2093 | 10-2092 |
| RE36-10-8451 | 36-610877 | 14–15 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | 10-2092 | 10-2093 | 10-2092 | 10-2093 | 10-2092 |
| RE36-10-8452 | 36-610878 | 4–5 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | —* | 10-2093 | 10-2092 | 10-2093 | 10-2092 |
| RE36-10-8453 | 36-610878 | 9–10 | QBT2 | 10-2094 | 10-2093 | 10-2092 | 10-2094 | 10-2094 | 10-2094 | 10-2094 | 10-2093 | — | 10-2093 | 10-2092 | 10-2093 | 10-2092 |

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

**Table 9.2-2**
**Inorganic Chemicals above BVs at SWMU 36-002**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Barium | Beryllium | Calcium | Chromium | Cobalt | Copper | Lead | Magnesium | Manganese | Nickel | Perchlorate | Selenium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **7340** | **0.5** | **46** | **1.21** | **2200** | **7.14** | **3.14** | **4.66** | **11.2** | **1690** | **482** | **6.58** | **na**[b] | **0.3** |
| **Industrial SSL**[c] | | | | **1290000** | **519** | **255000** | **2580** | **32400000** | **505**[d] | **350**[e] | **51900** | **800** | **5680000** | **160000** | **25700** | **908** | **6490** |
| **Residential SSL**[c] | | | | **78000** | **31.3** | **15600** | **156** | **13000000** | **96.9**[d] | **23**[e] | **3130** | **400** | **339000** | **10500** | **1560** | **54.8** | **391** |
| RE36-10-8448 | 36-610876 | 7.5–10 | QBT2 | —[f] | 1.02 (UJ) | — | — | — | — | — | — | — | — | — | — | — | 0.969 (UJ) |
| RE36-10-8449 | 36-610876 | 15–16 | QBT2 | — | 0.857 (UJ) | — | — | — | — | — | — | — | — | 497 | — | — | 0.884 (UJ) |
| RE36-10-8450 | 36-610877 | 9–10 | QBT2 | 13,800 | 1.07 (UJ) | 82.2 | 2.69 | 4700 | 9.64 | — | 9.92 | 13 | 3080 | — | 10.6 | 0.00127 (J) | 1.02 (UJ) |
| RE36-10-8451 | 36-610877 | 14–15 | QBT2 | — | 1.01 (UJ) | — | — | — | — | — | — | — | — | — | — | — | 0.999 (UJ) |
| RE36-10-8452 | 36-610878 | 4–5 | QBT2 | — | 0.913 (UJ) | 84.6 | — | — | — | 4.2 | 5.98 | — | 1730 | — | 6.82 | 0.00232 | 0.922 (UJ) |
| RE36-10-8453 | 36-610878 | 9–10 | QBT2 | — | 0.997 (UJ) | 63.7 | — | — | 8.38 | — | — | — | — | — | — | 0.00377 | 1.02 (UJ) |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SSLs from NMED (2015, 600915) unless otherwise noted.
[d] SSL for total chromium.
[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).
[f] — = Not detected or not detected above BV.

**Table 9.2-3**
**Organic Chemicals Detected at SWMU 36-002**

| Sample ID | Location ID | Depth (ft) | Media | Ethylbenzene |
|---|---|---|---|---|
| **Industrial SSL*** | | | | **368** |
| **Residential SSL*** | | | | **75.1** |
| RE36-10-8450 | 36-610877 | 9–10 | QBT2 | 0.000482 (J) |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* SSLs from NMED (2015, 600915).

**Table 9.2-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 36-002**

| Sample ID | Location ID | Depth (ft) | Media | Plutonium-238 | Tritium |
|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** |
| **Industrial SAL[c]** | | | | **1300** | **2400000** |
| **Residential SAL[c]** | | | | **84** | **1700** |
| RE36-10-8452 | 36-610878 | 4–5 | QBT2 | 0.033 | —[d] |
| RE36-10-8453 | 36-610878 | 9–10 | QBT2 | — | 0.0100606 |

Note: Results are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2015, 600929).
[d] — = Not detected or not detected above BV/FV.

**Table 9.3-1**
**Samples Collected and Analyses Requested at SWMU 36-003(a)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE36-10-8462 | 36-610879 | 49–50 | QBT2 | 10-2026 | 10-2025 | 10-2024 | 10-2026 | 10-2026 | 10-2026 | 10-2026 | 10-2025 | 10-2024 | 10-2025 | 10-2024 | 10-2025 | 10-2024 |
| RE36-10-8463 | 36-610879 | 59–60 | QBT2 | 10-2026 | 10-2025 | 10-2024 | 10-2026 | 10-2026 | 10-2026 | 10-2026 | 10-2025 | 10-2024 | 10-2025 | 10-2024 | 10-2025 | 10-2024 |
| RE36-10-8486 | 36-610879 | 69–70 | QBT2 | 10-2026 | 10-2025 | 10-2024 | 10-2026 | 10-2026 | 10-2026 | 10-2026 | 10-2025 | 10-2024 | 10-2025 | 10-2024 | 10-2025 | 10-2024 |
| RE36-10-8487 | 36-610879 | 77.5–80 | QBT2 | 10-2026 | 10-2025 | 10-2024 | 10-2026 | 10-2026 | 10-2026 | 10-2026 | 10-2025 | 10-2024 | 10-2025 | 10-2024 | 10-2025 | 10-2024 |
| RE36-10-8464 | 36-610880 | 3–4 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | 10-2137 | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8466 | 36-610881 | 1.5–2.5 | SOIL | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 | 10-2202 |
| RE36-10-8470 | 36-610882 | 5–5.6 | QBT2 | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | —* | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8471 | 36-610882 | 5.6–6.1 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8474 | 36-610884 | 0.5–1 | SOIL | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8475 | 36-610884 | 1–2.5 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8476 | 36-610885 | 1.5–2.5 | QBT3 | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8477 | 36-610885 | 2.5–3 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8478 | 36-610886 | 1.5–2.3 | SOIL | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8479 | 36-610886 | 2.3–3.9 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8480 | 36-610887 | 1.5–2 | SOIL | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8481 | 36-610887 | 2–4 | QBT2 | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8482 | 36-610888 | 2–3.5 | SOIL | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8483 | 36-610888 | 7–8 | QBT3 | 10-2029 | 10-2028 | 10-2027 | 10-2029 | 10-2029 | 10-2029 | 10-2029 | 10-2028 | — | 10-2028 | 10-2027 | 10-2028 | 10-2027 |
| RE36-10-8484 | 36-610889 | 2–3 | SOIL | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |
| RE36-10-8485 | 36-610889 | 3–4.2 | SOIL | 10-2139 | 10-2138 | 10-2137 | 10-2139 | 10-2139 | 10-2139 | 10-2139 | 10-2138 | — | 10-2138 | 10-2137 | 10-2138 | 10-2137 |

* — = Analysis not requested.

**Table 9.3-2**
**Inorganic Chemicals above BVs at SWMU 36-003(a)**

| Sample ID | Location ID | Depth (ft) | Media | Antimony | Beryllium | Cadmium | Chromium | Cobalt | Copper | Nickel | Nitrate | Perchlorate | Selenium | Sodium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.5** | **1.21** | **1.63** | **7.14** | **3.14** | **4.66** | **6.58** | **na[b]** | **na** | **0.3** | **2770** | **63.5** |
| **Soil BV[a]** | | | | **0.83** | **1.83** | **0.4** | **19.3** | **8.64** | **14.7** | **15.4** | **na** | **na** | **1.52** | **915** | **48.8** |
| **Industrial SSL[c]** | | | | **519** | **2580** | **1110** | **505[d]** | **350[e]** | **51900** | **25700** | **2080000** | **908** | **6490** | **35700000** | **389000** |
| **Residential SSL[c]** | | | | **31.3** | **156** | **70.5** | **96.6[d]** | **23[e]** | **3130** | **1560** | **125000** | **54.8** | **391** | **7820000** | **23500** |
| RE36-10-8462 | 36-610879 | 49–50 | QBT2 | 0.944 (UJ) | —[f] | — | — | — | — | — | 1.77 (J-) | — | 1 (U) | — | — |
| RE36-10-8463 | 36-610879 | 59–60 | QBT2 | 1.01 (UJ) | — | — | — | — | — | — | 2.87 (J-) | — | 0.93 (U) | — | — |
| RE36-10-8486 | 36-610879 | 69–70 | QBT2 | 0.957 (UJ) | — | — | 14.5 | — | — | — | 2.04 (J-) | — | 0.99 (U) | — | — |
| RE36-10-8487 | 36-610879 | 77.5–80 | QBT2 | 1.01 (UJ) | — | — | — | — | — | — | 2.27 (J-) | — | 1.01 (U) | — | — |
| RE36-10-8464 | 36-610880 | 3–4 | QBT2 | 1.05 (UJ) | — | — | 8.37 | 6.75 | 5.36 | — | 1.27 | — | 1.03 (U) | — | — |
| RE36-10-8466 | 36-610881 | 1.5–2.5 | SOIL | 1.08 (U) | — | 0.541 (U) | — | — | — | — | — | — | — | 1720 (J-) | — |
| RE36-10-8470 | 36-610882 | 5–5.6 | QBT2 | 1.03 (U) | — | — | 12 (J) | 3.32 | — | — | 2.38 (J-) | — | 0.991 (U) | — | — |
| RE36-10-8471 | 36-610882 | 5.6–6.1 | QBT2 | 1.08 (UJ) | — | — | 59.1 | 4.06 | — | — | 2.27 | — | 1.09 (U) | — | — |
| RE36-10-8474 | 36-610884 | 0.5–1 | SOIL | 1.11 (U) | — | 0.557 (U) | — | — | — | — | 1.92 (J-) | — | — | — | — |
| RE36-10-8475 | 36-610884 | 1–2.5 | QBT2 | 1.07 (UJ) | — | — | 13.4 | — | — | — | 2.24 | 0.000811 (J) | 1.05 (U) | — | — |
| RE36-10-8476 | 36-610885 | 1.5–2.5 | QBT3 | 1.01 (U) | — | — | — | — | — | — | — | — | 1.04 (U) | — | — |
| RE36-10-8477 | 36-610885 | 2.5–3 | QBT2 | 1.1 (UJ) | — | — | 13.3 | — | — | — | — | — | 1.07 (U) | — | — |
| RE36-10-8478 | 36-610886 | 1.5–2.3 | SOIL | 0.99 (U) | — | 0.495 (U) | — | — | — | — | 1.62 (J-) | — | — | — | — |
| RE36-10-8479 | 36-610886 | 2.3–3.9 | QBT2 | 1.07 (UJ) | — | — | — | — | — | — | 1.48 | 0.000631 (J) | 1.03 (U) | — | — |
| RE36-10-8480 | 36-610887 | 1.5–2 | SOIL | 1.07 (U) | — | 0.534 (U) | — | — | — | — | — | — | — | — | — |
| RE36-10-8481 | 36-610887 | 2–4 | QBT2 | 1.1 (UJ) | — | — | 10.8 | — | — | — | — | 0.000683 (J) | 1.1 (U) | — | — |
| RE36-10-8482 | 36-610888 | 2–3.5 | SOIL | 0.984 (U) | — | 0.492 (U) | — | — | — | — | 1.68 (J-) | — | — | — | — |
| RE36-10-8483 | 36-610888 | 7–8 | QBT3 | 1.02 (U) | — | — | 7.18 (J) | — | — | — | — | — | 0.986 (U) | — | — |
| RE36-10-8484 | 36-610889 | 2–3 | SOIL | 1.18 (UJ) | — | 0.591 (U) | 27.1 | — | — | — | 1.38 | 0.000796 (J) | — | 924 | — |
| RE36-10-8485 | 36-610889 | 3–4.2 | SOIL | 1.29 (UJ) | 5.57 | 0.644 (U) | 42.1 | — | — | 39.9 | 1.47 | 0.00229 (J) | — | 1300 | 50.5 |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2015, 600915) unless otherwise noted.

[d] SSL for total chromium.

[e] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected or not detected above BV.

**Table 9.3-3**
**Organic Chemicals Detected at SWMU 36-003(a)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Fluoranthene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] | Phenanthrene | Pyrene | RDX | Trimethylbenzene[1,2,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **253000** | **32.3** | **3.23** | **32.3** | **25300[b]** | **323** | **3230** | **33700** | **32.3** | **14200[c]** | **25300** | **25300** | **311** | **240[d]** |
| **Residential SSL[a]** | | | | **3480** | **17400** | **1.53** | **0.153** | **1.53** | **1740[b]** | **15.3** | **153** | **2320** | **1.53** | **2360[c]** | **1740** | **1740** | **60.4** | **58[d]** |
| RE36-10-8464 | 36-610880 | 3–4 | QBT2 | —[e] | 0.046 (J) | 0.106 (J) | 0.0863 (J) | 0.155 | — | — | 0.106 (J) | 0.235 | — | — | 0.221 | 0.211 | — | 0.000343 (J) |
| RE36-10-8466 | 36-610881 | 1.5–2.5 | SOIL | — | — | — | — | — | — | — | — | 0.0123 (J) | — | — | — | 0.0231 (J) | — | — |
| RE36-10-8470 | 36-610882 | 5–5.6 | QBT2 | — | — | — | — | — | — | — | — | 0.0151 (J) | — | — | 0.08 | 0.0123 (J) | — | — |
| RE36-10-8471 | 36-610882 | 5.6–6.1 | QBT2 | — | — | — | — | — | — | — | — | — | — | 0.00811 | — | — | — | — |
| RE36-10-8475 | 36-610884 | 1–2.5 | QBT2 | — | — | — | — | — | — | — | — | — | — | 0.000603 (J) | — | — | — | — |
| RE36-10-8481 | 36-610887 | 2–4 | QBT2 | 0.193 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8482 | 36-610888 | 2–3.5 | SOIL | — | 0.011 (J) | 0.106 | 0.106 | 0.176 | 0.0509 | 0.0684 | 0.145 | 0.148 | 0.0525 | — | 0.125 | 0.151 | 0.184 (J) | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] — = Not detected.

**Table 9.3-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMU 36-003(a)**

| Sample ID | Location ID | Depth (ft) | Media | Uranium-235/236 |
|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **0.09** |
| **Industrial SAL[b]** | | | | **160** |
| **Residential SAL[b]** | | | | **42** |
| RE36-10-8487 | 36-610879 | 77.5–80 | QBT2 | 0.0957 |

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

**Table 9.4-1**
**Samples Collected and Analyses Requested at SWMUs 36-008 and C-36-003**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SWMU 36-008** | | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | 10-2121 | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | 10-2121 | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | 10-2121 | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | 10-2121 | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | 10-2193 | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | 10-2074 | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | 10-2074 | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7416 | 36-610580 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | 10-2150 | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | 10-2193 | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | 10-2193 | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | 10-1916 | 10-1915 | 10-1914 | 10-1916 | 10-1916 | 10-1916 | 10-1916 | 10-1915 | —* | 10-1915 | 10-1914 | 10-1915 | 10-1914 |
| RE36-10-7424 | 36-610584 | 2–3 | QBT3 | 10-1916 | 10-1915 | 10-1914 | 10-1916 | 10-1916 | 10-1916 | 10-1916 | 10-1915 | — | 10-1915 | 10-1914 | 10-1915 | 10-1914 |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | 10-1916 | 10-1915 | 10-1914 | 10-1916 | 10-1916 | 10-1916 | 10-1916 | 10-1915 | — | 10-1915 | 10-1914 | 10-1915 | 10-1914 |
| RE36-10-7428 | 36-610586 | 2–3 | SOIL | 10-1916 | 10-1915 | 10-1914 | 10-1916 | 10-1916 | 10-1916 | 10-1916 | 10-1915 | — | 10-1915 | 10-1914 | 10-1915 | 10-1914 |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | 10-2123 | 10-2122 | 10-2121 | 10-2123 | 10-2123 | 10-2123 | 10-2123 | 10-2122 | — | 10-2122 | 10-2121 | 10-2122 | 10-2121 |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |

**Table 9.4-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7442 | 36-610593 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7443 | 36-610594 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7444 | 36-610594 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7447 | 36-610596 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7448 | 36-610596 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7449 | 36-610597 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7450 | 36-610597 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | 10-2195 | 10-2194 | 10-2193 | 10-2195 | 10-2195 | 10-2195 | 10-2195 | 10-2194 | — | 10-2194 | 10-2193 | 10-2194 | 10-2193 |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7454 | 36-610599 | 0.5–1 | QBT2 | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | 10-2136 | 10-2135 | 10-2134 | 10-2136 | 10-2136 | 10-2136 | 10-2136 | 10-2135 | — | 10-2135 | 10-2134 | 10-2135 | 10-2134 |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |

**Table 9.4-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | 10-2076 | 10-2075 | 10-2074 | 10-2076 | 10-2076 | 10-2076 | 10-2076 | 10-2075 | — | 10-2075 | 10-2074 | 10-2075 | 10-2074 |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7479 | 36-610612 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7488 | 36-610616 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | 10-2152 | 10-2151 | 10-2150 | 10-2152 | 10-2152 | 10-2152 | 10-2152 | 10-2151 | — | 10-2151 | 10-2150 | 10-2151 | 10-2150 |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7498 | 36-610621 | 2–3 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7499 | 36-610622 | 0–0.5 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |

**Table 9.4-1 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cyanide (Total) | Explosive Compounds | Gamma Spectroscopy | Tritium | Isotopic Plutonium | Isotopic Uranium | Nitrate | PCB | Perchlorate | SVOC | TAL Metals | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | 10-2156 | 10-2155 | 10-2154 | 10-2156 | 10-2156 | 10-2156 | 10-2156 | 10-2155 | — | 10-2155 | 10-2154 | 10-2155 | 10-2154 |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | 10-2197 | 10-2197 | 10-2196 | 10-2197 | 10-2197 | 10-2197 | 10-2197 | 10-2197 | — | 10-2197 | 10-2196 | 10-2197 | 10-2196 |
| **SWMU C-36-003** | | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8274 | 36-610821 | 2–3 | SOIL | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8276 | 36-610822 | 2–3 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8278 | 36-610823 | 2–3 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 | 10-2124 |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2140 | 10-2141 | 10-2140 |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2140 | 10-2141 | 10-2140 |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2140 | 10-2141 | 10-2140 |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2141 | 10-2140 | 10-2141 | 10-2140 | 10-2141 | 10-2140 |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | 10-2201 | 10-2200 | 10-2199 | 10-2201 | 10-2201 | 10-2201 | 10-2201 | 10-2200 | 10-2199 | 10-2200 | 10-2199 | 10-2200 | 10-2199 |

Note: Numbers in analyte columns are request numbers.

[*] — = Analysis not requested.

**Table 9.4-2**
**Inorganic Chemicals above BVs at SWMUs 36-008 and C-36-003**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **11.2** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **19.7** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **22.3** |
| **Industrial SSL[b]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[c]** | **350[d]** | **51900** | **63.3** | **800** |
| **Residential SSL[b]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[c]** | **23[d]** | **3130** | **11.2** | **400** |
| **SWMU 36-008** | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | —[e] | 5.62 (U) | — | — | — | — | — | — | — | 23.6 | — | — |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | — | 5.46 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | — | 1.17 (U) | — | — | — | — | — | — | — | — | 0.98 | — |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | — | 1.06 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | — | 1.18 (U) | — | — | — | — | — | — | — | — | 0.572 | — |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | — | 1 (U) | — | — | — | 0.436 (J) | — | 57.8 | — | 88.2 (J+) | 0.868 | 41.6 |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | — | 1.11 (U) | — | — | — | — | — | 9.78 | — | 18.5 (J+) | — | 11.9 |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | — | 1.71 (U) | — | — | — | — | 8490 | — | — | — | 0.633 | — |
| RE36-10-7416 | 36-610580 | 2–3 | SOIL | — | 1.12 (U) | — | — | — | 0.562 (U) | — | — | — | — | — | — |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | — | — | — | — | — | 0.578 (U) | — | 22.2 | — | — | — | — |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | 1.21 (U) | — | — | — | 0.603 (U) | — | — | — | — | — | — |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | — | 1.19 (U) | — | — | — | 0.596 (U) | — | — | — | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | 1.09 (U) | — | — | — | 0.545 (U) | — | — | — | — | — | — |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | — | 1.16 (U) | — | — | — | 0.578 (U) | — | — | — | — | — | — |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | — | 1.05 (U) | — | — | — | 0.524 (U) | — | — | — | — | — | — |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7424 | 36-610584 | 2–3 | QBT3 | 11,000 (J+) | 1.06 (U) | 3.2 | 153 | — | — | 6350 | 13.2 | 5.34 | 7.32 | — | — |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | — | 1.14 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | 1.14 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | 1.42 (U) | — | — | — | — | — | — | — | — | 0.659 | — |
| RE36-10-7428 | 36-610586 | 2–3 | SOIL | — | 1.02 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | — | 1.4 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | — | 1.13 (U) | — | — | — | 0.902 (J) | — | — | — | 4870 | — | 202 |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | — | 1.13 (U) | — | — | — | — | — | — | — | 31 | — | 106 |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | — | 1.34 (U) | — | — | — | 0.51 (U) | — | — | — | — | 0.577 | 27.1 |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | 1.29 (U) | — | — | — | — | — | — | — | — | 0.534 | — |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | — | 1.43 (U) | — | — | — | 0.713 (U) | — | — | — | — | — | — |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | — | 1.24 (U) | — | — | — | 0.62 (U) | — | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **11.2** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **19.7** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **22.3** |
| **Industrial SSL[b]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[c]** | **350[d]** | **51900** | **63.3** | **800** |
| **Residential SSL[b]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[c]** | **23[d]** | **3130** | **11.2** | **400** |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | — | 1.11 (U) | — | — | — | 0.557 (U) | — | — | — | — | 0.875 | — |
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | — | 0.989 (U) | — | — | — | — | — | 12.2 | — | — | — | — |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | — | 1.19 (U) | — | — | — | 0.593 (U) | — | — | — | — | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | 1.03 (U) | — | — | — | 0.514 (U) | — | — | — | — | — | — |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | — | 1.22 (U) | — | — | — | 0.612 (U) | — | — | — | — | — | — |
| RE36-10-7442 | 36-610593 | 2–3 | SOIL | — | 1.08 (U) | — | — | — | 0.539 (U) | — | — | — | — | — | — |
| RE36-10-7443 | 36-610594 | 0–0.5 | SOIL | — | 1.29 (U) | — | — | — | 0.643 (U) | — | — | — | — | — | — |
| RE36-10-7444 | 36-610594 | 2–3 | SOIL | — | 1.19 (U) | — | — | — | 0.596 (U) | — | 32.7 | 11.3 | — | — | — |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | — | 1.27 (U) | — | — | — | — | — | — | — | — | 0.621 | — |
| RE36-10-7447 | 36-610596 | 0–0.5 | SOIL | — | 1.25 (U) | — | — | — | 0.626 (U) | — | — | — | — | 1.78 | — |
| RE36-10-7448 | 36-610596 | 2–3 | SOIL | — | 1.2 (U) | — | — | — | 0.602 (U) | — | — | — | — | 0.888 | — |
| RE36-10-7449 | 36-610597 | 0–0.5 | SOIL | — | 1.18 (U) | — | — | — | 0.591 (U) | — | — | — | — | — | — |
| RE36-10-7450 | 36-610597 | 2–3 | SOIL | — | 1.1 (U) | — | — | — | 0.549 (U) | — | — | — | — | — | — |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | — | 1.57 (U) | — | — | — | 0.786 (U) | — | 21.5 | — | — | 2.88 | — |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | 1.22 (U) | — | — | — | 0.612 (U) | — | 23.2 | — | — | 4.24 | — |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | — | 1.76 (U) | — | — | — | 0.882 (U) | — | — | — | — | — | — |
| RE36-10-7454 | 36-610599 | 0.5–1 | QBT2 | — | 1.06 (U) | — | — | — | — | — | 11.7 | — | — | — | — |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | — | 1.26 (U) | — | — | — | 0.63 (U) | — | — | — | — | 0.596 | — |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | — | 1.07 (U) | — | 54.2 | — | — | — | 13.5 | — | — | — | — |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | — | 1.21 (U) | — | — | — | 0.607 (U) | — | — | — | — | 1.1 | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | 1.14 (U) | — | — | — | 0.572 (U) | — | — | — | — | — | — |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | — | 1.2 (U) | — | — | — | 0.601 (U) | — | — | — | — | 1.31 | — |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | 1.05 (U) | — | — | 2.44 | — | — | 17.9 | — | — | — | — |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | — | 1.06 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | 1.05 (U) | — | — | — | — | — | — | — | 420 (J+) | — | 35.4 |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | — | 0.919 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | 0.998 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | — | 1.19 (U) | — | — | — | 0.411 (J) | — | — | — | 37.9 (J+) | — | 65 |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **11.2** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **19.7** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **22.3** |
| **Industrial SSL[b]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[c]** | **350[d]** | **51900** | **63.3** | **800** |
| **Residential SSL[b]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[c]** | **23[d]** | **3130** | **11.2** | **400** |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | — | 1.12 (U) | — | — | — | — | — | — | — | 76.5 (J+) | — | 45.3 |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | — | 1.15 (U) | — | — | — | 1.23 | 4780 (J-) | — | — | 20.9 (J+) | — | 59.7 |
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | — | 1.31 (U) | — | — | — | 0.895 | — | — | — | 15.1 (J+) | — | 53.5 |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | — | 1.09 (U) | — | — | — | — | — | — | — | 33.5 (J+) | — | 75.7 |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | — | 1.09 (U) | — | — | — | — | — | — | — | 16.1 (J+) | — | 23.2 |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | — | 1.43 (U) | — | — | — | 0.642 (J) | — | 99 | — | 33.3 (J+) | — | 26.7 |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | — | 1.25 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | — | 1.27 (U) | — | — | — | — | 6260 (J-) | 15.6 | — | 12.8 (J+) | — | — |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | — | 1.3 (U) | — | — | — | 0.554 (J) | — | — | — | 87.4 (J+) | — | 39.4 |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | — | 1.19 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | — | 1.21 (U) | — | — | — | 0.607 (U) | — | — | — | — | — | — |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | 1.1 (U) | — | — | — | 0.549 (U) | — | — | — | — | — | — |
| RE36-10-7479 | 36-610612 | 0–0.5 | SOIL | — | 1.36 (U) | — | — | — | 0.679 (U) | — | 22 | — | — | — | — |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | 1.1 (U) | — | — | — | 0.552 (U) | — | — | — | — | — | — |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | — | — | — | — | — | — | — | 20 | — | — | — | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | — | 1.1 (U) | — | — | — | 0.579 (U) | — | 47.3 | — | — | — | — |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | — | 1.31 (U) | — | — | — | 0.654 (U) | — | — | — | — | — | — |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | 1.15 (U) | — | — | — | 0.577 (U) | — | — | — | — | — | — |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | — | 1.34 (U) | — | — | — | 0.669 (U) | — | — | — | — | — | — |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | — | — | — | — | — | 0.632 (U) | — | 20.6 | — | — | — | — |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | — | 1.32 (U) | — | — | — | 0.659 (U) | — | — | — | — | — | — |
| RE36-10-7488 | 36-610616 | 2–3 | SOIL | — | 1.06 (U) | — | — | — | 0.529 (U) | — | — | — | — | — | — |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | — | 1.42 (U) | — | — | — | 0.709 (U) | — | 29.9 | — | — | — | — |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | 1.2 (U) | — | — | — | 0.601 (U) | — | 21.4 | — | — | — | — |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | 1.53 (U) | — | — | — | 0.764 (U) | — | — | — | — | 0.697 | — |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | 1.2 (U) | — | — | — | 0.598 (U) | — | — | — | — | — | — |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | — | 1.3 (U) | — | — | — | 0.648 (U) | — | — | — | — | 0.591 | — |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | — | 1.13 (U) | — | — | — | 0.564 (U) | — | — | — | — | — | — |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | — | 1.26 (U) | — | — | — | — | — | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Cyanide (Total) | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **7340** | **0.5** | **2.79** | **46** | **1.21** | **1.63** | **2200** | **7.14** | **3.14** | **4.66** | **0.5** | **11.2** |
| **Sediment BV[a]** | | | | **15400** | **0.83** | **3.98** | **127** | **1.31** | **0.4** | **4420** | **10.5** | **4.73** | **11.2** | **0.82** | **19.7** |
| **Soil BV[a]** | | | | **29200** | **0.83** | **8.17** | **295** | **1.83** | **0.4** | **6120** | **19.3** | **8.64** | **14.7** | **0.5** | **22.3** |
| **Industrial SSL[b]** | | | | **1290000** | **519** | **21.5** | **255000** | **2580** | **1110** | **32400000** | **505[c]** | **350[d]** | **51900** | **63.3** | **800** |
| **Residential SSL[b]** | | | | **78000** | **31.3** | **4.25** | **15600** | **156** | **70.5** | **13000000** | **96.6[c]** | **23[d]** | **3130** | **11.2** | **400** |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | 1.02 (U) | — | — | — | 0.512 (U) | — | — | — | — | — | — |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | — | 1.46 (U) | — | — | — | 0.73 (U) | — | — | — | — | — | — |
| RE36-10-7498 | 36-610621 | 2–3 | SOIL | — | 1.24 (U) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7499 | 36-610622 | 0–0.5 | SOIL | — | 1.18 (U) | — | — | — | 0.588 (U) | — | — | — | — | — | — |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | 1.18 (U) | — | — | — | 0.588 (U) | — | — | — | — | — | — |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | — | 1.21 (U) | — | — | — | 0.607 (U) | — | — | — | — | — | — |
| **SWMU C-36-003** | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | 1.3 (U) | — | — | — | 0.648 (U) | — | 27.8 | — | — | — | — |
| RE36-10-8274 | 36-610821 | 2–3 | SOIL | — | 0.955 (U) | — | — | — | 0.478 (U) | — | — | — | — | — | — |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | — | 1.49 (U) | — | — | — | 0.745 (U) | — | — | — | — | — | — |
| RE36-10-8276 | 36-610822 | 2–3 | SED | — | 1.14 (U) | — | — | — | 0.568 (U) | — | 10.7 | — | — | — | — |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | — | 1.22 (U) | — | — | — | 0.609 (U) | — | 11.3 | — | — | — | — |
| RE36-10-8278 | 36-610823 | 2–3 | SED | — | 1.05 (U) | — | — | — | 0.524 (U) | — | — | — | — | — | — |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | — | 1 (U) | — | — | — | 0.542 | — | 101 | — | 18.5 | 0.838 | — |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | 1.07 (U) | — | — | — | 1.09 | — | 90.2 | — | 27.8 | 1.12 | — |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | — | 1.35 (U) | — | — | — | 1.36 | 11,700 | 28.5 | — | 2720 | 1.65 | 144 |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | 1.06 (U) | — | — | — | — | — | 30.4 | — | 309 | — | 35.7 |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | — | 1.04 (U) | — | — | — | 0.469 (J) | — | 108 | — | — | 2.18 | — |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | — | 1.02 (U) | — | — | — | — | — | 70.9 | — | — | 0.825 | — |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | — | 1.36 (U) | — | — | — | — | — | 192 | — | 15.3 | 1.57 | — |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | — | 0.986 (U) | — | — | — | 3.35 | — | 97.9 | — | 25.2 | 1.39 | — |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | — | 1.4 (U) | — | — | — | 0.7 (U) | 4470 (J+) | 21.1 | — | — | — | — |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | 1.19 (U) | — | — | — | 0.595 (U) | — | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Magnesium | Manganese | Mercury | Nickel | Nitrate | Perchlorate | Selenium | Silver | Sodium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **1690** | **482** | **0.1** | **6.58** | **na[f]** | **na** | **0.3** | **1** | **2770** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **2370** | **543** | **0.1** | **9.38** | **na** | **na** | **0.3** | **1** | **1470** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **4610** | **671** | **0.1** | **15.4** | **na** | **na** | **1.52** | **1** | **915** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[b]** | | | | **5680000** | **160000** | **389** | **25700** | **2080000** | **908** | **6490** | **6490** | **35700000** | **3800** | **6530** | **389000** |
| **Residential SSL[b]** | | | | **339000** | **10500** | **23.5** | **1560** | **125000** | **54.8** | **391** | **391** | **7820000** | **234** | **394** | **23500** |
| **SWMU 36-008** | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | — | — | 0.169 | — | 15.5 | 0.0591 | — | — | — | — | — | 67.9 |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | — | — | 0.118 | — | 17.7 | 0.0882 | — | — | — | — | — | 51.2 |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | — | — | — | — | 1.61 | 0.0136 | — | — | — | — | — | 51.4 |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | — | — | — | — | — | 0.0124 | — | — | — | — | — | — |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | — | — | 0.706 | — | 4.25 | 0.0541 | — | — | — | — | — | 72.8 |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | — | — | — | — | — | — | — | — | — | — | — | 109 |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | — | — | — | — | — | — | 1.24 (U) | — | — | — | — | — |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | — | — | — | — | 12.4 | 0.00104 (J) | 1.69 (U) | — | — | 3.55 | — | — |
| RE36-10-7416 | 36-610580 | 2–3 | SOIL | — | — | — | — | 2.97 | — | — | — | — | — | — | — |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | — | — | — | — | 1.34 | — | — | — | — | — | — | 61.7 |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | — | — | — | 1.47 | — | — | — | — | — | — | — |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | — | — | 0.302 | — | 5.29 | 0.0188 | — | — | — | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | — | — | — | 2.73 | 0.0219 | — | — | — | — | — | — |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | — | — | — | — | 1.39 | 0.00181 (J) | — | — | — | — | — | — |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | — | — | — | — | 1.01 | 0.0015 (J) | — | — | — | — | — | — |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | — | — | — | — | — | 0.00128 (J+) | 2.03 (U) | — | — | 4.63 | — | — |
| RE36-10-7424 | 36-610584 | 2–3 | QBT3 | 2590 | — | — | 9.22 | 1.33 (J) | — | 1.01 (U) | — | — | — | 26.2 | — |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | — | — | — | — | 29.9 | 0.00506 | — | — | — | — | — | — |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | — | — | — | — | 0.00319 | — | — | — | — | — | — |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | — | — | — | 12.7 (J) | 0.00215 (J+) | — | — | — | 2.97 | — | — |
| RE36-10-7428 | 36-610586 | 2–3 | SOIL | — | — | — | — | 2.08 (J) | 0.00113 (J+) | — | — | — | — | — | — |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | — | — | — | — | 4.09 | 0.00499 | — | — | — | 1.85 | — | 200 |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | — | — | 14.8 | — | — | 0.00912 | — | 1.15 | — | 3.1 | — | 936 |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | — | — | 10.3 | — | — | 0.0175 | — | — | — | 1.88 | — | 134 |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | — | — | — | — | 2.04 | 0.0029 | — | — | — | 3.88 | — | — |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | — | — | — | 1.84 | 0.00221 (J) | — | — | — | — | — | — |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | — | 646 | — | — | 1.58 | — | 1.33 (U) | — | — | — | — | — |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | — | — | — | — | 1.25 | 0.00143 (J) | — | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Magnesium | Manganese | Mercury | Nickel | Nitrate | Perchlorate | Selenium | Silver | Sodium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **1690** | **482** | **0.1** | **6.58** | **na[f]** | **na** | **0.3** | **1** | **2770** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **2370** | **543** | **0.1** | **9.38** | **na** | **na** | **0.3** | **1** | **1470** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **4610** | **671** | **0.1** | **15.4** | **na** | **na** | **1.52** | **1** | **915** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[b]** | | | | **5680000** | **160000** | **389** | **25700** | **2080000** | **908** | **6490** | **6490** | **35700000** | **3800** | **6530** | **389000** |
| **Residential SSL[b]** | | | | **339000** | **10500** | **23.5** | **1560** | **125000** | **54.8** | **391** | **391** | **7820000** | **234** | **394** | **23500** |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | — | — | — | — | 4.61 | 0.0018 (J) | 1.18 (U) | — | — | — | — | — |
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | — | — | — | — | 1.03 | 0.000633 (J) | 1.02 (U) | — | — | — | — | — |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | — | — | — | — | — | 0.000991 (J) | — | — | — | — | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | — | — | — | 1.17 | 0.000658 (J) | — | — | — | — | — | — |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | — | — | 0.109 | — | 3.29 | 0.00268 | — | — | — | 2.68 | — | — |
| RE36-10-7442 | 36-610593 | 2–3 | SOIL | — | — | — | — | 1.24 | 0.00164 (J) | — | — | — | — | — | — |
| RE36-10-7443 | 36-610594 | 0–0.5 | SOIL | — | — | — | — | 4.83 | — | — | — | — | — | — | — |
| RE36-10-7444 | 36-610594 | 2–3 | SOIL | — | — | — | — | 1.86 | 0.000673 (J) | — | — | — | — | — | — |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | — | 692 | 0.199 | — | 2.64 | 0.0319 | — | — | — | — | — | 53.7 |
| RE36-10-7447 | 36-610596 | 0–0.5 | SOIL | — | — | — | — | 7.51 | 0.000994 (J) | — | — | — | — | — | — |
| RE36-10-7448 | 36-610596 | 2–3 | SOIL | — | — | — | — | 4.29 | — | — | — | — | — | — | — |
| RE36-10-7449 | 36-610597 | 0–0.5 | SOIL | — | — | — | — | 1.95 | 0.000714 (J) | — | — | — | — | — | — |
| RE36-10-7450 | 36-610597 | 2–3 | SOIL | — | — | — | — | 1.22 | 0.000672 (J) | — | — | — | — | — | — |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | — | — | — | — | 1.69 | — | — | — | — | — | — | — |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | — | — | — | 1.56 | — | — | — | — | — | — | — |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | — | — | — | — | 3.42 | — | 1.74 (U) | — | — | — | — | 55.5 |
| RE36-10-7454 | 36-610599 | 0.5–1 | QBT2 | — | — | — | — | 1.47 | — | 1.04 (U) | — | — | — | — | — |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | — | — | — | — | 2.39 | 0.00206 (J) | — | — | — | 2.34 | — | — |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | — | — | — | — | 1.39 | 0.00178 (J) | 1.08 (U) | — | — | — | — | — |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | — | — | — | — | 2.52 | 0.00433 | — | — | — | — | — | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | — | — | — | — | 0.00384 | — | — | — | — | — | — |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | — | 679 | — | — | 1.99 | 0.00414 | — | — | — | — | — | — |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | — | — | — | 1.68 | 0.00241 | 1.09 (U) | — | — | — | — | — |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | 188 |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | — | — | — | — | 2.87 (J-) | 0.000689 (J) | — | — | — | — | — | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | — | — | — | 1.56 (J-) | 0.000602 (J) | — | — | — | — | — | — |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | — | — | — | — | — | — | — | — | — | 2.35 | — | 80.8 |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | — | — | 0.469 | — | — | — | — | — | — | — | — | 69.4 |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | — | — | 1.68 | — | 2.66 (J-) | 0.00072 (J) | 1.07 (U) | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Magnesium | Manganese | Mercury | Nickel | Nitrate | Perchlorate | Selenium | Silver | Sodium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **1690** | **482** | **0.1** | **6.58** | **na[f]** | **na** | **0.3** | **1** | **2770** | **2.4** | **17** | **63.5** |
| **Sediment BV[a]** | | | | **2370** | **543** | **0.1** | **9.38** | **na** | **na** | **0.3** | **1** | **1470** | **2.22** | **19.7** | **60.2** |
| **Soil BV[a]** | | | | **4610** | **671** | **0.1** | **15.4** | **na** | **na** | **1.52** | **1** | **915** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL[b]** | | | | **5680000** | **160000** | **389** | **25700** | **2080000** | **908** | **6490** | **6490** | **35700000** | **3800** | **6530** | **389000** |
| **Residential SSL[b]** | | | | **339000** | **10500** | **23.5** | **1560** | **125000** | **54.8** | **391** | **391** | **7820000** | **234** | **394** | **23500** |
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | — | — | 1.75 | — | — | — | 1.33 (U) | — | — | — | — | — |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | — | — | 25 | 12.2 (J) | 19.9 (J-) | 0.00905 | 1.13 (U) | 1.5 | — | — | — | 70.6 |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | — | — | 22 | — | 2.91 (J-) | 0.00222 (J) | — | — | — | — | — | 59.6 |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | — | — | 0.421 | — | — | — | — | — | — | — | — | 96.7 |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | — | — | 0.111 | — | — | — | — | — | — | — | — | 50.7 |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | — | — | 2.32 | — | 2.25 (J-) | 0.0107 | 1.09 (U) | — | — | — | — | — |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | — | — | 0.862 | — | — | 0.00347 | 1.36 (U) | — | — | — | — | 126 |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | — | — | 0.146 | — | — | 0.002 (J) | — | — | — | — | — | 51.8 |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | — | — | — | 2.23 | — | — | — | — | — | — | — |
| RE36-10-7479 | 36-610612 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | 2.78 | — | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | — | — | — | — | 1.96 | 0.000724 (J) | — | — | — | 2.43 | — | — |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | — | — | — | 1.7 | 0.000817 (J) | — | — | — | — | — | — |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | — | — | — | — | — | 0.00137 (J) | — | — | — | — | — | — |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | — | — | — | — | — | 0.00173 (J) | — | — | — | 2.21 | — | — |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | — | — | — | — | 6.15 | — | — | — | — | — | — | — |
| RE36-10-7488 | 36-610616 | 2–3 | SOIL | — | — | — | — | 2.67 | 0.000627 (J) | — | — | — | — | — | — |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | — | — | — | 1.45 | — | — | — | — | — | — | — |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | — | — | — | 1.93 | 0.00264 (J) | 1.54 (U) | — | — | 4.12 | — | — |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | — | — | — | 5.34 | 0.00118 (J) | — | — | — | — | — | — |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | — | 893 | 0.186 | — | — | 0.00931 | — | — | — | — | — | — |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | — | — | — | — | — | 0.00604 | — | — | — | — | — | 51.5 |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | — | — | 0.135 | — | 1.81 | 0.00218 (J) | — | — | — | 1.88 | — | — |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | — | — | — | 5.04 | 0.00205 (J) | — | — | — | — | — | — |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | — | — | — | — | 2.91 | — | — | — | — | 2.43 | — | — |
| RE36-10-7498 | 36-610621 | 2–3 | SOIL | — | — | — | — | 1.9 | — | — | — | — | — | — | — |

**Table 9.4-2 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Magnesium | Manganese | Mercury | Nickel | Nitrate | Perchlorate | Selenium | Silver | Sodium | Uranium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV**[a] | | | | **1690** | **482** | **0.1** | **6.58** | **na**[f] | **na** | **0.3** | **1** | **2770** | **2.4** | **17** | **63.5** |
| **Sediment BV**[a] | | | | **2370** | **543** | **0.1** | **9.38** | **na** | **na** | **0.3** | **1** | **1470** | **2.22** | **19.7** | **60.2** |
| **Soil BV**[a] | | | | **4610** | **671** | **0.1** | **15.4** | **na** | **na** | **1.52** | **1** | **915** | **1.82** | **39.6** | **48.8** |
| **Industrial SSL**[b] | | | | **5680000** | **160000** | **389** | **25700** | **2080000** | **908** | **6490** | **6490** | **35700000** | **3800** | **6530** | **389000** |
| **Residential SSL**[b] | | | | **339000** | **10500** | **23.5** | **1560** | **125000** | **54.8** | **391** | **391** | **7820000** | **234** | **394** | **23500** |
| RE36-10-7499 | 36-610622 | 0–0.5 | SOIL | — | — | — | — | 1.55 | — | — | — | — | 3.09 | — | — |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | — | — | — | 2.61 | — | — | — | — | — | — | — |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | — | — | — | — | — | 0.00775 | — | — | — | — | — | — |
| **SWMU C-36-003** | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | 576 | 0.232 | — | 4.43 | 0.000991 (J) | 1.39 (U) | 4.32 | — | 3.89 | — | — |
| RE36-10-8274 | 36-610821 | 2–3 | SOIL | — | — | — | — | 2.43 | 0.000926 (J) | — | 2.96 | — | — | — | — |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | — | — | 0.109 | — | — | — | 1.56 (U) | — | — | 2.26 | — | — |
| RE36-10-8276 | 36-610822 | 2–3 | SED | — | — | — | — | 1.73 | 0.000642 (J) | 1.1 (U) | — | — | — | — | — |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | — | — | — | — | 2.23 | — | 1.34 (U) | — | — | — | — | — |
| RE36-10-8278 | 36-610823 | 2–3 | SED | — | — | — | — | 1.44 | — | 1.04 (U) | — | — | — | — | — |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | — | — | 0.582 | — | 54.1 | 0.027 | — | 348 | — | 5.2 | — | 89.7 (J+) |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | — | 0.815 | — | 20.4 | 0.0216 | — | 338 | — | 5.96 | — | 74.9 (J+) |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | — | — | 0.297 | 53 | 19.9 | 0.0304 | — | 32.4 | — | 2.23 | — | 1320 |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | — | 0.131 | — | 4.07 | 0.00801 | 0.635 (J-) | 85.9 | — | — | — | 235 |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | — | — | 0.366 | — | 540 | 0.688 | — | 215 | 1000 | 5.15 | — | 58.3 |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | — | — | 0.309 | — | 131 | 0.212 | — | 199 | — | 4.36 | — | 49.5 |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | — | — | 0.461 | — | 1.92 | 0.0126 | — | 102 | — | 10.4 | — | 74.2 |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | — | — | 0.254 | — | — | 0.0117 | — | 302 | — | 4.73 | — | 53.2 |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | — | 860 | 0.139 | — | 3.36 | 0.00715 | 1.38 (U) | 6.49 | — | — | — | — |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | — | — | — | 5.08 | 0.0111 | — | 1.03 | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2015, 600915) unless otherwise noted.

[c] SSL for total chromium.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] — = Not detected or not detected above BV.

[f] na = Not available.

**Table 9.4-3**
**Organic Chemicals Detected at SWMUs 36-008 and C-36-003**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acenaphthylene | Acetone | Anthracene | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Benzoic Acid | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Butylbenzylphthalate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **25300[b]** | **960000** | **253000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **323** | **3300000[c]** | **1830** | **30.2** | **12000[c]** |
| **Residential SSL[a]** | | | | **3480** | **1740[b]** | **66300** | **17400** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **15.3** | **250000[c]** | **380** | **6.19** | **2900[c]** |
| **SWMU 36-008** | | | | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | —[d] | — | — | 0.0484 (J) | 0.0151 | 0.0103 | 0.242 | 0.234 | 0.705 | 0.153 (J) | — | — | — | — | — |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | — | — | — | 0.042 (J) | 0.015 | 0.0117 | 0.19 | 0.194 | 0.414 | 0.123 | — | — | — | — | — |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | — | — | — | — | 0.0079 | 0.0057 | 0.0416 (J) | 0.0348 (J) | 0.0772 (J) | — | — | — | — | — | — |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | — | — | — | — | 0.0185 | 0.013 | 0.0272 (J) | 0.0201 (J) | — | — | — | 0.621 (J) | — | — | — |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | 0.765 | 0.0202 (J) | — | 1.49 | 0.191 | 0.116 | 4.03 | 3.7 | 6.62 | 1.79 | — | — | — | — | — |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | 0.0149 (J) | — | — | 0.0248 (J) | 0.0197 | 0.0159 | 0.0898 | 0.0846 | 0.156 | 0.0679 (J) | — | — | 0.231 (J) | — | — |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | — | — | — | — | 0.0054 (J) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | — | — | — | — | 0.0043 | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | — | — | — | — | 0.0048 | — | 0.0171 (J) | — | 0.0174 (J) | — | — | — | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | 0.245 (J) | — | — | — |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | — | — | 0.00474 (J+) | — | 0.0444 | 0.034 | 0.0199 (J) | — | — | — | — | 0.702 (J) | — | — | — |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | — | — | 0.00228 (J) | — | 0.0043 | 0.0031 (J) | — | — | — | — | — | 0.427 (J) | — | — | — |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | — | — | 0.0236 | — | NA[e] | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | 0.0353 (J) | — | — | 0.709 | NA | NA | 6.25 | 6.52 | 17.8 | 2.72 | — | — | — | — | — |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | — | — | 0.171 | NA | NA | 1.61 | 1.51 | 2.53 | 0.623 | — | — | — | — | — |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | — | 0.0095 (J+) | — | NA | NA | — | — | 0.0236 (J) | — | — | — | — | — | — |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.0488 (J) | 0.0371 (J) | 0.074 (J) | — | — | — | — | — | — |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | 3.43 | 0.0638 (J) | — | 5.03 | NA | NA | 11.4 | 10.1 | 19.6 | 4.88 | — | — | 0.436 (J) | — | — |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | 0.563 | — | — | 0.958 | NA | NA | 2.55 | 2.08 | 4.12 | 0.802 | — | — | 0.178 (J) | — | — |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | 0.0613 (J) | — | — | 0.0889 (J) | NA | NA | 0.297 | 0.263 | 0.517 | 0.134 | — | 1.56 (J) | — | — | — |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | — | — | — | NA | NA | 0.0793 (J) | 0.061 (J) | 0.119 | 0.0374 (J) | — | 1.65 (J) | — | — | — |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | — | — | 0.00429 (J+) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | — | — | 0.00332 (J) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | — | — | 0.00261 (J) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | — | — | 0.00474 (J) | 0.0239 (J) | NA | NA | 0.0749 | 0.0845 | 0.128 | 0.0596 (J) | 0.0528 | 0.562 (J) | — | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | — | 0.00358 (J+) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | — | — | 0.00442 (J+) | — | NA | NA | — | — | — | — | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acenaphthylene | Acetone | Anthracene | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Benzoic Acid | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Butylbenzylphthalate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **25300[b]** | **960000** | **253000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **323** | **3300000[c]** | **1830** | **30.2** | **12000[c]** |
| **Residential SSL[a]** | | | | **3480** | **1740[b]** | **66300** | **17400** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **15.3** | **250000[c]** | **380** | **6.19** | **2900[c]** |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | — | — | 0.00328 (J+) | — | NA | NA | 0.027 (J) | — | — | — | — | 0.602 (J) | — | — | — |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | — | — | 0.00286 (J+) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | — | 0.00614 (J+) | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.0521 (J) | 0.0554 (J) | 0.0752 | — | 0.0324 (J) | — | — | — | — |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.036 (J) | 0.0365 (J) | 0.0507 | — | — | 0.627 (J) | — | — | — |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | — | — | — | 0.0204 (J) | NA | NA | 0.072 | 0.0741 | 0.148 | 0.039 (J) | — | 0.615 (J) | — | — | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | — | — | — | NA | NA | 0.0267 (J) | — | 0.0301 (J) | — | — | 0.568 (J) | — | — | — |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.0278 (J) | 0.0247 (J) | 0.0439 | — | — | 0.552 (J) | — | — | — |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | 0.0329 (J) | — | — | 0.0647 | NA | NA | 0.242 | 0.219 | 0.413 | 0.178 (J) | — | — | — | — | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | — | — | 0.0187 (J) | NA | NA | 0.0667 | 0.0577 | 0.108 | 0.055 (J) | — | — | — | — | — |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | 0.0129 (J) | — | — | 0.029 (J) | NA | NA | 0.107 | 0.113 | 0.207 | 0.0818 (J) | — | — | — | — | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | — | — | — | NA | NA | 0.0227 (J) | 0.0209 (J) | 0.0353 (J) | 0.0167 (J) | — | — | — | — | — |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | 1.04 (J-) | 0.0243 (J-) | — | 2.29 (J-) | NA | NA | 5.16 (J-) | 4.87 (J-) | 8.12 (J-) | 2.67 (J-) | — | — | 0.112 (J-) | — | — |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | 0.108 | — | — | 0.205 | NA | NA | 0.604 | 0.559 | 1.01 | 0.36 | — | — | — | — | — |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | 0.0604 | — | — | 0.0213 (J) | NA | NA | 0.078 | 0.0768 | 0.144 | 0.0562 | — | — | — | — | — |
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | — | — | — | — | NA | NA | 0.0269 (J) | 0.0249 (J) | 0.035 (J) | 0.0254 (J) | — | — | — | — | — |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | — | — | — | 0.0127 (J) | NA | NA | 0.0424 | 0.0386 | 0.0719 | 0.0355 (J) | — | — | — | — | — |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | 0.0931 | — | — | 0.158 | NA | NA | 0.237 | 0.208 | 0.325 | 0.161 (J) | — | — | — | — | — |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | 0.556 | — | — | 1.02 | NA | NA | 1.95 | 1.74 | 3.04 | 1.06 (J) | — | — | — | — | — |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | — | — | — | 0.0097 (J) | NA | NA | 0.0348 (J) | 0.0327 (J) | 0.0578 | 0.0268 (J) | — | — | — | — | — |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | — | — | — | — | NA | NA | 0.0153 (J) | 0.0165 (J) | 0.0325 (J) | — | — | — | — | — | — |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | 0.692 | — | — | 1.19 | NA | NA | 2.08 | 1.76 | 2.9 | 1.27 (J) | — | — | — | — | — |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | — | — | — | — | NA | NA | 0.024 (J) | 0.0217 (J) | 0.0402 | 0.0194 (J) | — | — | — | — | — |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.0179 (J) | 0.0136 (J) | 0.0248 (J) | — | — | — | — | — | — |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | — | — | — | NA | NA | 0.0133 (J) | — | 0.0193 (J) | — | — | — | — | — | — |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | 0.12 | — | — | 0.216 | NA | NA | 0.363 | 0.328 | 0.538 | 0.137 (J) | — | — | — | — | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | 0.0646 | — | — | 0.104 | NA | NA | 0.168 | 0.117 | 0.195 | 0.0545 (J) | — | — | — | — | — |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | 0.214 (J) |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | — | — | — | — | NA | NA | 0.0139 (J) | — | 0.0145 (J) | — | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Acenaphthene | Acenaphthylene | Acetone | Anthracene | Aroclor-1254 | Aroclor-1260 | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Benzoic Acid | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Butylbenzylphthalate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **50500** | **25300[b]** | **960000** | **253000** | **11.5** | **11.5** | **32.3** | **3.23** | **32.3** | **25300[b]** | **323** | **3300000[c]** | **1830** | **30.2** | **12000[c]** |
| **Residential SSL[a]** | | | | **3480** | **1740[b]** | **66300** | **17400** | **1.14** | **2.43** | **1.53** | **0.153** | **1.53** | **1740[b]** | **15.3** | **250000[c]** | **380** | **6.19** | **2900[c]** |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | — | — | — | — | NA | NA | 0.0144 (J) | — | 0.0173 (J) | — | — | — | — | — | — |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | 0.0173 (J) | 0.0232 (J) | 0.0234 (J) | — | — | — | — | — |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | 0.0221 (J) | 0.0327 (J) | — | — | — | — | — | — |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | 0.604 | — | — |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | — | — | — | NA | NA | — | — | — | — | — | — | — | — | — |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | — | — | 0.0394 | — | NA | NA | — | — | — | — | — | — | — | — | — |
| **SWMU C-36-003** | | | | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | — | — | — | 0.00442 (J) | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8278 | 36-610823 | 2–3 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | 0.0965 (J) | — | — | 0.294 | 0.0315 | 0.0176 | 2.03 | 2.24 | 4.17 | 1.29 | — | — | — | — | — |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | — | — | 0.133 (J) | 0.0655 | 0.0369 | 0.971 | 1.15 | 2.31 | 0.682 | — | — | — | — | — |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | — | — | — | — | 1.03 | 0.617 | — | 0.792 (J) | 1.7 (J) | — | — | — | — | 0.00117 (J+) | — |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | 0.0912 (J) | — | — | 0.277 | 0.0678 | 0.0473 | 1.55 | 1.57 | 3 | 0.71 | — | — | — | — | — |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | 0.0725 (J) | — | — | 0.191 | 0.0641 | 0.043 | 0.988 | 1.08 | 1.96 | 0.525 | — | — | — | — | — |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | 0.244 | — | — | 0.787 | 0.137 | 0.101 | 4.68 | 5.94 | 13 | 3.13 | — | — | — | — | — |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | 0.0145 (J) | — | — | 0.0304 (J) | 0.0791 | 0.0556 | 0.171 | 0.22 | 0.49 | 0.126 | — | — | — | — | — |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | 0.355 (J) | — | — | — |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Chlorodibromomethane | Chloroform | Chloromethane | Chloronaphthalene[2-] | Chlorotoluene[4-] | Chrysene | Dibenz(a,h)anthracene | Dibenzofuran | Dichloroethene[1,1-] | Di-n-butylphthalate | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **67.4** | **28.7** | **201** | **104000** | **23000** | **3230** | **3.23** | **1000[c]** | **2260** | **91600** | **33700** | **33700** | **32.3** | **14200[f]** |
| **Residential SSL[a]** | | | | **13.9** | **5.9** | **41.1** | **6260** | **1600** | **153** | **0.153** | **73[c]** | **440** | **6160** | **2320** | **2320** | **32.31.53** | **2360[f]** |
| **SWMU 36-008** | | | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | — | — | — | — | — | 0.267 | — | — | — | — | 0.411 | — | 0.157 | — |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | — | — | — | — | — | 0.208 | — | — | — | — | 0.362 | — | 0.117 | — |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | — | — | — | — | — | 0.0337 (J) | — | — | — | — | 0.0497 (J) | — | — | — |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | — | — | — | — | — | 0.0214 (J) | — | — | — | — | 0.0448 | — | — | — |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | — | — | — | — | — | 4.24 | 0.669 | 0.481 | — | 0.185 (J) | 10 | 0.764 | 1.85 | — |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | — | — | — | — | — | 0.0935 | 0.0253 (J) | — | — | — | 0.216 | 0.0136 (J) | 0.0635 | — |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.026 (J-) |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00101 (J-) |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00161 |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.0258 (J) | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | — | — | — | — | — | 0.02 (J) | — | — | — | 0.168 (J) | 0.0357 (J) | — | — | — |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.000846 (J) | — | — | — | — | 0.0696 |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | — | — | — | — | — | 6.76 | — | — | — | — | 8.25 | 0.0605 (J) | 2.73 | — |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | — | — | — | — | 1.48 | — | — | — | — | 2.02 | — | 0.628 | 0.00364 |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.000495 (J+) | — | 0.0281 (J) | — | — | — |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | — | — | — | — | — | 0.0394 (J) | — | — | — | — | 0.0749 (J) | — | — | — |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | — | — | — | — | — | 12.3 | — | 2.94 | — | 0.377 (J) | 79.8 | 4 | 4.65 | — |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | — | — | — | — | — | 2.35 | — | 0.404 (J) | — | 0.193 (J) | 5.88 | 0.627 | 0.81 | — |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | — | — | — | — | — | 0.29 | — | — | — | 0.403 (J) | 0.617 | 0.0507 (J) | 0.13 | — |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | — | — | — | — | 0.0653 (J) | — | — | — | — | 0.149 | — | 0.0337 (J) | — |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00208 (J+) |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | — | — | — | — | 0.000496 (J) | — | — | — | — | — | — | — | — | 0.00261 |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | — | — | — | — | — | 0.0297 (J) | — | — | — | — | 0.0545 | — | — | — |
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00187 |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | — | — | — | — | — | 0.115 | — | — | — | — | 0.241 | 0.014 (J) | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.027 (J) | — | — | 0.00233 (J+) |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | — | — | — | — | — | 0.0324 (J) | — | — | — | — | 0.0673 | — | — | 0.000451 (J+) |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Chlorodibromomethane | Chloroform | Chloromethane | Chloronaphthalene[2-] | Chlorotoluene[4-] | Chrysene | Dibenz(a,h)anthracene | Dibenzofuran | Dichloroethene[1,1-] | Di-n-butylphthalate | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **67.4** | **28.7** | **201** | **104000** | **23000** | **3230** | **3.23** | **1000[c]** | **2260** | **91600** | **33700** | **33700** | **32.3** | **14200[f]** |
| **Residential SSL[a]** | | | | **13.9** | **5.9** | **41.1** | **6260** | **1600** | **153** | **0.153** | **73[c]** | **440** | **6160** | **2320** | **2320** | **32.31.53** | **2360[f]** |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | — | — | — | — | — | 0.0288 (J) | — | — | — | — | 0.0574 | — | — | — |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.00246 (J+) | — | — | — | — | 0.00338 (J+) |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0128 (J+) |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | — | — | — | — | — | 0.0636 | — | — | — | — | 0.146 | — | 0.0313 (J) | 0.00185 |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | — | — | — | — | — | 0.0477 | — | — | — | — | 0.0903 | — | — | — |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00067 (J) |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | — | — | — | — | — | 0.0899 | — | — | — | — | 0.181 | 0.013 (J) | 0.042 (J) | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | — | — | — | — | 0.0264 (J) | — | — | — | — | 0.0527 | — | — | 0.00264 |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | — | — | — | — | — | 0.0368 (J) | — | — | — | — | 0.0634 | — | — | 0.00101 (J+) |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000575 (J) |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | — | — | — | — | — | 0.264 | 0.0651 | — | — | — | 0.539 | 0.0297 (J) | 0.164 | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | — | — | — | — | 0.0764 | — | — | — | — | 0.166 | — | 0.0451 | — |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | — | — | — | — | — | 0.128 | 0.031 (J) | — | — | — | 0.249 | 0.0136 (J) | 0.0715 | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | — | — | — | — | 0.026 (J) | — | — | — | — | 0.0489 | — | 0.0136 (J) | — |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | — | — | — | — | — | 5.63 (J-) | 0.943 (J-) | 0.665 (J-) | — | — | 13.6 (J-) | 1.04 (J-) | 2.63 (J-) | 0.000399 (J) |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | — | — | — | — | — | 0.681 | 0.122 | — | — | — | 1.44 | 0.102 | 0.336 | — |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | — | — | — | — | — | 0.0868 | 0.0187 (J) | — | — | 0.0913 (J) | 0.17 | — | 0.0506 | — |
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | — | — | — | — | — | 0.0295 (J) | — | — | — | — | 0.0488 | — | 0.0226 (J) | 0.00294 |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | — | — | — | — | — | 0.05 | 0.0123 (J) | — | — | 0.211 (J) | 0.105 | — | 0.0311 (J) | — |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | — | — | — | — | — | 0.255 | 0.0514 | — | — | — | 0.614 | 0.112 | 0.146 | — |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | — | — | — | — | — | 2.11 | 0.354 | 0.341 (J) | — | — | 4.74 | 0.637 | 1.01 | 0.000484 (J) |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | — | — | — | — | — | 0.0366 (J) | — | — | — | — | 0.0849 | — | 0.023 (J) | — |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | — | — | — | — | — | 0.0148 (J) | — | — | — | — | 0.0206 (J) | — | — | — |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | — | — | — | — | — | 2.26 | — | 0.529 | — | — | 5.47 | 0.843 | 1.2 | — |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | — | — | — | — | — | 0.0251 (J) | — | — | — | — | 0.0505 | — | 0.0159 (J) | — |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | — | — | — | — | — | 0.0167 (J) | — | — | — | — | 0.0297 (J) | — | — | 0.00093 (J) |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | — | — | — | — | 0.0158 (J) | — | — | — | — | 0.0217 (J) | — | — | — |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | — | — | 0.0215 (J) | — | — | — | — | — | — | — | — | — | 0.00091 (J+) |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | — | — | — | — | — | 0.407 | — | — | — | — | 0.962 | 0.131 | 0.131 | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | — | — | — | — | — | 0.146 | — | — | — | — | 0.399 | 0.0842 | 0.0492 | 0.0656 (J-) |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0893 (J+) |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00342 (J+) |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.017 (J) | — | — | 0.00235 (J+) |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | — | — | — | — | — | 0.013 (J) | — | — | — | — | 0.0212 (J) | — | — | — |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00232 (J-) |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Chlorodibromomethane | Chloroform | Chloromethane | Chloronaphthalene[2-] | Chlorotoluene[4-] | Chrysene | Dibenz(a,h)anthracene | Dibenzofuran | Dichloroethene[1,1-] | Di-n-butylphthalate | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Isopropyltoluene[4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL**[a] | | | | **67.4** | **28.7** | **201** | **104000** | **23000** | **3230** | **3.23** | **1000**[c] | **2260** | **91600** | **33700** | **33700** | **32.3** | **14200**[f] |
| **Residential SSL**[a] | | | | **13.9** | **5.9** | **41.1** | **6260** | **1600** | **153** | **0.153** | **73**[c] | **440** | **6160** | **2320** | **2320** | **32.31.53** | **2360**[f] |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0561 (J+) |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00666 |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | — | 0.000633 (J+) | — | — | — | — | — | — | — | 0.018 (J) | — | — | — |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | — | — | — | — | — | 0.0337 (J) | 0.0169 (J) | — | — | — | 0.0359 (J) | — | 0.0197 (J) | — |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.0383 (J) | — | — | 0.000591 (J+) |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.0152 (J) | — | — | — |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.000711 (J) | — | — | — | — | 0.00117 (J) |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0246 |
| **SWMU C-36-003** | | | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | 0.0183 (J) | — | — | 0.00235 (J+) |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0101 (J+) |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0124 (J+) |
| RE36-10-8278 | 36-610823 | 2–3 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00105 (J+) |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | — | — | — | — | — | 2.18 | — | — | — | 0.441 (J) | 3.34 | 0.0928 (J) | 1.21 | — |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | — | — | — | — | 1.21 | — | — | — | — | 1.63 | — | 0.641 | — |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | 0.000635 (J+) | 0.00982 (J+) | — | — | — | 0.888 (J) | — | — | — | 8.07 (J) | 1.2 (J) | — | — | 0.000453 (J+) |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | 0.00052 (J) | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | — | — | — | — | — | 1.62 | — | — | — | 0.547 (J) | 2.77 | 0.0957 (J) | 0.695 | 0.00236 (J-) |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | — | — | — | — | — | 1.2 | — | — | — | 0.739 (J) | 2.04 | 0.0719 (J) | 0.502 | 0.0101 (J-) |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | — | — | — | — | — | 5.7 | — | — | — | 1.24 (J) | 7.63 | 0.253 | 3.01 | — |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | — | — | — | — | — | 0.269 | — | — | — | 0.258 (J) | 0.425 | 0.0134 (J) | 0.111 | — |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00731 (J) |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Methylene Chloride | Methylnaphthalene[2-] | Naphthalene | Phenanthrene | Pyrene | RDX | Styrene | TATB | Toluene | Trichloroethene | Trimethylbenzene[1,2,4-] | Trimethylbenzene[1,3,5-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **5130** | **3000[c]** | **241** | **25300** | **25300** | **311** | **51300** | **32000[c,g]** | **61300** | **36.5** | **240[c]** | **12000[c]** | **3940** | **4280[h]** |
| **Residential SSL[a]** | | | | **409** | **240[c]** | **49.7** | **1740** | **1740** | **60.4** | **7260** | **2200[c,g]** | **5230** | **6.77** | **58[c]** | **780[c]** | **805** | **871[h]** |
| **SWMU 36-008** | | | | | | | | | | | | | | | | | |
| RE36-10-7403 | 36-610574 | 0–0.5 | SOIL | — | — | — | 0.265 | 0.412 | — | — | — | — | — | — | — | — | — |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | — | — | — | 0.252 | 0.379 | — | — | — | — | — | — | — | — | — |
| RE36-10-7405 | 36-610575 | 0–0.5 | SOIL | 0.00297 (J) | — | — | 0.0272 (J) | 0.0508 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7406 | 36-610575 | 2–2.5 | SOIL | — | — | — | — | — | — | — | — | 0.000437 (J) | — | — | — | — | — |
| RE36-10-7407 | 36-610576 | 0–0.5 | SOIL | — | — | — | 0.0273 (J) | 0.0357 (J) | — | — | — | — | 0.000661 (J+) | 0.000454 (J+) | — | — | 0.000454 (J+) |
| RE36-10-7413 | 36-610579 | 0–0.5 | FILL | — | 0.158 | 0.26 | 8.64 | 7.76 | — | — | 0.331 (J) | 0.000455 (J) | — | — | — | — | — |
| RE36-10-7414 | 36-610579 | 2–3 | QBT3 | — | — | — | 0.16 | 0.202 | — | — | — | — | — | — | — | — | — |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.00351 (J-) | — | — | — | — | — |
| RE36-10-7417 | 36-610581 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7419 | 36-610582 | 0–0.5 | SOIL | — | — | — | 0.0163 (J) | 0.0212 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-7421 | 36-610583 | 0–0.5 | SOIL | — | — | — | 0.0225 (J) | 0.036 (J) | — | — | — | — | 0.000905 (J+) | — | — | — | — |
| RE36-10-7422 | 36-610583 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.000414 (J) |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | — | — | — | — | — | — | 0.00197 (J) | — | 0.00552 | — | — | — | — | 0.00072 (J) |
| RE36-10-7425 | 36-610585 | 0–1 | SOIL | — | 0.0235 (J) | 0.0661 (J) | 1.17 | 19.1 | — | — | — | — | — | — | — | — | — |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | — | — | 0.278 | 2.71 | — | — | — | — | — | — | 0.00569 | — | — |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | — | — | 0.0179 (J) | 0.0315 (J) | — | — | — | 0.000763 (J+) | — | — | — | — | — |
| RE36-10-7429 | 36-610587 | 0–0.5 | SOIL | — | — | — | 0.0524 (J) | 0.0775 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | 0.00268 (J) | 1.3 | 2.67 | 85.7 | 75.6 | — | — | — | — | — | — | — | — | — |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | — | 0.153 | 0.277 | 5.58 | 5.34 | — | — | — | — | — | — | — | — | — |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | — | — | — | 0.522 | 0.737 | — | — | — | — | — | — | — | — | — |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | — | — | 0.118 | 0.145 | — | — | — | — | — | — | — | — | — |
| RE36-10-7435 | 36-610590 | 0–0.5 | SED | — | — | — | — | — | — | — | — | 0.000816 (J+) | 0.000701 (J+) | — | — | 0.000616 (J+) | — |
| RE36-10-7436 | 36-610590 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000559 (J) | — | — | — | — | — |
| RE36-10-7437 | 36-610591 | 0–0.5 | SED | — | — | — | 0.0351 (J) | 0.0489 | — | — | — | — | — | — | — | — | — |
| RE36-10-7438 | 36-610591 | 2–3 | QBT3 | — | — | — | — | — | — | — | — | 0.00109 | — | — | — | — | — |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | — | — | — | 0.178 | 0.226 | — | — | — | — | — | — | — | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | — | — | 0.0154 (J) | 0.0223 (J) | — | — | — | 0.00371 (J+) | — | — | — | — | 0.00037 (J+) |
| RE36-10-7441 | 36-610593 | 0–0.5 | SOIL | — | — | — | 0.0458 | 0.0585 | — | — | — | — | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Methylene Chloride | Methylnaphthalene[2-] | Naphthalene | Phenanthrene | Pyrene | RDX | Styrene | TATB | Toluene | Trichloroethene | Trimethylbenzene[1,2,4-] | Trimethylbenzene[1,3,5-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **5130** | **3000[c]** | **241** | **25300** | **25300** | **311** | **51300** | **32000[c,g]** | **61300** | **36.5** | **240[c]** | **12000[c]** | **3940** | **4280[h]** |
| **Residential SSL[a]** | | | | **409** | **240[c]** | **49.7** | **1740** | **1740** | **60.4** | **7260** | **2200[c,g]** | **5230** | **6.77** | **58[c]** | **780[c]** | **805** | **871[h]** |
| RE36-10-7445 | 36-610595 | 0–0.5 | SOIL | — | — | — | 0.0322 (J) | 0.0438 (J) | — | — | — | — | 0.000632 (J+) | — | — | — | 0.00043 (J+) |
| RE36-10-7451 | 36-610598 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.0032 (J+) | — | — | — | — | 0.000792 (J+) |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.015 (J+) | — | — | — | — | — |
| RE36-10-7453 | 36-610599 | 0–0.5 | SOIL | — | — | — | 0.089 | 0.107 | — | — | — | — | — | — | — | — | — |
| RE36-10-7455 | 36-610600 | 0–0.5 | SOIL | — | — | — | 0.0537 | 0.0754 | — | — | — | — | — | — | — | — | — |
| RE36-10-7456 | 36-610600 | 1–2 | QBT2 | — | — | — | — | — | — | — | — | 0.0008 (J) | — | 0.000454 (J) | — | — | 0.00053 (J) |
| RE36-10-7457 | 36-610601 | 0–0.5 | SOIL | — | — | — | 0.126 | 0.161 | — | — | — | — | — | — | — | — | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | — | — | 0.0344 (J) | 0.0427 | — | — | — | — | — | — | — | — | — |
| RE36-10-7459 | 36-610602 | 0–0.5 | SOIL | — | — | — | 0.0369 (J) | 0.0517 | — | — | — | — | — | — | — | — | — |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | — | — | — | — | — | — | — | 0.000442 (J) | — | — | — | — | 0.000343 (J) |
| RE36-10-7461 | 36-610603 | 0–0.5 | FILL | — | — | — | 0.41 | 0.51 | — | — | 0.303 (J) | — | — | — | — | — | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | — | — | 0.107 | 0.129 | — | — | — | — | — | — | — | — | — |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | — | — | — | 0.172 | 0.222 | — | — | — | — | — | — | — | — | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | — | — | 0.0314 (J) | 0.0408 | — | — | — | — | — | — | — | — | — |
| RE36-10-7465 | 36-610605 | 0–0.5 | FILL | — | 0.207 (J-) | 0.357 (J-) | 12.1 (J-) | 9.79 (J-) | — | — | — | 0.000489 (J) | — | — | — | — | 0.000437 (J) |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | — | 0.0202 (J) | 0.0315 (J) | 1.35 | 1.36 | — | — | — | — | — | — | — | — | — |
| RE36-10-7467 | 36-610606 | 0–0.5 | SED | 0.00462 (J) | — | — | 0.136 | 0.157 | — | — | — | — | — | — | — | — | — |
| RE36-10-7468 | 36-610606 | 2–2.9 | SED | — | — | — | 0.028 (J) | 0.0372 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | — | — | — | 0.0829 | 0.0854 | — | — | — | — | — | — | — | — | — |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | — | 0.0227 (J) | 0.037 (J) | 0.762 | 0.453 | — | — | — | — | — | — | — | — | — |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | — | 0.115 | 0.164 | 4.93 | 3.98 | — | — | — | 0.000869 (J) | — | 0.00499 | 0.00279 | — | — |
| RE36-10-7472 | 36-610608 | 2–3 | FILL | — | — | — | 0.0594 | 0.0686 | — | — | — | — | — | — | — | — | — |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | 0.00573 (J) | — | — | — | 0.0206 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7475 | 36-610610 | 0–0.5 | SED | — | 0.203 | 0.41 | 6.15 | 3.68 | — | — | — | — | — | — | — | — | — |
| RE36-10-7476 | 36-610610 | 2–3 | SOIL | — | — | — | 0.0299 (J) | 0.0404 | — | — | — | — | — | — | — | — | — |
| RE36-10-7477 | 36-610611 | 0–0.5 | SOIL | — | — | — | 0.0154 (J) | 0.0279 (J) | — | — | — | — | — | 0.000406 (J) | — | — | — |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | — | — | 0.0117 (J) | 0.024 (J) | — | — | — | — | — | — | — | 0.000366 (J+) | 0.000543 (J+) |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000626 (J+) | 0.000501 (J+) | — | — | — | — |
| RE36-10-7481 | 36-610613 | 0–0.5 | SOIL | — | 0.0324 (J) | 0.0815 | 0.919 | 0.829 | — | — | — | 0.00161 (J+) | — | — | — | — | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | — | 0.0178 (J) | 0.0396 (J) | 0.48 | 0.345 | — | — | — | 0.00155 (J-) | — | — | — | — | — |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | 0.00357 (J+) | — | — | — | 0.0134 (J) | — | — | — | 0.00524 (J+) | 0.000605 (J+) | — | — | 0.000513 (J+) | 0.00096 (J+) |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000412 (J+) | — | — | — | — | — |
| RE36-10-7485 | 36-610615 | 0–0.5 | SOIL | — | — | — | — | 0.0169 (J) | — | — | — | 0.000707 (J+) | — | — | — | — | — |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | 0.0026 (J-) | — | — | 0.013 (J) | 0.02 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7487 | 36-610616 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.00199 (J-) | — | — | — | — | — |

**Table 9.4-3 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Methylene Chloride | Methylnaphthalene[2-] | Naphthalene | Phenanthrene | Pyrene | RDX | Styrene | TATB | Toluene | Trichloroethene | Trimethylbenzene[1,2,4-] | Trimethylbenzene[1,3,5-] | Xylene[1,2-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Industrial SSL[a]** | | | | **5130** | **3000[c]** | **241** | **25300** | **25300** | **311** | **51300** | **32000[c,g]** | **61300** | **36.5** | **240[c]** | **12000[c]** | **3940** | **4280[h]** |
| **Residential SSL[a]** | | | | **409** | **240[c]** | **49.7** | **1740** | **1740** | **60.4** | **7260** | **2200[c,g]** | **5230** | **6.77** | **58[c]** | **780[c]** | **805** | **871[h]** |
| RE36-10-7489 | 36-610617 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.00106 (J+) | — | — | — | — | — |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.00159 | — | — | — | — | — |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | — | — | — | 0.016 (J) | — | — | — | 0.000494 (J+) | — | — | — | — | — |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000418 (J) | — | 0.000862 (J) | — | 0.000393 (J) | 0.000774 (J) |
| RE36-10-7493 | 36-610619 | 0–0.5 | SOIL | — | — | — | 0.112 | 0.0298 (J) | — | — | — | — | — | — | — | — | — |
| RE36-10-7494 | 36-610619 | 2–3 | SOIL | — | — | — | — | — | — | — | — | — | — | 0.000388 (J) | — | — | 0.000548 (J) |
| RE36-10-7495 | 36-610620 | 0–0.5 | SOIL | — | — | — | 0.114 | 0.0403 (J) | — | — | — | 0.00106 (J+) | — | — | — | — | 0.000523 (J+) |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | — | — | — | 0.0126 (J) | — | — | — | 0.000599 (J) | — | — | — | — | — |
| RE36-10-7497 | 36-610621 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.000874 (J) | — | — | — | — | — |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000537 (J) | 0.000448 (J) | — | — | — | — |
| RE36-10-7501 | 36-610623 | 0–0.5 | SOIL | — | — | — | — | — | — | — | — | 0.00184 | — | — | — | — | — |
| **SWMU C-36-003** | | | | | | | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | — | — | — | 0.0156 (J) | — | — | — | 0.001 (J+) | — | — | — | — | — |
| RE36-10-8275 | 36-610822 | 0–0.5 | SED | — | — | — | — | — | — | — | — | 0.00135 (J+) | — | — | — | — | — |
| RE36-10-8277 | 36-610823 | 0–0.5 | SED | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8278 | 36-610823 | 2–3 | SED | — | — | — | — | — | — | — | — | 0.000331 (J+) | — | — | — | — | — |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | — | — | — | 1.35 | 3.31 | — | — | — | 0.000334 (J+) | — | — | — | — | — |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | — | — | 0.608 | 1.57 | — | — | — | 0.000398 (J+) | — | — | — | — | — |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | 0.00378 (J+) | — | — | 0.879 (J) | 1.44 (J) | 0.106 (J) | — | — | 0.000524 (J+) | — | — | — | — | — |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | 0.00315 (J-) | — | — | 1.33 | 2.83 | — | — | — | 0.00113 (J-) | — | 0.001 (J-) | — | — | 0.000822 (J-) |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | — | — | — | 0.988 | 1.88 | — | — | — | 0.000476 (J-) | — | — | — | — | — |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | — | — | — | 3.59 | 9.03 | — | — | — | — | — | — | — | — | — |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | — | — | — | 0.212 | 0.425 | — | — | — | 0.000422 (J-) | — | — | — | — | — |
| RE36-10-8287 | 36-610828 | 0–0.5 | SED | — | — | — | — | — | — | — | — | 0.00113 (J) | — | — | — | — | — |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | — | — | — | — | — | — | — | 0.000455 (J+) | — | — | — | — | — |

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as a surrogate based on structural similarity.

[g] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[h] Xylenes used as a surrogate based on structural similarity.

**Table 9.4-4**
**Radionuclides Detected or Detected above BVs/FVs at SWMUs 36-008 and C-36-003**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-238 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.006** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013** | **1.65** | **0.023** | **0.054** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[c]** | | | | **1000** | **41** | **1300** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[c]** | | | | **83** | **12** | **84** | **79** | **1700** | **290** | **42** | **150** |
| **SWMU 36-008** | | | | | | | | | | | |
| RE36-10-7404 | 36-610574 | 2–2.5 | SOIL | —[d] | 0.362 | — | — | — | — | — | — |
| RE36-10-7415 | 36-610580 | 0–0.5 | SOIL | 0.0246 | — | — | — | — | — | — | — |
| RE36-10-7416 | 36-610580 | 2–3 | SOIL | — | 0.0773 | — | — | — | — | — | — |
| RE36-10-7418 | 36-610581 | 2–3 | SOIL | — | 0.39 | — | — | — | — | — | — |
| RE36-10-7420 | 36-610582 | 2–3 | SOIL | — | 0.207 | — | — | — | — | — | — |
| RE36-10-7423 | 36-610584 | 0–0.5 | SOIL | 0.0318 | 3.31 | — | 0.0895 | — | — | — | 3.27 |
| RE36-10-7426 | 36-610585 | 2–3 | SOIL | — | 0.166 | — | — | — | — | — | — |
| RE36-10-7427 | 36-610586 | 0–0.5 | SOIL | — | — | — | 0.087 | — | — | — | — |
| RE36-10-7431 | 36-610588 | 0–0.5 | SOIL | — | — | — | — | 0.97974 | 4.3 | — | 5.17 |
| RE36-10-7432 | 36-610588 | 2–2.5 | SOIL | — | 0.228 | — | — | — | — | — | — |
| RE36-10-7433 | 36-610589 | 0–0.5 | SOIL | — | — | — | 0.0953 | — | — | — | — |
| RE36-10-7434 | 36-610589 | 1–2 | SOIL | — | 0.31 | — | — | — | — | — | — |
| RE36-10-7439 | 36-610592 | 0–0.5 | SOIL | 0.0169 | — | — | — | — | — | — | — |
| RE36-10-7440 | 36-610592 | 2–3 | SOIL | — | 0.0793 | — | — | — | — | — | — |
| RE36-10-7442 | 36-610593 | 2–3 | SOIL | — | 0.193 | — | — | — | — | — | — |
| RE36-10-7443 | 36-610594 | 0–0.5 | SOIL | 0.0171 | — | — | — | — | — | — | — |
| RE36-10-7444 | 36-610594 | 2–3 | SOIL | — | 0.383 | — | — | — | — | — | — |
| RE36-10-7448 | 36-610596 | 2–3 | SOIL | — | 0.312 | — | — | — | — | — | — |
| RE36-10-7452 | 36-610598 | 2–3 | SOIL | — | 0.733 | — | 0.0258 | — | — | — | — |
| RE36-10-7458 | 36-610601 | 2–3 | SOIL | — | 0.156 | — | — | — | — | — | — |
| RE36-10-7460 | 36-610602 | 1.5–2.6 | QBT2 | — | 0.0986 | — | — | — | — | — | — |
| RE36-10-7462 | 36-610603 | 2–3 | SOIL | — | 0.139 | — | — | — | — | — | — |
| RE36-10-7463 | 36-610604 | 0–0.5 | SOIL | — | — | — | 0.0633 | 0.0125553 | — | — | — |
| RE36-10-7464 | 36-610604 | 2–3 | SOIL | — | — | — | — | 0.00940506 | — | — | — |
| RE36-10-7466 | 36-610605 | 2–3 | FILL | — | 0.157 | — | — | — | — | — | 2.49 |
| RE36-10-7469 | 36-610607 | 0–0.5 | SED | 0.0465 | 1.14 | — | — | — | — | — | — |
| RE36-10-7470 | 36-610607 | 2–3 | SOIL | — | 0.469 | — | — | 0.0346542 | — | — | — |
| RE36-10-7471 | 36-610608 | 0–0.8 | FILL | — | — | — | — | 0.0517892 | — | — | — |
| RE36-10-7473 | 36-610609 | 0–0.5 | SED | — | 1.17 | — | — | — | — | — | — |

**Table 9.4-4 (continued)**

| Sample ID | Location ID | Depth (ft) | Media | Americium-241 | Cesium-137 | Plutonium-238 | Plutonium-239/240 | Tritium | Uranium-234 | Uranium-235/236 | Uranium-238 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qbt 2,3,4 BV[a]** | | | | **na[b]** | **na** | **na** | **na** | **na** | **1.98** | **0.09** | **1.93** |
| **Sediment BV[a]** | | | | **0.04** | **0.9** | **0.006** | **0.068** | **0.093** | **2.59** | **0.2** | **2.29** |
| **Soil BV[a]** | | | | **0.013[c]** | **1.65[c]** | **0.023[c]** | **0.054[c]** | **na** | **2.59** | **0.2** | **2.29** |
| **Industrial SAL[d]** | | | | **1000** | **41** | **1300** | **1200** | **2400000** | **3100** | **160** | **710** |
| **Residential SAL[d]** | | | | **83** | **12** | **84** | **79** | **1700** | **290** | **42** | **150** |
| RE36-10-7478 | 36-610611 | 2–3 | SOIL | — | 0.161 | — | — | — | — | — | — |
| RE36-10-7480 | 36-610612 | 2–3 | SOIL | — | 0.103 | — | — | — | — | — | — |
| RE36-10-7482 | 36-610613 | 2–3 | SOIL | — | 0.296 | — | — | — | — | — | — |
| RE36-10-7483 | 36-610614 | 0–0.5 | SOIL | 0.0189 | — | — | — | — | — | — | — |
| RE36-10-7484 | 36-610614 | 2–3 | SOIL | — | 0.553 | — | — | — | — | — | — |
| RE36-10-7486 | 36-610615 | 2–3 | SOIL | — | 0.663 | — | 0.0262 | — | — | — | — |
| RE36-10-7490 | 36-610617 | 2–3 | SOIL | — | 0.148 | — | — | — | — | — | — |
| RE36-10-7491 | 36-610618 | 0–0.5 | SOIL | — | — | — | 0.0829 | — | — | — | 2.68 |
| RE36-10-7492 | 36-610618 | 2–3 | SOIL | — | 0.629 | — | — | — | — | — | — |
| RE36-10-7496 | 36-610620 | 2–3 | SOIL | — | 0.415 | — | 0.031 | — | — | — | — |
| RE36-10-7500 | 36-610622 | 2–3 | SOIL | — | 0.516 | — | 0.0263 | — | — | — | — |
| **SWMU C-36-003** | | | | | | | | | | | |
| RE36-10-8273 | 36-610821 | 0–0.5 | SED | — | 2.02 | — | 0.0762 | — | — | — | — |
| RE36-10-8274 | 36-610821 | 2–3 | SOIL | — | 0.379 | — | — | — | — | — | — |
| RE36-10-8276 | 36-610822 | 2–3 | SED | — | — | 0.026 | — | — | — | — | — |
| RE36-10-8279 | 36-610824 | 0–0.5 | SOIL | — | — | — | — | — | 3.43 (J+) | — | 3.24 (J+) |
| RE36-10-8280 | 36-610824 | 2–3 | SOIL | — | 0.614 | — | — | — | 3.49 (J+) | — | 3.01 (J+) |
| RE36-10-8281 | 36-610825 | 0–1 | SOIL | — | — | — | — | 0.0913562 | — | — | — |
| RE36-10-8282 | 36-610825 | 2–2.5 | QBT3 | — | — | — | — | 0.15437 | — | 0.122 | — |
| RE36-10-8283 | 36-610826 | 0–0.5 | SOIL | — | — | — | — | 0.0241377 | 4.43 | — | 3.72 |
| RE36-10-8284 | 36-610826 | 2–3 | SOIL | — | 0.326 | — | — | 0.0277619 | 3.72 | — | 2.88 |
| RE36-10-8285 | 36-610827 | 0–0.5 | SOIL | — | — | — | — | 0.0812778 | 6.1 | 0.278 | 4.51 |
| RE36-10-8286 | 36-610827 | 2–3 | SOIL | — | 0.143 | — | — | — | 3.21 | — | 2.62 |
| RE36-10-8288 | 36-610828 | 2–3 | SOIL | — | 0.166 | — | — | — | — | — | — |

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

**Table 11.1-1**
**Summary of Investigation Results and Recommendations**

| SWMU/AOC | Brief Description | Extent Defined or No Further Sampling Warranted? | Potential Unacceptable Risk/Dose? | Recommendation |
|---|---|---|---|---|
| **Former TA-12** | | | | |
| SWMU 12-001(a) | Firing pit steel-lined chamber | Yes | No | Complete without controls |
| SWMU 12-001(b) | Former firing pit | Yes | No | Complete without controls |
| SWMU 12-002 | Potential soil contamination | Yes | No | Complete without controls |
| AOC 12-004(a) | Radiation test site | Yes | No | Complete without controls |
| AOC 12-004(b) | Pipe | Yes | No | Complete without controls |
| AOC C-12-001 | Potential soil contamination associated with former building | Yes | No | Complete without controls |
| AOC C-12-002 | Potential soil contamination associated with former building | Yes | No | Complete without controls |
| AOC C-12-003 | Potential soil contamination associated with former building | Yes | No | Complete without controls |
| AOC C-12-004 | Potential soil contamination associated with former building | Yes | No | Complete without controls |
| AOC C-12-005 | Potential soil contamination associated with former junction box | Yes | No | Complete without controls |
| **TA-14** | | | | |
| AOC C-14-006 | Potential soil contamination associated with former building | Yes | No | Complete without controls |
| **TA-15** | | | | |
| AOC 15-005(c) | Container storage area (R-41) | Yes | No | Complete without controls |
| SWMU 15-007(c) | Shaft | No | Yes (industrial and residential) | Soil removal, additional extent sampling |
| SWMU 15-007(d) | Shaft | Yes | No | Complete without controls |
| SWMU 15-008(b) | Surface disposal area | No | Yes (industrial, residential, and ecological) | Soil removal, additional extent sampling |
| AOC 15-008(g) | Surface disposal area | No | No | Additional extent sampling and sampling to replace rejected data |
| SWMU 15-009(b) | Septic system | No | Yes (residential) | Additional extent sampling |
| SWMU 15-009(c) | Septic system | Yes | No | Complete without controls |
| SWMU 15-009(h) | Septic system | Yes | No | Complete without controls |
| SWMU 15-010(b) | Settling tank | No | No | Sampling at locations not sampled during 2009–2010 investigation |
| AOC 15-014(h) | Outfalls from building 15-40 | Yes | No | Complete without controls |

**Table 11.1-1 (continued)**

| SWMU/AOC | Brief Description | Extent Defined or No Further Sampling Warranted? | Potential Unacceptable Risk/Dose? | Recommendation |
|---|---|---|---|---|
| **TA-36** | | | | |
| SWMU 36-002 | Former sump | Yes | No | Complete without controls |
| SWMU 36-003(a) | Septic system | Yes | No | Complete without controls |
| SWMU 36-008 | Surface disposal area located near building 36-1 | Yes | No | Complete without controls |
| SWMU C-36-003 | Outfall from building 36-1 | Yes | No | Complete without controls |

# Appendix A

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

## A-1.0 ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| %R | percent recovery |
| %RSD | percent relative standard deviation |
| ALARA | as low as reasonably achievable |
| AK | acceptable knowledge |
| AOC | area of concern |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| AUF | area use factor |
| bgs | below ground surface |
| BMP | best management practice |
| BV | background value |
| CCB | continuing calibration blank |
| CCV | continuing calibration verification |
| COC | chain of custody |
| Consent Order | Compliance Order on Consent |
| COPC | chemical of potential concern |
| COPEC | chemical of potential ecological concern |
| CSM | conceptual site model |
| CVAA | cold vapor atomic absorption |
| DAF | dilution attenuation factor |
| DE-1 | Dynamic Experimentation Division's High Explosives and Technology group (LANL) |
| DER | duplicate error ratio |
| DGPS | differential global positioning system |
| DL | detection limit |
| DOE | Department of Energy (U.S.) |
| dpm | disintegrations per minute |
| DU | depleted uranium |
| EC | expedited cleanup |
| EDL | estimated detection limit |
| EH | oxidation-reduction potential |
| EM | Office of Environmental Management (DOE) |
| EPA | Environmental Protection Agency (U.S.) |
| EPC | exposure point concentration |
| EQL | estimated quantitation limit |

| | |
|---|---|
| ESH | Environment, Safety, and Health |
| ESL | ecological screening level |
| FV | fallout value |
| GFAA | graphite furnace atomic absorption |
| GPS | global positioning system |
| HE | high explosives |
| HI | hazard index |
| HMX | 1,3,5,7-tetranitro-1,3,5,7-tetrazocine |
| HQ | hazard quotient |
| HR | home range |
| ICB | initial calibration blank |
| ICPES | inductively coupled plasma emission spectroscopy |
| ICS | interference check sample |
| ICV | initial calibration verification |
| I.D. | inside diameter |
| IDW | investigation-derived waste |
| IS | internal standard |
| $K_d$ | soil-water partition coefficient |
| $K_{oc}$ | organic carbon-water partition coefficient |
| $K_{ow}$ | octanol/water partition coefficient |
| KPA | kinetic phosphorescence analysis |
| LAL | lower acceptance limit |
| LANL | Los Alamos National Laboratory |
| LANS | Los Alamos National Security, LLC |
| LASL | Los Alamos Scientific Laboratory |
| LCS | laboratory control sample |
| LOAEL | lowest observed adverse effect level |
| LLW | low-level waste |
| MDC | minimum detectable concentration |
| MDL | method detection limit |
| MLLW | mixed low-level waste |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| MSW | municipal solid waste |
| N3B | Newport News Nuclear BWXT – Los Alamos, LLC |

| | |
|---|---|
| NMED | New Mexico Environment Department |
| NNSA | National Nuclear Security Administration |
| NOAEL | no observed adverse effect level |
| NPDES | National Pollutant Discharge Elimination System |
| PAH | polycyclic aromatic hydrocarbon |
| PAUF | population area use factor |
| PCB | polychlorinated biphenyl |
| PETN | pentaerythritol tetranitrate |
| PPE | personal protective equipment |
| QA | quality assurance |
| QC | quality control |
| RCRA | Resource Conservation and Recovery Act |
| RCT | radiological control technician |
| RDX | hexahydro-1,3,5-trinitro-1,3,5-triazine |
| RER | relative error ratio |
| RfD | reference dose |
| RFI | Resource Conservation and Recovery Act Facility Investigation |
| RL | reporting limit |
| RPD | relative percent difference |
| RRF | relative response factor |
| SAL | screening action level |
| SCL | sample collection log |
| SF | slope factor |
| SMO | Sample Management Office |
| SOP | standard operating procedure |
| SOW | statement of work |
| SSL | soil screening level |
| SVOC | semivolatile organic compound |
| SWMU | solid waste management unit |
| SWSC | Sanitary Wastewater Systems Consolidation (plant) |
| T&E | threatened and endangered |
| TA | technical area |
| TAL | target analyte list |
| TATB | triaminotrinitrobenzene |
| TNT | trinitrotoluene[2,4,6-] |

| | |
|---|---|
| TPU | total propagated uncertainty |
| TRV | toxicity reference value |
| UAL | upper acceptance level |
| UCL | upper confidence limit |
| UTL | upper tolerance limit |
| VCA | voluntary corrective action |
| VCP | vitrified-clay pipe |
| VOC | volatile organic compound |
| WCSF | waste characterization strategy form |

## A-2.0 METRIC CONVERSION TABLE

| Multiply SI (Metric) Unit | by | To Obtain U.S. 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-3.0 DATA QUALIFIER DEFINITIONS

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but not detected. |
| J | The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis. |
| J+ | The analyte was positively identified, and the result is likely to be biased high. |
| J- | The analyte was positively identified, and the result is likely to be biased low. |
| UJ | The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit. |
| R | The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters. |

# Appendix B

*Field Methods*

## B-1.0 INTRODUCTION

This appendix summarizes the field methods used during the 2009–2010 investigation of the Threemile Canyon Aggregate Area at Los Alamos National Laboratory (LANL or Laboratory). Table B-1.0-1 presents a summary of the field methods used, and the following sections provide more detailed descriptions of these methods. All activities were conducted in accordance subcontractor procedures that are equivalent to Laboratory standard operating procedures (SOPs) listed in Table B-1.0-2 and are available http://www.lanl.gov/community-environment/environmental-stewardship/plans-procedures.php.

## B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted. All drilling was conducted for the purpose of collecting investigation samples.

## B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the investigation activities. Field screening for radioactivity was performed on each sample collected. The field-screening results are presented in Table 3.2-2 of the investigation report.

### B-3.1 Field Screening for Organic Vapors

Field screening for organic vapors was not required per the New Mexico Environment Department–(NMED-) approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256).

### B-3.2 Field Screening for Radioactivity

During sampling of soil, fill, tuff, and sediment, each sample was screened for radioactivity immediately as it was collected, targeting alpha and beta/gamma emitters. Screening was conducted by a Laboratory radiological control technician (RCT) using an Eberline E-600 radiation meter with an 380AB or SHP360 probe (or equivalent) and as ESP-1 rate meter with a 210 probe (or equivalent). The Eberline E-600 with attachment 380AB or SHP360 consists of a dual-phosphor plate covered by two Mylar windows housed in a light-excluding metal body. The phosphor plate is a plastic scintillator for the detection of beta and gamma emissions and is thinly coated with zinc sulfide for the detection of alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute (dpm). The screening results are presented in Table 3.2-2 of the supplemental investigation report.

## B-4.0 FIELD INSTRUMENT CALIBRATION

All instruments were calibrated before use. Calibration of the Eberline E-600 was conducted by the RCT. All calibrations were performed according to the manufacturers' specifications and requirements.

### B-4.1 Eberline E-600 Instrument Calibration

The Eberline E-600 was calibrated daily by the RCT before local background levels for radioactivity were measured. The instrument was calibrated using plutonium-239 and chloride-36 sources for alpha and beta emissions, respectively. The following five checks were performed as part of the calibration procedures:

- calibration date
- physical damage
- battery
- response to a source of radioactivity
- background

All calibrations performed for the Eberline E-600 met the manufacturer's specifications, the requirements of SOP-5006, and the applicable radiation detection instrument manual. Calibrations were recorded in daily activity logs.

## B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used to collect surface and subsurface samples, including soil, fill, tuff, and sediment samples, according to the revised investigation work plan (LANL 2008, 105673) and NMED's approval with modifications letter (NMED 2008, 104256).

### B-5.1 Surface Sampling Methods

Surface samples were collected within former Technical Area 12 (TA-12), TA-14, TA-15, and TA-36 using either hand-auger or spade-and-scoop methods. Surface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. A hand auger or spade and scoop was used to collect material in approximately 6-in. increments. The sample material was placed in a stainless-steel bowl with a stainless-steel scoop, after which it was transferred to sterile sample collection jars or bags. Samples were preserved using coolers to maintain the required temperature and chemical preservatives, such as nitric acid, in accordance with an approved subcontractor procedure technically equivalent to SOP-5056, Sample Containers and Preservation.

Samples were appropriately labeled, sealed with custody seals, and documented before transporting to the Sample Management Office (SMO). Samples were managed according to approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5058, Sample Control and Field Documentation.

Sample collection tools were decontaminated immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Drilling and Sampling Equipment (section B-5.7).

### B-5.2 Borehole Logging

Borehole logs were completed for boreholes drilled with a hollow-stem auger drill rig. Information recorded on field boring logs included footage and percent recovery, lithology and depths of lithologic contacts, depth of samples collected, core descriptions, and other relevant observations. The borehole logs are presented in Appendix C (on CD).

### B-5.3 Subsurface Sampling Methods

Subsurface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials. Borehole samples were collected in a stainless-steel split-spoon core-barrel sampler that retrieved core in 2.5-ft intervals. The samples collected, listed by location and depth, are provided in tables for each site in the supplemental investigation report.

Core retrieved from the subsurface was field screened for radioactivity and was visually inspected and logged. Following inspection, the 2.5-ft core section to be sampled was removed from the core barrel and placed in a stainless-steel bowl and homogenized. The material was crushed, if necessary, with a decontaminated rock hammer and stainless-steel spoon to allow core material to fit into sample containers.

Samples for volatile organic compound (VOC) analysis were collected immediately to minimize the loss of subsurface VOCs during the sample-collection process. After the VOC samples were collected, a stainless-steel scoop and bowl were used to transfer samples for the remaining analytical suites to sterile sample collection jars or bags for transport to the SMO. The sample collection tools were decontaminated immediately before each sample was collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment (section B-5.7).

### B-5.4 Quality Control Samples

Quality control (QC) samples were collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5059, Field Quality Control Samples. The QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as the regular investigation samples and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples.

Field rinsate blanks were collected to evaluate field decontamination procedures. Rinsate blanks were collected by rinsing sampling equipment (i.e., auger buckets, sampling bowls and spoons) with deionized water after decontamination. The rinsate water was collected in a sample container and submitted to the SMO. Field rinsate blank samples were analyzed for inorganic chemicals (target analyte list metals, perchlorate, and total cyanide) and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks also were collected at a frequency of one per day when samples were being collected for VOC analysis. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process.

### B-5.5 Sample Documentation and Handling

Field personnel completed a sample collection log (SCL) and a chain-of-custody (COC) form for each sample. Sample containers were sealed with signed custody seals and placed in coolers at approximately 4°C. Samples were handled in accordance with approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5056, Sample Containers and Preservation. Samples were transported to the SMO for processing and shipment to off-site contract analytical laboratories. The SMO personnel reviewed and approved the SCL/COC forms and accepted custody of the samples. The SCL/COC forms are provided in Appendix E (on DVD).

### B-5.6 Borehole Abandonment

All boreholes were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, Monitor Well and RFI Borehole Abandonment, by filling the boreholes with bentonite chips up to 2.0–3.0 ft from the ground surface. The chips were hydrated and clean soil was placed on top. All cuttings were managed as investigation-derived waste (IDW) as described in Appendix F.

### B-5.7 Decontamination of Sampling Equipment

The split-spoon core barrels and all other sampling equipment that came (or could have come) in contact with sample material were decontaminated after each core was retrieved and logged. Decontamination included wiping the equipment with Fantastik and paper towels. The drilling equipment was decontaminated before mobilization of the drill rig to another borehole to avoid cross-contamination between samples and borehole locations. Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. Decontamination activities were performed in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment. Field rinsate blank samples were collected in accordance with an approved procedure technically equivalent to SOP-5059, Field Quality Control Samples.

## B-6.0 GEODETIC SURVEYING

Geodetic surveys of all sample locations were performed using a Trimble RTK 5700 differential global-positioning system (DGPS) referenced from published and monumented external Laboratory survey control points in the vicinity. All sampling locations were surveyed in accordance with an approved subcontractor procedure technically equivalent to SOP-5028, Coordinating and Evaluating Geodetic Surveys. Horizontal accuracy of the monumented control points is within 0.1 ft. The DGPS instrument referenced from Laboratory control points is accurate within 0.2 ft. The surveyed coordinates are presented in Table 3.2-1 of the supplemental investigation report.

## B-7.0 IDW STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with an approved subcontractor procedure technically equivalent to SOP-5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved waste characterization strategy form and the IDW management appendix of the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256). Details of IDW management for the Threemile Canyon Aggregate Area investigation are presented in Appendix F.

## B-8.0 DEVIATIONS FROM WORK PLAN

At each solid waste management unit (SWMU) and area of concern (AOC) investigated, proposed sampling for polychlorinated biphenyls (PCBs) was changed from the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256). Additional samples were collected beyond the planned minimum 20% for PCB analysis to aid in determining the extent of contamination.

Proposed sampling locations identified in the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256) were moved as a result of site conditions encountered during the fieldwork activities. These locations were moved because they were sited on top of, or next to, underground utilities, sample refusal occurred, or the proposed locations were inaccessible. When locations were moved, the new locations were sited as close as possible to the original locations. Deviations to sampling locations and to the work plan scope are discussed below.

*AOC C-12-003:* Ground-truthing of the former structure was conducted. Based on the location of the structure sign and the berm, the sampling locations were moved to include the former structure.

*SWMUs 12-001(a) and 12-001(b):* Refusal occurred at two locations, and samples could not be collected at the second depth. Four locations were moved to be sited in the drainage.

*AOC 12-004(a):* Refusal occurred at one location, and a sample could not be collected at the second depth.

*AOC 12-004(b):* Two additional sampling locations were sampled.

*AOC 15-005(c):* Two locations were moved because of the presence of active utilities: one was moved a few feet to the north and the other approximately 5 ft to the east.

*SWMU 15-007(c):* Two sampling locations were inadvertently not sampled. These locations were in the outer row of the 20-ft sampling grid around the shaft, to the northeast of location 15-610799 and to the northeast of location 15-610812. Lateral extent is defined for all inorganic and organic chemicals detected in the sampling grid, and grid samples were not analyzed for radionuclides. Because lateral extent is defined, the omission of the planned samples at these locations does not constitute a data gap.

*SWMU 15-008(b):* Refusal occurred at one location, and a sample could not be collected at the second depth.

*SWMU 15-009(c):* Six locations were moved to be sited in the drainage. Refusal occurred at one location, and a sample could not be collected at the second depth.

*SWMU 15-009(h):* The septic tank was not removed because active utilities were located too close to the septic tank to safely remove it. Consequently, the proposed samples from below the tank were not collected.

*SWMU 15-010(b):* The high explosives settling tank was not removed. Samples were not collected from below the inlet line, the tank, or the outlet line. Two locations were moved to be sited in the drainage. Refusal occurred at one drainage location, and a sample could not be collected at the second depth.

*SWMU 36-003(a):* Three locations were moved north because of the presence of active utilities. One location was not sampled because refusal occurred; in addition, the location was within 5 ft of two other sampling locations. A sample could not be collected at the second depth because of refusal at two locations.

*SWMU 36-008:* Two locations were not sampled because they were located on solid rock and were inaccessible to a drill rig. Refusal occurred at five locations, and a sample could not be collected at the second depth.

## B-9.0 REFERENCES

*The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

LANL (Los Alamos National Laboratory), October 2008. "Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-6727, Los Alamos, New Mexico. (LANL 2008, 105673)

NMED (New Mexico Environment Department), November 20, 2008. "Approval with Modifications for Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 104256)

**Table B-1.0-1**
**Summary of Field Investigation Methods**

| Method | Summary |
|---|---|
| Spade and Scoop Collection of Soil Samples | This method is typically used to collect shallow (i.e., approximately 0–12 in.) soil or sediment samples. The spade-and-scoop method involves digging a hole to the desired depth, as prescribed in the work plan, and collecting a discrete grab sample. The sample is typically placed in a clean stainless-steel bowl for transfer into various sample containers. |
| Hand Auger Sampling | This method is typically used for sampling soil or sediment at depths of less than 10–15 ft but in some cases may be used to collect samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter [I.D.]), creating a vertical hole that can be advanced to the desired sample depth. When the desired depth was reached, the auger was decontaminated before advancing the hole through the sampling depth. The sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers were filled. |
| Split-Spoon Core-Barrel Sampling | In this method, a stainless-steel core barrel (typically 4 in. I.D., 2.5 ft long) is advanced using a powered drilling rig. The core barrel extracts a continuous length of soil and/or rock that can be examined as a unit. The split-spoon core barrel is a cylindrical barrel split lengthwise so the two halves can be separated to expose the core sample. Once extracted, the section of core was screened for radioactivity and organic vapors and described in a geologic log. A portion of the core was then collected as a discrete sample from the desired depth. |
| Handling, Packaging, and Shipping of Samples | Field team members sealed and labeled samples before packing to ensure the sample and the transport containers were free of external contamination.<br>Field team members packaged all samples to minimize the possibility of breakage during transport.<br>After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged to ship the samples to the analytical laboratories. |
| Sample Control and Field Documentation | The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs, COC forms, and sample container labels. SCLs were completed at the time of sample collection, and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. COC forms were completed and signed to verify that the samples were not left unattended. |
| Field Quality Control Samples | Field QC samples were collected as follows:<br>*Field Duplicates*: at a frequency 10%; collected at the same time as a regular sample and submitted for the same analyses<br>*Equipment Rinsate Blank*: at a frequency of 10%; collected by rinsing sampling equipment with deionized water, which was collected in a sample container and submitted for laboratory analysis<br>*Trip Blanks*: required for all field events that include the collection of samples for VOC analysis. Trip blanks containers of certified clean sand were opened and kept with the other sample containers during the sampling process |
| Field Decontamination of Drilling and Sampling Equipment | Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination included the use of a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes. |

**Table B-1.0-1 (continued)**

| Method | Summary |
|---|---|
| Containers and Preservation of Samples | Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample were printed on the SCL provided by the SMO (size and type of container, e.g., glass, amber glass, and polyethylene). All samples were preserved by placing them in insulated containers with ice to maintain a temperature of 4ºC. |
| Coordinating and Evaluating Geodetic Surveys | Geodetic surveys focused on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys were conducted with a Trimble 5700 DGPS. The survey data conformed to Laboratory Information Architecture project standards IA-CB02, GIS Horizontal Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standard for A/E/C/ and Facility Management. All coordinates were expressed as State Plain Coordinate System 83, NM Central, U.S. feet. All elevation data were reported relative to the National Geodetic Vertical Datum of 1983. |
| Management of Environmental Restoration Project Waste, Waste Characterization | IDW is managed, characterized, and stored in accordance with an approved waste characterization strategy form that documents site history, field activities, and characterization approach for each waste stream managed. During the investigation, waste characterization complied with on- or off-site waste acceptance criteria. All stored IDW was marked with appropriate signage and labels. Drummed IDW was stored on pallets to prevent deterioration of containers. A waste storage area was established before waste was generated. Waste storage areas located in controlled areas of the Laboratory and were monitored as needed to prevent inadvertent addition or management of wastes by unauthorized personnel. Each container of waste generated was individually labeled with waste classification, item identification number, and radioactivity (if applicable), immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination. Management of IDW is described in Appendix F. |

**Table B-1.0-2**
**Standard Operating Procedures Used for the Investigation Activities at Threemile Canyon Aggregate Area**

| |
|---|
| SOP-5018, Integrated Fieldwork Planning and Authorization |
| SOP-5238, Characterization and Management of Environmental Program Waste |
| SOP-5028, Coordinating and Evaluating Geodetic Surveys |
| SOP-5034, Monitor Well and RFI Borehole Abandonment |
| SOP-5055, General Instructions for Field Investigations |
| SOP-5056, Sample Containers and Preservation |
| SOP-5057, Handling, Packaging, and Transporting Field Samples |
| SOP-5058 Sample Control and Field Documentation |
| SOP-5059 Field Quality Control Samples |
| SOP-5061, Field Decontamination of Equipment |
| SOP-01.12 Field Site Closeout Checklist |
| SOP-06.09, Spade and Scoop Method for Collection of Soil Samples |
| SOP-06.10, Hand Auger and Thin-Wall Tube Sampler |
| SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials |
| 06.33, Headspace Vapor Screening with a Photoionization Detector |
| SOP-5181, Notebook Documentation for Environmental Restoration Technical Activities |
| EP-DIR-QAP-0001, Quality Assurance Plan for the Environmental Programs |

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.

# Appendix C

*Borehole Logs*
*(on CD included with this document)*

# Appendix D

*Analytical Program*

## D-1.0 INTRODUCTION

This appendix presents the analytical methods used and the review of the data quality of the analytical results for the Threemile Canyon Aggregate Area investigation at Los Alamos National Laboratory (LANL or the Laboratory).

The analytical program for this investigation includes submission of samples to approved contract laboratories, with specific requirements for analytical methods, data quality, and reporting. Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the requirements of the Quality Assurance Project Plan Requirements for Sampling and Analysis (LANL 1996, 054609), and the analytical services statement of works (SOWs) for contract laboratories (LANL 1995, 049738; LANL 2000, 071233). The results of the QA/QC activities were used to estimate accuracy, bias, and precision of the analytical measurements. The QC samples included preparation blanks, spikes, matrix spikes (MSs), and laboratory control samples (LCSs) to assess accuracy and bias. Internal standards (ISs), external standards, surrogates, and tracers were also used to assess accuracy.

The type and frequency of QC analyses are described in the analytical service SOWs (LANL 1995, 049738; LANL 2000, 071233), along with the applicable analytical methods. Other QC factors such as sample preservation and holding times were also assessed in accordance with the requirements outlined in Standard Operating Procedure (SOP) 5056, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (also referred to as request numbers).

The following SOPs were used for data validation:

- SOP-5161, Routine Validation of Volatile Organic Compound (VOC) Analytical Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data
- SOP-5163, Routine Validation of Organochlorine Pesticide (PEST) and Polychlorinated Biphenyl (PCB) Analytical Data
- SOP-5165, Routine Validation of Metals Analytical Data
- SOP-5166, Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data
- SOP-5168, Routine Validation of LC/MS/MS High Explosive Analytical Data
- SOP-5191, Routine Validation of LC/MS/MS Perchlorate Analytical Data (SW-846 EPA Method 6850)

The focused validation included a more detailed review of the data generated by the analytical laboratory. The analytical data and instrument printouts used during focused validation and the validation reports are provided in Appendix E.

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for inorganic and organic chemical data review where applicable (EPA 1994, 048639; EPA 1999, 066649). As a result of the data validation and assessment efforts, qualifiers may be assigned to the analytical records as appropriate. The data qualifiers used in the data validation procedures are defined in Appendix A.

## D-2.0 ANALYTICAL DATA ORGANIZATION

The data sets evaluated for the Threemile Canyon Aggregate Area include analytical results for samples collected in the 2009–2010 investigation and, for some sites, historical data collected during previous investigations in 1994 and/or 1998. All historical analytical data included in the report were reviewed and revalidated to current data-quality standards. Only analytical data for which complete data packages and sample documentation are available are appropriate for decision-making purposes and included in the data set(s). All other data are screening-level data only and are not included in the data tables in the investigation report or in this appendix.

## D-3.0 INORGANIC CHEMICAL ANALYSES

Threemile Canyon Aggregate Area samples collected during historical investigations as well as the 2009–2010 investigation were analyzed for one or more of the following inorganic chemicals: nitrate, target analyte list (TAL) metals, total uranium, perchlorate, and total cyanide. Samples were analyzed for nitrate using EPA Method 300.0. Samples were analyzed for TAL metals and uranium (2009–2010 samples only) using EPA SW-846 Methods 6010, 6010B, 6020, 7470A, 7471A, and 7841. Other analytical methods included EPA SW-846 Method 9012A for total cyanide, EPA SW-846 Method 6850 for perchlorate, and generic kinetic phosphorescence analysis (KPA) for uranium (historical samples only). The analytical methods used for inorganic chemicals are listed in Table D-3.0-1.

A total of 773 samples (plus 79 field duplicates) were submitted for analysis of TAL metals; 227 samples (plus 24 field duplicates) were submitted for analysis of nitrate, 754 samples (plus 79 field duplicates) were submitted for analysis of perchlorate and total cyanide, and 655 samples were submitted for analysis of total uranium.

All decision-level analytical data are included in Appendix E (on DVD).

### D-3.1 Inorganic Chemical Analyses

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. To assess the accuracy and precision of inorganic chemical analyses, LCSs, preparation blanks, MS samples, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed as part of the Threemile Canyon Aggregate Area investigations. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) and is described briefly in the sections below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For inorganic chemicals in soil/tuff, LCS percent recoveries (%R) should fall within the lower acceptance limit (LAL) and upper acceptance limit (UAL).

Preparation blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. Preparation blanks are used to measure bias and potential cross-contamination. All inorganic chemical results should be below the method detection limit (MDL).

MS samples assess the accuracy of inorganic chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is between the LAL and UAL, inclusive for all spiked analytes.

Laboratory duplicate samples assess the precision of inorganic chemical analyses. All relative percent differences (RPDs) between the sample and laboratory duplicate should be ±35% for soil (LANL 1995, 049738; LANL 2000, 071233).

The ICSs assess the accuracy of the analytical laboratory's interelement and background correction factors used for inductively coupled plasma emission spectroscopy. The ICS %R should be between the LAL and UAL.

Serial dilution samples measure potential physical or chemical interferences and correspond to a sample dilution ratio of 1:5. The chemical concentration in the undiluted sample must be at least 50 times the MDL (100 times for inductively coupled plasma mass spectroscopy) for valid comparison. For sufficiently high concentrations, the RPD should be within 10%.

Details regarding the quality of the inorganic chemical analytical data included in the data set are summarized in the following subsections.

### D-3.2 Data Quality Results for Inorganic Chemicals

The majority of the analytical results are qualified as not detected (U) because the analytes were not detected by the respective analytical methods or were not qualified. These data do not have any quality issues associated with the values presented.

#### D-3.2.1 Chain of Custody

Chain-of-custody forms were maintained properly for all samples analyzed for inorganic chemicals (see Appendix E).

#### D-3.2.2 Sample Documentation

All samples analyzed for inorganic chemicals were properly documented in the field in the sample collection logs (see Appendix E).

#### D-3.2.3 Sample Dilutions

Some samples were diluted for inorganic chemical analyses. No qualifiers were applied to any inorganic chemical analytical results because of dilutions.

#### D-3.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

#### D-3.2.5 Holding Times

Holding time criteria were met for all samples analyzed for inorganic chemicals.

#### D-3.2.6 Initial and Continuing Calibration Verifications

Three nitrate results were qualified as estimated (J), and one nitrate result was qualified as estimated not detected (UJ) because the associated initial calibration verification (ICV) or continuing calibration verification (CCV) was recovered outside the method-specific limits.

Six nitrate results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the initial calibration blank (ICB) or continuing calibration blank (CCB).

Forty-one TAL metal results were qualified as estimated (J) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 202 TAL metal results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the ICB/CCB.

Fourteen TAL metal results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

Fourteen cyanide (total) results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the ICB/CCB.

Twelve cyanide (total) results were qualified as estimated not detected (UJ) because the associated matrix spike recovery was less than the LAL but greater than 10%.

#### D-3.2.7 Interference Check Sample and/or Serial Dilutions

Interference check sample and serial dilution results were within acceptable limits for all samples analyzed for inorganic chemicals.

#### D-3.2.8 Laboratory Duplicate Samples

A total of 643 TAL metal results were qualified as estimated (J) because the sample and duplicates were greater than or equal to 5 times the reporting limit (RL) and the duplicate RPD was greater than 35%.

#### D-3.2.9 Preparation Blanks

A total of 371 TAL metal results were qualified as estimated (J) because the results were less than 5 times the amount in the preparation blank.

A total of 100 TAL metal results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the preparation blank.

#### D-3.2.10 MS Samples

Twenty-two nitrate results were qualified as estimated and potentially biased low (J-), and 38 nitrate results were qualified as estimated not detected (UJ) because the analyte was recovered below the LAL but above 10% in the associated MS sample.

Nine TAL metal results were qualified as estimated and potentially biased low (J-) because the analyte was recovered below the LAL but above 30% in the associated MS sample.

A total of 434 TAL metal results were qualified as estimated and potentially biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

Six TAL metal results were qualified as estimated and potentially biased high (J+) because the associated MS recovery was less than the LAL but greater than 10%.

A total of 1800 TAL metal results were qualified as estimated and potentially biased high (J+) because the analyte was recovered above the UAL in the associated MS sample.

A total of 264 TAL metal results were qualified as estimated not detected (UJ) because the associated MS recovery was below the LAL but above 10%.

Six TAL metal results were qualified as estimated not detected (UJ) because the associated MS recovery was above the UAL.

Four perchlorate results were qualified as estimated and potentially biased high (J+) because the MS or matrix spike duplicate (MSD) %R was greater than 125%.

Six cyanide (total) results were qualified as estimated and potentially biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

#### D-3.2.11 LCS Recoveries

Three TAL metal results were qualified as estimated and potentially biased low (J-) because the LCS %R was less than 10%.

Ninety-seven TAL metal results were qualified as estimated not detected (UJ) because the LCS %R was less than 10%.

Four TAL metal results were qualified as estimated not detected (UJ) because the mass calibration was not within 0.1 atomic mass units or the percent relative standard deviation (%RSD) exceeded 5%.

#### D-3.2.12 Detection Limits

Detection limits were within acceptable ranges for all samples analyzed for inorganic chemicals.

#### D-3.2.13 Trip Blanks, Equipment Blanks, and Rinsate Blanks

A total of 256 TAL metal results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the trip blank or equipment rinsate blank.

Four perchlorate results were qualified as undetected (U) because the sample results were less than or equal to 5 times the concentration in the trip blank or equipment rinsate blank.

#### D-3.2.14 Rejected Results

Twenty-one barium results [seven from Solid Waste Management Unit [SWMU] 15-007(d), eight from Area of Concern [AOC] 15-008(g), and six from SWMU 15-009(c)] were rejected (R) because the associated MS recoveries were less than 10%.

Fifteen copper results from SWMU 15-008(b) were rejected (R) because the associated MS recoveries were less than 10%.

The rejected data were not used to characterize the extent of contamination. However, sufficient data of good quality are available to characterize the site(s), with the exceptions of barium at AOC 15-008(g), where no sample results remained after the eight results were rejected. The results of other qualified data were used as reported and do not affect the usability of the sample results.

## D-4.0 ORGANIC CHEMICAL ANALYSES

Soil, tuff, and sediment samples collected during the investigation were analyzed for one or more of the following organic chemicals: explosive compounds, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and pesticides. Samples were analyzed for explosive compounds using SW-846 Methods 8321A and 8330; for PCBs using SW-846 Method 8082; for pesticides using SW-846 Method 8081; for SVOCs using SW-846 Method 8270C; and for VOCs using SW-846 Method 8260B. All QC procedures were followed as required by the analytical laboratory SOWs (LANL 1995, 049738; LANL 2000, 071233). The analytical methods used for organic chemicals are listed in Table D-4.0-1.

A total of 763 samples (plus 79 field duplicates) were submitted for analysis of high explosives (HE); 263 samples (plus 71 field duplicates) were submitted for analysis of PCBs; 9 samples were submitted for analysis of pesticides; 350 samples (plus 37 field duplicates) were submitted for analysis of SVOCs, and 308 samples (plus 31 field duplicates) were submitted for analysis of VOCs.

All organic chemical analytical results are included in Appendix E (on DVD).

### D-4.1 Organic Chemical QA/QC Samples

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. Calibration verifications, LCSs, method blanks, MS samples, surrogates, and ISs were analyzed to assess the accuracy and precision of organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 1995, 049738; LANL 2000, 071233) and described briefly below.

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration ensures the initial calibration is still holding and is correct as the instrument is used to process samples. The continuing calibration also serves to determine that analyte identification criteria such as retention times and spectral matching are being met.

The LCS is a sample of a known matrix that has been spiked with compounds that are representative of the target analytes, and it serves as a monitor of overall performance on a “controlled” sample. The LCS is the primary demonstration, on a daily basis, of the ability to analyze samples with good qualitative and quantitative accuracy. The LCS recoveries should fall between the LAL and UAL.

A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during extraction and analysis. All target analytes should be below the contract-required detection limit in the method blank (LANL 1995, 049738; LANL 2000, 071233).

Matrix spike samples are used to measure the ability to recover prescribed analytes from a native sample matrix and consist of aliquots of the submitted samples spiked with a known concentration of the target analyte(s). Spiking typically occurs before sample preparation and analysis. The spike sample recoveries should be between the LAL and UAL.

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but normally is not found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges or the sample may be rejected or assigned a qualifier.

ISs are chemical compounds added to every blank, sample, and standard extract at a known concentration. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract and (2) quantitation variations that can occur during analysis. Internal standards are used as the basis for quantitation of target analytes. The %R for ISs should be within the range of 50% to 200%.

Details regarding the quality of the organic chemical analytical data included in the datasets are summarized in the following subsections.

### D-4.2 Data Quality Results for Organic Chemicals

The majority of the analytical results are qualified as not detected (U) because the analytes were not detected by the respective analytical methods or were not qualified. These data do not have any quality issues associated with the values presented.

#### D-4.2.1 Maintenance of Chain of Custody

Chain-of-custody forms were maintained properly for all samples analyzed for organic chemicals (see Appendix E).

#### D-4.2.2 Sample Documentation

All samples analyzed for organic chemicals were properly documented in the sample collection logs in the field (see Appendix E).

#### D-4.2.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. No qualifiers were applied to any organic chemical sample results because of dilutions.

#### D-4.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

#### D-4.2.5 Holding Times

Three explosive compound results were qualified as estimated and potentially biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

A total of 1218 explosive compound results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

Eighteen SVOC results were qualified as estimated and potentially biased low (J-) because the extraction holding time was exceeded by less than 2 times the published method holding times.

Fifty-one SVOC results were qualified as estimated not detected (UJ) because the extraction holding time was exceeded by less than 2 times the published method holding times.

Twenty-nine VOC results were qualified as estimated and potentially biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

A total of 827 VOC results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

### D-4.2.6 ICVs and CCVs

Twenty-four explosive compound results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 306 explosive compound results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with a relative response factor (RRF) of less than 0.05 in the ICV and or CCV.

A total of 349 explosive compound results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

One PCB result was qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Twenty-nine SVOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 1733 SVOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Twenty-one VOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 863 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

### D-4.2.7 Surrogate Recoveries

Fourteen PCB results were qualified as estimated not detected (UJ) because the associated surrogate recovery was less than the LAL but greater than or equal to 10%.

Thirty-seven SVOC results were qualified as estimated not detected (UJ) because the associated surrogate was recovery was less than the LAL but greater than or equal to 10%.

Two VOC results were qualified as estimated (J) because at least one surrogate was recovered above the UAL and one surrogate was recovered below the LAL.

Ninety-eight VOC results were qualified as estimated and potentially biased high (J+) because the surrogate %R was greater than the UAL.

Fifty-seven VOC results were qualified as estimated not detected (UJ) because at least one surrogate was recovered above the UAL and one surrogate was recovered below the LAL.

#### D-4.2.8 Internal Standard Responses

The IS responses were within acceptable limits for all samples analyzed for organic chemicals.

#### D-4.2.9 Method Blanks

Method blanks used for organic chemical analyses indicated acceptable results for all samples analyzed for organic chemicals.

#### D-4.2.10 Laboratory Duplicate Samples

Laboratory duplicates collected for organic chemical analyses indicated acceptable precision for all samples analyzed for organic chemicals.

#### D-4.2.11 Laboratory Control Sample Recoveries

A total of 270 explosive compound results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

Thirty SVOC results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

#### D-4.2.12 Quantitation and MDLs

Quantitation and MDLs were within acceptable ranges for all samples analyzed for organic chemicals.

#### D-4.2.13 MS Samples

One explosive compound result was qualified as estimated (J) because the MS/MSD RPD was greater than 30%.

Two explosive compound results were qualified as estimated and potentially biased high (J+) because the MS/MSD percent recovery was greater than 130%.

A total of 185 explosive compound results were qualified as estimated not detected (UJ) because the MS/MSD %R was greater than 10% but less than 70%.

A total of 183 explosive compound results were qualified as estimated not detected (UJ) because the MS/MSD RPD was greater than 30%.

#### D-4.2.14 Trip Blanks, Equipment Blanks, and Rinsate Blanks

Twenty-six VOC results were qualified as undetected (U) because the sampling results were less than or equal to the concentration of the related analyte in the trip blank or equipment rinsate blank.

#### D-4.2.15 Rejected Data

All eight 4-nitrotoluene results from AOC 15-008(g) were rejected (R) because the samples were analyzed with an RRF of less than 0.05 in the ICV and/or CCV. All of the rejected results were initially qualified as nondetects by the analytical laboratories.

Thirty-four tetryl results [2 from AOC 12-004(b); 1 from SWMU 36-003(a); 21 from SWMU 36-008; and 10 from SWMU C-36-003] were rejected (R) because the LCS %R was less than 10%. All the rejected results were initially qualified as nondetects by the analytical laboratories.

Forty-three tetryl results [18 from SWMU 15-008(b), 5 from SWMU 15-009(h), and 20 from SWMU 36-008] were rejected (R) because the MS/MSD %R was less than 10%. All of the rejected results were initially qualified as nondetects by the analytical laboratories.

Fifty-nine VOC results (1 result for each of 59 VOC analytes) at SWMU 15-009(c) were rejected (R) because the quantitating IS area was less than 10% of the expected value. All of the rejected results were initially qualified as nondetects by the analytical laboratories.

One acetone result at SWMU 15-010(b) was rejected (R) because the result was not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.

Eighty-six 1,1,2-trichloro-1,2,2-trifluoroethane results [13 from SWMU 15-010(b); 9 from SWMU 36-003(a); 40 from SWMU 36-008; 10 from AOC C-14-006; and 14 from SWMU C-36-003] were rejected (R) because the affected analytes were analyzed with an RRF of less than 0.05 in the ICV and/or CCV. All of the rejected results were initially qualified as nondetects by the analytical laboratories.

The rejected data were not used to characterize the extent of contamination. However, sufficient data of good quality are available to characterize the site(s) and conduct the risk assessments, except the 4-nitrotoluene results at AOC 15-008(g). The results of other qualified data were used as reported and do not affect the usability of the sampling results.

## D-5.0 RADIONUCLIDE ANALYSES

Samples were analyzed for radionuclides by gamma spectroscopy using EPA Method 901.1 or generic gamma spectroscopy (historical samples only); for americium-241, isotopic plutonium, and isotopic uranium by alpha spectroscopy (HASL-300 Methods); and for tritium by liquid scintillation using EPA Method 906.0. All QC procedures were followed as required by the analytical laboratories SOW (LANL 1995, 049738; LANL 2000, 071233). The methods used for analyzing radionuclides are listed in Table D-5.0-1.

A total of 656 samples (plus 67 field duplicates) were submitted for analyses by gamma spectroscopy; 647 samples (plus 67 field duplicates) were submitted for analysis of americium-241; 647 samples (plus 67 field duplicates) were submitted for analysis of isotopic plutonium, 656 samples (plus 67 field duplicates) were submitted for analysis of isotopic uranium; and 514 samples (plus 52 field duplicates) were submitted for analysis of tritium.

All radionuclide results are included in Appendix E (provided on DVD).

### D-5.1 Radionuclide QA/QC Samples

All procedures were followed as required by the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to the minimum detectable concentration (MDC). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to 3 times the total propagated uncertainty. This data qualification is related to detection status only and not to data quality issues.

To assess the accuracy and precision of radionuclide analyses, LCSs, method blanks, MS samples, laboratory duplicate samples, and tracers were analyzed. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) and is described briefly below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For radionuclides in soil/tuff, LCS %Rs should fall between the LAL and UAL.

Method blanks are an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during analysis. All radionuclide results should be below the MDC.

MS samples assess the accuracy of inorganic chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is between the LAL and UAL.

Tracers are radioisotopes added to a sample for the purposes of monitoring losses of the target analyte. The tracer is assumed to behave in the same manner as the target analytes. The tracer recoveries should fall between the LAL and UAL.

Laboratory duplicate samples assess the precision of inorganic chemical analyses. All RPDs between the sample and laboratory duplicate should be ±35% for soil (LANL 1995, 049738; LANL 2000, 071233).

Details regarding the quality of the radionuclide analytical data included in the data set are summarized in the following subsections.

### D-5.1 Data Quality Results for Radionuclides

The majority of the analytical results are qualified as undetected (U) because the analytes were not detected by the respective analytical methods. These data do not have any quality issues associated with the values presented.

#### D-5.1.1 Chain of Custody

Chain-of-custody forms were maintained properly for all samples (see Appendix E).

#### D-5.1.2 Sample Documentation

All samples were properly documented on the sample collection logs in the field (see Appendix E).

#### D-5.1.3 Sample Dilutions

Some samples were diluted for radionuclide analyses. No qualifiers were applied to any radionuclide sample results because of dilutions.

#### D-5.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

#### D-5.1.5 Holding Times

Holding-time criteria were met for all samples analyzed for radionuclides.

#### D-5.1.6 Method Blanks

Fourteen isotopic uranium results were qualified as estimated (J) because the analyte was identified in the method blank, but the sample results were greater than 5 times the concentration in the method blank.

#### D-5.1.7 MS Samples

Six isotopic plutonium results were qualified as estimated not detected (UJ) because the matrix spike %R value was less than the LAL and the sample results were greater than the MDC.

Twenty-two isotopic uranium results were qualified as estimated and potentially biased low (J-) because the MS %R value was less than the LAL and the sample results were greater than the MDC.

Two isotopic uranium results were qualified as estimated not detected (UJ) because the MS %R value was less than the LAL and the sample result was greater than the MDC.

#### D-5.1.8 Tracer Recoveries

One isotopic plutonium result was qualified as estimated and potentially biased high (J+) because the tracer %R was greater than the UAL.

Fifty-nine isotopic uranium results were qualified as estimated and potentially biased high (J+) because the tracer %R value was greater than the UAL.

#### D-5.1.9 LCS Recoveries

The LCS recoveries were within acceptable limits for all samples analyzed for radionuclides.

#### D-5.1.10 Laboratory Duplicate Samples Recoveries

Thirty isotopic uranium results were qualified as estimated (J) because the associated duplicate sample had a duplicate error ration (DER) or relative error ratio (RER) greater than the analytical laboratory’s acceptance limits.

### D-5.1.11 Rejected Data

A total of 354 cesium-134 results were rejected (R) for the following sites because the MDC and/or total propagated uncertainty (TPU) documentation was missing: 6 from AOC C-12-001; 5 from AOC C-12-002; 4 from AOC C-12-003; 4 from AOC C-12-004; 3 from AOC C-12-005; 25 from SWMU 12-001(a) and Consolidated Unit 12-001(a)-99; 19 from SWMU 12-001(b); 2 from SWMU 12-002; 16 from AOC 12-004(a); 2 from AOC 12-004(b); 5 from AOC C-14-006; 13 from AOC 15-005(c); 90 from SWMU 15-008(b); 2 from AOC 15-008(g); 11 from SWMU 15-009(b); 17 from SWMU 15-009(c); 3 from SWMU 15-009(h); 12 from SWMU 15-010(b); 24 from AOC 15-014(h); 3 from SWMU 36-002; 16 from SWMU 36-003(a); 59 from SWMU 36-008; and 9 from SWMU C-36-003.

Seventeen cesium-137 results were rejected (R) for the following site because the MDC and/or TPU documentation was missing: 1 from SWMU 12-001(b); 7 from SWMU 15-008(b); 2 from SWMU 15-009(c); 1 from SWMU 15-009(h); 1 from AOC 15-014(h); 3 from SWMU 36-008; 1 from AOC C-12-004; and 1 from AOC C-14-006. All of the rejected results were initially qualified as nondetects by the analytical laboratories.

One cobalt-60 result from SWMU 15-009(c) was rejected (R) because the MDC and/or TPU documentation was missing.

The rejected data were not used to characterize the nature and extent or the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and do not affect the usability of the sample results.

## D-6.0 REFERENCES

*The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

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**Table D-3.0-1**
**Inorganic Chemical Analytical Methods for**
**Samples Collected from the Threemile Canyon Aggregate Area**

| Analytical Method | Analytical Description | Analytical Suite |
|---|---|---|
| EPA Method 300.0 | Ion chromatography | Nitrate |
| SW-846:6850 | High-performance liquid chromatography/mass spectrometry | Perchlorate |
| SW-846: 6010/6010B | Inductively coupled plasma emission spectroscopy (ICPES)—atomic emission spectroscopy | Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, silver, thallium, vanadium, and zinc (TAL metals) |
| SW-846:6020 | ICPES | Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, silver, thallium, uranium, vanadium, and zinc (TAL metals plus uranium) |
| SW-846:9012a | Colorimetric method | Cyanide (total) |
| SW-846:7470A | Cold vapor atomic absorption (CVAA) | Mercury |
| SW-846:7471A | Graphite furnace atomic absorption (GFAA) | Mercury (TAL metal) |
| SW-846:7841 | GFAA | Thallium |
| Generic: KPA | KPA | Uranium (total) |

**Table D-4.0-1**
**Organic Chemical Analytical Methods for**
**Samples Collected from the Threemile Canyon Aggregate Area**

| Analytical Method | Analytical Description | Target Compound List |
|---|---|---|
| EPA SW-846:8321A_MOD | Explosive compounds | Consent Order Table III-1 |
| EPA SW-846:8330 | Explosive compounds | Consent Order Table III-1 |
| EPA SW-846:8270C | SVOCs | Analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) |
| EPA SW-846:8260B | VOCs | Analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) |
| EPA SW-846:8082 | PCBs | Analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) |
| EPA SW-846:8081 | Pesticides | Analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) |

**Table D-5.0-1**
**Radionuclide Analytical Methods for**
**Samples Collected from the Threemile Canyon Aggregate Area**

| Analytical Method | Analytical Description | Target Compound List |
|---|---|---|
| HASL-300: Am-241 | Alpha spectroscopy | Americium-241 |
| EPA Method: 901.1 | Gamma spectroscopy | Cesium-137, cesium-134, cobalt-60, sodium-22 |
| EPA Method: 906.0 | Liquid scintillation | Tritium |
| HASL-300: ISOPU | Alpha spectroscopy | Isotopic plutonium |
| HASL-300: ISOU | Alpha spectroscopy | Isotopic uranium |

# Appendix E

*Analytical Suites and Results and Analytical Reports*
*(on DVD included with this document)*

# Appendix F

*Investigation-Derived Waste Management*

## F-1.0 INTRODUCTION

This appendix contains the waste management records for the investigation-derived waste (IDW) generated during the implementation of the investigation work plan for the Threemile Canyon Aggregate Area at former Technical Area 12 (TA-12), TA-14, TA-15, and TA-36 of Los Alamos National Laboratory (LANL or the Laboratory).

All IDW generated during the field investigation was managed in accordance with Standard Operating Procedure SOP 5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements.

Consistent with Laboratory procedures, a waste characterization strategy form (WCSF) was prepared to address characterization approaches, on-site management, and final disposition options for wastes. Information from previous investigation wastes and analytical data and/or acceptable knowledge (AK) were used to complete the WCSF. The WCSF and Amendment 1 are included as Attachment F-1 to this appendix.

The selection of waste containers was based on appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding waste classification, contents, radioactivity, and date generated.

Wastes were staged in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements were based on the type of IDW and its classification. Container and storage requirements were detailed in the WCSF and approved before waste was generated.

Investigation activities were conducted in a manner that minimizes the generation of waste. Waste minimization was accomplished by implementing the most recent version of the “Los Alamos National Laboratory Hazardous Waste Minimization Report” (LANL 2008, 104174).

## F-2.0 WASTE STREAMS

The IDW streams were generated and managed during the investigation of Threemile Canyon Aggregate Area are described below and summarized in Table F-2.0-1. Waste, except for municipal waste, has not yet been fully characterized or dispositioned, so Table F-2.0-1 identifies potential waste classifications and destinations.

- *WCSF Waste #1: Municipal solid waste (MSW).* MSW consists of noncontact trash and debris. It was stored in plastic-lined trash cans and disposed of at the Los Alamos County landfill.
- *WCSF Waste #2: Drill cuttings.* This waste stream includes drill cuttings from boreholes. Approximately 16 $yd^3$ of cuttings were stored in a lined rolloff container and approximately 1 $yd^3$ of cuttings was stored in lined 55-gal. drums. The waste was initially stored as hazardous waste pending data analysis. The rolloff and all drums were directly sampled and were determined to be nonhazardous. Drill cuttings that meet Notice of Intent Decision Tree for Land Application of Investigation Derived Waste solids from Construction of Wells/Boreholes were land applied.

- *WCSF Waste #3: Contact Waste.* This waste stream includes spent personal protective equipment (PPE), material used in dry decontamination of sampling equipment (e.g., paper towels) and plastic bags. These wastes were containerized at the point of generation and were characterized based on AK of the waste materials, the methods of generation, and analytical data for the media with which they came into contact. These wastes were initially managed as hazardous waste pending data analysis. Approximately 0.75 $yd^3$ of contact waste was generated. Contact waste was Green-Is-Clean, low-level waste (LLW), or industrial waste disposed of at an authorized off-site facility appropriate for the type of waste.
- *WCSF Waste #6: Returned American Radiation Services (Rad Van) samples.* This waste stream consists of returned soil and tuff samples (including ziplock bag and sample labels) from Rad Van. Approximately 0.25 $yd^3$ was generated and initially managed in a lined 55-gal. drum within a less-than-90-day-accumulation area pending data analysis. The drum was directly sampled and was managed as hazardous until the analytical data were received. The waste was determined to be mixed low-level waste (MLLW) and was treated/disposed of at an authorized off-site MLLW facility.
- *WCSF Waste #7: Debris.* This waste stream consists of concrete with rebar, asphalt, and metal piping. Approximately 32 $yd^3$ of debris was generated and stored in locked rolloffs and in an 85-gal. drum and 55-gal. The debris was initially managed within a less-than-90-day-accumulation area pending data analysis. The asphalt and concrete were characterized by direct sampling. The metal piping associated with the tanks was characterized based on data from the associated debris and placed in the same bins as the associated tank. The tank debris in rolloff bin 5623 was determined to be nonhazardous and will be disposed of in an authorized off-site industrial landfill. The tank debris in rolloff bin 5735 and asphalt debris in 55-gal. drums were determined to be LLW. They will be disposed of in an authorized off-site LLW facility. The excavated pipe from TA-12, not associated with the tanks from TA-15, was decontaminated and determined to be nonhazardous and nonradioactive per swipes taken. It was recycled through the Laboratory's recycling program.
- *WCSF Waste #8: Excavated soil.* This waste stream includes overburden soil and rock excavated next to and above septic tanks. The excavated soil was sampled and determined to be nonhazardous and nonradioactive and met residential soil screening levels. It was returned to the bottom portion of the excavations.
- *WCSF Waste #9: Water.* This waste stream includes the liquids that were in the high explosives (HE) settling tank, Solid Waste Management Unit (SWMU) 15-010(b). Approximately 300 gal. of material was generated and containerized in two 300-gal. tanks at the point of generation. It was initially managed within a less-than-90-day-accumulation area pending data analysis. The waste was characterized by direct sampling and was determined to be nonhazardous and nonradioactive. It was treated at one of the on-site permitted wastewater treatment facilities.
- *WCSF Waste #10: Lead shot.* This waste stream consists of 0.25-in.-diameter lead shot from SWMU 15-007(c). Less than 10 gal. of material was generated and is stored in two 5-gal. containers within a less than-90-day-accumulation area pending data analysis. It was disposed of in an authorized off-site mixed waste facility.
- *WCSF Waste #11: HE spot test waste.* This waste stream consists of filter paper, soil, sodium methoxide/dimethyl sulfoxide, hydrochloric acid/sulfanilamide, and 1-n-(naphthyl-ethylene)diamine hydrochloride/water. Less than 1 gal. of waste was generated and stored in a 5-gal. drum. The waste was characterized based on the analytical data for the media with which they came into contact. It was classified as MLLW and disposed of at an authorized off-site mixed waste facility.

WCSF wastes #4 (decontamination fluids) and #5 (petroleum contaminated soils) were not generated during the Threemile Canyon Aggregate Area investigation.

## F-3.0 REFERENCES

*The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

LANL (Los Alamos National Laboratory), November 2008. "Los Alamos National Laboratory Hazardous Waste Minimization Report," Los Alamos National Laboratory document LA-UR-08-7274, Los Alamos, New Mexico. (LANL 2008, 104174)

**Table F-2.0-1**
**Summary of IWD Generation and Management**

| Waste Stream | Waste Type | Volume | Characterization Method | On-Site Management | Disposition |
|---|---|---|---|---|---|
| Municipal solid | MSW | 2 $yd^3$ | AK | Plastic bags | Off-site municipal landfill |
| Drill cutting | Reusable material<br>Industrial<br>LLW | 17 $yd^3$ | Direct sampling | Rolloff container, 55-gal. drums | Land apply |
| Contact waste | Green Is Clean<br>Industrial<br>LLW | 0.75 $yd^3$ | AK and analytical results of site characterization | 55-gal. drums | Off-site authorized disposal facility |
| Returned rad van samples | Industrial<br>LLW<br>MLLW | 0.25 $yd^3$ | Direct sampling | 55-gal. drums | Off-site authorized disposal facility |
| Debris | Recyclable material<br>Industrial<br>LLW | 32 $yd^3$ | Direct sampling | Rolloff container, 85-gal. drum, and 55-gal. drums | Recycle or dispose of at an authorized off-site facility |
| Excavated soil | Reusable | 64 $yd^3$ | Direct sampling | Stored next to excavation | Return to excavation |
| Water | Nonhazardous | 1.5 $yd^3$ | Direct sampling | 300-gal. tanks | Treatment at an on-site facility |
| Lead shot | Hazardous<br>MLLW<br>Recycle | 1 gal. | AK, sampled to determine if MLLW | 5-gal. containers | Dispose of at an off-site authorized facility |
| HE spot test waste | Green Is Clean<br>LLW<br>Industrial | 1 gal. | AK and analytical results of site characterization | 5-gal. drum | Off-site authorized facility |

# Attachment F-1

*Waste Characterization Strategy Form for Threemile Canyon Aggregate Area and Amendment #1 to the Form*

# Waste Characterization Strategy Form

| | |
|---|---|
| **Project Title** | Implementation of the Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1 |
| **Solid Waste Management Unit or Area of Concern #** | AOCs: C-12-005, 12-004(a), 12-004(b), C-12-001, C-12-002, C-12-003, C-12-004, C-14-006, 15-004(d), 15-005(c), 15-008(g), 15-014(h), 36-008, C-36-003<br>SWMUs: 12-001(a), 12-001(b), 12-002, 15-004(a), 15-006(b), 15-006(c), 15-008(b), 15-006(d), 15-007(c), 15-007(d), 15-009(b), 15-009(c), 15-009(h), 15-010(b), 36-002, 36-003(a), |
| **Activity Type** | Characterization sampling and remediation |
| **Field Team Leader** | Tracy McFarland |
| **Field Waste Management Technician** | Jon Roberson |
| **Completed by** | Jon Roberson |
| **Date** | 11/19/2009 |

**Description of Activity**

The objective of the project is to characterize the nature and extent of contamination, if any, associated with 30 sites in the Threemile Canyon Aggregate Area. The project is to be executed in compliance with the Consent Order and as described in the Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1, and subsequent NOD modifications. The following activities are planned:

- Site preparation – This activity includes establishment of site access control immediately prior to performing survey, sampling, or drilling activities.
- Non-intrusive field surveys – This activity includes the use of various instruments to perform non-intrusive geodetic site surveys. Geodetic surveys will involve the use of GPS or Total Station instruments to determine coordinates of sampling locations and structures as necessary.
- Surface and subsurface sampling – This activity includes collection of samples using hand auger, spade and scoop and/or core-barrel (hollow-stem auger drill rig) methods. The method(s) used will depend on site conditions and depth of required samples; all samples will be collected using hand methods if possible, and a drill rig will be used only at sites where samples cannot be collected by hand.
- Removal of septic tanks and tank contents – This activity includes the characterization and disposal of septic tank contents and septic tanks.
- Removal of HE settling tank and tank contents – This activity includes the characterization and disposal of HE settling tank contents and settling tank.
- Removal of Lead Shot – This activity includes removal and containerization of lead shot around the shaft in SWMU 15-007(c).
- Waste management – This task involves the management of the investigation-derived waste following all applicable procedures, including but not limited to SOP-5238 Characterization and Management of Environmental Program Waste, P930-1 LANL Waste Acceptance Criteria, P930-2 Waste Certification Program, and P409 Waste Management,.

- Site restoration – This step involves the restoration of sites to pre-investigation conditions to the degree practicable. This may involve patching concrete or asphalt pavement, filling excavations with backfill material, land application of cuttings, and seeding or planting vegetation.

**Relevant Site History and Description**

The Threemile Canyon Aggregate Area consists of sites within Technical Area 14 (TA-14), TA-15, TA-18, TA-36 and TA-67 at Los Alamos National Laboratory. This aggregate area also includes sites associated with former TA-12 that lie within the boundaries of TA-15 and TA-67. Former TA-12, known as L-Site, was constructed in 1944 on Pajarito Mesa and was used as a firing site and dynamic testing area through the mid-1960s. The testing site was abandoned in 1946. In 1950, the Biomedical Group used TA-12 and constructed a bermed radiation test bunker for conducting an experiment using a 1000-Ci radioactive lanthanum-140 source. In 1951, the Dynamic Experimentation Group began using the area, reportedly firing 600 shots per month. By 1953, the entire site was vacated. In 1960, the structures were decontaminated, decommissioned, and intentionally burned. Structures at the former site included a generator building, a junction shelter, and a steel-lined pit. Materials used included explosives, lead, aluminum, copper, and uranium-238. As a result of the Laboratory redefining TA boundaries in 1989, former TA-12 was incorporated into TA-15 and TA-67.

TA-14, known as Q-Site, is one of five major firing sites at the Laboratory and is used for high explosives (HE) testing. TA-14 contains 10 structures and 5 firing mounds. TA-14 was used for close observation work on small explosive charges and included both open and closed firing chambers. TA-14 has always been a dedicated site for developing and testing of explosives, including tests involving radioactive materials. TA-14 remains an active site with scheduled tests at both the firing area and bullet test facility.

TA-15, known as R-Site, was constructed on Threemile Mesa in 1945. TA-15 contains a complex of firing sites and related support structures used for HE research, development, and testing, mainly through hydrodynamic testing and dynamic experimentation. TA-15 personnel also investigate weapons functioning and systems behavior in non-nuclear testing. Test explosions ranging from a few kilograms of HE to as much as 1800 kg have been detonated. In most cases, the tests are carried out aboveground, resulting in the test materials being scattered over areas as large as hundreds of square meters. Sites located within the Threemile Canyon Aggregate Area include Firing Sites C, R-44, and R-45, and Ector and related support structures. Part of former TA-12 now lies within the boundary of TA-15.

TA-36, known as Kappa Site, contains four active firing sites that support explosives testing. The sites and associated buildings are used for a wide variety of nonnuclear ordnance tests for the Department of Defense. TA-36 is primarily located within the Potrillo Canyon watershed; however, the northwest portion of TA-36 (west of TA-18) is located in the Threemile Canyon Aggregate Area. Operations at TA-36 started in 1950. Structures at TA-36 consist of the group office and sanitary facilities, four active firing sites, and a storage magazine. In 1983, the boundary was changed to incorporate the I-J firing site (formerly part of TA-15). Activities at TA-36 include the storage and assembly of prefabricated metal and explosives components, detonators, cables, and instrumentation for shots; and the detonation of these shots. Sites located within the Threemile Canyon Aggregate Area are associated with building 36-1, which houses laboratory activities and photoprocessing operations. None of the TA-36 sites within Threemile Canyon Aggregate Area are associated with firing-site activities. TA-67 contains significant archeological sites and serves as a buffer area for Laboratory activities. Part of former TA-12 now lies within the boundary of TA-67.

## Characterization Strategy

This WCSF identifies the types of wastes expected, based on previous investigations. However, other types of waste may be an encountered. An amendment to this WCSF shall be prepared and submitted for review and approval if any of the waste streams change in description or characterization approach or a new waste stream is generated. All wastes will be managed in accordance with SOP-5238, *Characterization and Management of Environmental Program Waste.*

In accordance with the work plan, all investigation-derived wastes (IDW) except municipal wastes will initially be managed as hazardous waste. Characterization of IDW will be completed through acceptable knowledge (AK), including associated environmental sampling data, process knowledge, and existing documents; and/or the waste may be directly sampled. Samples must be collected by trained sampling personnel in accordance with this WCSF and Environmental Protection Agency (EPA) guidance. Sampling personnel must record waste sampling information in accordance with EP-ERSS-SOP-5058, *Sample Control and Field Documentation* and EP-ERSS-SOP-5181, *Documentation for Waste and Environmental Services Technical Field Activities*. The field notebook must be used to document sample collection activities (e.g., equipment and sampling methods used, number and location of samples, etc.). Sampling personnel must also record field conditions, problems encountered, local sources of contamination (e.g., operating generators or vehicles), the personnel involved, equipment and supplies used, wastes generated, and field observations.

If the waste determination identifies the waste as non-hazardous, the wastes will be managed in secure designated non-hazardous waste areas appropriate to the type of waste and its regulatory classification. The selection of waste containers will be based on U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information regarding waste classification, contents, and date generated. A waste determination must be made within 45 days of the generation of the waste. A WAC exception form (WEF) can be used if the generator does not meet the 45 day deadline.

If analyses indicate the presence of listed constituents, a due diligence document review may be performed to identify whether the contaminants are from a listed process. If no or inconclusive documentation of a listed source exists, the waste will not carry the listed hazardous waste numbers(s). If documentation exist that the contaminant(s) originated from a listed source but the levels are below residential screening levels and the land disposal restriction treatment standards, a "contained-in" request may be submitted to the New Mexico Environment Department (NMED), who may approve dropping the listings from the waste stream. A copy of either the ENV-RCRA approved due diligence or the NMED contained-in approval letter must accompany all waste profiles prepared for the subject waste(s).

**Waste #1: Municipal Solid Waste (MSW)** - This waste stream primarily consists of non-contact trash including but not limited to paper, cardboard, wood, plastic, food and beverage containers, empty solution containers, and other non-contact trash. This waste stream may also include vegetation from sites with no radioactive contamination. It is estimated that approximately 3 cubic yards of MSW will be generated (Note: Volume may change if vegetation removal is required).

*Anticipated Regulatory Status:* MSW

*Characterization Approach:* MSW will be characterized based on acceptable knowledge (AK) of the waste materials (including Material Safety Data Sheets) and methods of generation.

*Management and Disposal Method:* MSW will be segregated from all other waste streams. It is anticipated that the waste will be stored in plastic trash bags or other appropriate containers and disposed of at the County of Los Alamos solid waste transfer station or other authorized off-site solid waste facility.

**Waste # 2: Drill Cuttings (IDW)** - Drill cuttings consist of soil and rock removed during the mechanized drilling of boreholes. This may include small chips or unused core samples collected with a hollow-stem auger core barrel. Cuttings will not contain residue of drilling additives (drilling mud or foam) as only dry drilling will be used. It is estimated that approximately 22 cubic yards of borehole cuttings will be generated during this investigation.

*Anticipated Regulatory Status:* Industrial, Hazardous, Low-level waste (LLW), Mixed low-level waste (MLLW), Beryllium, Polychlorinated Biphenyls (PCB), Land Applied

*Characterization Approach:* Waste characterization will be based upon the analytical results obtained from direct sampling of containerized waste. Cuttings will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. A hand auger or thin-wall tube sampler will be used in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, to collect waste material from each container, augering from the surface to the bottom of the waste in a sufficient number of locations to obtain a representative sample. Samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, high explosives, perchlorate, nitrate, radionuclides, total metals, toxicity characteristic metals, total cyanide, total petroleum hydrocarbons (TPH), and TCLP organics. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility.

*Storage and Disposal Method:* The cuttings will be collected and containerized at the point of generation and initially stored in registered hazardous waste accumulation or storage areas pending analytical data availability. If the waste is characterized as non-hazardous, it will be stored in a designated non-hazardous waste area appropriate for the waste classification. The containers will be appropriate for the quantity of wastes generated (e.g., roll-off bins for large quantities of wastes and drums for small quantities of waste). Cuttings meeting the criteria of the NMED-approved NOI decision tree for land application may be land applied. Land application of drill cuttings will be conducted in accordance with ENV-RCRA-QP-011, *Land Application of Drill Cuttings.* Cuttings that cannot be land applied will be treated and/or disposed of at authorized off-site facilities appropriate for the waste classification.

**Waste #3: Contact IDW** - This waste stream is comprised of PPE, sampling equipment and other materials that contacted or potentially contacted contaminated environmental media and that cannot be decontaminated. This includes but is not limited to plastic sheeting (e.g., tarps and liners), gloves, coveralls, booties, paper towels, plastic and glass sample bottles, and disposable sampling supplies. It is estimated that approximately 1 cubic yard of contact IDW will be generated during this investigation.

*Anticipated Regulatory Status:* Industrial, Hazardous, LLW, MLLW, PCB, Beryllium, Green is Clean

*Characterization Approach:* Contact IDW generated during drilling operations will be characterized using AK based on the direct sampling and analyses of the drill cuttings. Contact waste that is generated using a hand auger will be inspected before being placed in containers to determine if environmental media or staining is present, indicating contamination. If staining is present, an estimate of the portion or percentage of the item stained will be recorded. Results from the analytical data will be weighted by the extent of contamination for determining whether wastes are characteristics. If the material with which the contact waste came into contact is listed, the contact waste will be assumed to be listed unless a "contained-in" approval is obtained. *Storage and Disposal Method:* The contact waste may be separately containerized in drums or it may be placed into the same containers as the media with which it is contaminated. Contact waste will initially be stored in a registered hazardous waste accumulation or storage areas pending analytical data availability. If the waste is characterized as non-hazardous, it will be stored in a designated non-hazardous waste area appropriate for the waste classification. For disposal, the separately containerized contact waste may be also be combined with the material from which they originated (the WPF will document the decision to combine the waste streams). Wastes will be treated and/or disposed of in authorized on- or off-site facilities appropriate for the waste classification.

**Waste #4: Decontamination fluids (potential)** - This waste stream consists of liquid wastes generated from the decontamination of excavation, sampling and drilling equipment. This waste stream will be generated only if dry decontamination methods are not effective. It is estimated that less than 55 gallons of decontamination fluids will be generated from this activity.

*Anticipated Regulatory Status:* Industrial, Hazardous, LLW, MLLW, PCB

*Characterization Approach:* The decontamination water will be characterized by direct sampling of the containerized fluids or analysis of the media associated with the decontamination fluids. Representative waste characterization samples will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be collected from the storage container in accordance with LANL SOP-06.15, *COLIWASA Sampler for Liquids and Slurries.* If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, PCBs, total cyanide, high explosives, perchlorate, radionuclides, total metals. Other analyses may be required to meet the WAC of the receiving facility. Note that decontamination fluids destined for LANL's sanitary plant (SWS) must be sampled by ENV-RCRA for microtox analysis, total suspended solids (TSS), total dissolved solids (TDS), oil and grease, and pH. Submit a request for analysis at https://esp-esh-as01-f5.lanl.gov/~esh19/databases/rfa_form.shtml.

*Storage and Disposal Method:* These wastes will be containerized in drums at the point of generation and will initially be stored in registered hazardous waste accumulation or storage areas. It is expected that most of the decontamination fluids will be treated on-site at the SWS or Radioactive Liquid Waste Treatment Facility (RLWTF). Wastes that do not meet the WAC for the on-site facilities will be treated and/or disposed of in authorized off-site facilities appropriate for the waste classification.

**Waste #5: Petroleum Contaminated Soils (PCS) (potential) -** PCS may be generated from releases of products such as hydraulic fluid, motor oil, unleaded gasoline, or diesel fuel (e.g. from the rupture of hydraulic or fuel hoses, or spills during maintenance or filling equipment) onto soil. Absorbent padding, paper towels, spill pillows or other absorbent material used to contain the released material may be added to the PCS waste for storage and disposal. It is estimated that less than one cubic yard of PCS will be generated.

*Anticipated Regulatory Status*: New Mexico Special Waste (NMSW), Industrial, Hazardous, LLW, MLLW. PCB, Beryllium

*Characterization Approach*: The contaminated soil may either be sampled in-place (by gridding the spill location and collecting and combining incremental samples into one sample) or after containerization in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. If the spill is shallow (in-place sampling) or containers are small, Spade and Scoop Method for Collection of Soil Samples (SOP-06.11) may also be appropriate. Samples will be analyzed for VOCs; SVOC, PCBs, radionuclides, high explosives, perchlorate, total metals, TPH (DRO/GRO), TCLP metals, and TCLP organics. Other constituents must be analyzed as needed to meet the receiving disposal facility's WAC.

*Storage and Disposal Method*: PCS will be stored in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the most restrictive waste classification appropriate to the area where the spill occurred. If the PCS is suspect or known hazardous or mixed low-level waste (MLLW), it will initially be managed in a registered hazardous waste accumulation area pending analysis. All PCS will be treated/disposed at an authorized off-site facility appropriate for the waste classification.

**Waste # 6: Returned Rad-Van Samples** - This waste stream consists of returned soil and tuff samples (zip lock bag and sample labels) from American Radiation Services (Rad-Van). It is estimated that approximately 0.5 cubic yards of soil will be generated from this activity.

*Anticipated Regulatory Status:* Industrial, Hazardous, LLW, MLLW, Beryllium, PCB

*Characterization Approach:* Waste characterization will be based upon the analytical results obtained from the direct sampling of containerized waste or the environmental media from which the samples were collected. Direct samples will be collected within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be collected using a hand auger or thin-wall tube sampler in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. Samples will be collected by augering from the surface to the bottom of the waste in a sufficient number of locations to obtain a representative sample. Samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, high explosives, perchlorate, nitrate, radionuclides, total metals, toxicity characteristic metals, total cyanide, total petroleum hydrocarbons (TPH), and TCLP organics.

*Storage and Disposal Method:* Upon their return, these wastes will be containerized in drums or placed into the same containers as the materials (i.e., drill cuttings, excavated soil, or debris) from which they were taken. The waste containers will initially be stored in registered hazardous waste accumulation areas. If the waste is characterized as non-hazardous, it will be stored in a designated non-hazardous waste area appropriate for the waste classification. For disposal, the separately containerized samples may be also be combined with the material from which they originated (the WPF will document the decision to combine the waste streams). Wastes will be treated and/or disposed of in authorized on-site or off-site facilities appropriate for the waste classification.

**Waste # 7: Debris** - This waste stream consists of concrete with rebar, asphalt, vitrified clay pipe or metal piping. It is estimated that approximately 16 cubic yards of debris will be generated from this activity. Debris will contain less than 1% excavated soil. Sealants or caulking in septic tank concrete joint or around pipe penetrations may contain PCB material. If present, caulking must be characterized for PCBs. PCBs in sealants at or above 50 part per million must be managed as PCB Bulk Waste.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, PCB, Beryllium, Recycled

*Characterization Approach*: When possible, the debris will be characterized by direct sampling in accordance with SOP-5194, R0, Chip Sampling of Porous Surfaces. Qualified sampling personnel will make the decision in the field of how many samples are necessary to represent the debris and will document these decisions in the field notebook. If the materials are difficult to sample (e.g., metal piping), the characterization will be made by using AK of processes, data from associated debris, tank contents, and/or site characterization sampling. Debris will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be analyzed for total metals, VOCs, SVOCs, radionuclides, PCBs, and TCLP metals. The presence of high explosives will be determined by direct sampling or though the use of HE spot test kits. Additional analyses may be required to meet the WAC of the receiving facility or if process knowledge or visual observations indicate that other contaminants may be present (e.g., asbestos).

*Storage and Disposal Method*: These wastes will be collected and containerized (e.g., rolloff bins) at the point of generation and initially stored in registered hazardous waste accumulation or storage areas. If the waste is characterized as non-hazardous, it will be stored in a designated non-hazardous waste area appropriate for the waste classification.

Clean debris (non-hazardous, non-radioactive, non-PCB, non-beryllium) may be recycled in a manner consistent with LANL procedures and the approved work plan. . If debris cannot be recycled, it will be treated and/or disposed of in authorized on-site or off-site facilities appropriate for the waste classification.

**Waste # 8: Excavated Soil** - Overburden soil and rock excavated adjacent to and above septic tanks, settling tanks and piping are expected to be non-contaminated. It is estimated that approximately 30 cubic yards of excavated soil will be generated during these activities.

*Anticipated Regulatory Status:* Industrial, Hazardous, LLW, MLLW, PCB, Beryllium , Fill

*Characterization Approach:* Waste characterization will be based upon the analytical results obtained from direct sampling of the waste. Representative composite samples will be collected for each excavation location. A minimum of one sample must be collected for every 50 cubic yards of soil excavated. Excavated soil will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. If the soil is sampled after it is excavated, a hand auger or thin-wall tube sampler will be used in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler to collect waste material from each container or spoils pile, augering from the surface to the bottom of the waste in a sufficient number of locations to obtain a representative composite sample. If the soil is stored in a pile, the pile must be constructed so that the entire depth of the pile can be sampled. If the soil is incrementally sampled as it is generated, the incremental samples will be collected in accordance with SOP-06.11, *Spade and Scoop Method for Collection of Soil Samples*. Samples will be analyzed for total metals, nitrate, cyanide, perchlorate, VOCs, SVOCs, high explosives, PCBs, TPH, and radionuclides. Additional analyses may be required to meet the WAC of the receiving facility or if process knowledge or visual observations indicate that other contaminants may be present (e.g., asbestos).

*Storage and Disposal Method:* Excavated material will be field-screened during the excavation process and will remain within the solid waste management unit boundary from which it was excavated. If the field screening does not indicate that contamination is present, the excavated material will be stored on the ground surface with appropriate best management practices. If field screening indicates contamination is present, the excavated material will be placed in rolloff containers, which will initially be stored in a hazardous waste accumulation area. The analytical results will be compared to residential soil screening levels (SSLs). If the concentrations are less than the residential SSLs the material will be used as backfill for the excavation. If the concentrations exceed the residential SSLs, the material will be disposed of at an authorized off-site disposal facility appropriate for the waste classification.

**Waste # 9: Tank Contents** – This waste steam consists of liquids and/or sludge that could potentially be in the tanks to be excavated. It is estimated that up to 10 cubic yards of tank contents will be generated during these activities.

*Anticipated Regulatory Status:* LLW, Industrial, Hazardous, or MLLW

*Characterization Approach:* Waste characterization will be based upon the analytical results obtained from direct sampling of the waste. The containerized liquids will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be collected from the storage container in accordance with LANL SOP-06.15, *COLIWASA Sampler for Liquids and Slurries.* If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, high explosives, perchlorate, radionuclides, PCBs, and total metals. Other analyses may be required to meet the WAC of the receiving facility. Note that fluids destined for LANL's sanitary plant (SWS) must be sampled by ENV-RCRA for microtox analysis, total suspended solids (TSS), total dissolved solids (TDS), oil and grease, and pH. Submit a request for analysis at https://esp-esh-as01-f5.lanl.gov/~esh19/databases/rfa_form.shtml.

*Storage and Disposal Method:* These wastes will be containerized at the point of generation and will initially be stored in registered hazardous waste accumulation or storage areas. It is expected that most of the tank contents will be treated on-site at the SWS or RLWTF. Wastes that do not meet the WAC for the on-site facilities will be treated and/or disposed of in authorized off-site facilities appropriate for the waste classification.

**Waste # 10: Lead Shot** – This waste stream consists of 0.25-inch diameter lead shot scattered on the concrete pad adjacent to the shaft at SWMU 15-007(c). It is estimated that less that 1 gallon of lead will be generated in the cleanup activity.

*Anticipated Regulatory Status:* Hazardous, MLLW, or Recycled

*Characterization Approach:* Waste characterization will be based upon AK. The use of smears will be used to detect the presence of radiological contamination.

*Storage and Disposal Method:* These wastes will be containerized at the point of generation and will be stored in registered hazardous waste accumulation areas within the aggregate area boundary as directed in the work plan.

Lead may be recycled in a manner consistent with LANL procedures and the approved work plan if it is determined that the waste meets release criteria. If the waste cannot be recycled, it will be treated and/or disposed of in an authorized off-site hazardous waste facility.

**References**

LANL (Los Alamos National Laboratory), July 2008. "Historical Investigation Report for Threemile Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-08-4713, Los Alamos, New Mexico. (LANL 2008, 102244)

LANL (Los Alamos National Laboratory), October 2008. "Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-6727, Los Alamos, New Mexico. (LANL 2008, EP2008-0549)

**Characterization Table**

| Waste Description | Waste # 1 MSW | Waste #2 Drill Cuttings | Waste #3 Contact IDW | Waste #4 Decon Fluids | Waste #5 PCS | Waste #6 Returned Rad-Van Samples | Waste #7 Debris | Waste #8 Excavated Soil | Waste #9 Tank Contents | Waste #10 Lead Shot |
|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 3 cy | 22 cy | 1 cy | < 55 gal | <1 cy | 0.5 cy | 16 cy | 30 cy | 10 cy | 1 gallon |
| Packaging | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container | Approved Container |
| **Regulatory Classification** | | | | | | | | | | |
| Radioactive | | X | X | X | X | X | X | X | X | |
| MSW | X | | | | | | | | | |
| Hazardous | | X | X | X | X | X | X | X | X | X |
| MLLW (hazardous and radioactive) | | X | X | X | X | X | X | X | X | X |
| Beryllium | | X | X | | X | X | X | X | X | |
| PCB | | X | X | X | X | X | X | X | X | |
| New Mexico Special Waste | | | | | X | | | | | |
| Industrial | | X | X | X | X | X | X | X | X | |
| **Characterization Method** | | | | | | | | | | |
| Acceptable knowledge (AK): Existing Data/Documentation | X | | X | X | X | X | X | | | X |
| AK: Site Characterization | | | X | | | X | X | | | |
| Direct Sampling/ or smears for lead shot | | X | | X | X | X | X | X | X | X |
| **Analytical Testing** | | | | | | | | | | |
| Volatile Organic Compounds (EPA 8260-B) | | X | | X | X | X | X | X | X | |
| Semivolatile Organic Compounds (EPA 8270-C) | | X | | X | X | X | X | X | X | |
| Organic Pesticides (EPA 8081-A) | | X | | | | | | X | X | |
| Organic Herbicides (EPA 8151-A) | | X | | | | | | X | X | |

| Waste Description | Waste # 1 MSW | Waste #2 Drill Cuttings | Waste #3 Contact IDW | Waste #4 Decon Fluids | Waste #5 PCS | Waste #6 Returned Rad-Van Samples | Waste #7 Debris | Waste #8 Excavated Soil | Waste #9 Tank Contents | Waste #10 Lead Shot |
|---|---|---|---|---|---|---|---|---|---|---|
| PCBs (EPA 8082) | | X | | X | X | X | X | X | X | |
| Total Metals (EPA 6010-B/7471-A) | | X | | X | X | X | X | X | X | |
| Total Cyanide (EPA 9012-A) | | X | | X | | X | | X | | |
| High Explosives Constituents (EPA 8330/8321-A) | | X | | X | X | X | X[a] | X | X | |
| Asbestos | | | | | | | X[a] | X[a] | | |
| Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M) | | X | | | X | X | | X | | |
| TPH-DRO (EPA 8015-M) | | X | | | X | X | | X | | |
| TCLP Metals (EPA 1311/6010-B) | | X | | | X | X | X | | | |
| TCLP Organics (EPA 1311/8260-B & 1311/8270-C) | | X | | | X | X | | | | |
| TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A) | | | | | | | | | | |
| Gross Alpha (alpha counting) (EPA 900) | | | | | | | | | | |
| Gross Beta (beta counting) (EPA 900) | | | | | | | | | | |
| Tritium (liquid scintillation) (EPA 906.0) | | X | | X | X[d] | X | X | X | X | |
| Gamma spectroscopy (EPA 901.1) | | | | | | | | X | | |
| Isotopic plutonium (chem. separation/alpha spec.) (HASL-300) | | X | | X | X[d] | X | X | X | X | |

| Waste Description | Waste # 1 MSW | Waste #2 Drill Cuttings | Waste #3 Contact IDW | Waste #4 Decon Fluids | Waste #5 PCS | Waste #6 Returned Rad-Van Samples | Waste #7 Debris | Waste #8 Excavated Soil | Waste #9 Tank Contents | Waste #10 Lead Shot |
|---|---|---|---|---|---|---|---|---|---|---|
| Isotopic uranium (chem. separation/alpha spec.) (HASL-300) | | X | | X | X[d] | X | X | X | X | |
| Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS]) | | | | | | | | | | |
| Strontium-90 (EPA 905) | | X | | X | X[d] | X | X | X | X | |
| Americium-241 (chem. separation/alpha spec.) (HASL-300) | | X | | X | X[d] | X | X | X | X | |
| TDS | | | | X[e] | | | | | X[e] | |
| TSS | | | | X[e] | | | | | X[e] | |
| COD | | | | X[e] | | | | | X[e] | |
| TTO (Method 624, 625A, 625B) | | | | X[e] | | | | | X[e] | |
| Perchlorate | | X | | X | | X | | X | X | |
| Nitrates | | X | | X[e] | | X | | X | X[e] | |
| Gross Gamma | | | | X[e] | | | | | X[e] | |
| Waste Profile Form # | NA | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

[a] If needed
[b] If waste is destined for Energy Solutions facility in Clive, Utah.
[c] If waste is destined for an authorized New Mexico Special Waste Facility, it will require TPH data.
[d] If waste may have contacted radioactively-contaminated soil.
[e] If the waste is destined for the RLWTF.

Note: Section 1.2 of the TCLP method 1311 states "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run." The methodology for using total waste analyses determination for the 40 TC constituents is as follows;

Liquids – Wastes containing less than 0.5% filterable solids do not require extraction and therefore by filtering the waste and measuring the total constituent levels of the filtrate and comparing those levels to regulatory levels is appropriate.

Solids – Constituent concentrations from the extraction fluid of wastes that are 100% physical solids are divided by 20 (reflecting the 20 to 1 ratio of TCLP extraction) and then compared to the regulatory levels. If the theoretical levels do not equal or exceed the regulatory levels, the TCLP need not be run. If the levels do equal or exceed the regulatory levels, the generator will run TCLP analyses.

| Signatures | Date |
|---|---|
| WES-CAP Project Leader (Sign below) John McCann | 12-1-09 |
| WES Waste Management Coordinator (Sign below) Gordon Jio | 12\1\2009 |
| ENV-RCRA Representative (Sign below) Ann Sherrard | 12/1/09 |
| Waste Certification Program Representative (Sign below) Michelle Coriz | 12/1/09 |
| WES-WA Representative (Sign below) Andy Elicio | 12/02/2009 |

**Amendment #1**
**to the Waste Characterization Strategy Form (WCSF) (EP2009-0637) for**
**Implementation of the Investigation Work Plan for Threemile Canyon Agg Area**

Date: 12/15/2009



## REASON FOR CHANGE

Amendment #1 to WCSF EP2009-0637 for the Implementation of the IWP for Threemile Canyon Aggregate Area will add waste stream #11, HE spot test waste. The field investigation of Threemile canyon requires that a HE spot test be conducted at each location prior to collecting a characterization sample The HE Spot Test was inadvertently left out of the original WCSF.

### WASTE DESCRIPTION

Waste #11: HE spot test waste

This waste stream will be composed of filter paper, soil or rock, sodium methoxide/dimethyl sulfoxide, hydrochloric acid/sulfanilamide, 1-N-(naphthyl-ethylene) diamine hydrochloride/water. There will not be free liquids associated with the waste.

### CHARACTERIZATION, MANAGEMENT, AND DISPOSAL

Waste #11: HE spot test waste

This waste stream will be characterized by the HE Spot Test material safety data sheets and AK from the characterization of the investigation surface samples from each location. Contact waste will initially be stored in a registered hazardous waste accumulation area pending analytical data availability. If the waste is characterized as non-hazardous, it will be stored in a designated non-hazardous waste area appropriate for the waste classification. For disposal, the separately containerized HE spot test waste may be combined with the contact waste (waste stream #3). The WPF will document the decision to combine the waste streams. Wastes will be treated and/or disposed of in authorized on- or off-site facilities appropriate for the waste classification.

| **SIGNATURES** (Print name and then sign.) | **DATE** |
|---|---|
| **WES-CAP Project Leader** (Sign below.) John McCann | |
| [signature] | 1-4-10 |
| **WES Waste Management Coordinator** (Sign below.) Gordon Jio | |
| [signature] | 1/4/2010 |
| **ENV-RCRA Representative** (Sign below) Ann Sherrard | |
| [signature] | 1/4/2010 |
| **Waste Certification Program Representative** (Sign below.) Michelle Coriz | |
| [signature] | 1/4/2010 |
| **WES-WA Representative** (Sign below.) Andy Elicio | |
| [signature] | 1/4/2010 |

# Appendix G

*Box Plots and Statistical Results*

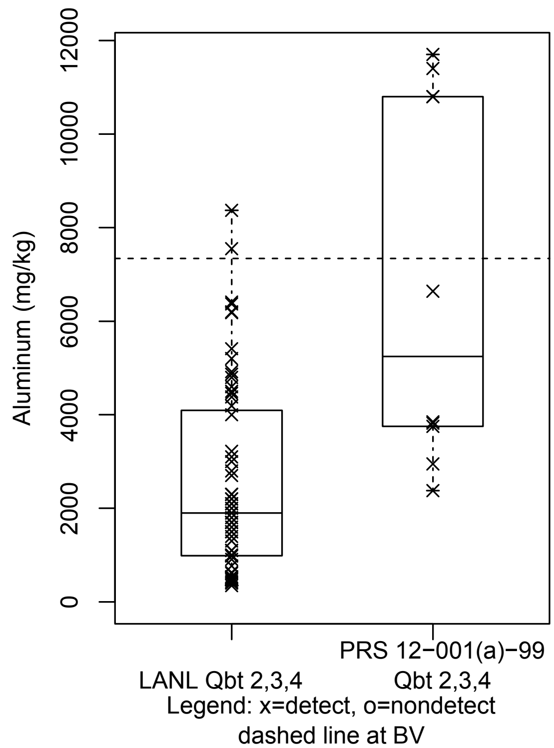


**Figure G-1 Box plot for aluminum in tuff at SWMUs 12-001(a) and 12-001(b)**

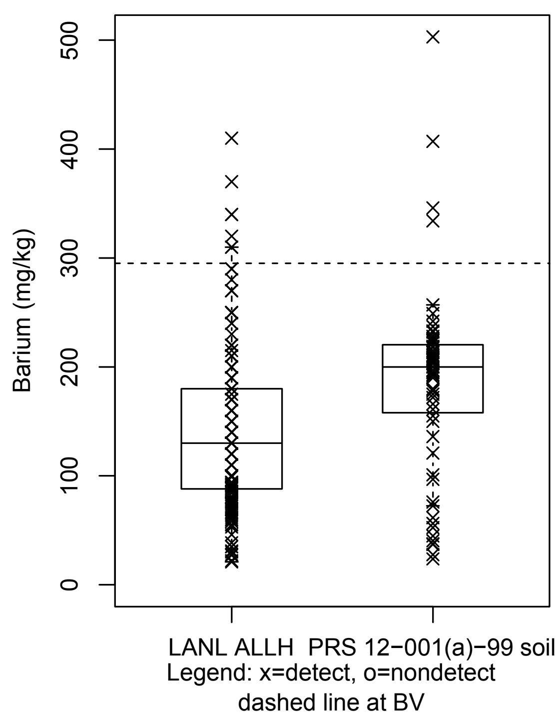


**Figure G-2 Box plot for barium in soil at SWMUs 12-001(a) and 12-001(b)**

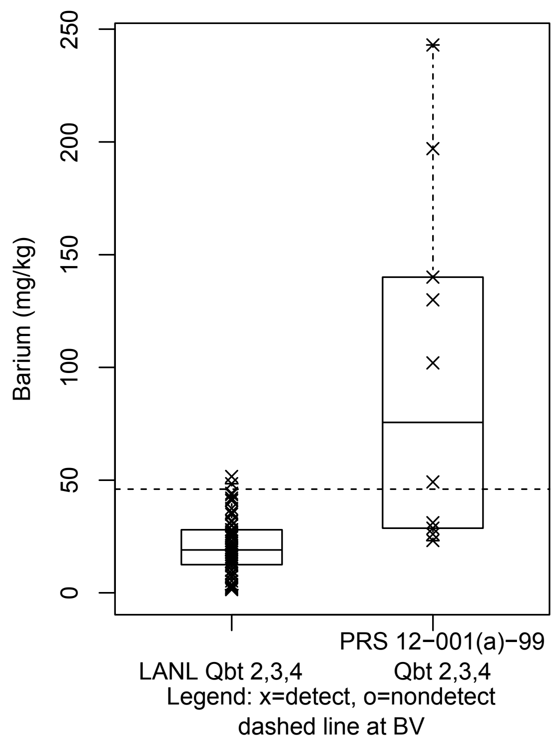


**Figure G-3 Box plot for barium in tuff at SWMUs 12-001(a) and 12-001(b)**

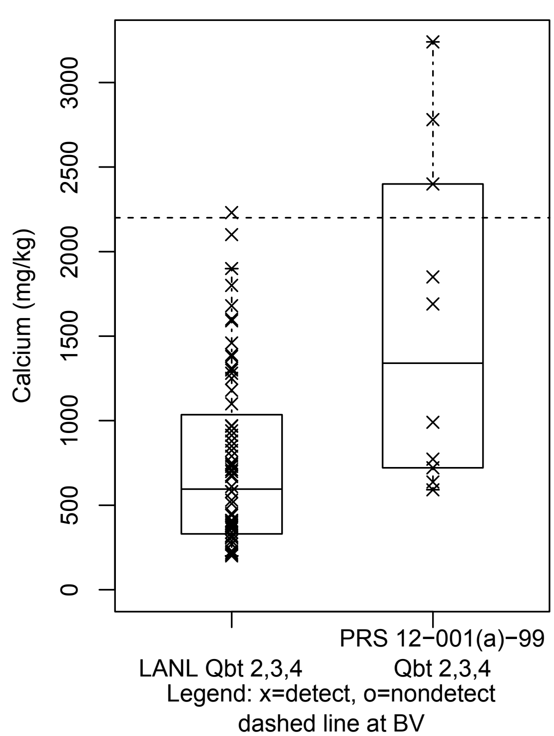


**Figure G-4 Box plot for calcium in tuff at SWMUs 12-001(a) and 12-001(b)**

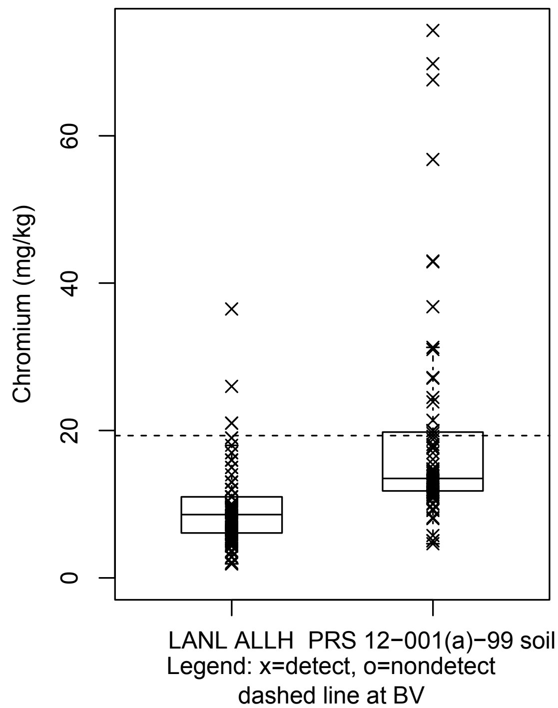


**Figure G-5 Box plot for chromium in soil at SWMUs 12-001(a) and 12-001(b)**

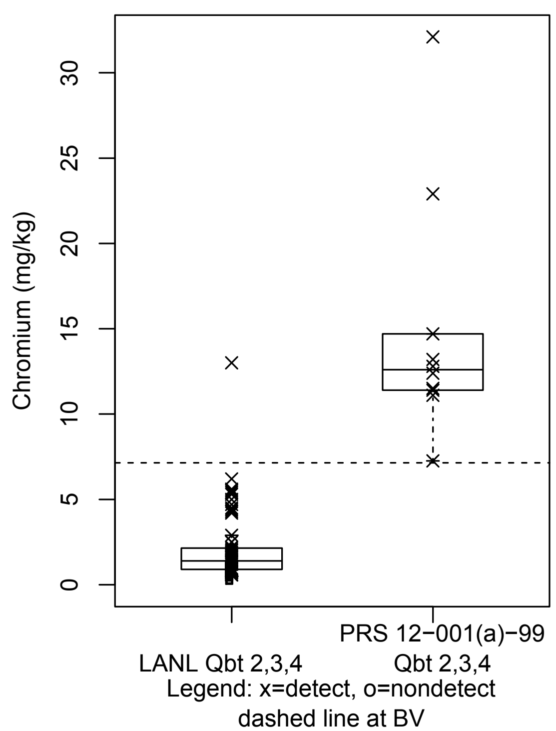


**Figure G-6 Box plot for chromium in tuff at SWMUs 12-001(a) and 12-001(b)**

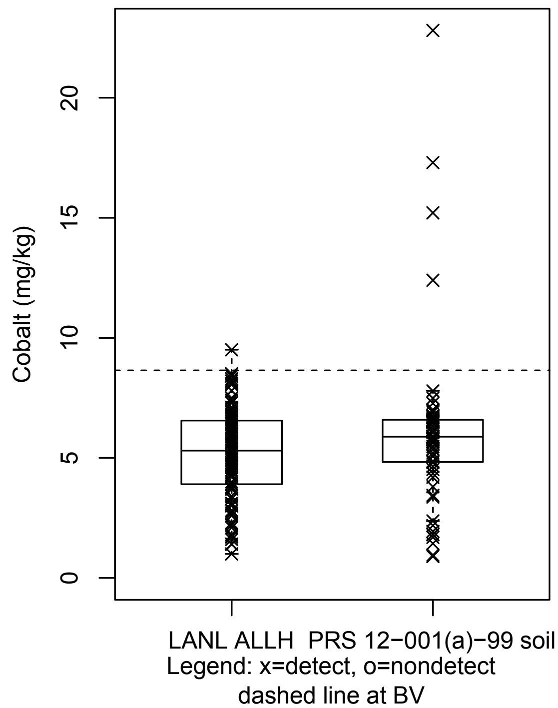


**Figure G-7 Box plot for cobalt in soil at SWMUs 12-001(a) and 12-001(b)**

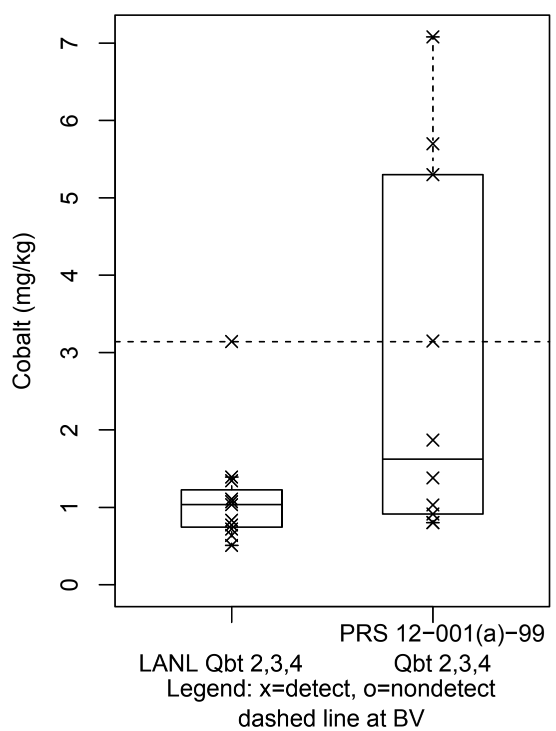


**Figure G-8 Box plot for cobalt in tuff at SWMUs 12-001(a) and 12-001(b)**

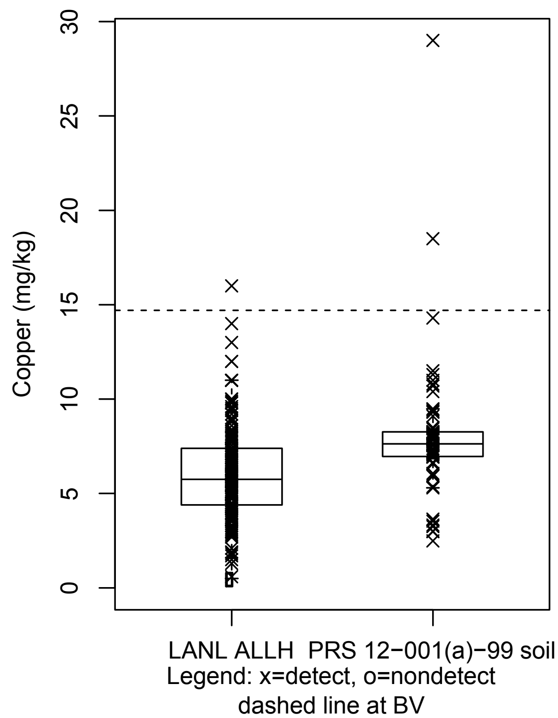


**Figure G-9 Box plot for copper in soil at SWMUs 12-001(a) and 12-001(b)**

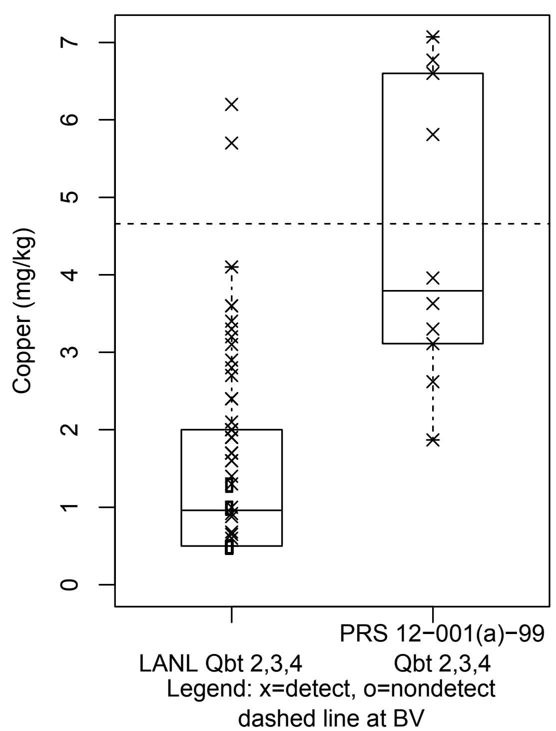


**Figure G-10 Box plot for copper in tuff at SWMUs 12-001(a) and 12-001(b)**

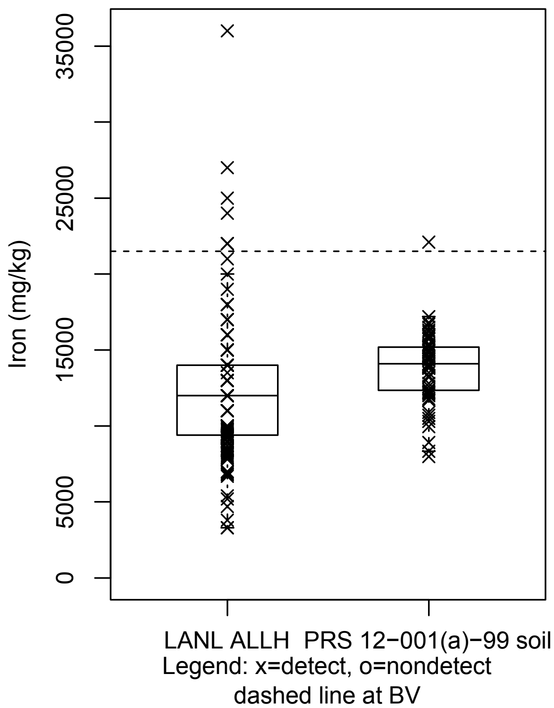


**Figure G-11 Box plot for iron in soil at SWMUs 12-001(a) and 12-001(b)**

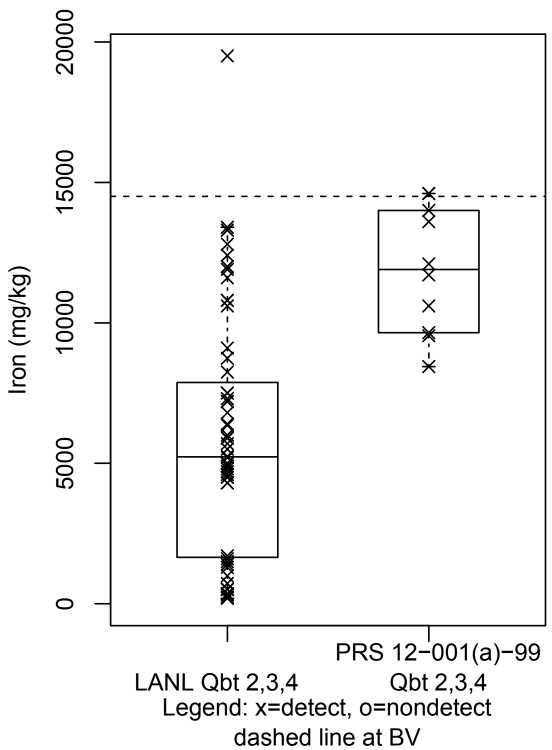


**Figure G-12 Box plot for iron in tuff at SWMUs 12-001(a) and 12-001(b)**

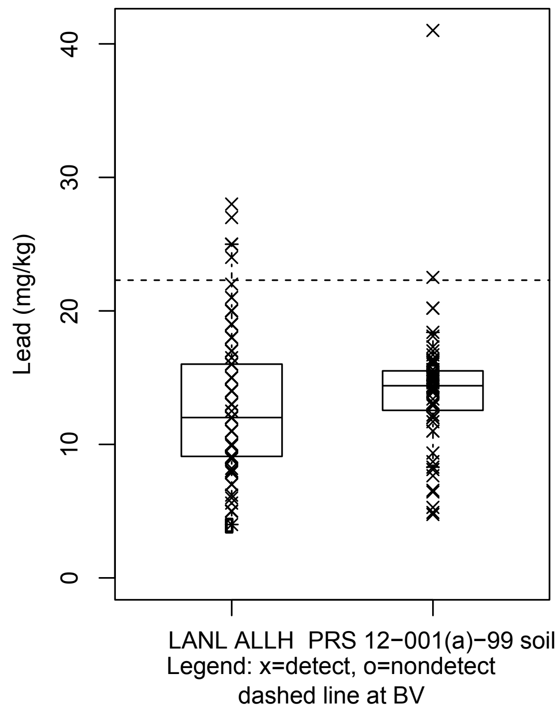


**Figure G-13 Box plot for lead in soil at SWMUs 12-001(a) and 12-001(b)**

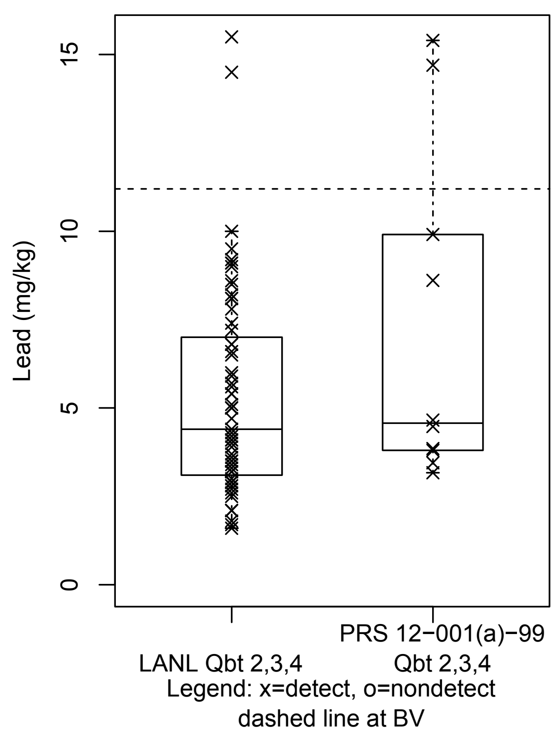


**Figure G-14 Box plot for lead in tuff at SWMUs 12-001(a) and 12-001(b)**

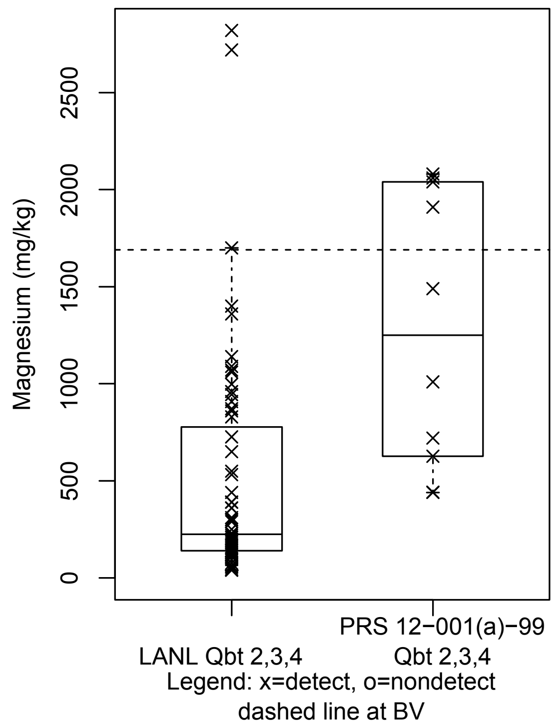


**Figure G-15 Box plot for magnesium in tuff at SWMUs 12-001(a) and 12-001(b)**

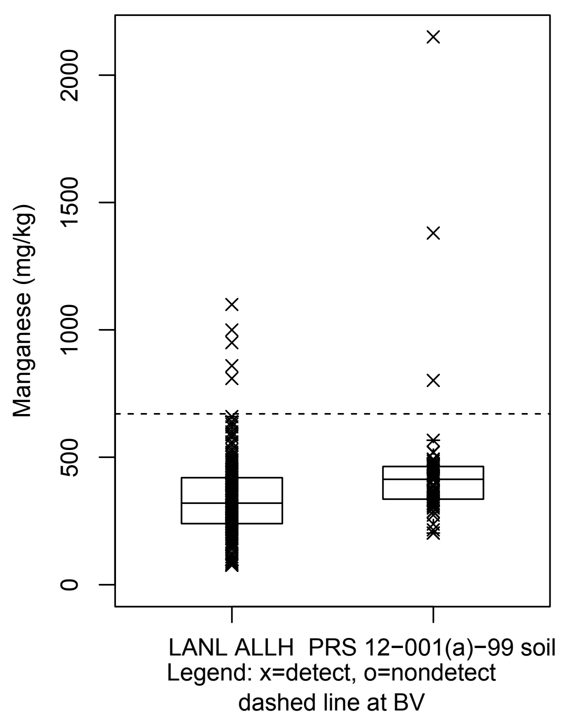


**Figure G-16 Box plot for manganese in soil at SWMUs 12-001(a) and 12-001(b)**

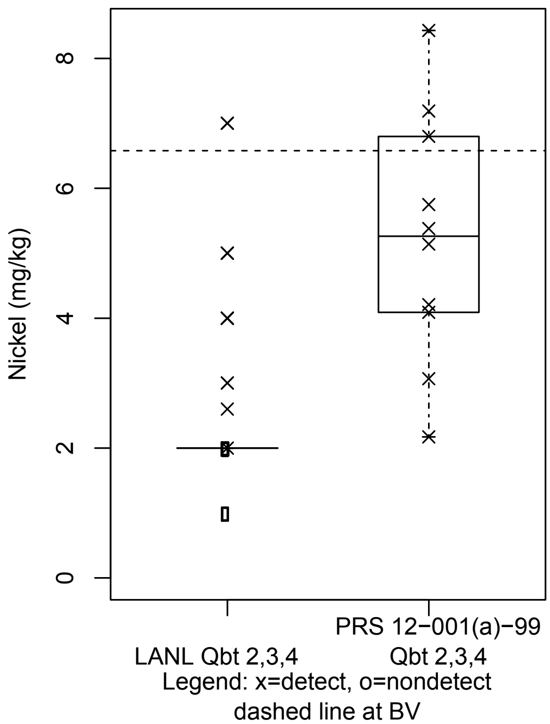


**Figure G-17 Box plot for nickel in tuff at SWMUs 12-001(a) and 12-001(b)**

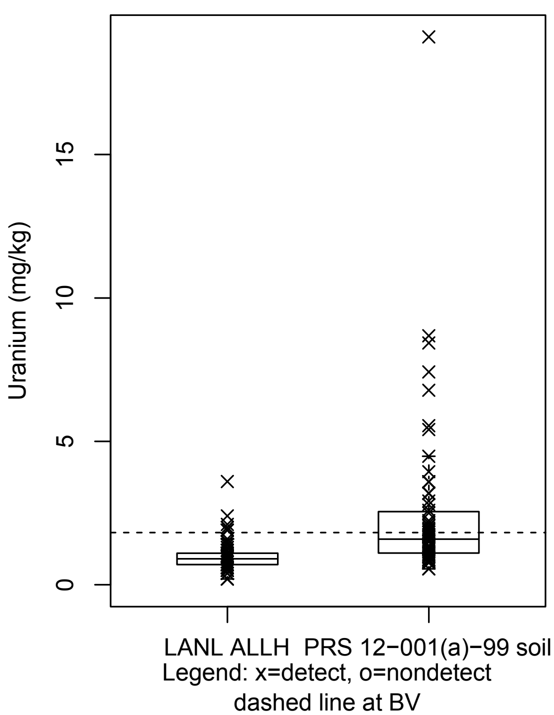


**Figure G-18 Box plot for uranium in soil at SWMUs 12-001(a) and 12-001(b)**

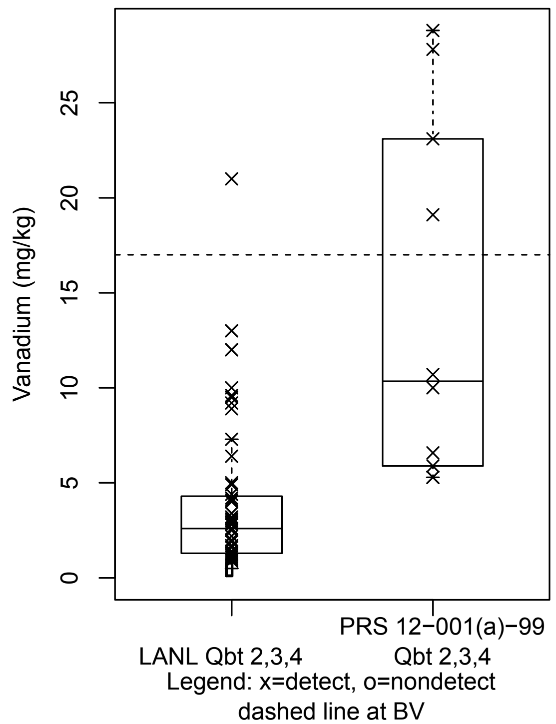


**Figure G-19 Box plot for vanadium in tuff at SWMUs 12-001(a) and 12-001(b)**

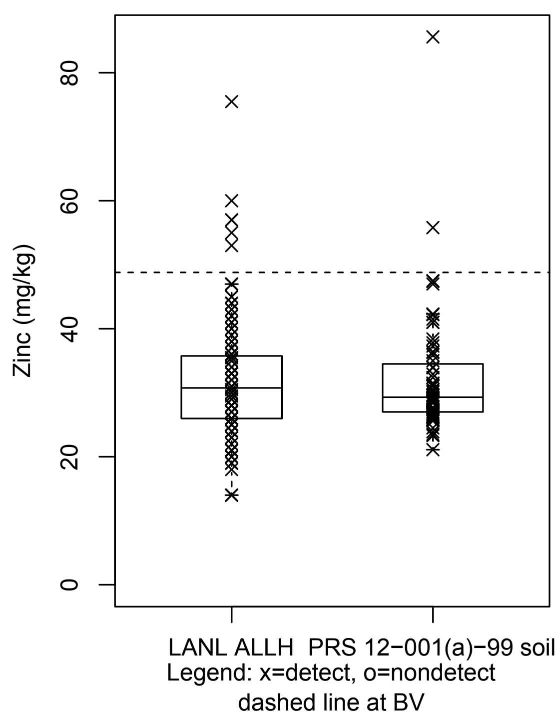


**Figure G-20 Box plot for zinc in soil at SWMUs 12-001(a) and 12-001(b)**

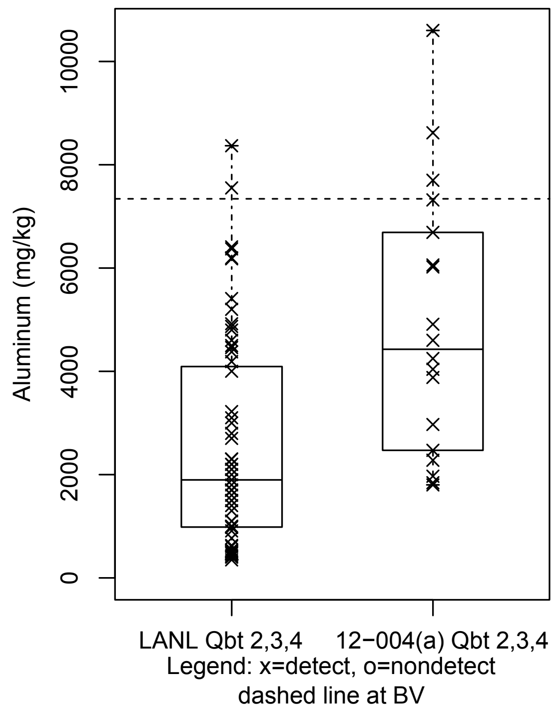


**Figure G-21 Box plot for aluminum in tuff at AOC 12-004(a)**

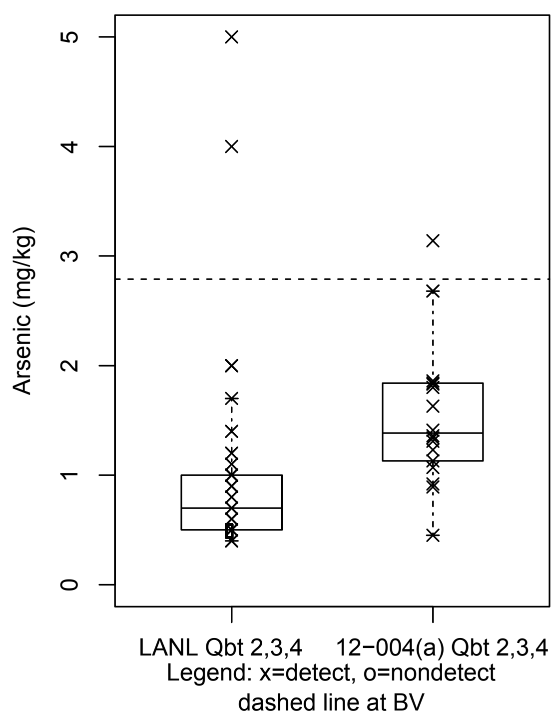


**Figure G-22 Box plot for arsenic in tuff at AOC 12-004(a)**

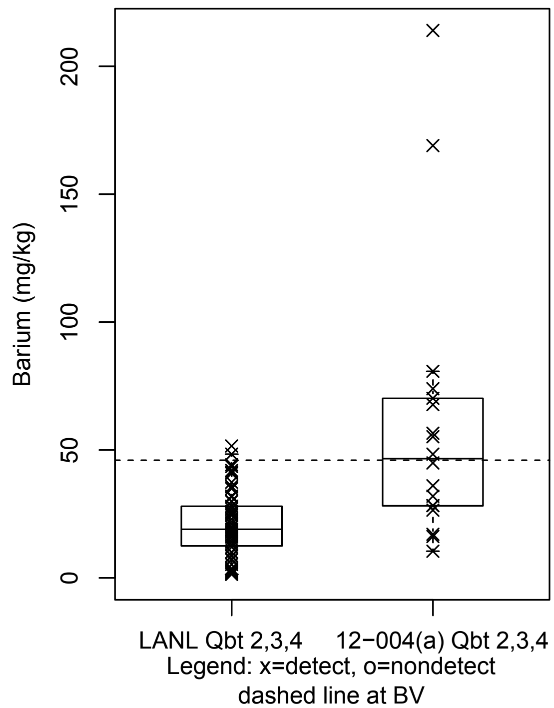


**Figure G-23 Box plot for barium in tuff at AOC 12-004(a)**

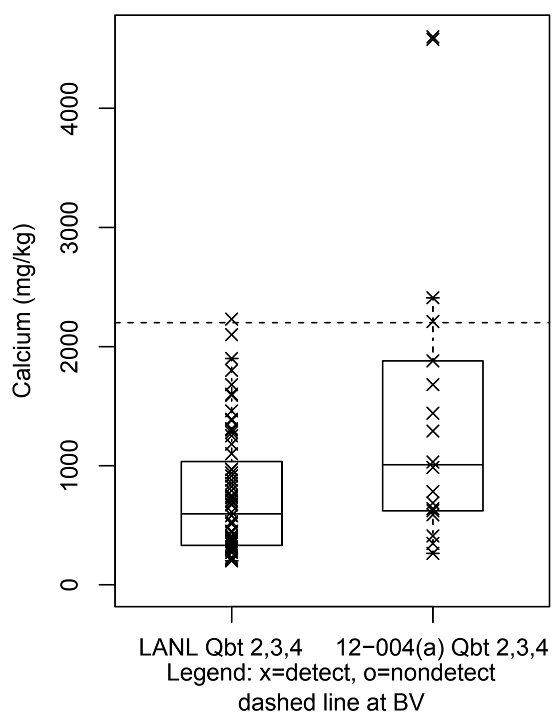


**Figure G-24 Box plot for calcium in tuff at AOC 12-004(a)**

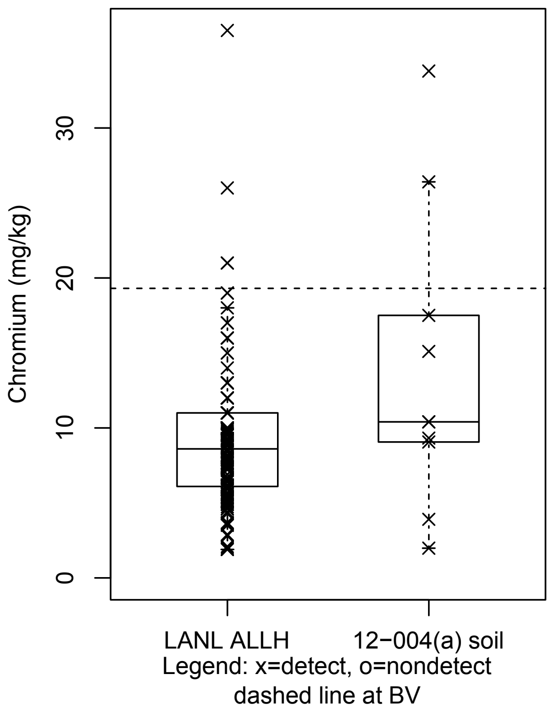


**Figure G-25 Box plot for chromium in soil at AOC 12-004(a)**

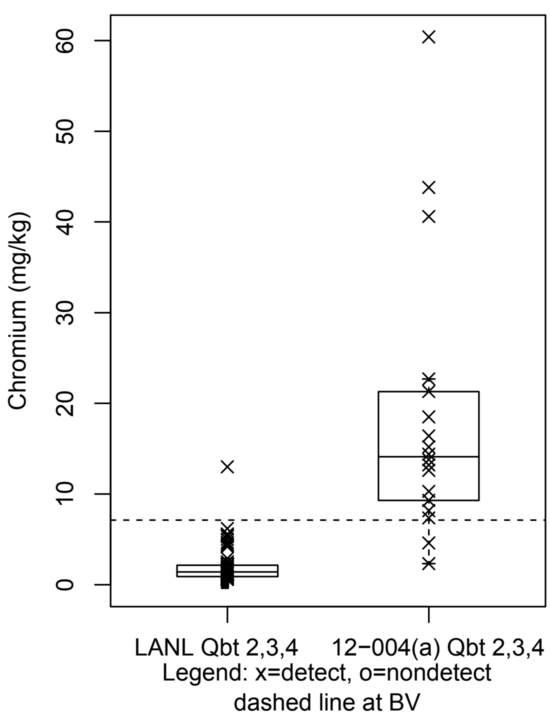


**Figure G-26 Box plot for chromium in tuff at AOC 12-004(a)**

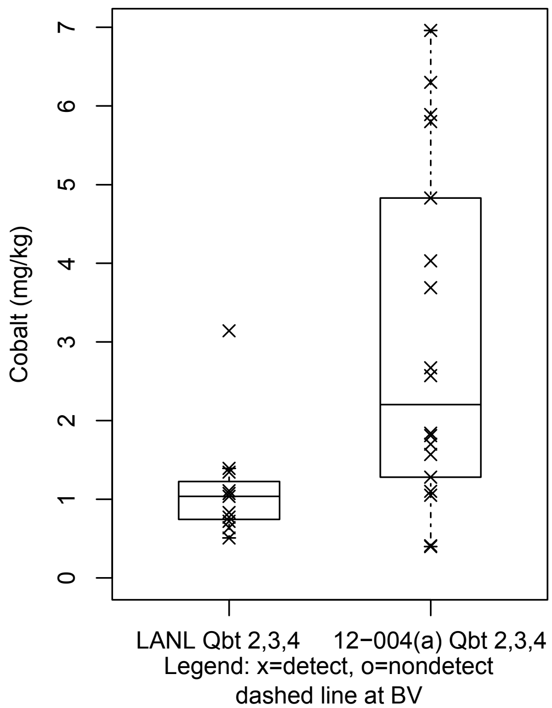


**Figure G-27 Box plot for cobalt in tuff at AOC 12-004(a)**

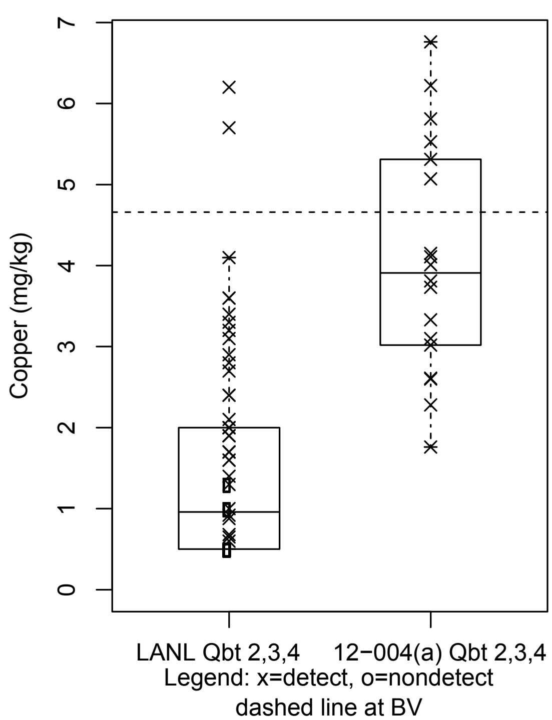


**Figure G-28 Box plot for copper in tuff at AOC 12-004(a)**

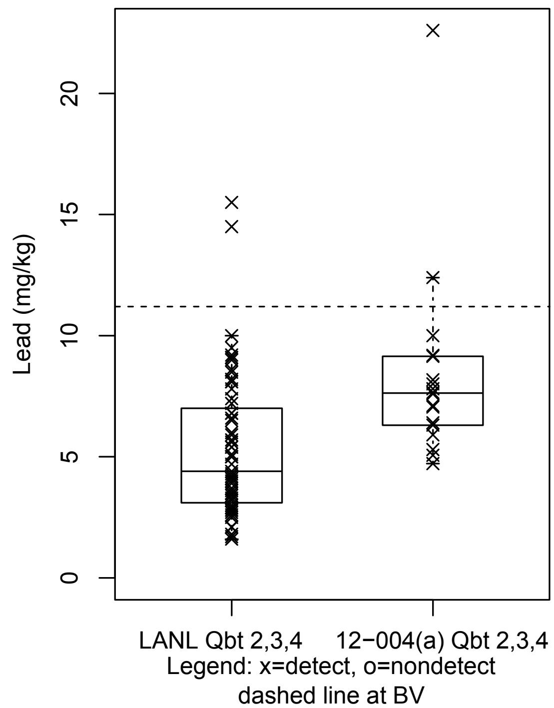


**Figure G-29 Box plot for lead in tuff at AOC 12-004(a)**

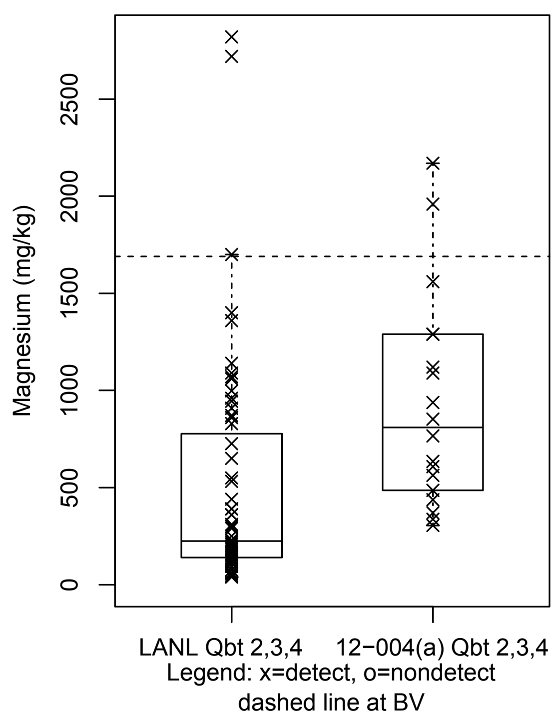


**Figure G-30 Box plot for magnesium in tuff at AOC 12-004(a)**

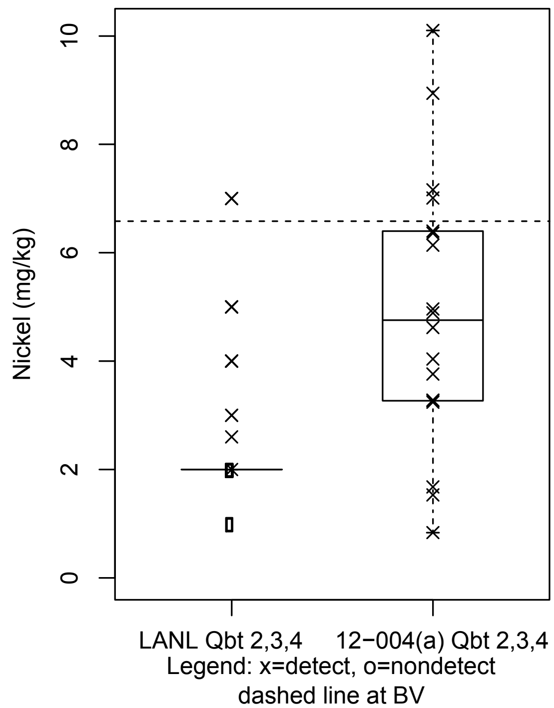


**Figure G-31 Box plot for nickel in tuff at AOC 12-004(a)**

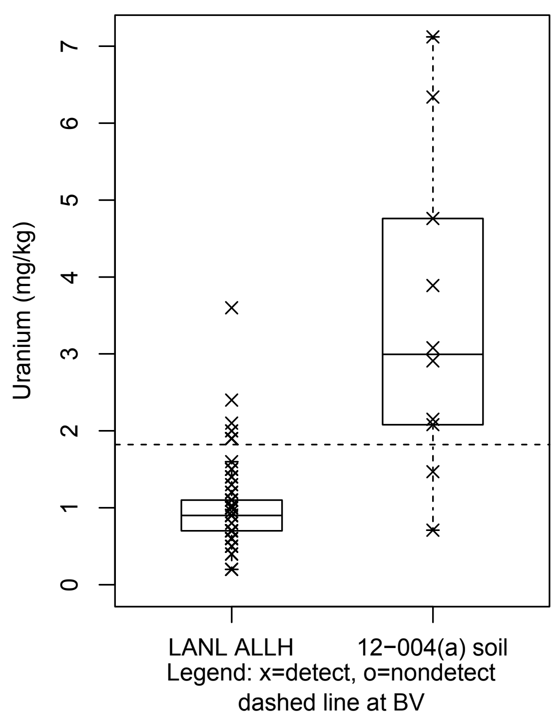


**Figure G-32 Box plot for uranium in soil at AOC 12-004(a)**

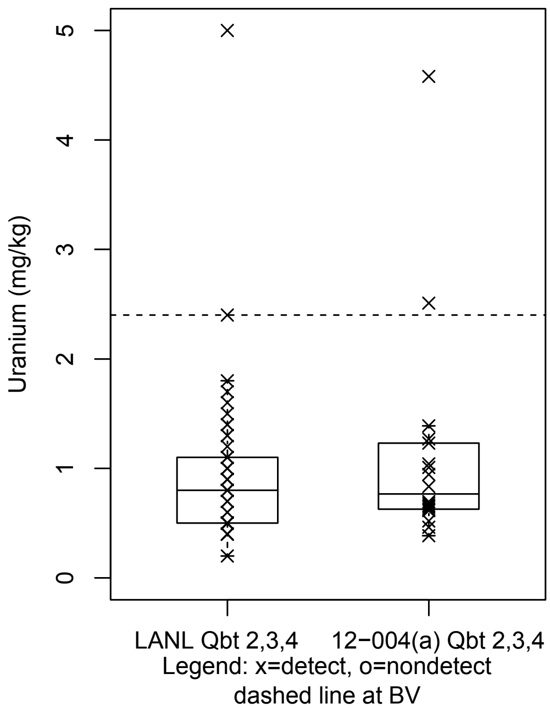


**Figure G-33 Box plot for uranium in tuff at AOC 12-004(a)**

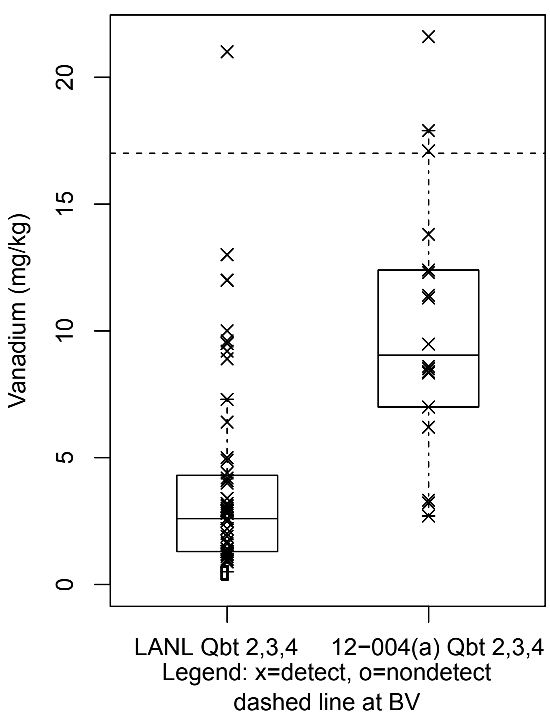


**Figure G-34 Box plot for vanadium in tuff at AOC 12-004(a)**

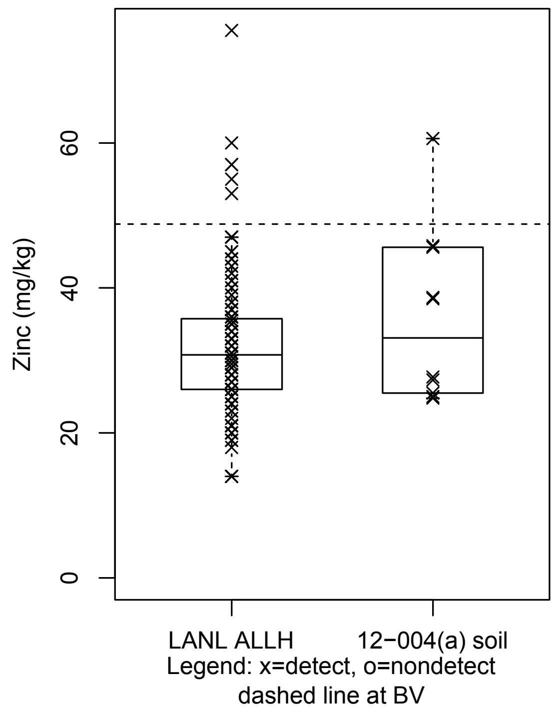


**Figure G-35 Box plot for zinc in soil at AOC 12-004(a)**

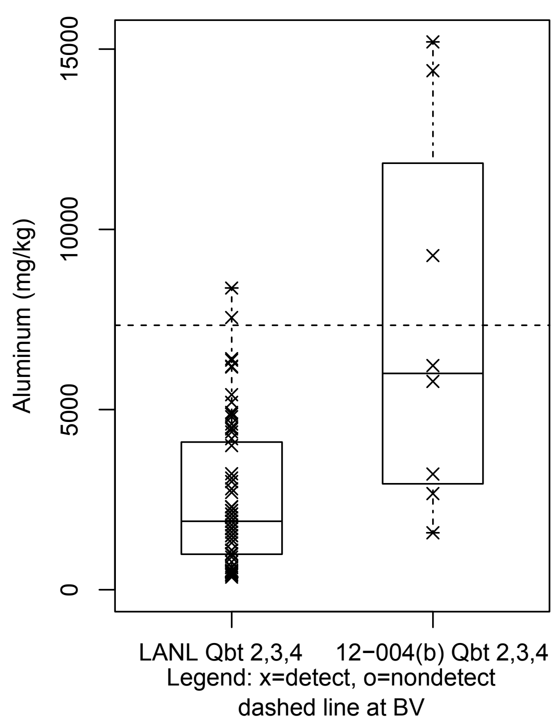


**Figure G-36 Box plot for aluminum in tuff at AOC 12-004(b)**

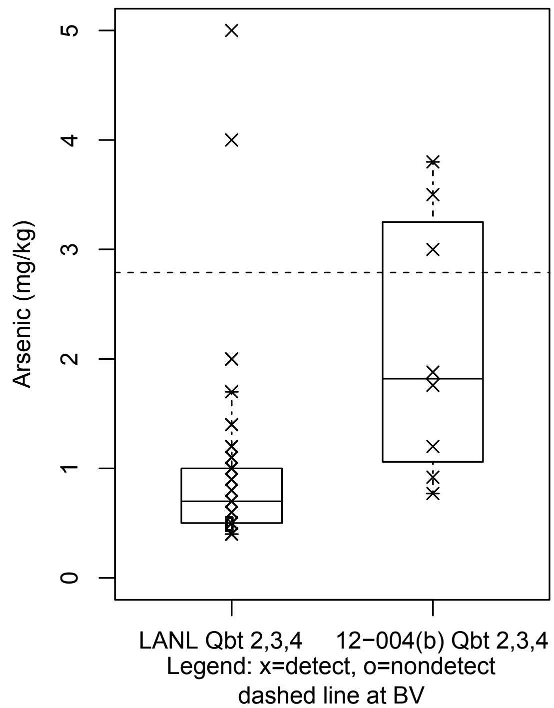


**Figure G-37 Box plot for arsenic in tuff at AOC 12-004(b)**

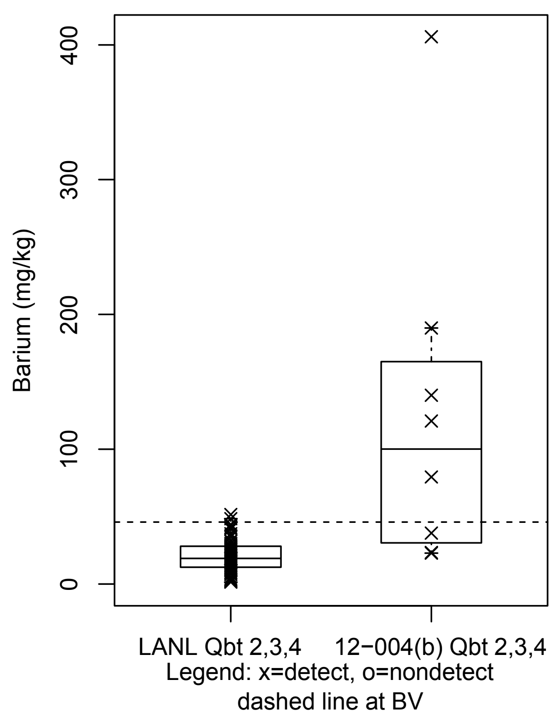


**Figure G-38 Box plot for barium in tuff at AOC 12-004(b)**

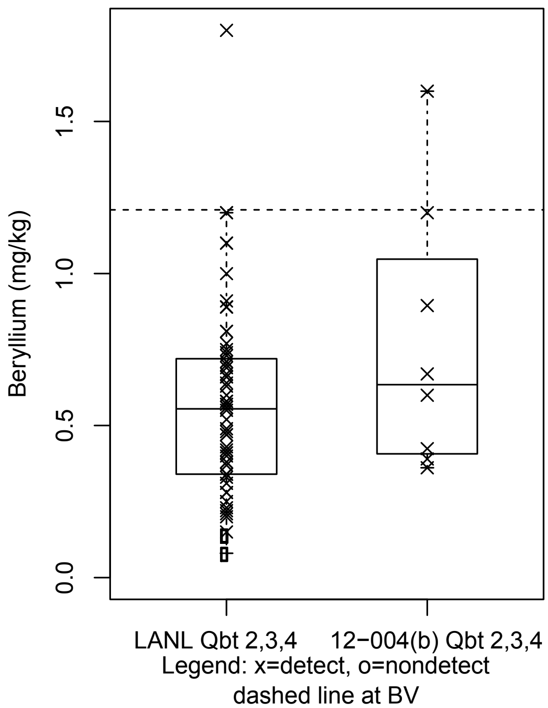


**Figure G-39 Box plot for beryllium in tuff at AOC 12-004(b)**

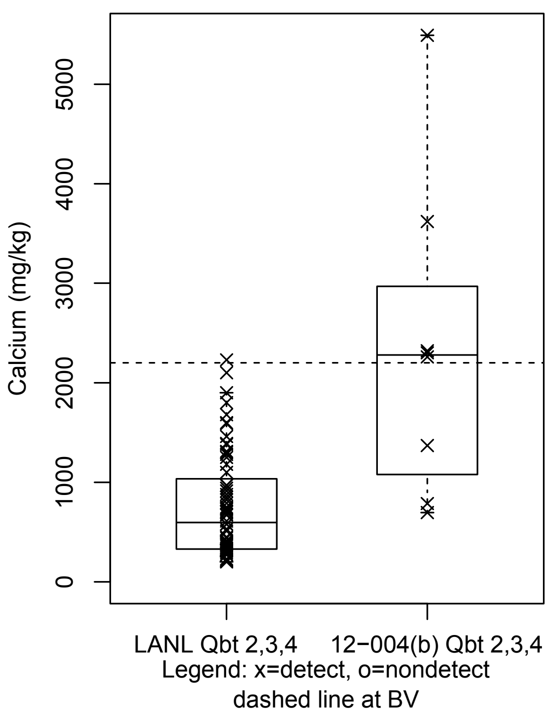


**Figure G-40 Box plot for calcium in tuff at AOC 12-004(b)**

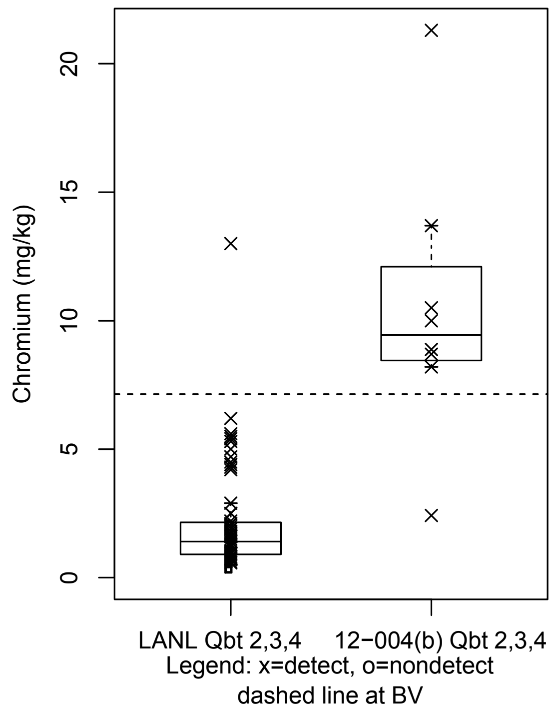


**Figure G-41 Box plot for chromium in tuff at AOC 12-004(b)**

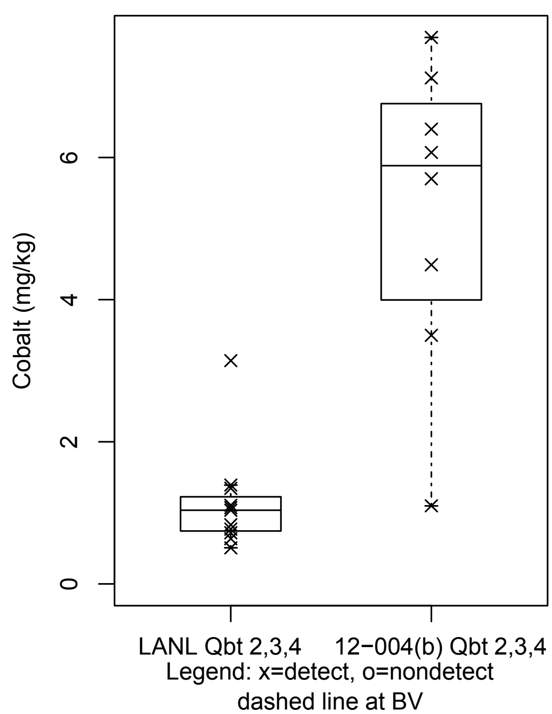


**Figure G-42 Box plot for cobalt in tuff at AOC 12-004(b)**

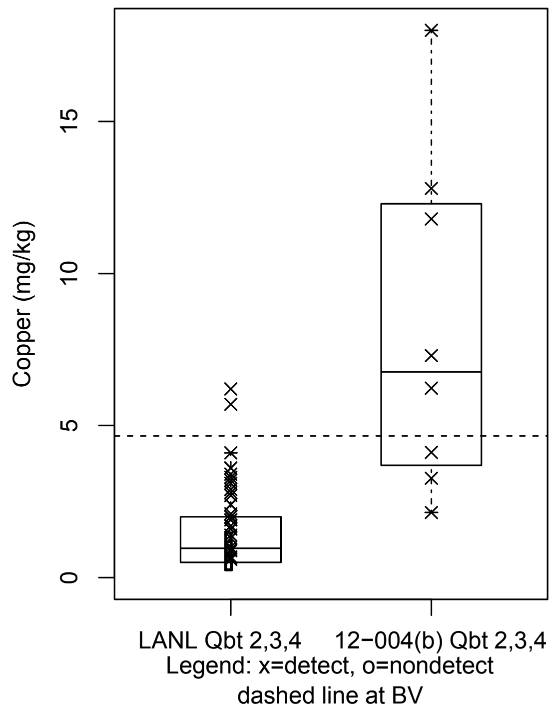


**Figure G-43 Box plot for copper in tuff at AOC 12-004(b)**

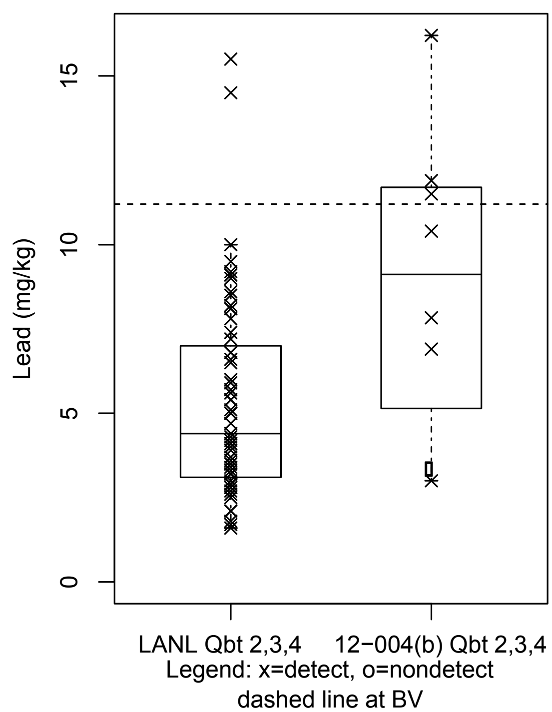


**Figure G-44 Box plot for lead in tuff at AOC 12-004(b)**

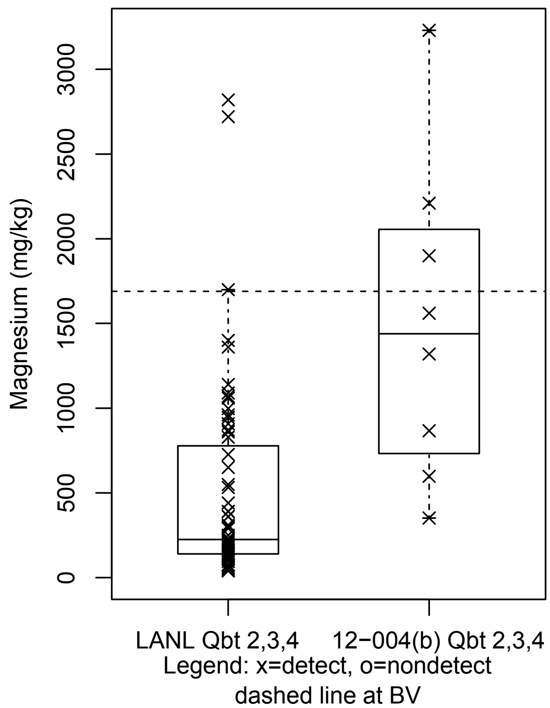


**Figure G-45 Box plot for magnesium in tuff at AOC 12-004(b)**

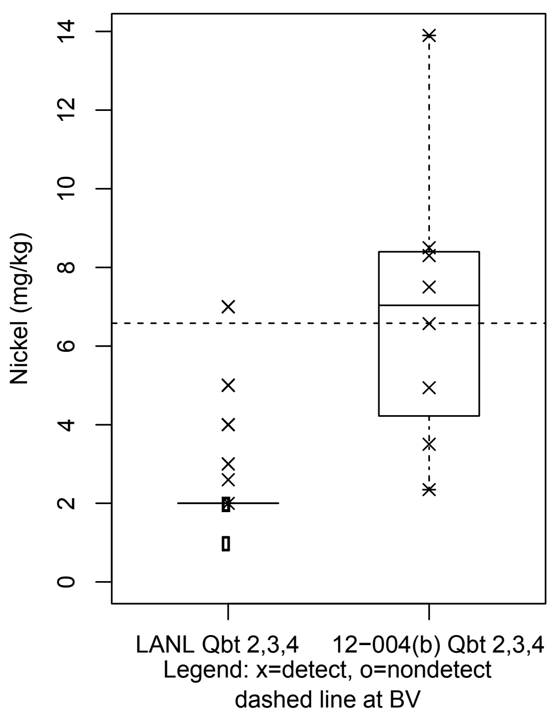


**Figure G-46 Box plot for nickel in tuff at AOC 12-004(b)**

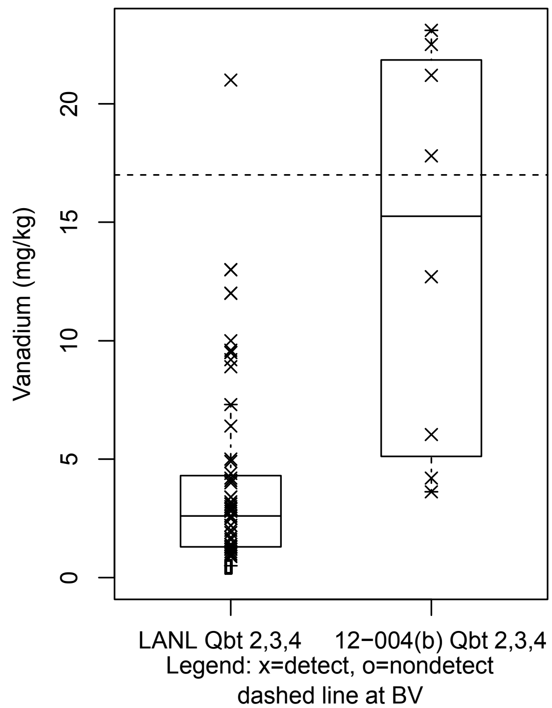


**Figure G-47 Box plot for vanadium in tuff at AOC 12-004(b)**

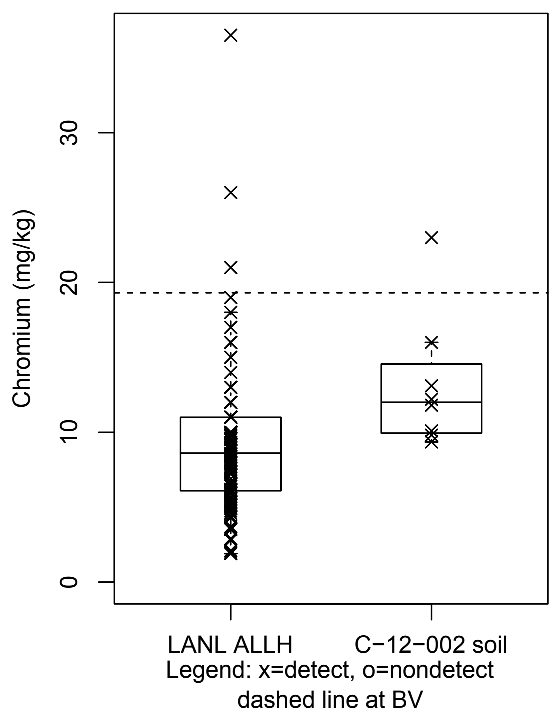


**Figure G-48 Box plot for chromium in soil at AOC C-12-002**

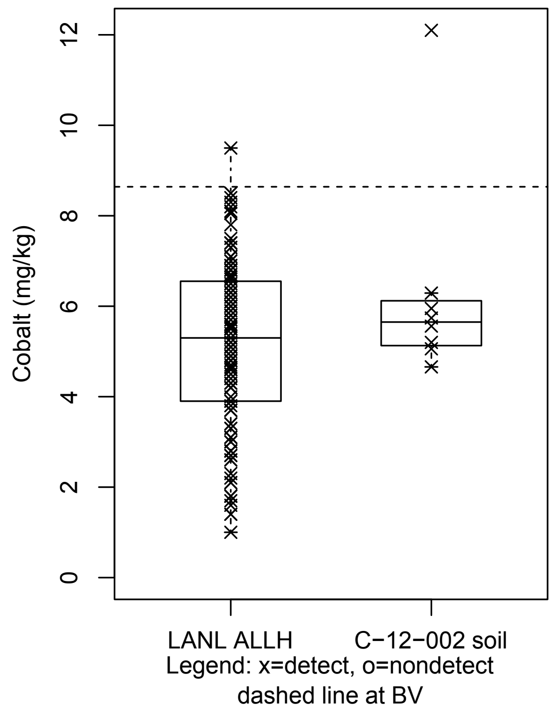


**Figure G-49 Box plot for cobalt in soil at AOC C-12-002**

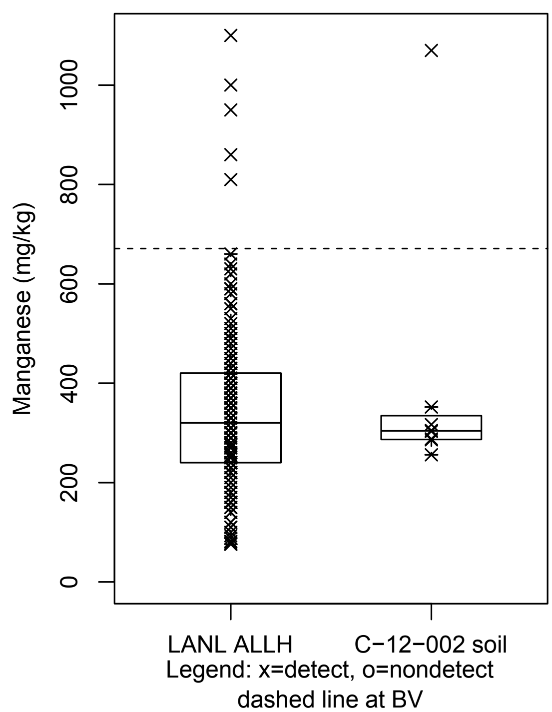


**Figure G-50 Box plot for manganese in soil at AOC C-12-002**

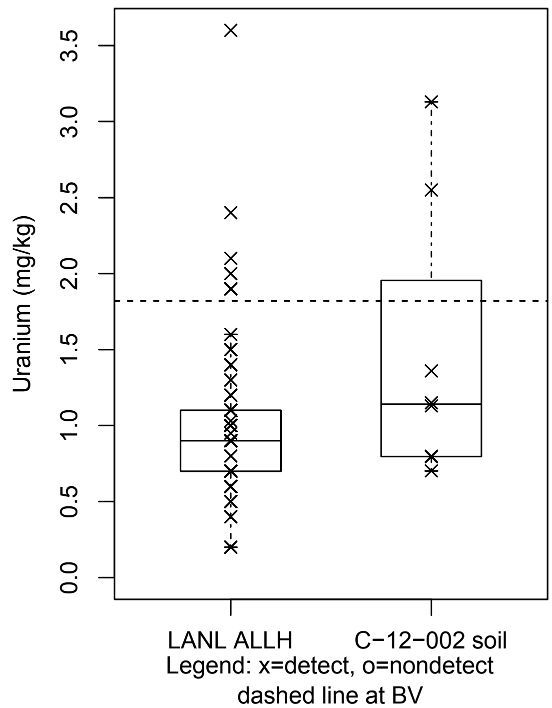


**Figure G-51 Box plot for uranium in soil at AOC C-12-002**

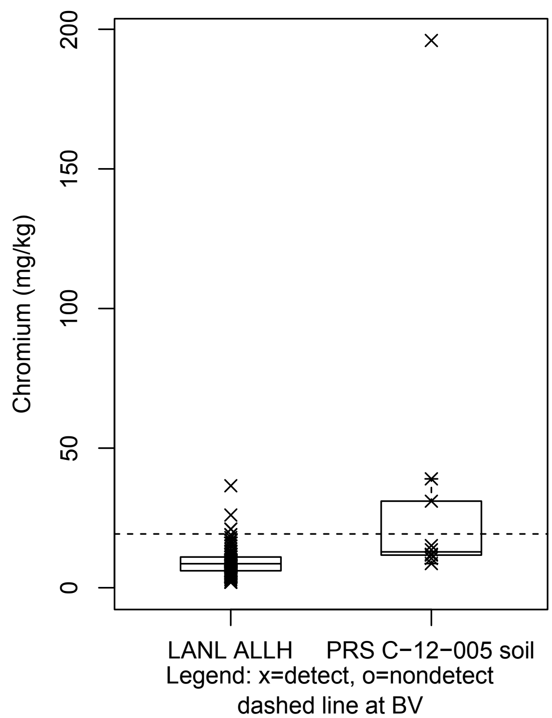


**Figure G-52 Box plot for chromium in soil at AOC C-12-005**

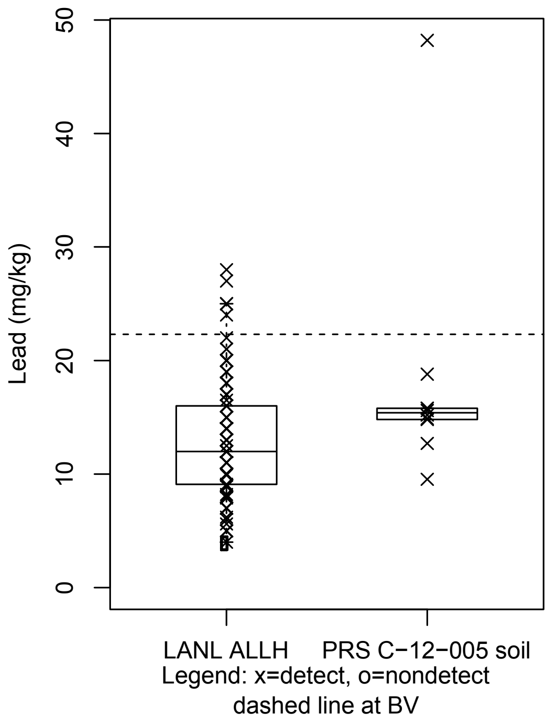


**Figure G-53 Box plot for lead in soil at AOC C-12-005**

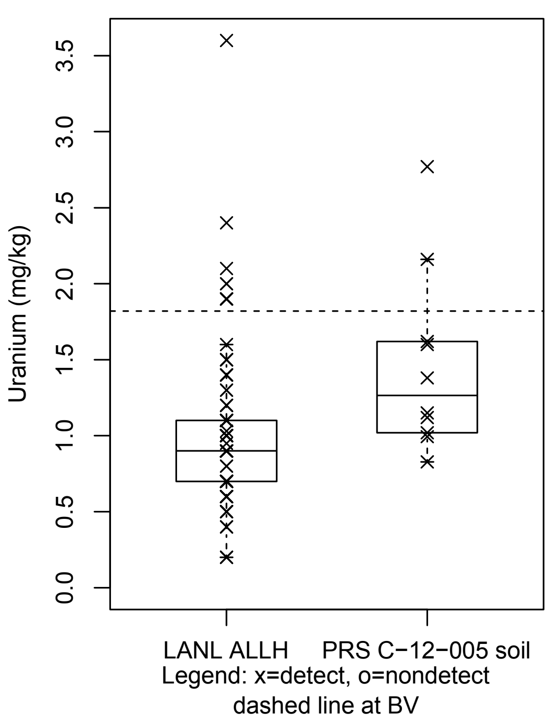


**Figure G-54 Box plot for uranium in soil at AOC C-12-005**

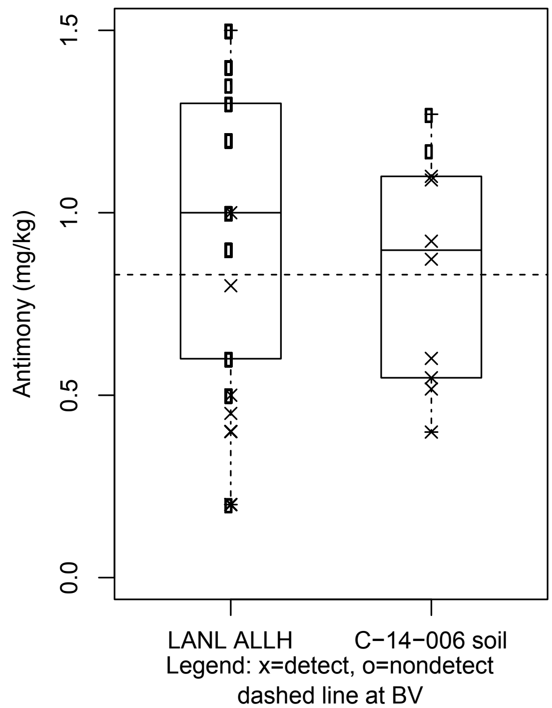


**Figure G-55 Box plot for antimony in soil at AOC C-14-006**

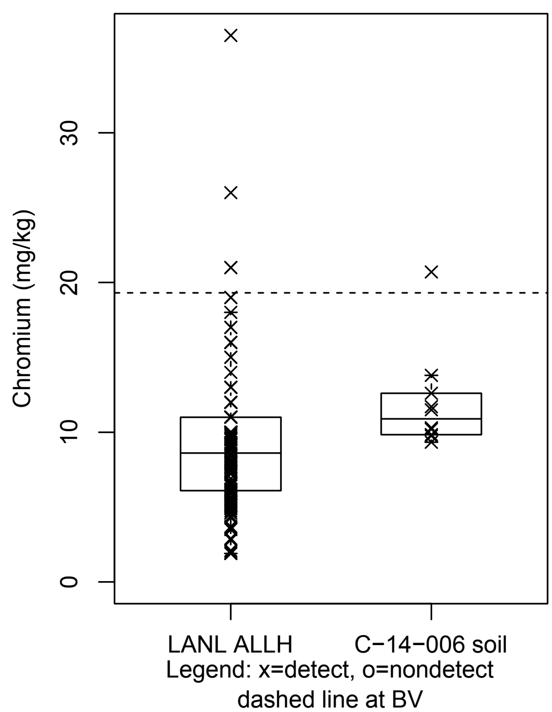


**Figure G-56 Box plot for chromium in soil at AOC C-14-006**

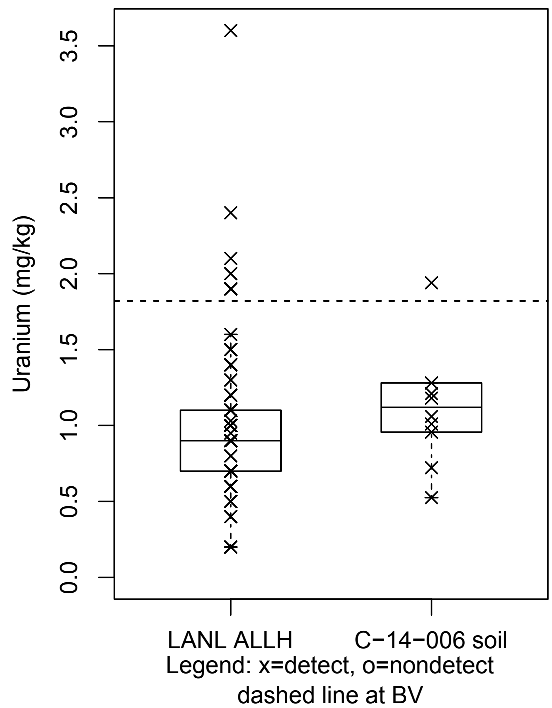


**Figure G-57 Box plot for uranium in soil at AOC C-14-006**

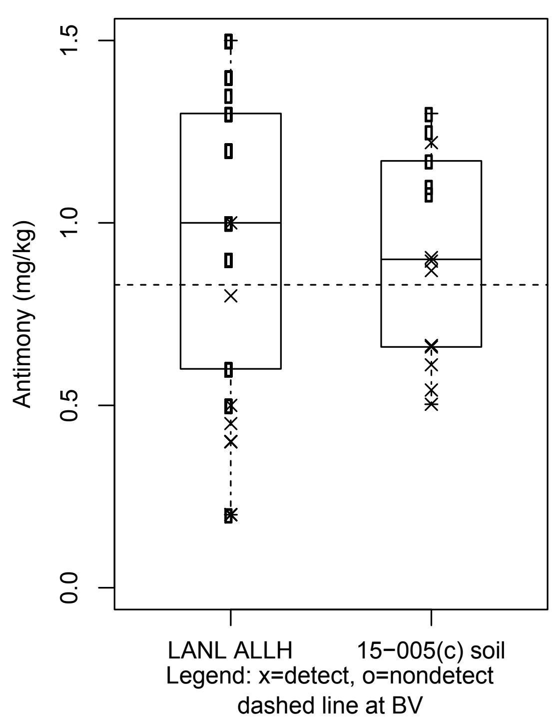


**Figure G-58 Box plot for antimony in soil at AOC 15-005(c)**

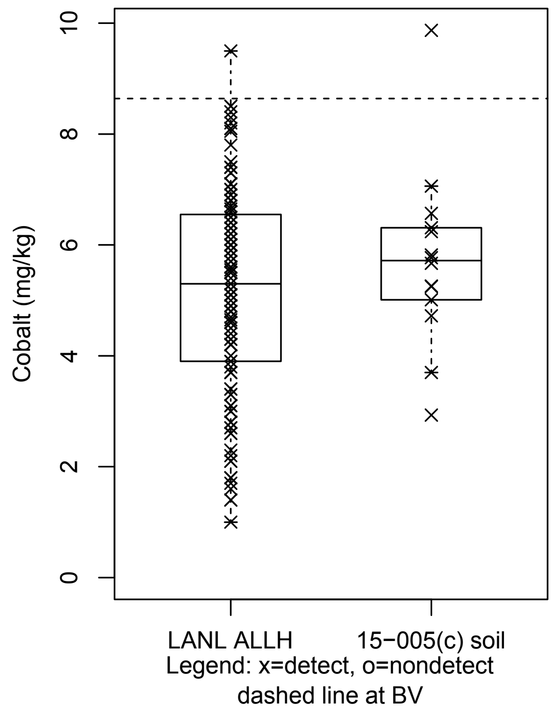


**Figure G-59 Box plot for cobalt in soil at AOC 15-005(c)**

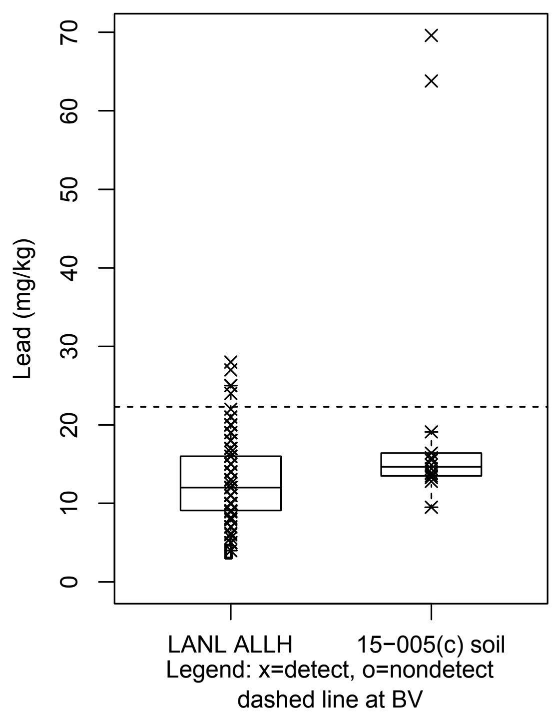


**Figure G-60 Box plot for lead in soil at AOC 15-005(c)**

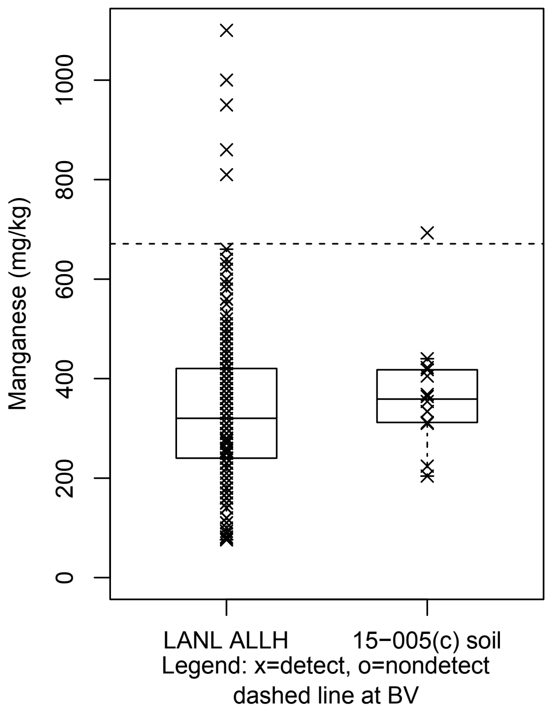


**Figure G-61 Box plot for manganese in soil at AOC 15-005(c)**

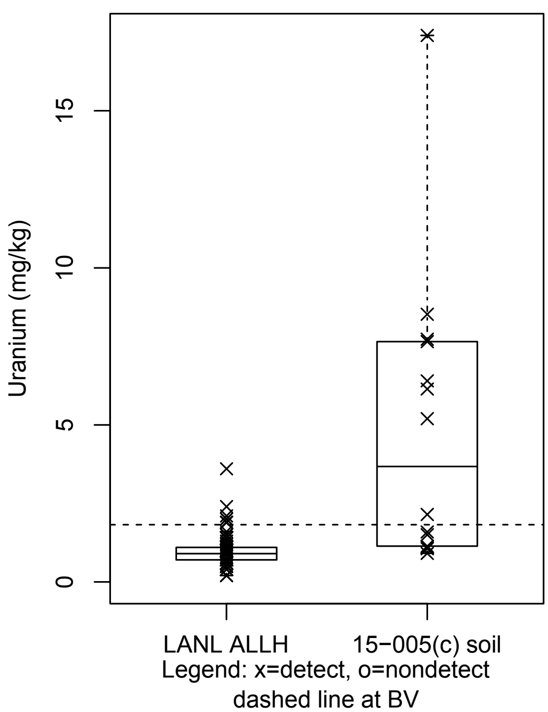


**Figure G-62 Box plot for uranium in soil at AOC 15-005(c)**

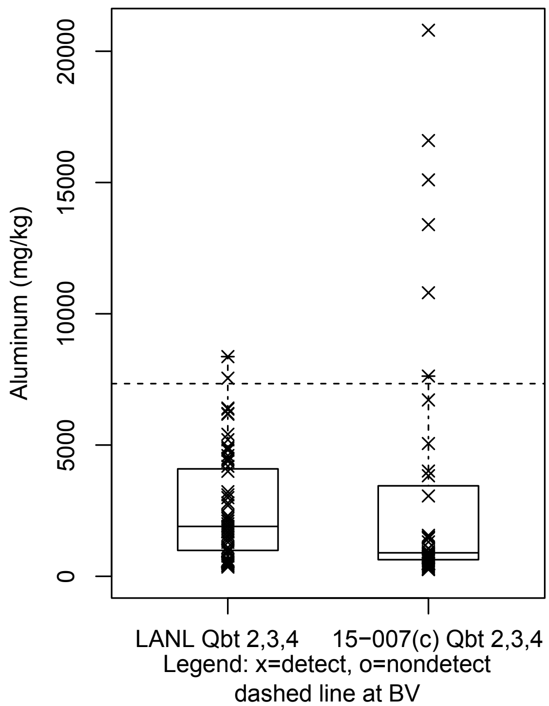


**Figure G-63 Box plot for aluminum in tuff at SWMU 15-007(c)**

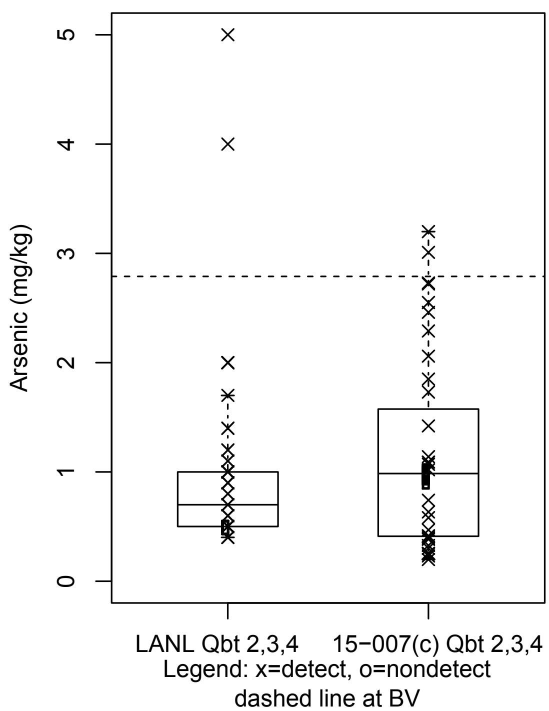


**Figure G-64 Box plot for arsenic in tuff at SWMU 15-007(c)**

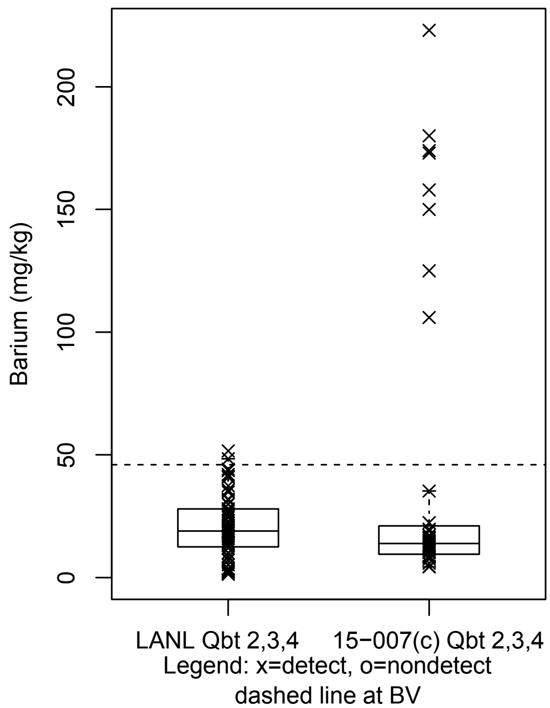


**Figure G-65 Box plot for barium in tuff at SWMU 15-007(c)**

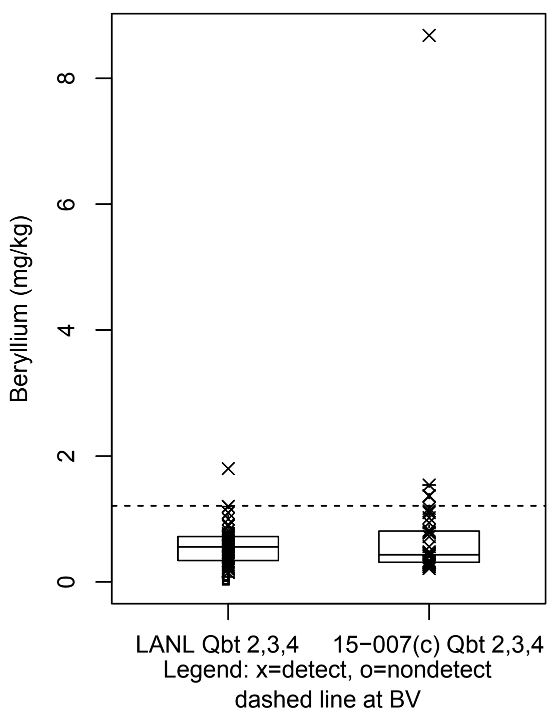


**Figure G-66 Box plot for beryllium in tuff at SWMU 15-007(c)**

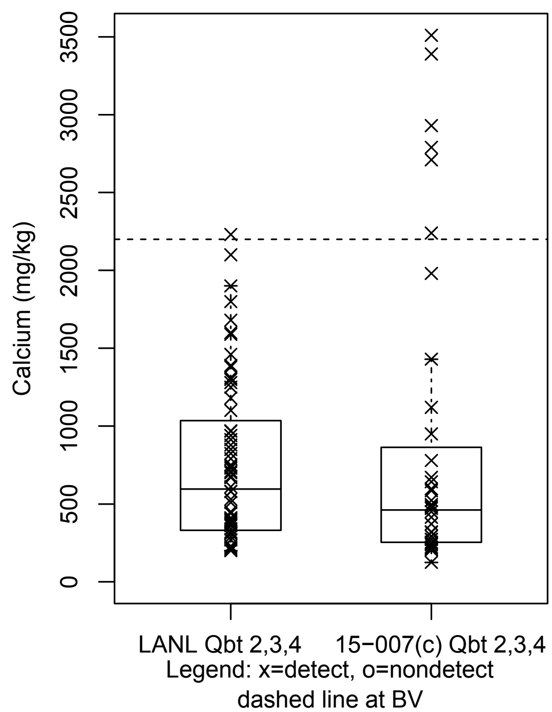


**Figure G-67 Box plot for calcium in tuff at SWMU 15-007(c)**

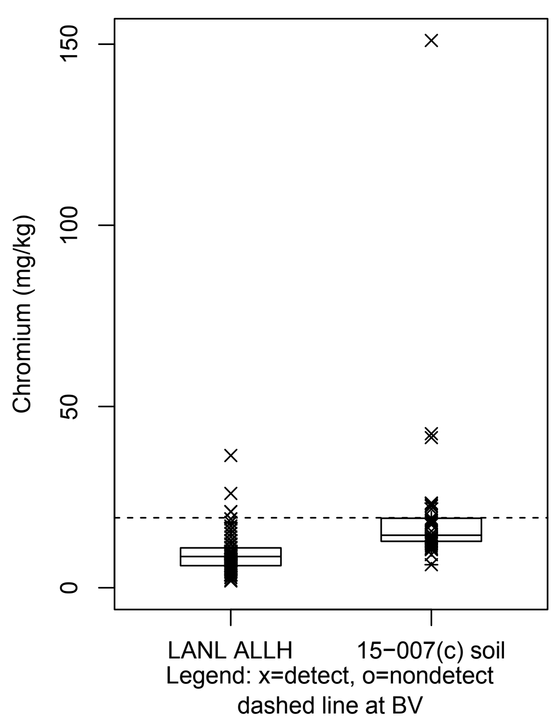


**Figure G-68 Box plot for chromium in soil at SWMU 15-007(c)**

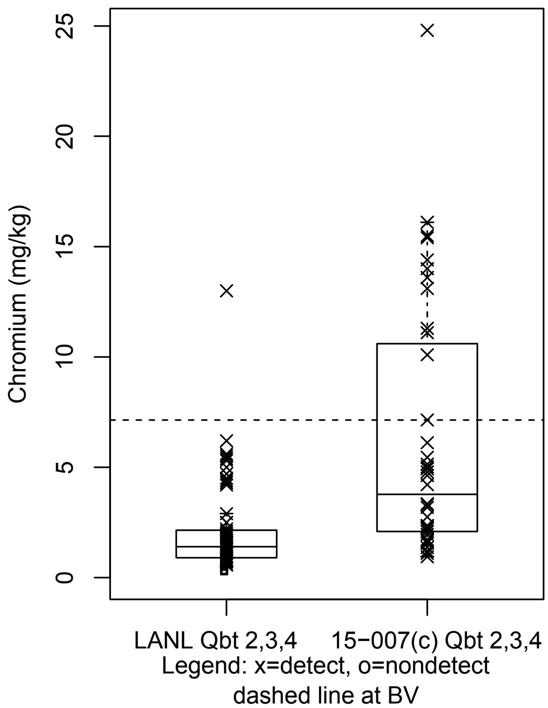


**Figure G-69 Box plot for chromium in tuff at SWMU 15-007(c)**

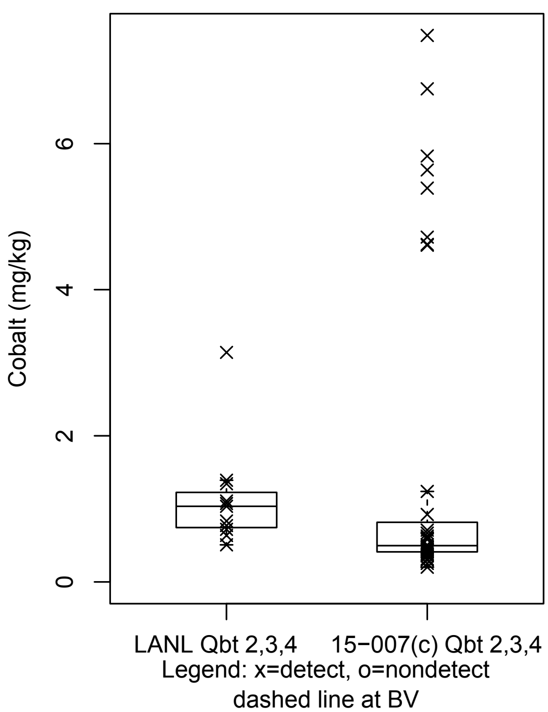


**Figure G-70 Box plot for cobalt in tuff at SWMU 15-007(c)**

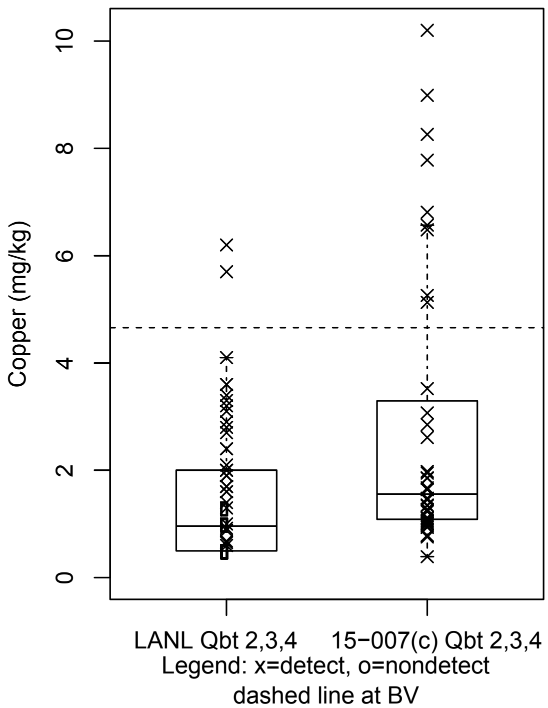


**Figure G-71 Box plot for copper in tuff at SWMU 15-007(c)**

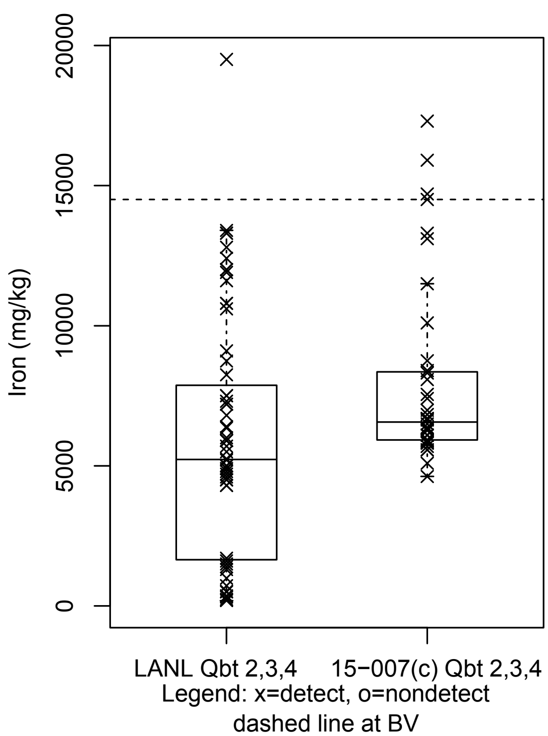


**Figure G-72 Box plot for iron in tuff at SWMU 15-007(c)**

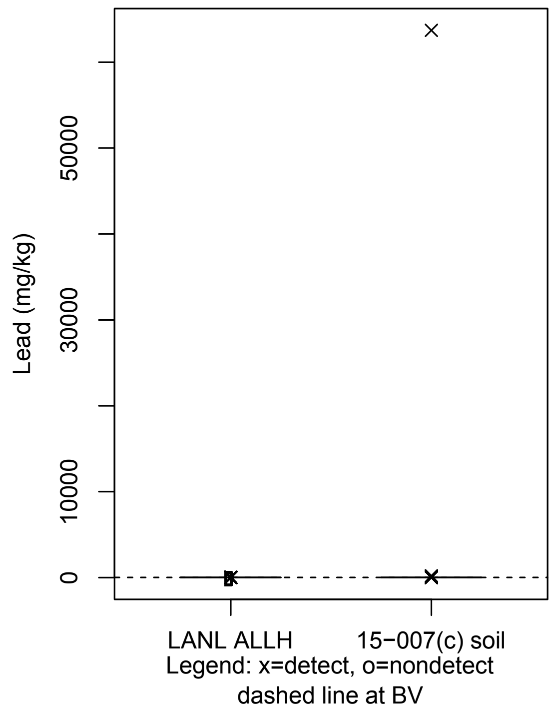


**Figure G-73 Box plot for lead in soil at SWMU 15-007(c)**

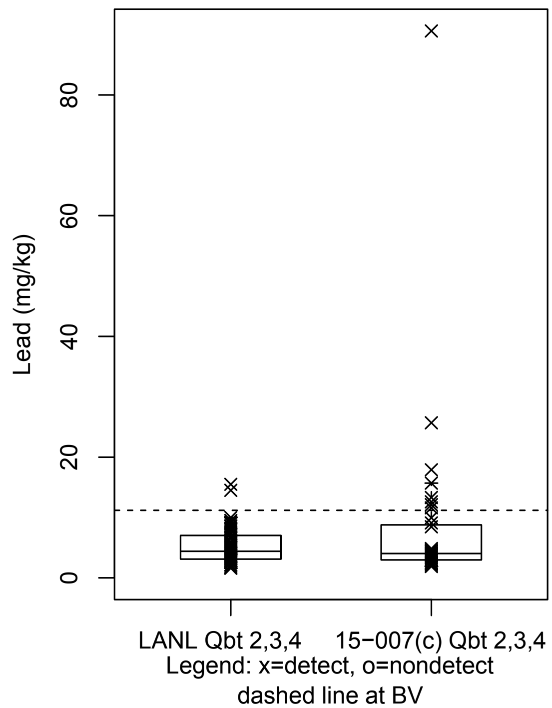


**Figure G-74 Box plot for lead in tuff at SWMU 15-007(c)**

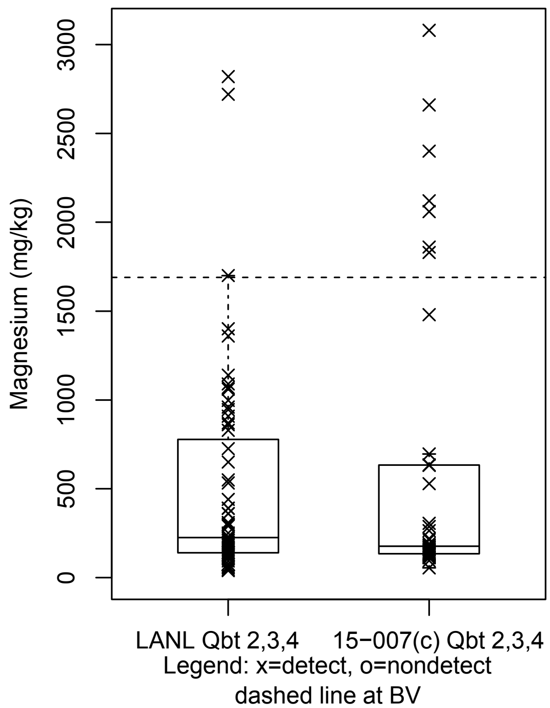


**Figure G-75 Box plot for magnesium in tuff at SWMU 15-007(c)**

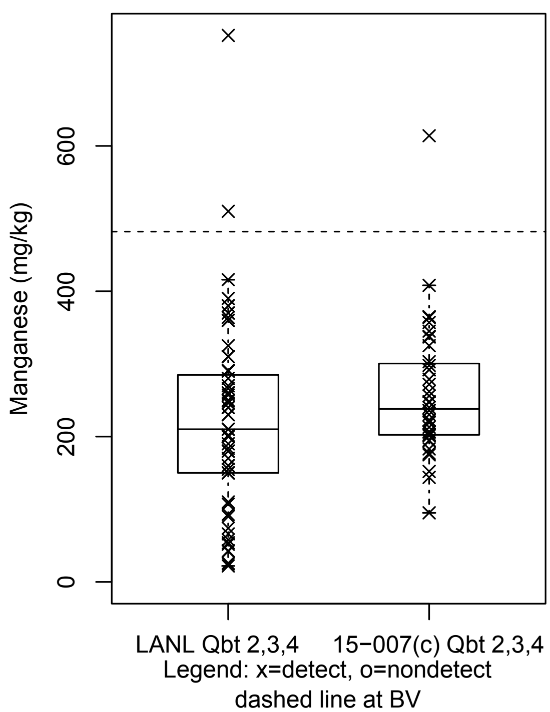


**Figure G-76 Box plot for manganese in tuff at SWMU 15-007(c)**

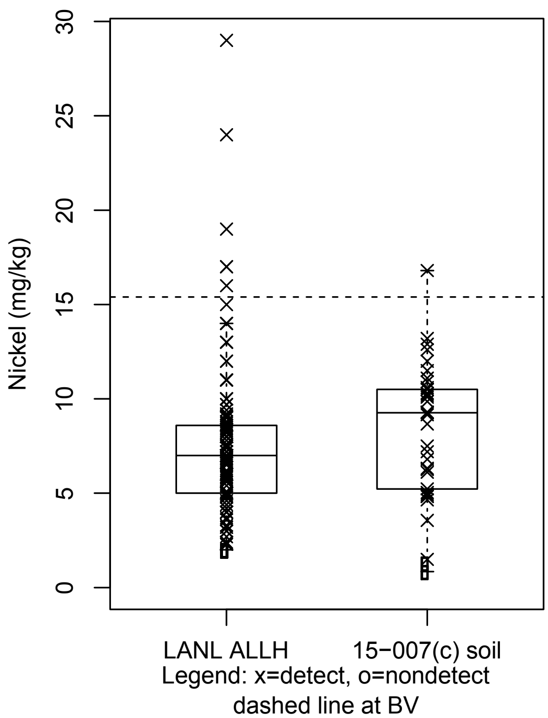


**Figure G-77 Box plot for nickel in soil at SWMU 15-007(c)**

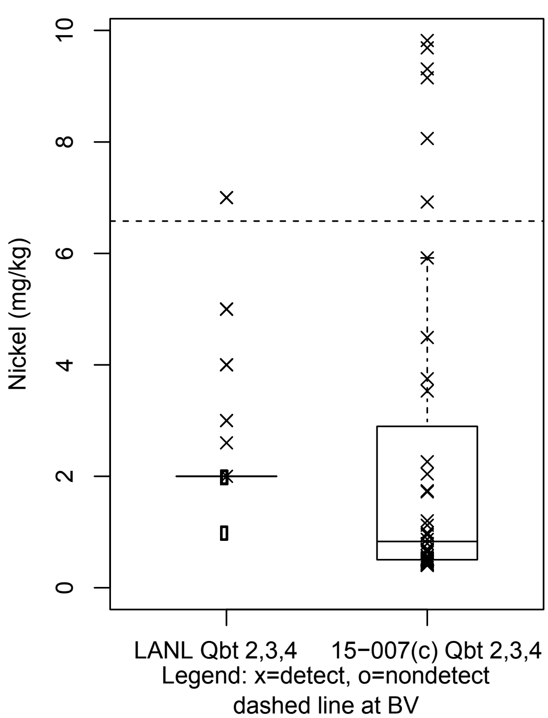


**Figure G-78 Box plot for nickel in tuff at SWMU 15-007(c)**

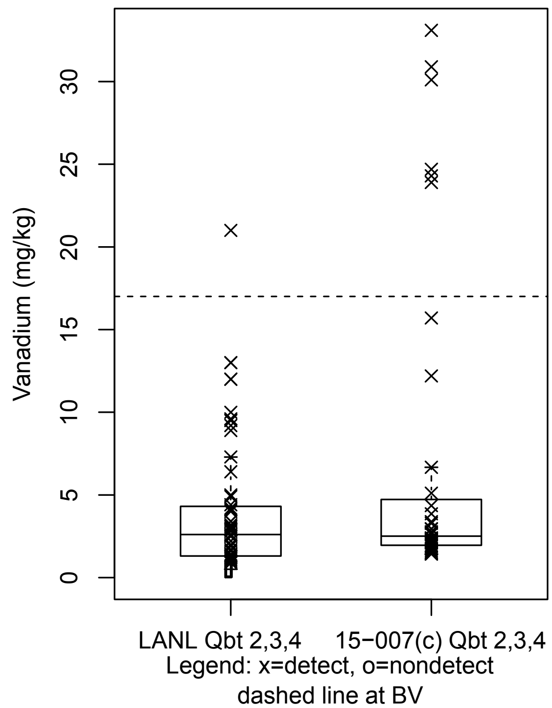


**Figure G-79 Box plot for vanadium in tuff at SWMU 15-007(c)**

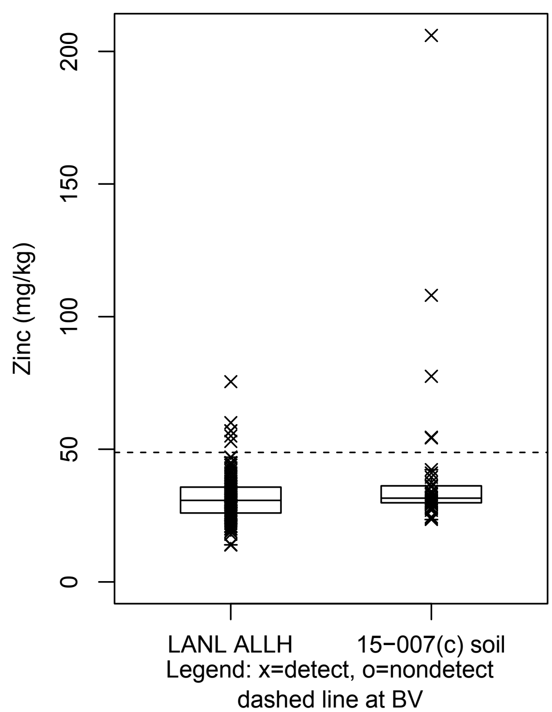


**Figure G-80 Box plot for zinc in soil at SWMU 15-007(c)**

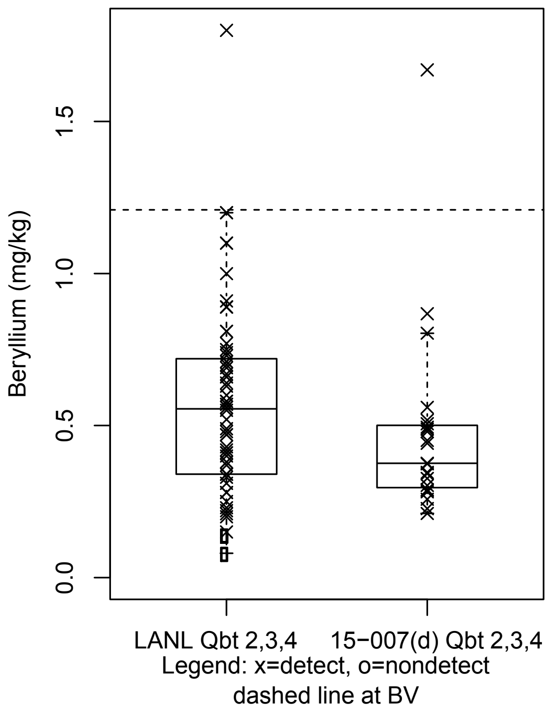


**Figure G-81 Box plot for beryllium in tuff at SWMU 15-007(d)**

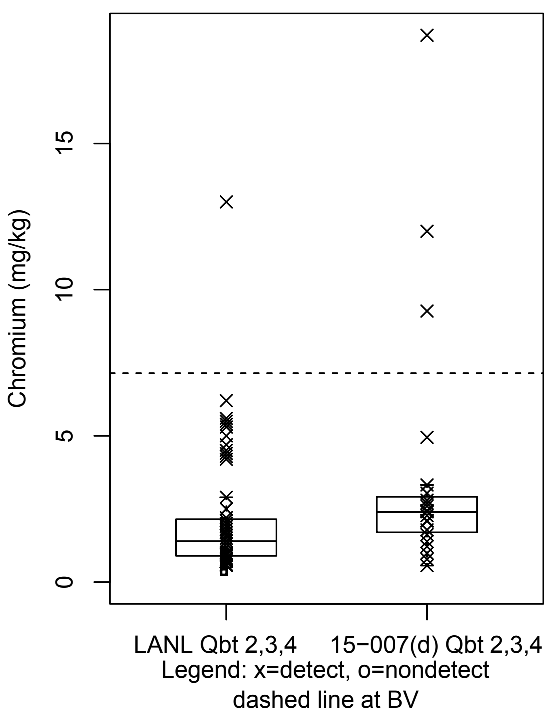


**Figure G-82 Box plot for chromium in tuff at SWMU 15-007(d)**

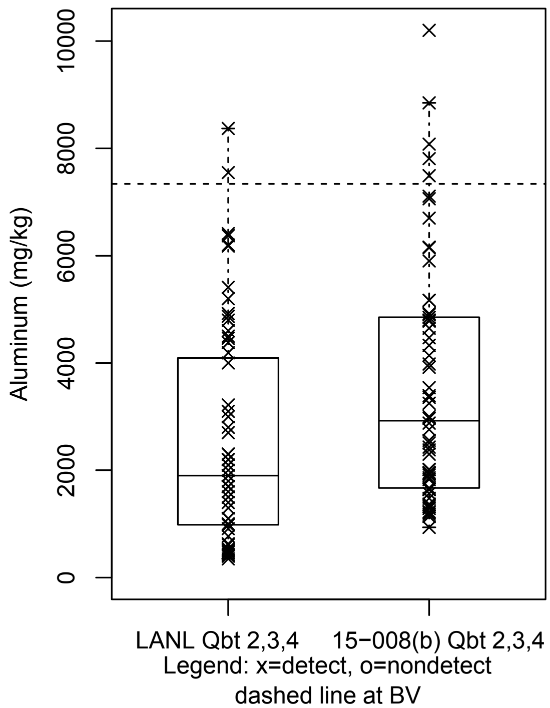


**Figure G-83 Box plot for aluminum in tuff at SWMU 15-008(b)**

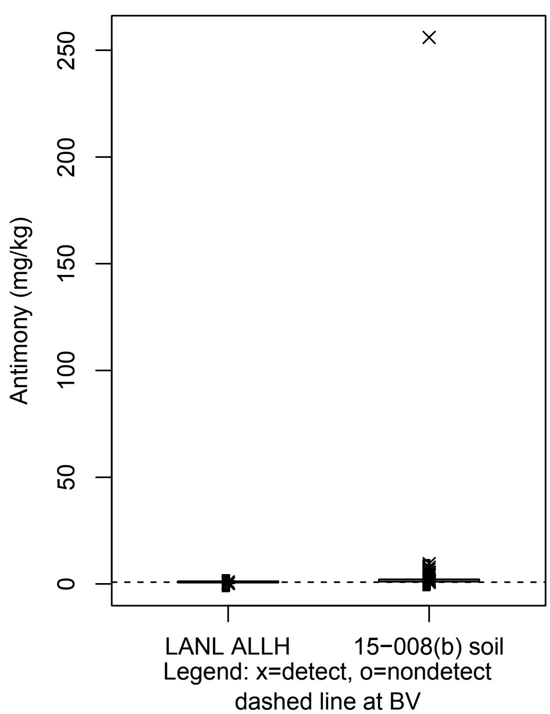


**Figure G-84 Box plot for antimony in soil at SWMU 15-008(b)**

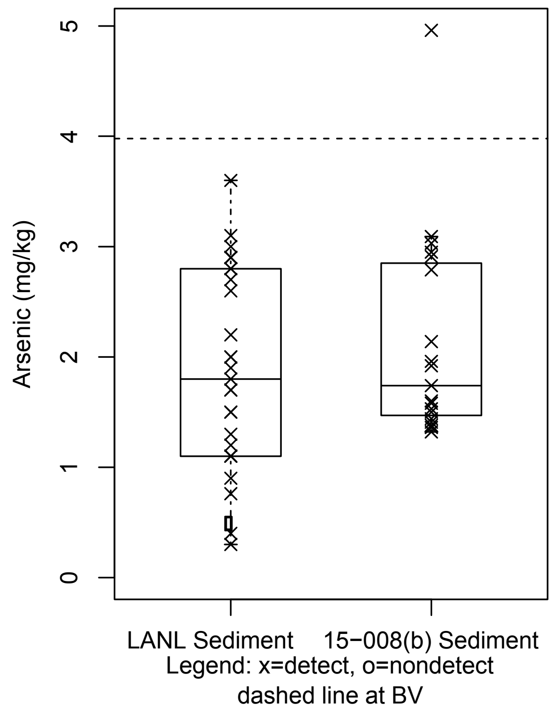


**Figure G-85 Box plot for arsenic in sediment at SWMU 15-008(b)**

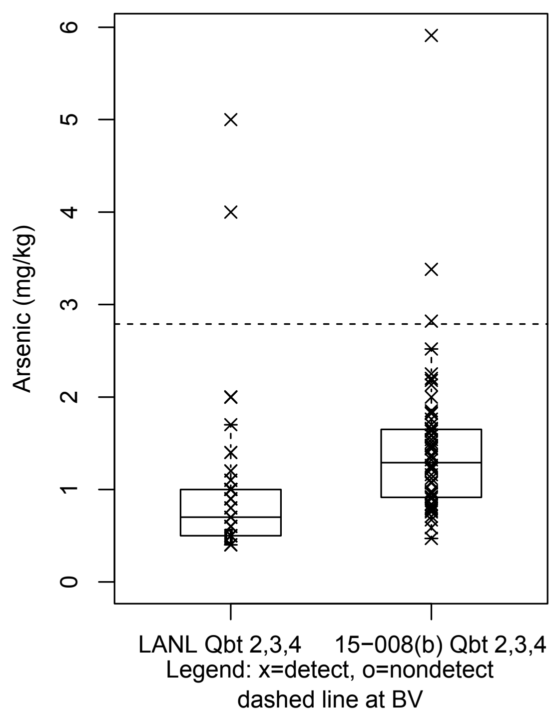


**Figure G-86 Box plot for arsenic in soil at SWMU 15-008(b)**

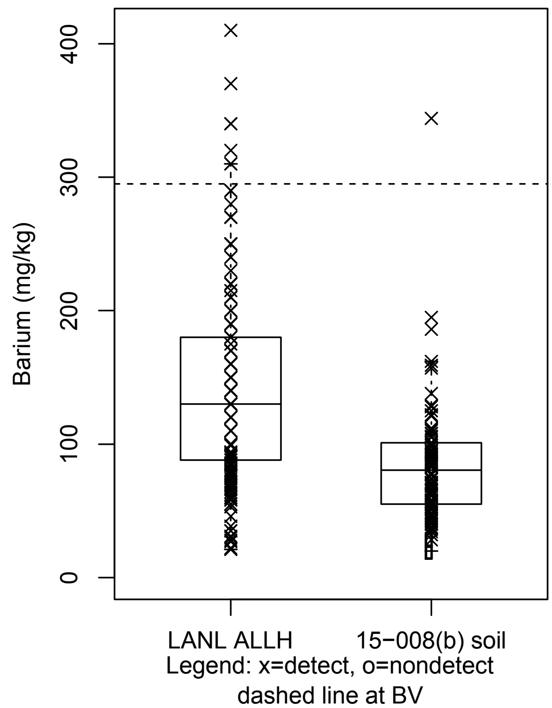


**Figure G-87 Box plot for barium in soil at SWMU 15-008(b)**

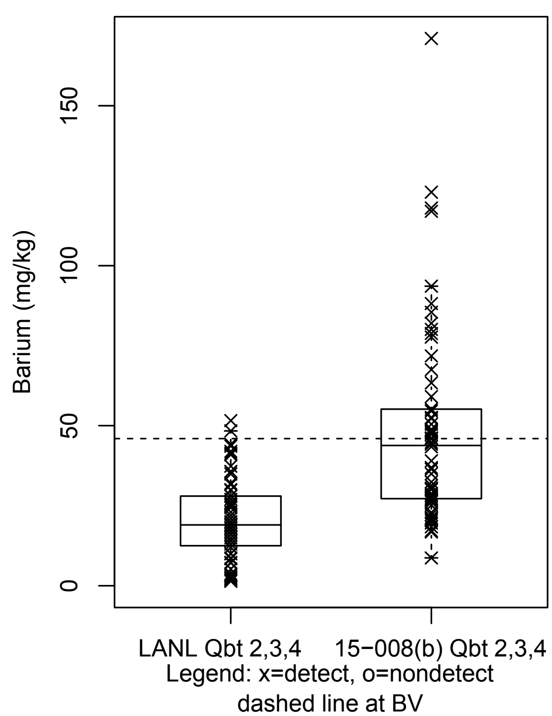


**Figure G-88 Box plot for barium in tuff at SWMU 15-008(b)**

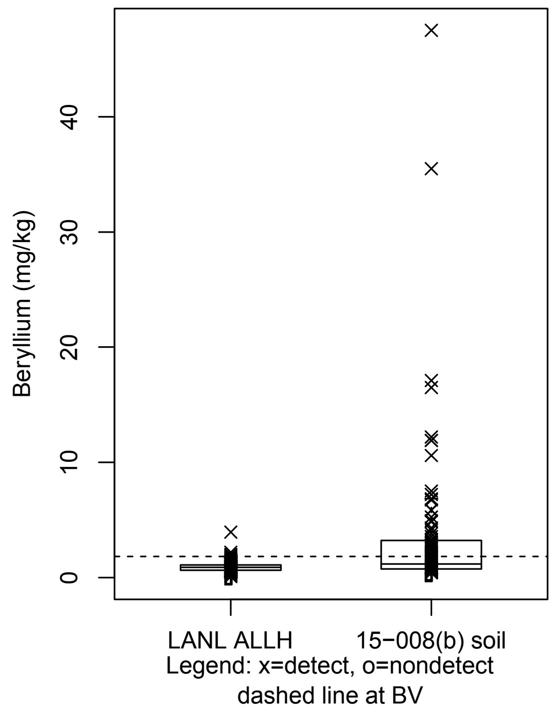


**Figure G-89 Box plot for beryllium in soil at SWMU 15-008(b)**

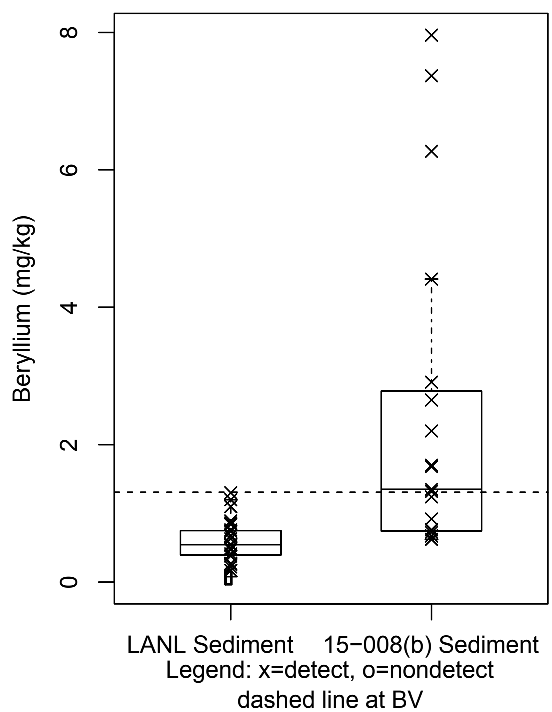


**Figure G-90 Box plot for beryllium in sediment at SWMU 15-008(b)**

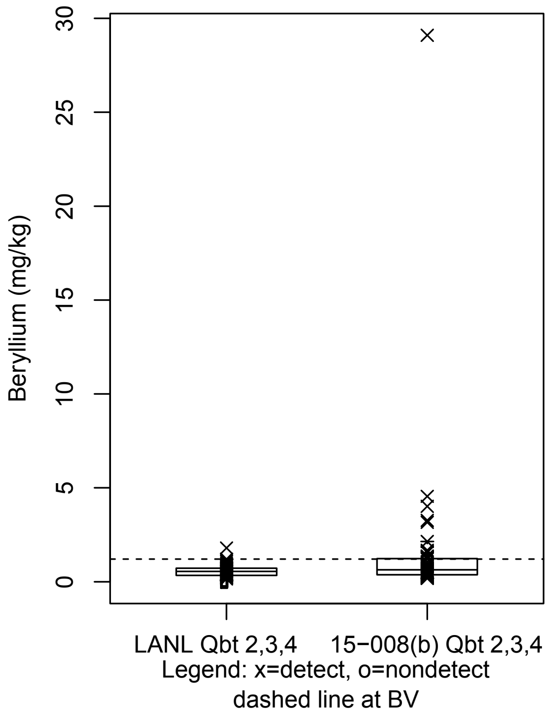


**Figure G-91 Box plot for beryllium in tuff at SWMU 15-008(b)**

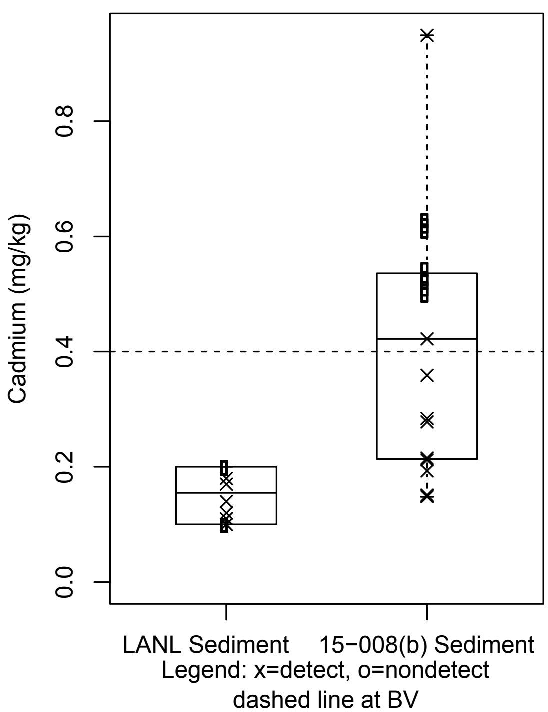


**Figure G-92 Box plot for cadmium in sediment at SWMU 15-008(b)**

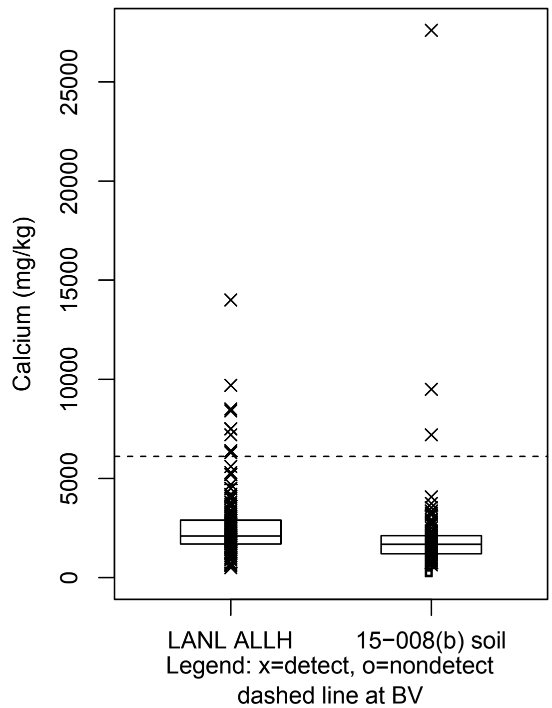


**Figure G-93 Box plot for calcium in soil at SWMU 15-008(b)**

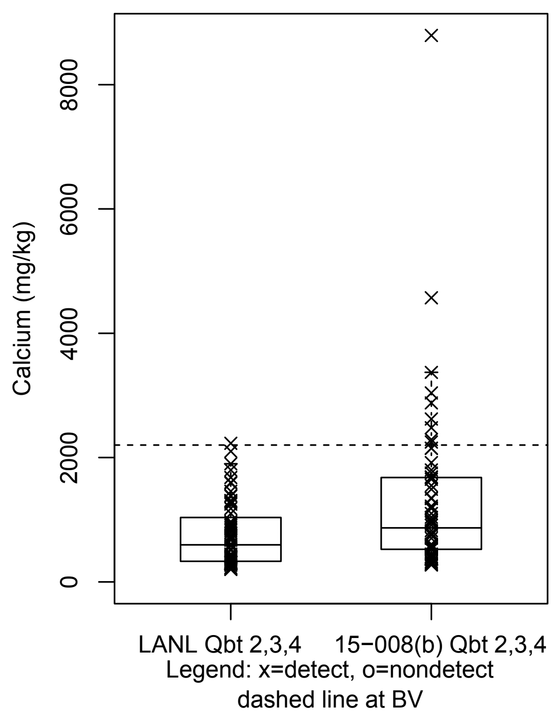


**Figure G-94 Box plot for calcium in tuff at SWMU 15-008(b)**

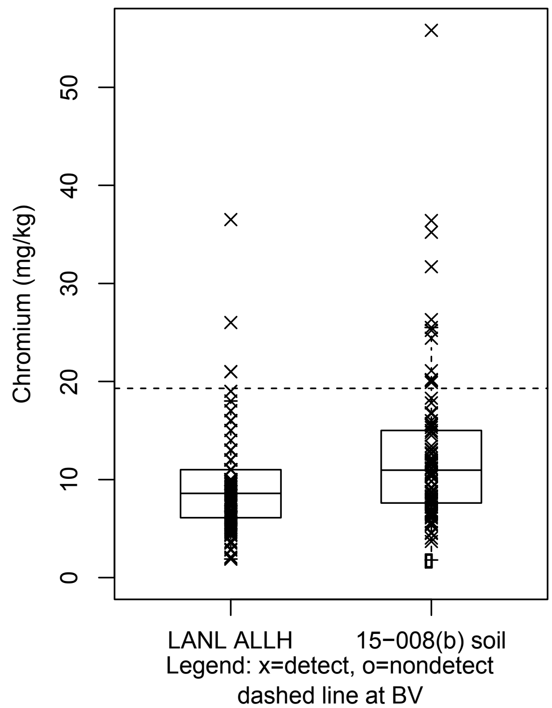


**Figure G-95 Box plot for chromium in soil at SWMU 15-008(b)**

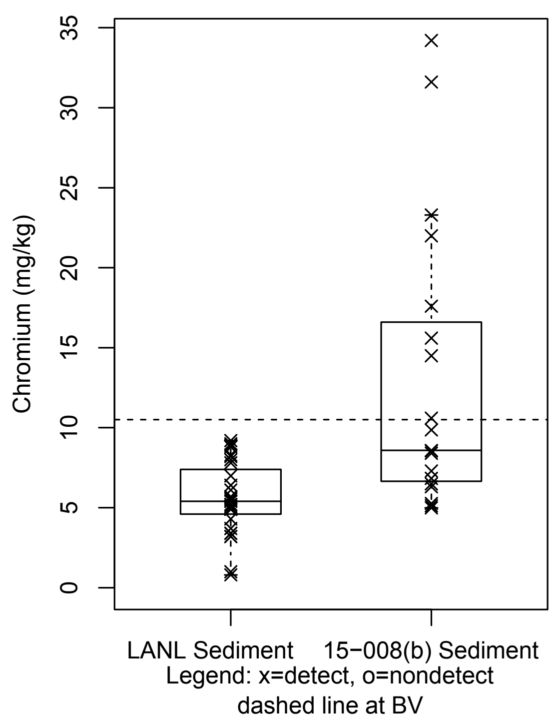


**Figure G-96 Box plot for chromium in sediment at SWMU 15-008(b)**

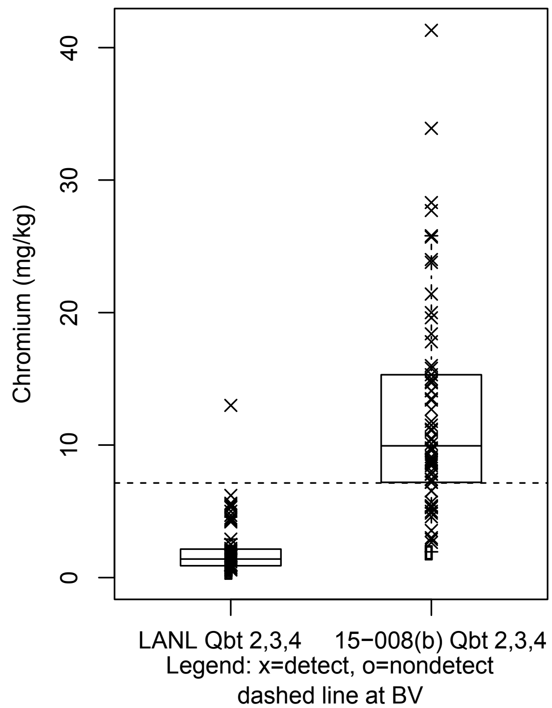


**Figure G-97 Box plot for chromium in tuff at SWMU 15-008(b)**

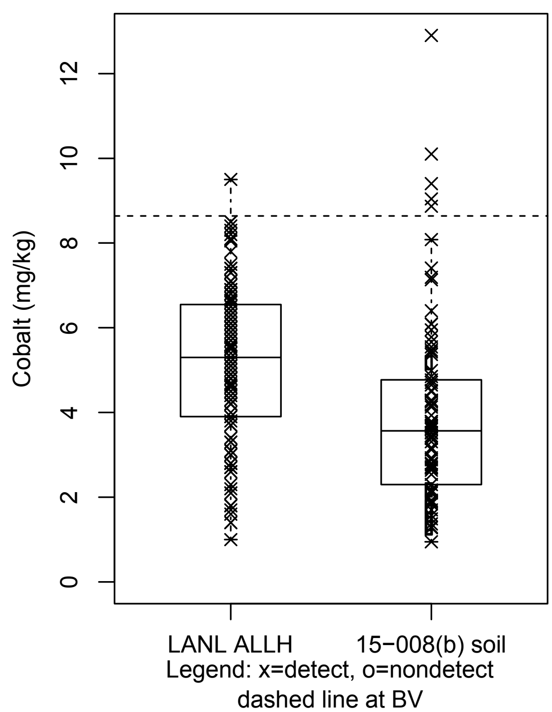


**Figure G-98 Box plot for cobalt in soil at SWMU 15-008(b)**

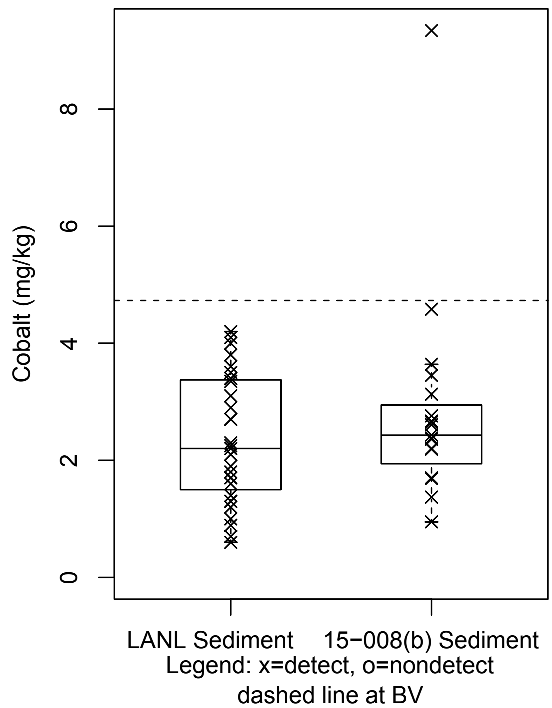


**Figure G-99 Box plot for cobalt in sediment at SWMU 15-008(b)**

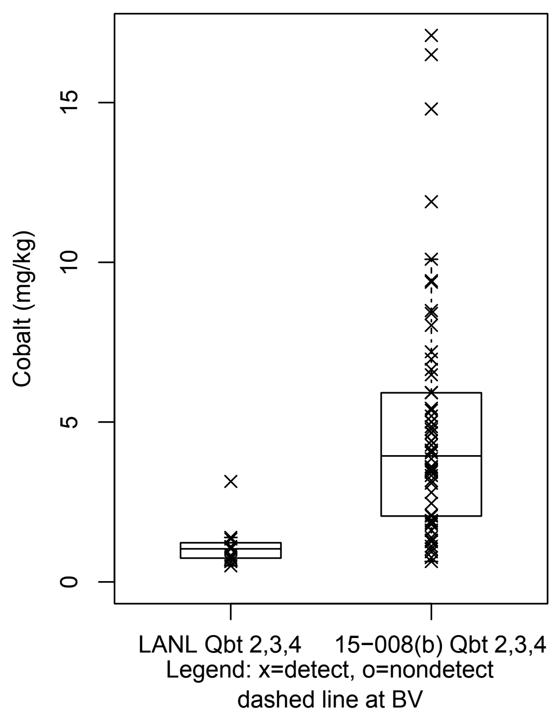


**Figure G-100 Box plot for cobalt in tuff at SWMU 15-008(b)**

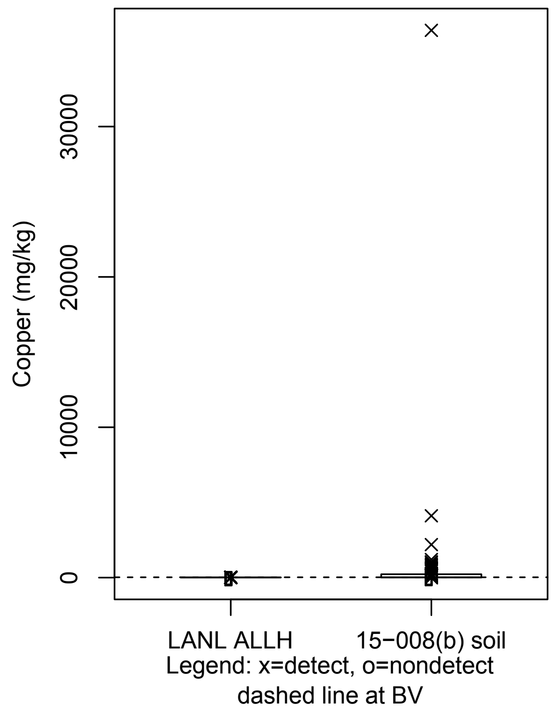


**Figure G-101 Box plot for copper in soil at SWMU 15-008(b)**

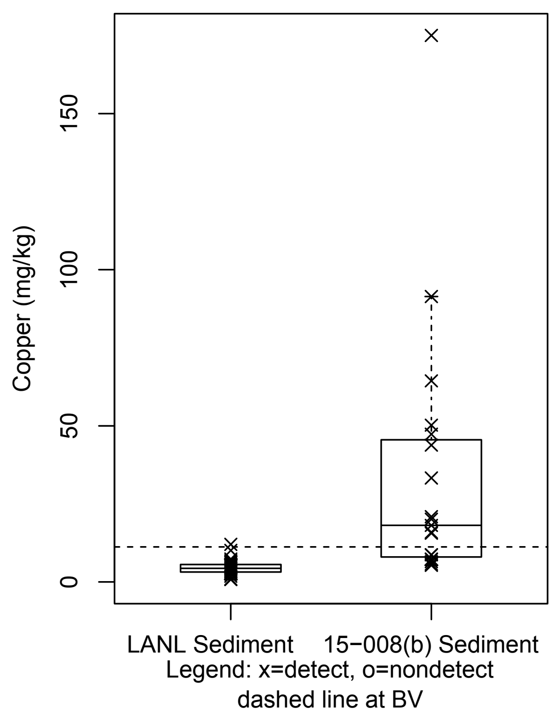


**Figure G-102 Box plot for copper in sediment at SWMU 15-008(b)**

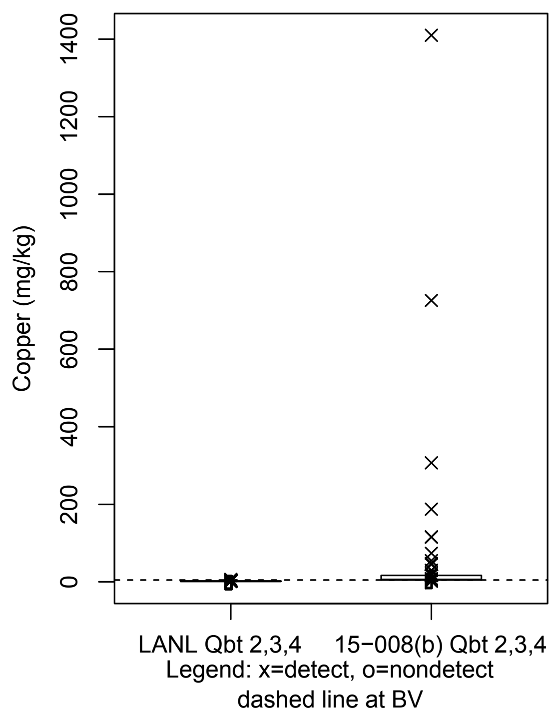


**Figure G-103 Box plot for copper in tuff at SWMU 15-008(b)**

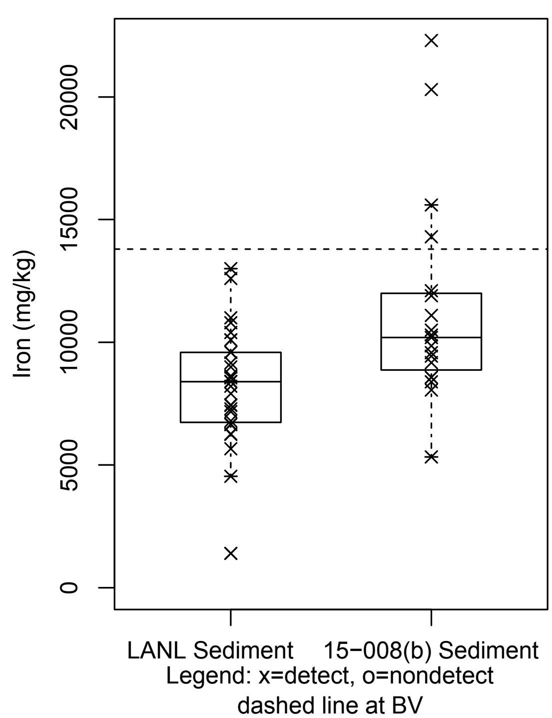


**Figure G-104 Box plot for iron in sediment at SWMU 15-008(b)**

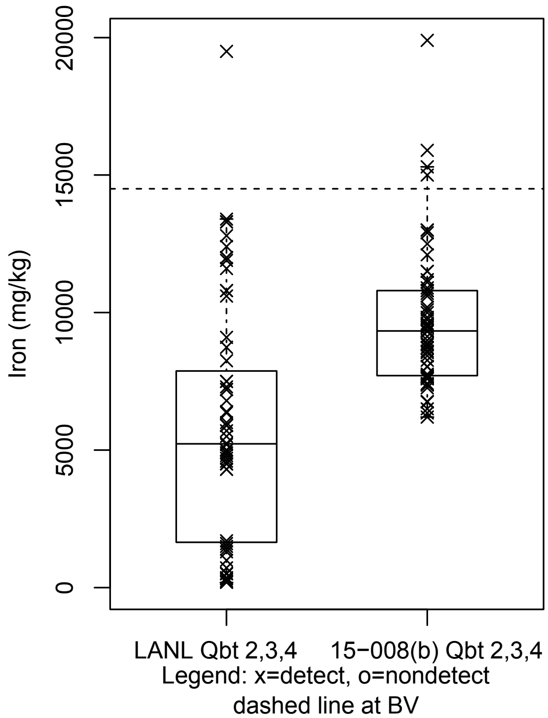


**Figure G-105 Box plot for iron in tuff at SWMU 15-008(b)**

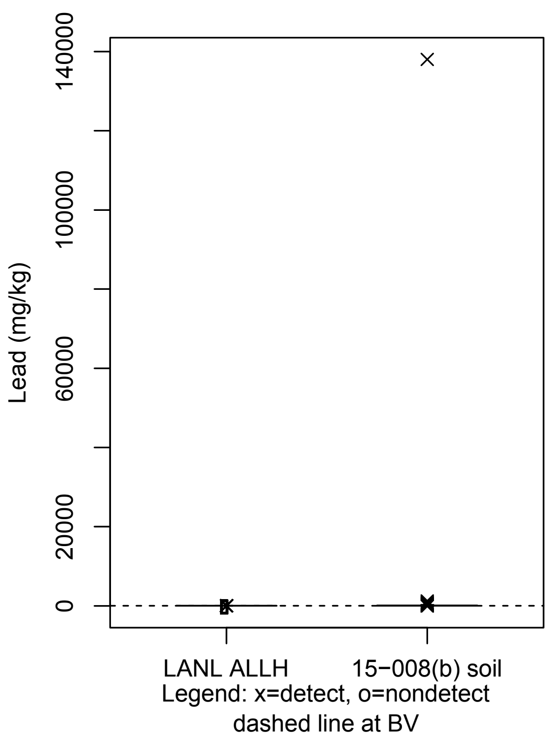


**Figure G-106 Box plot for lead in soil at SWMU 15-008(b)**

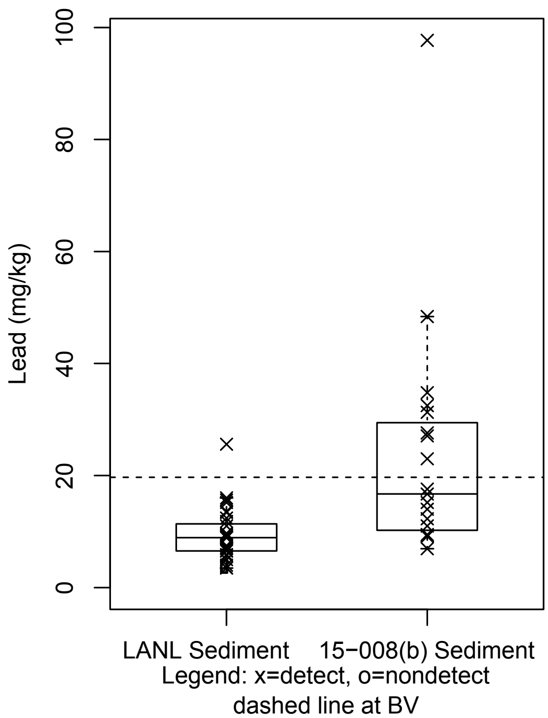


**Figure G-107 Box plot for lead in sediment at SWMU 15-008(b)**

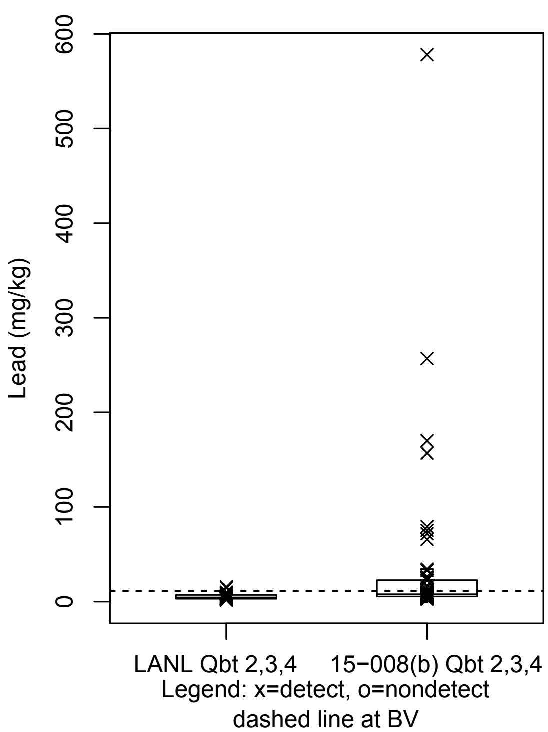


**Figure G-108 Box plot for lead in tuff at SWMU 15-008(b)**

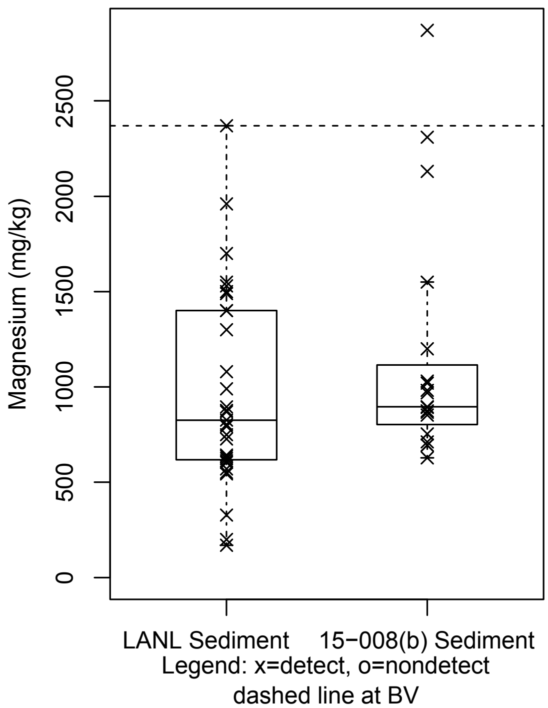


**Figure G-109 Box plot for magnesium in sediment at SWMU 15-008(b)**

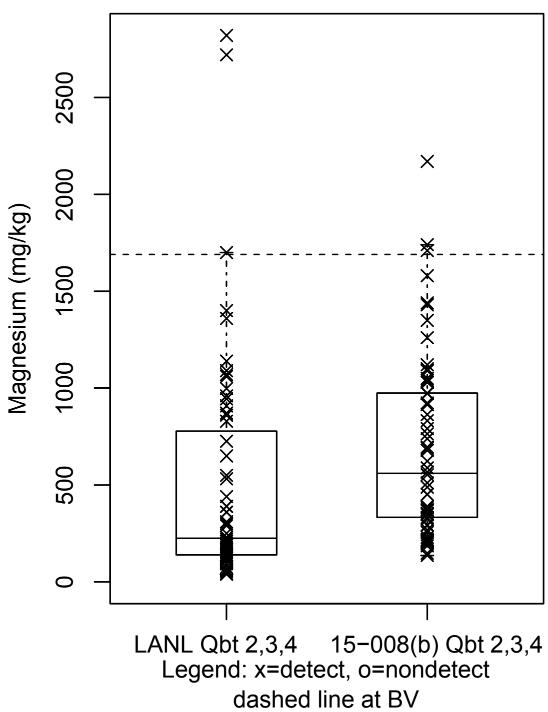


**Figure G-110 Box plot for magnesium in tuff at SWMU 15-008(b)**

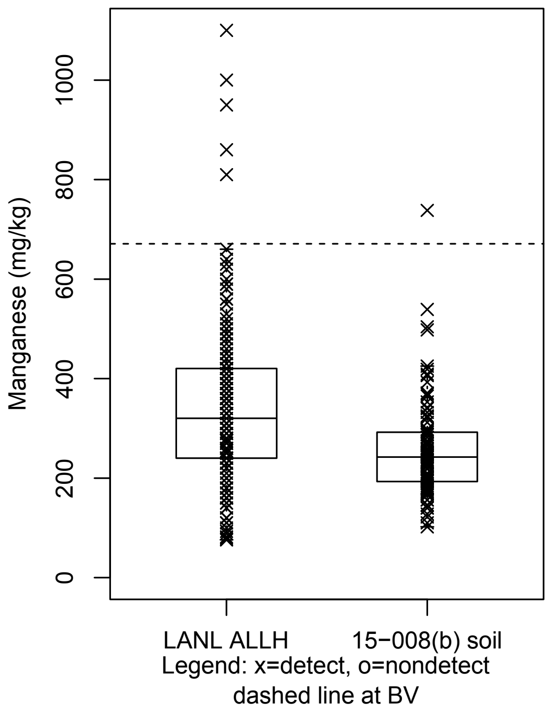


**Figure G-111 Box plot for manganese in soil at SWMU 15-008(b)**

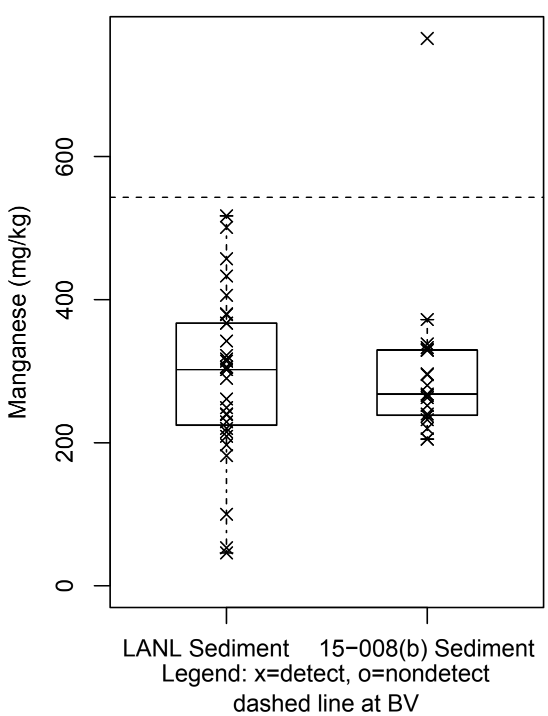


**Figure G-112 Box plot for manganese in sediment at SWMU 15-008(b)**

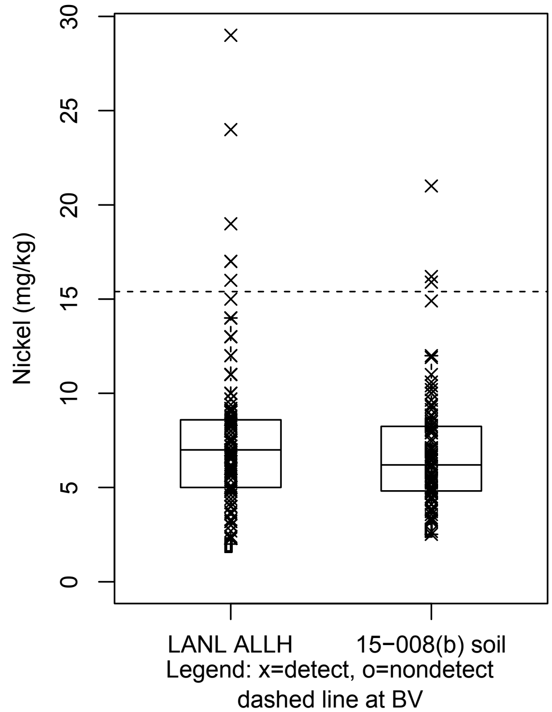


**Figure G-113 Box plot for nickel in soil at SWMU 15-008(b)**

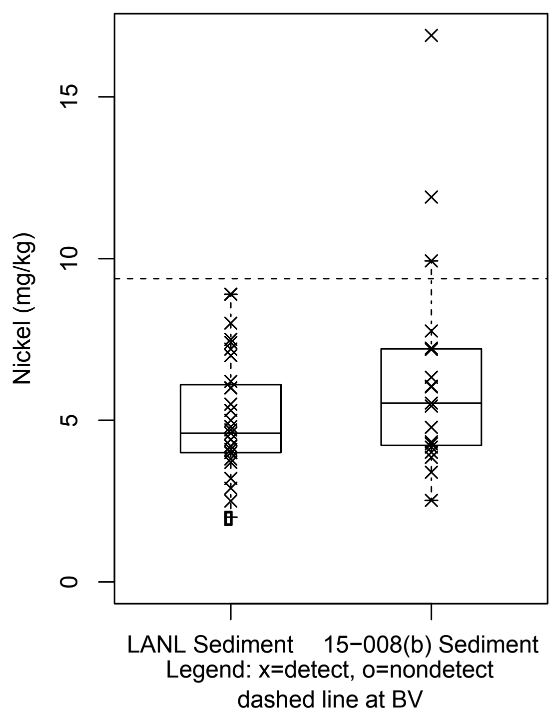


**Figure G-114 Box plot for nickel in sediment at SWMU 15-008(b)**

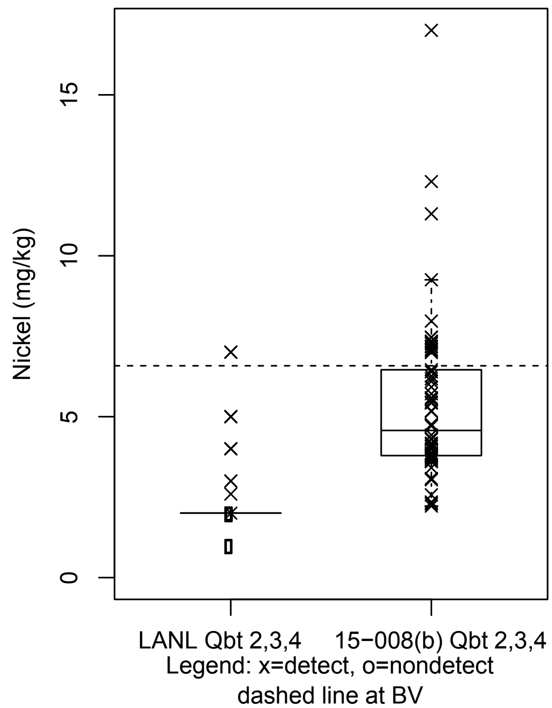


**Figure G-115 Box plot for nickel in tuff at SWMU 15-008(b)**

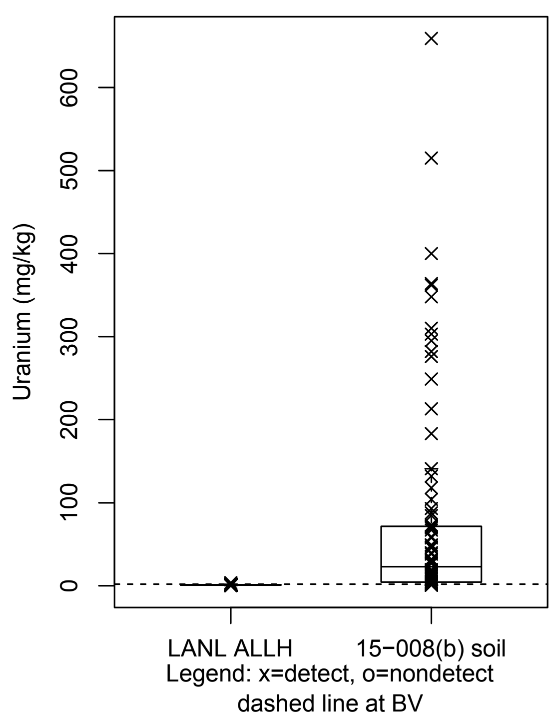


**Figure G-116 Box plot for uranium in soil at SWMU 15-008(b)**

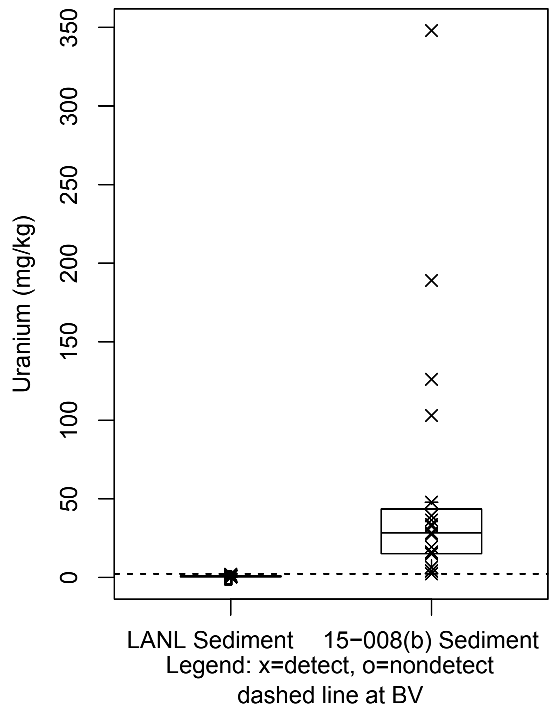


**Figure G-117 Box plot for uranium in sediment at SWMU 15-008(b)**

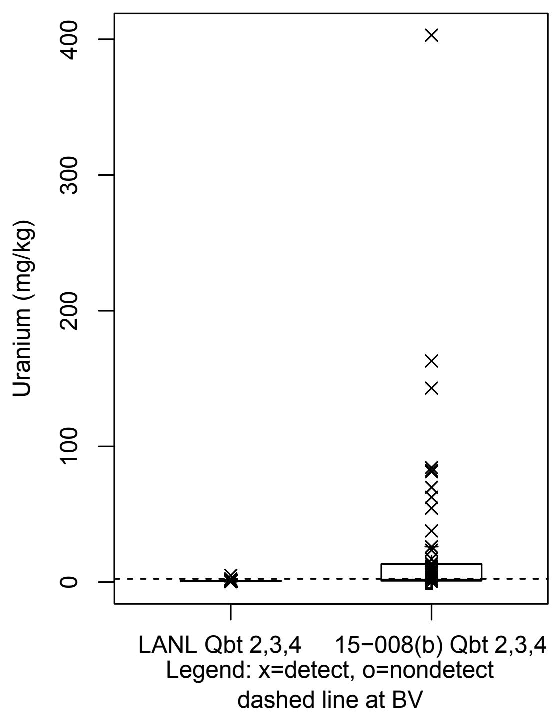


**Figure G-118 Box plot for uranium in tuff at SWMU 15-008(b)**

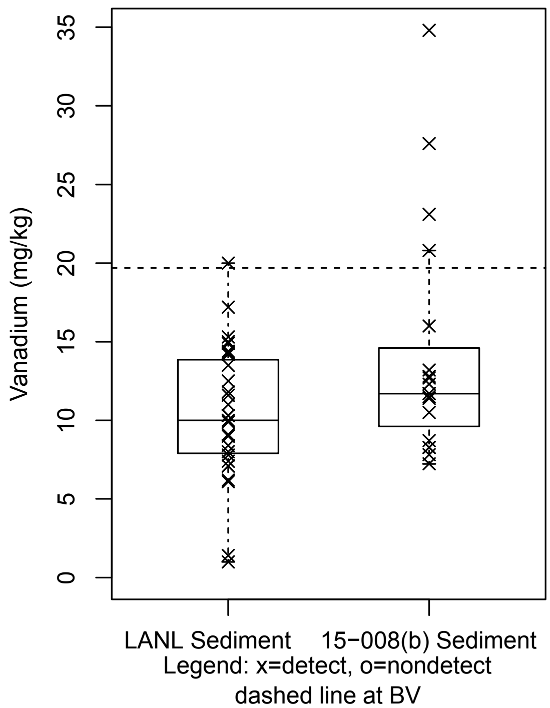


**Figure G-119 Box plot for vanadium in sediment at SWMU 15-008(b)**

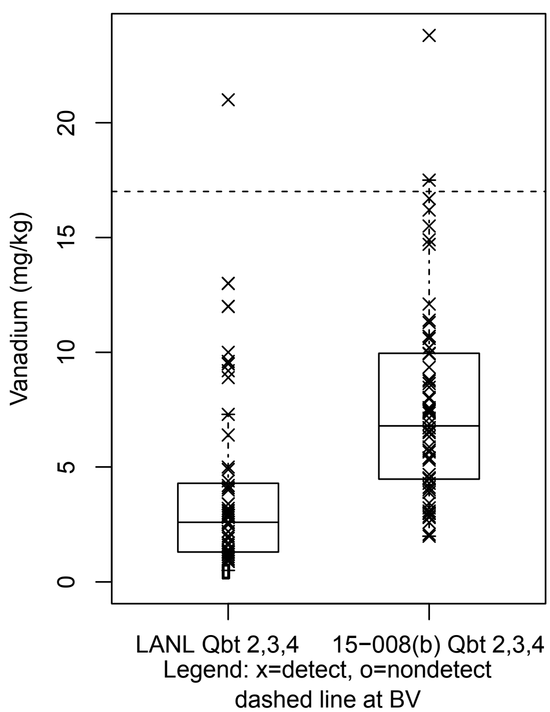


**Figure G-120 Box plot for vanadium in tuff at SWMU 15-008(b)**

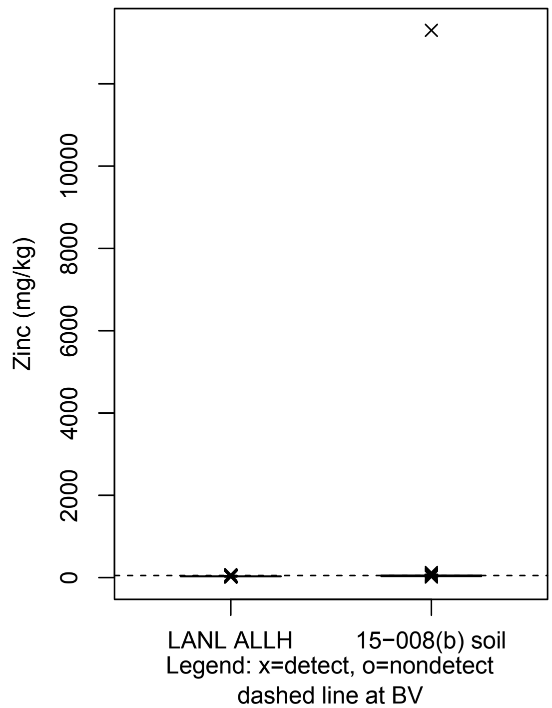


**Figure G-121 Box plot for zinc in soil at SWMU 15-008(b)**

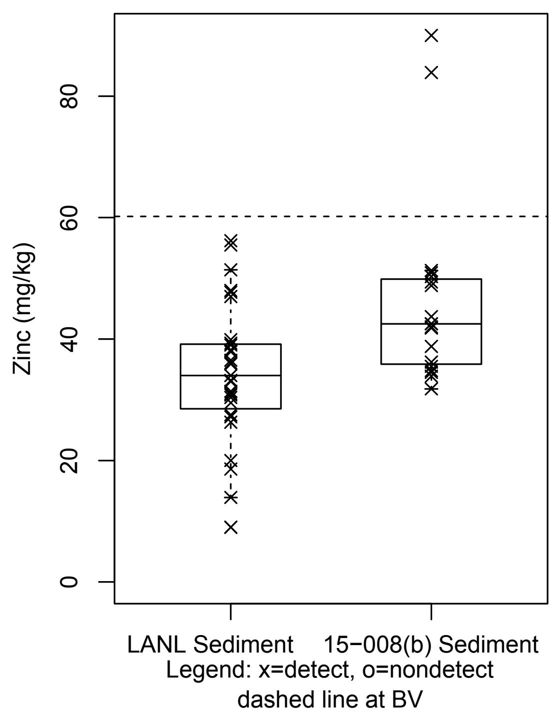


**Figure G-122 Box plot for zinc in sediment at SWMU 15-008(b)**

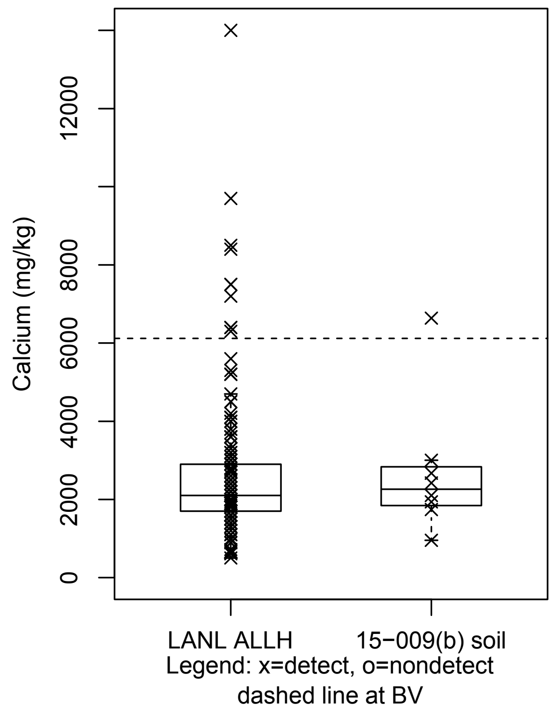


**Figure G-123 Box plot for calcium in soil at SWMU 15-009(b)**

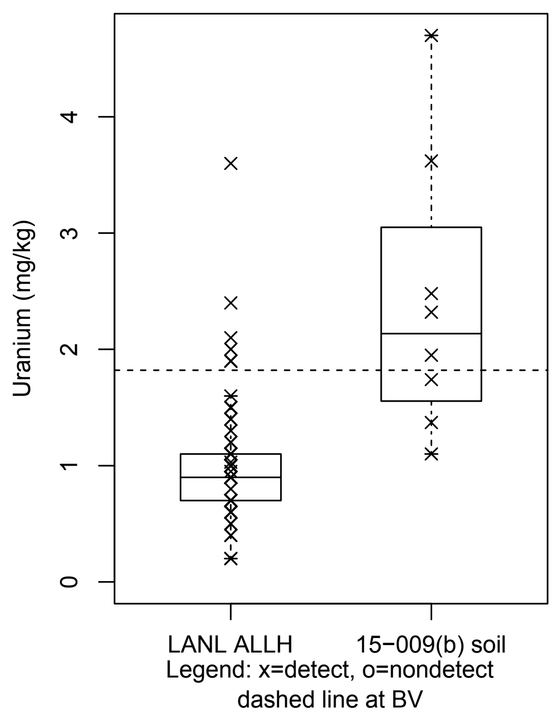


**Figure G-124 Box plot for uranium in soil at SWMU 15-009(b)**

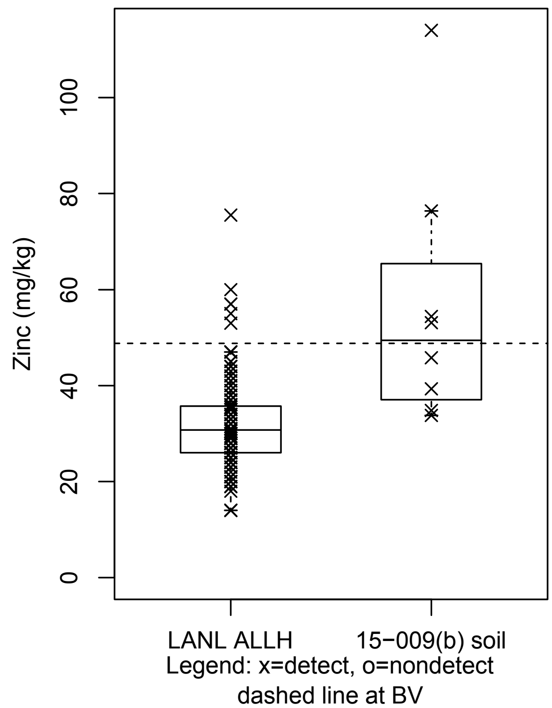


**Figure G-125 Box plot for zinc in soil at SWMU 15-009(b)**

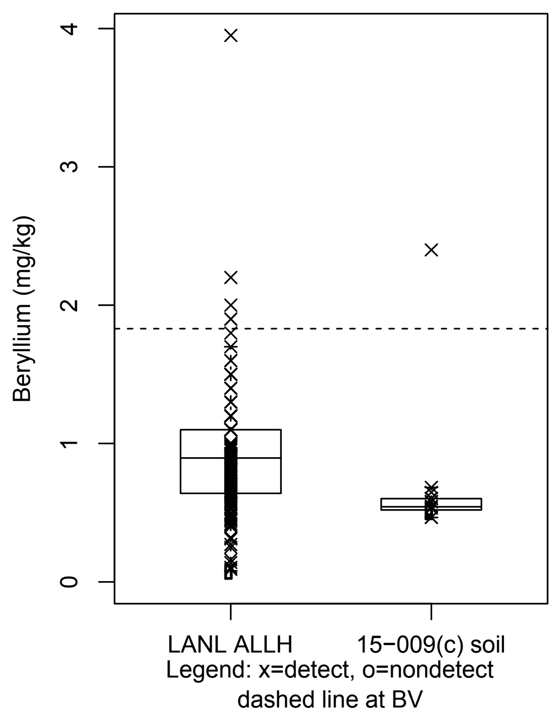


**Figure G-126 Box plot for beryllium in soil at SWMU 15-009(c)**

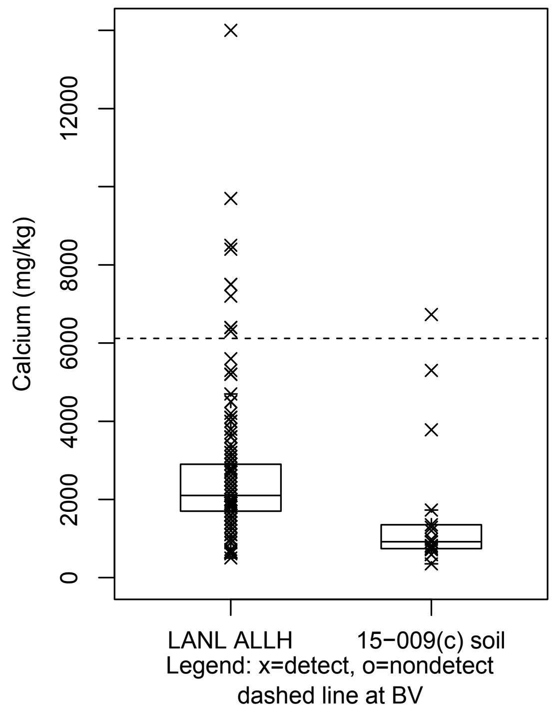


**Figure G-127 Box plot for calcium in soil at SWMU 15-009(c)**

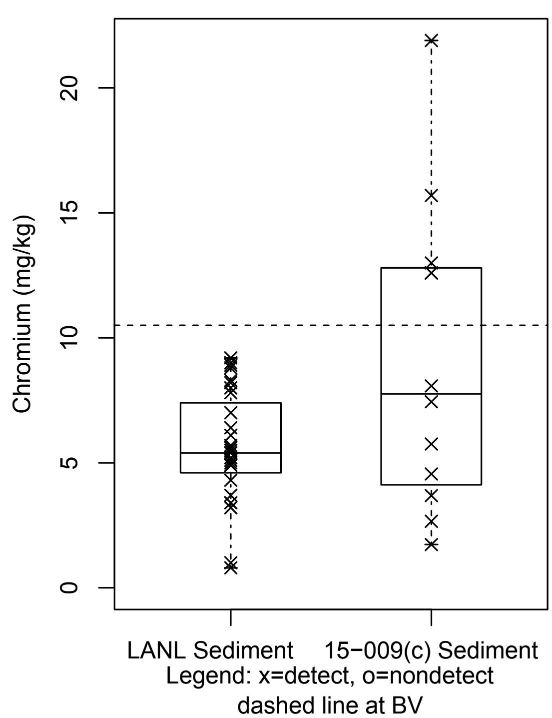


**Figure G-128 Box plot for chromium in sediment at SWMU 15-009(c)**

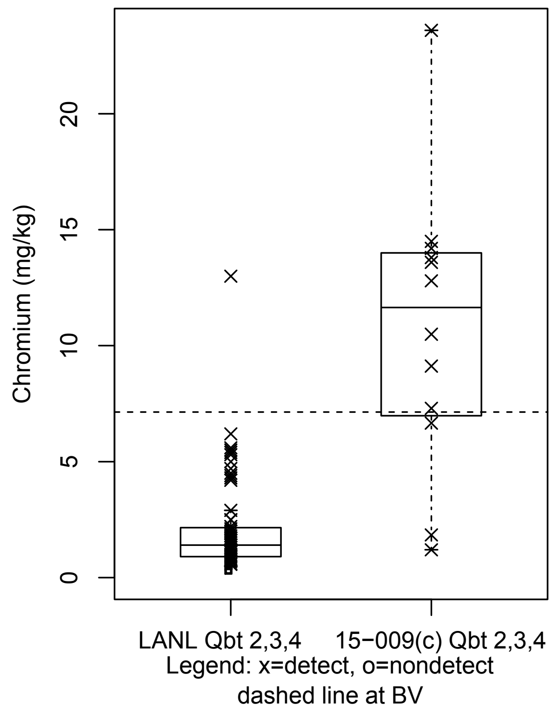


**Figure G-129 Box plot for chromium in tuff at SWMU 15-009(c)**

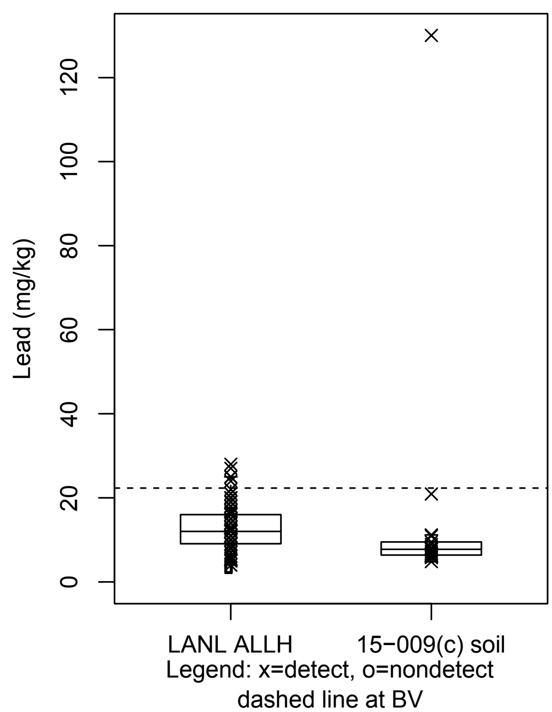


**Figure G-130 Box plot for lead in soil at SWMU 15-009(c)**

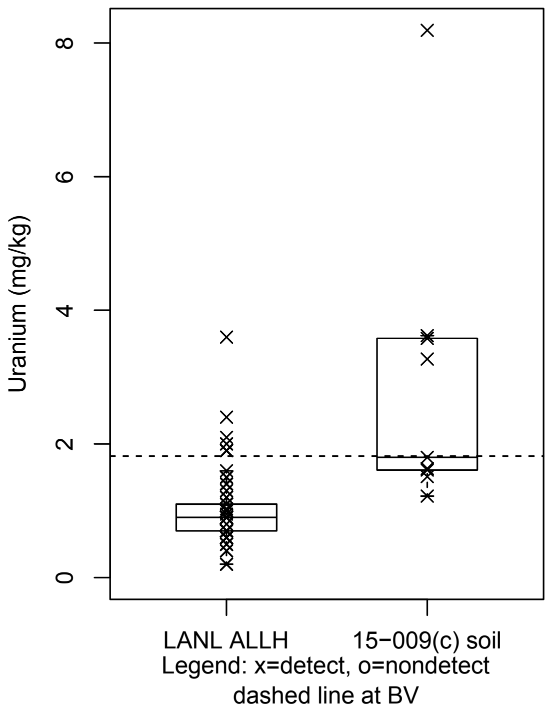


**Figure G-131 Box plot for uranium in soil at SWMU 15-009(c)**

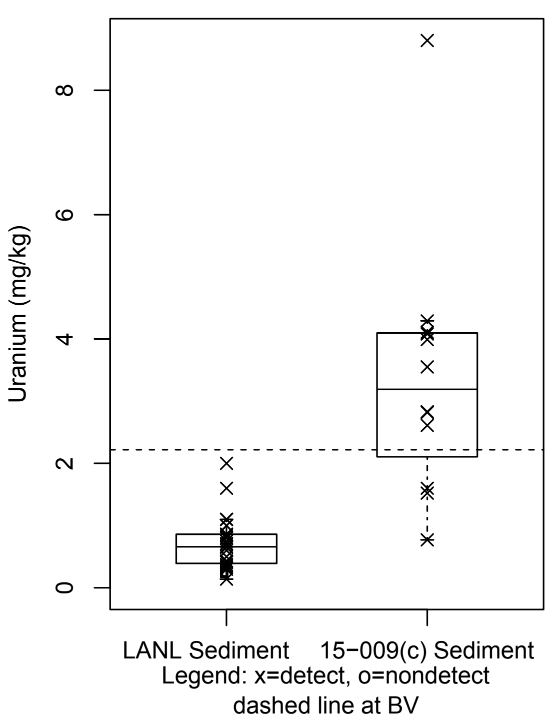


**Figure G-132 Box plot for uranium in sediment at SWMU 15-009(c)**

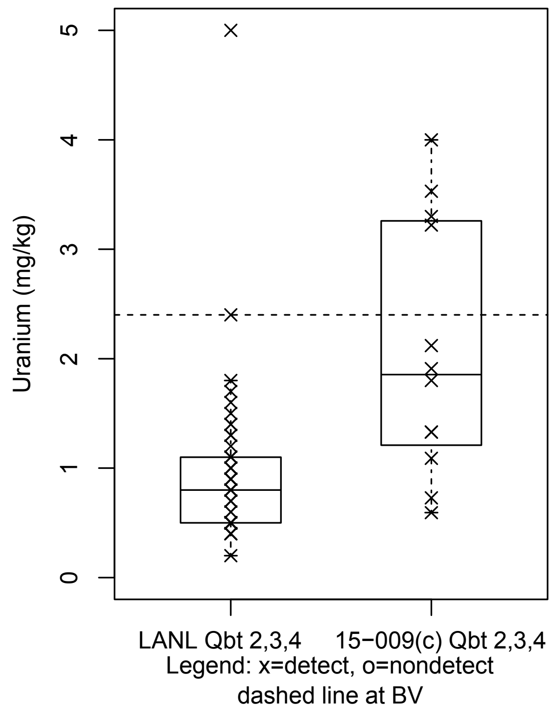


**Figure G-133    Box plot for uranium in tuff at SWMU 15-009(c)**

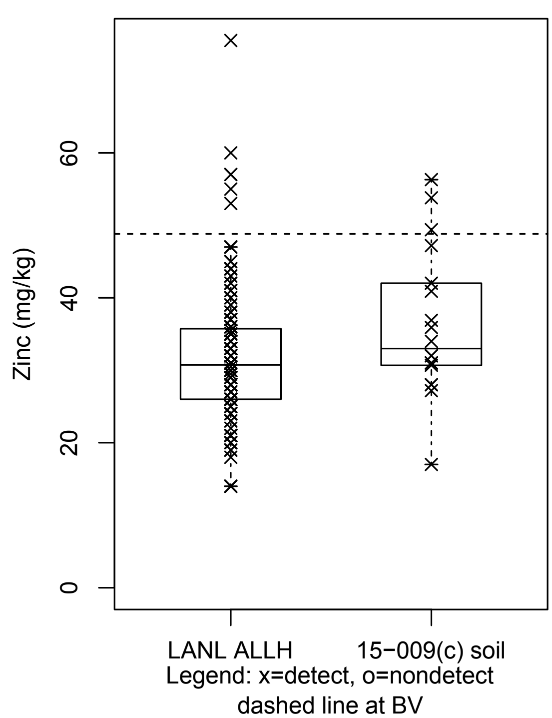


**Figure G-134    Box plot for zinc in soil at SWMU 15-009(c)**

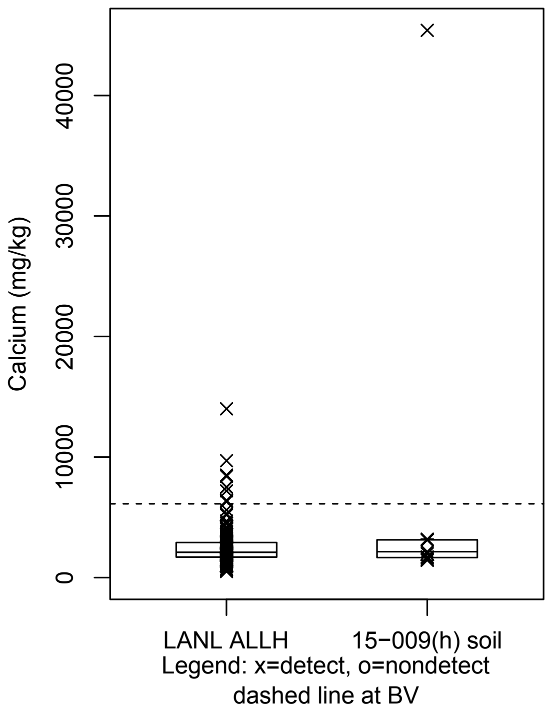


**Figure G-135 Box plot for calcium in soil at SWMU 15-009(h)**

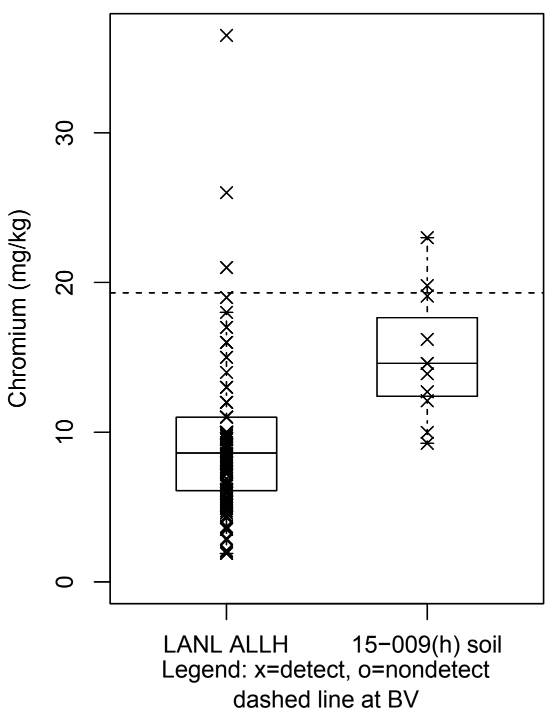


**Figure G-136 Box plot for chromium in soil at SWMU 15-009(h)**

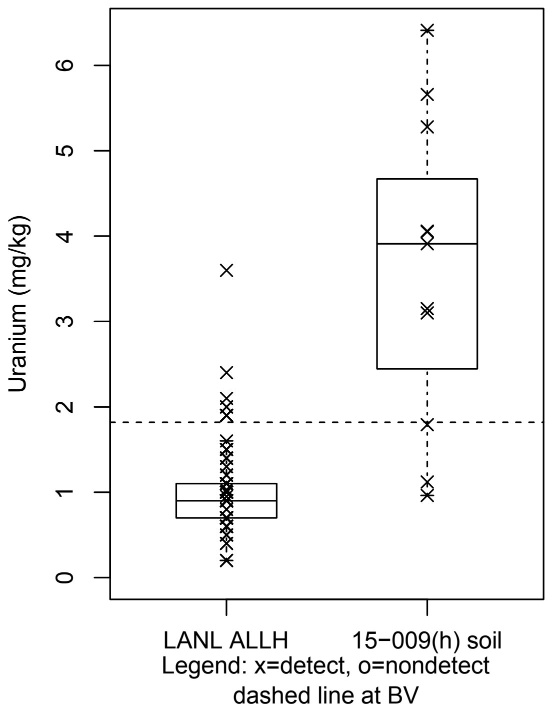


**Figure G-137 Box plot for uranium in soil at SWMU 15-009(h)**

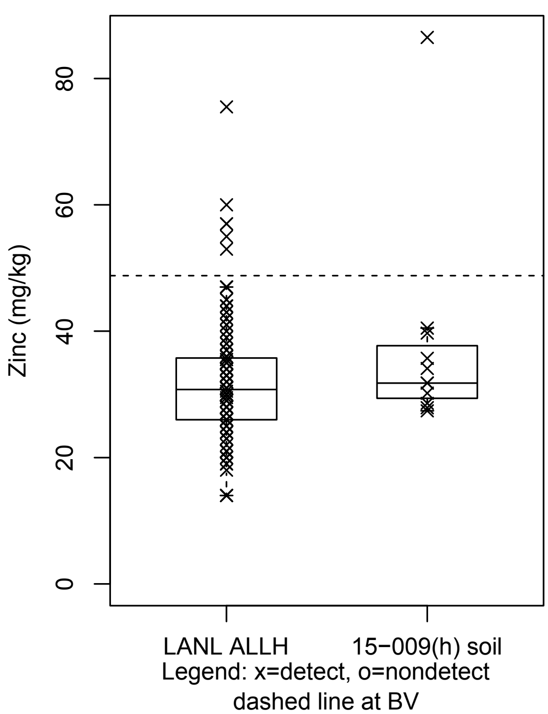


**Figure G-138 Box plot for zinc in soil at SWMU 15-009(h)**

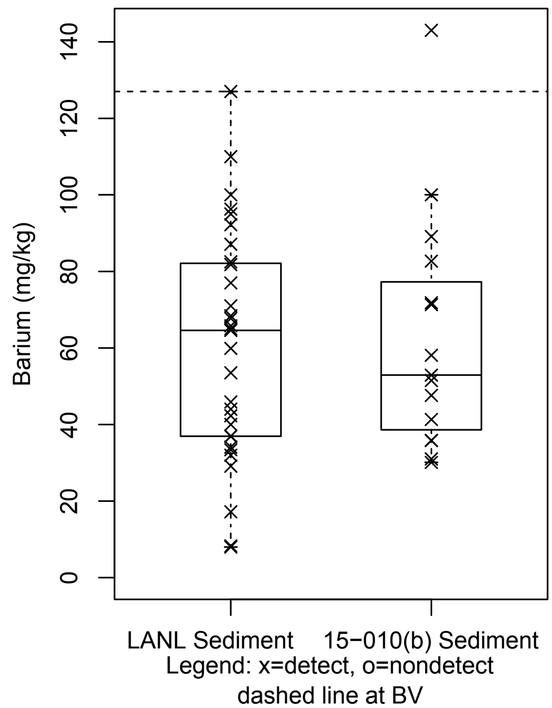


**Figure G-139 Box plot for barium in sediment at SWMU 15-010(b)**

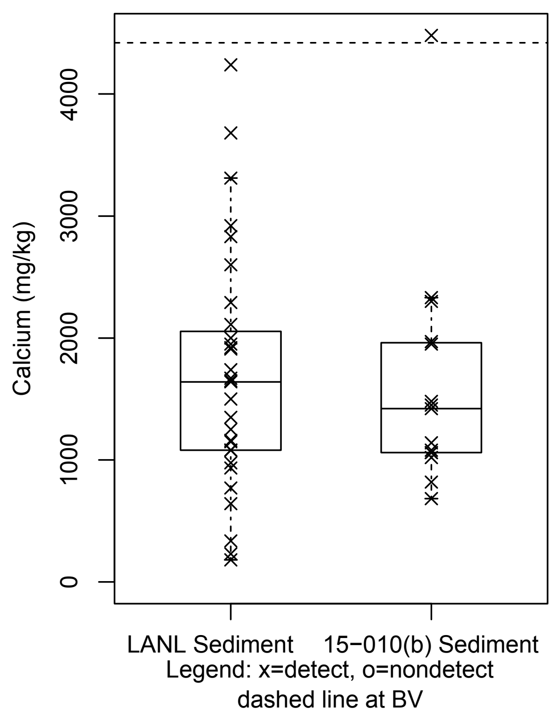


**Figure G-140 Box plot for calcium in sediment at SWMU 15-010(b)**

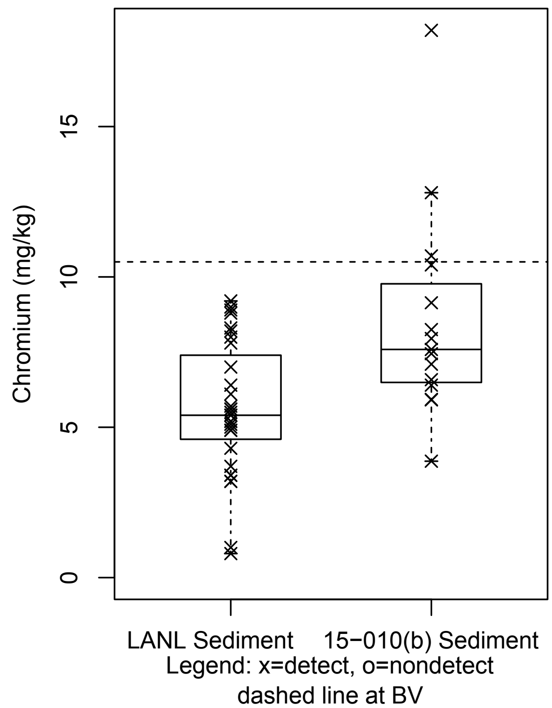


**Figure G-141 Box plot for chromium in sediment at SWMU 15-010(b)**

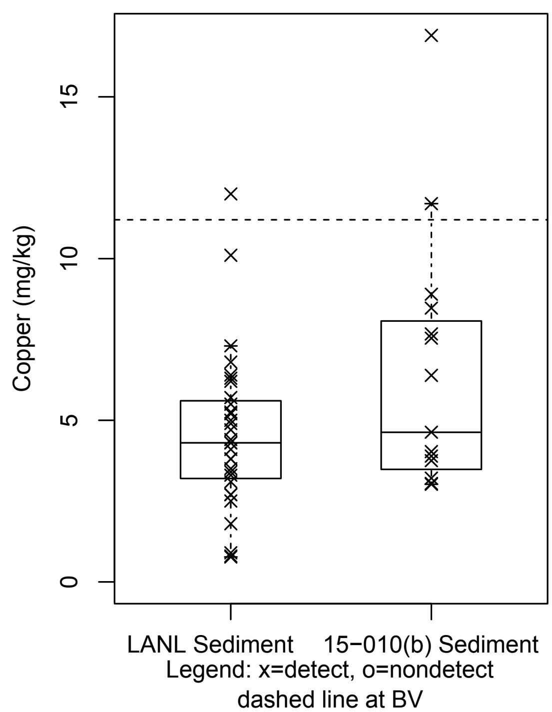


**Figure G-142 Box plot for copper in sediment at SWMU 15-010(b)**

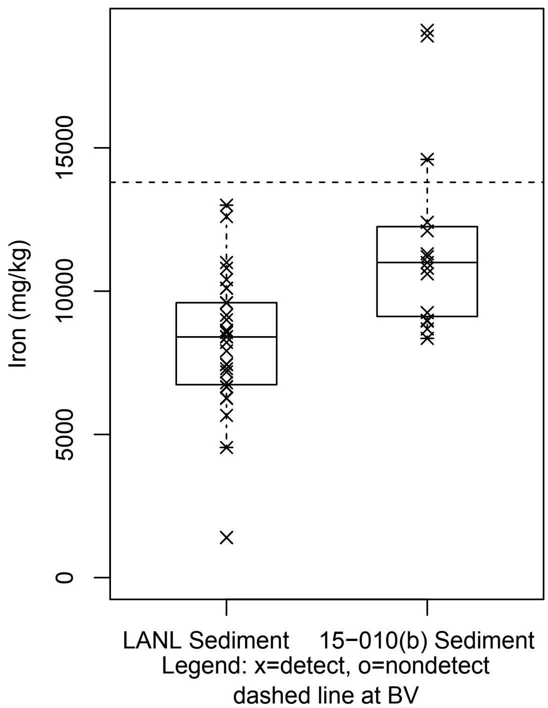


**Figure G-143 Box plot for iron in sediment at SWMU 15-010(b)**

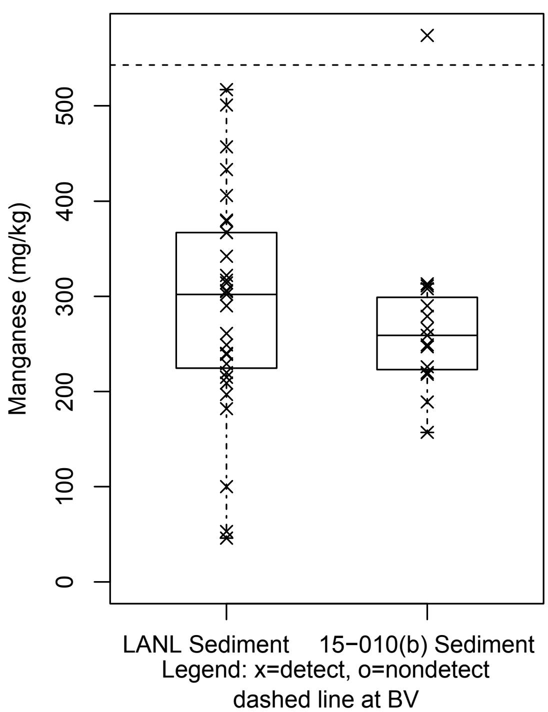


**Figure G-144 Box plot for manganese in sediment at SWMU 15-010(b)**

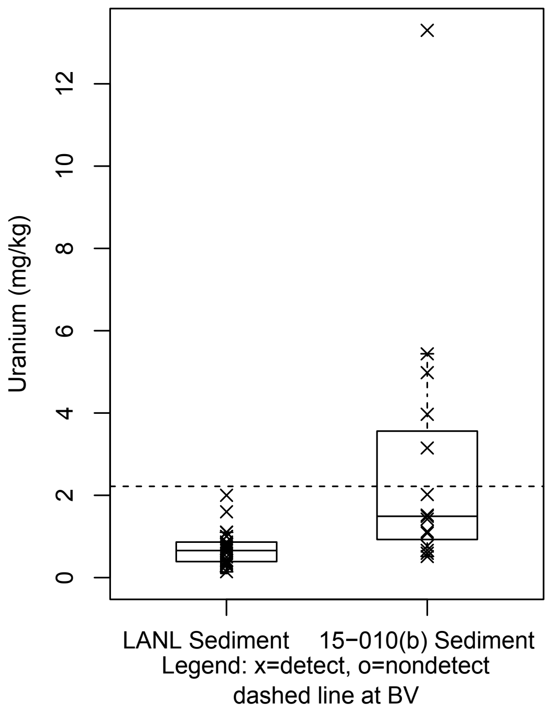


**Figure G-145 Box plot for uranium in sediment at SWMU 15-010(b)**

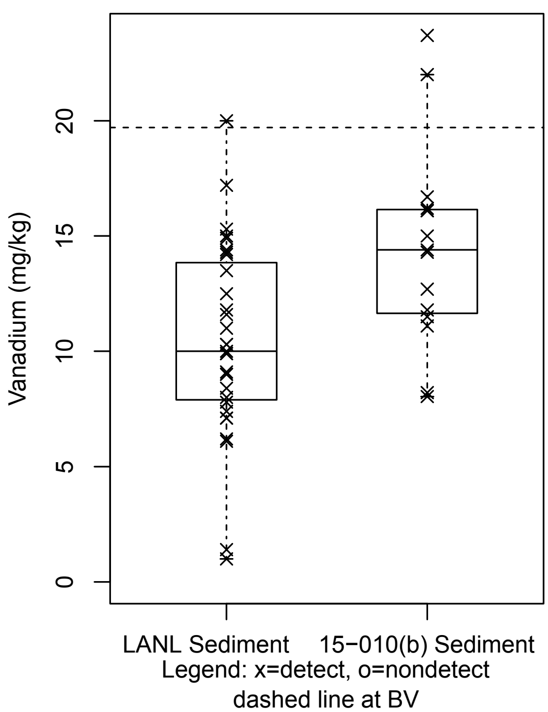


**Figure G-146 Box plot for vanadium in sediment at SWMU 15-010(b)**

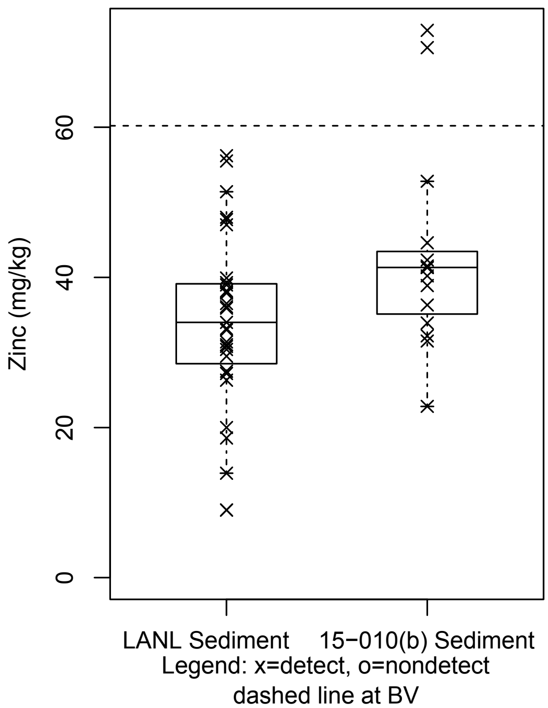


**Figure G-147 Box plot for zinc in sediment at SWMU 15-010(b)**

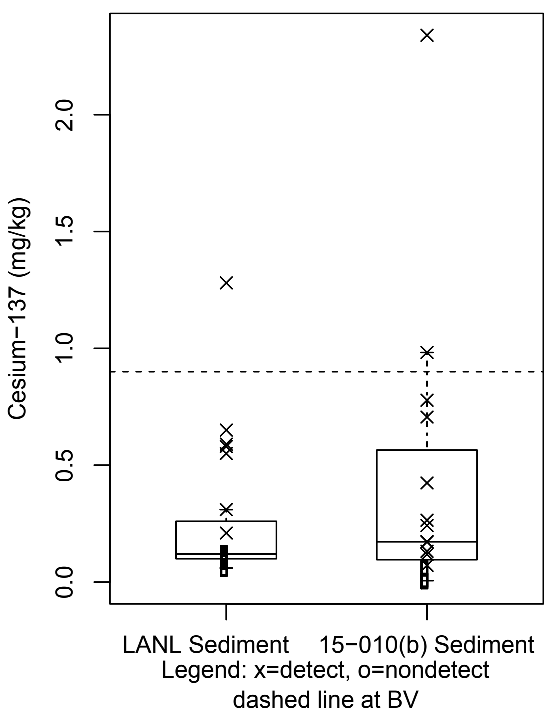


**Figure G-148 Box plot for cesium-137 in sediment at SWMU 15-010(b)**

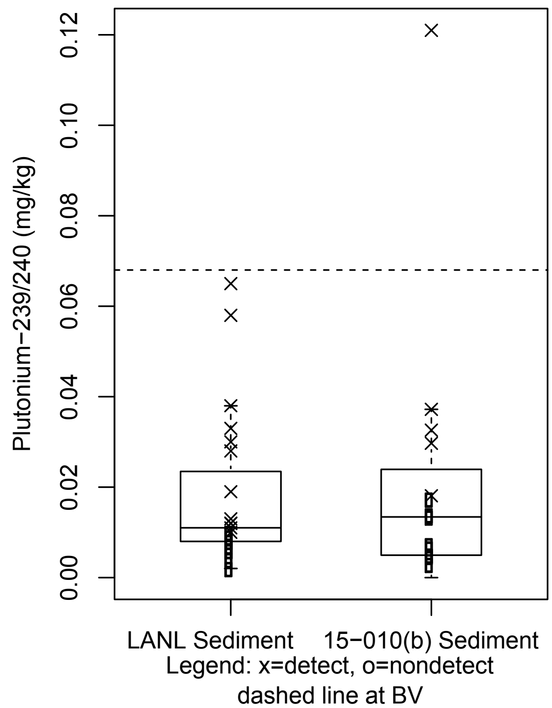


**Figure G-149    Box plot for plutonium-239/240 in sediment at SWMU 15-010(b)**

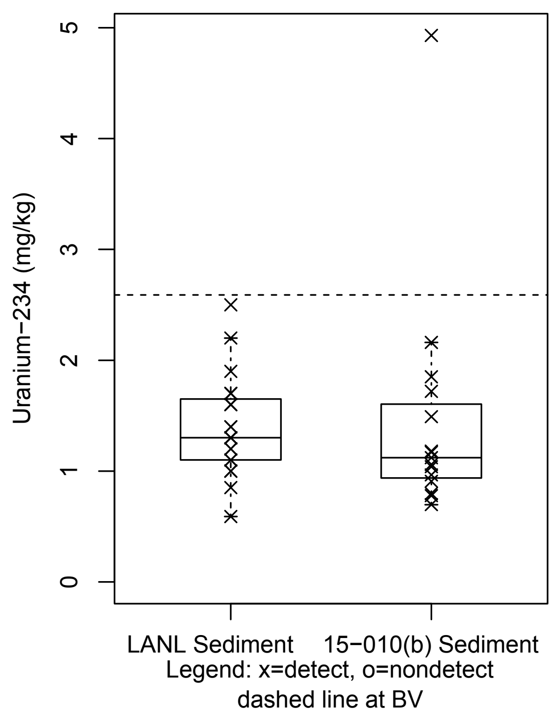


**Figure G-150    Box plot for uranium-234 in sediment at SWMU 15-010(b)**

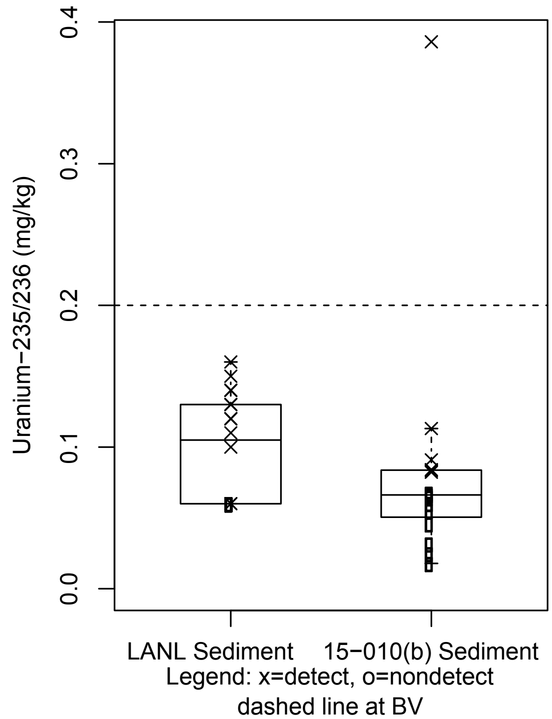


**Figure G-151 Box plot for uranium-235/236 in sediment at SWMU 15-010(b)**

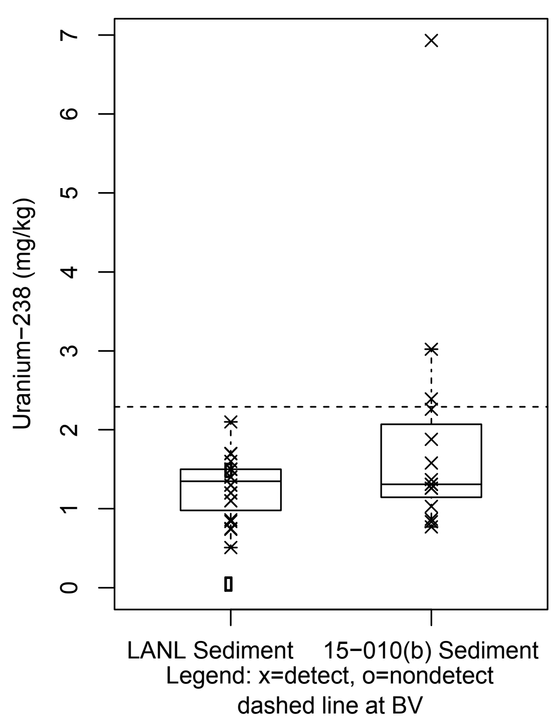


**Figure G-152 Box plot for uranium-238 in sediment at SWMU 15-010(b)**

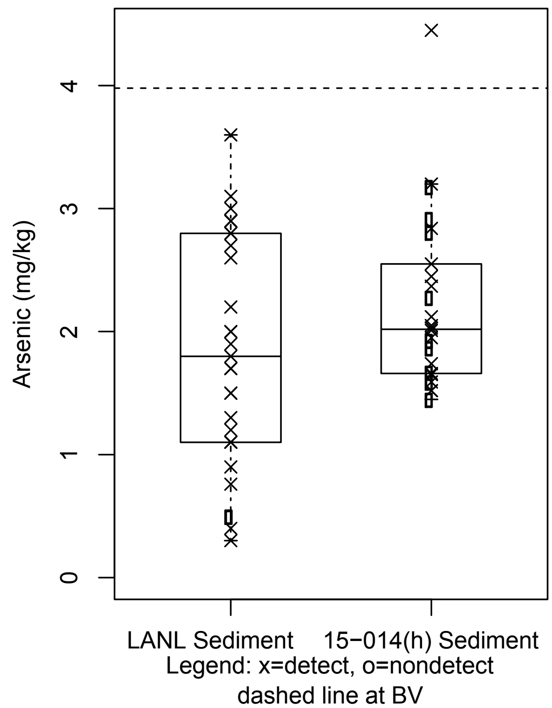


**Figure G-153  Box plot for arsenic in sediment at AOC 15-014(h)**

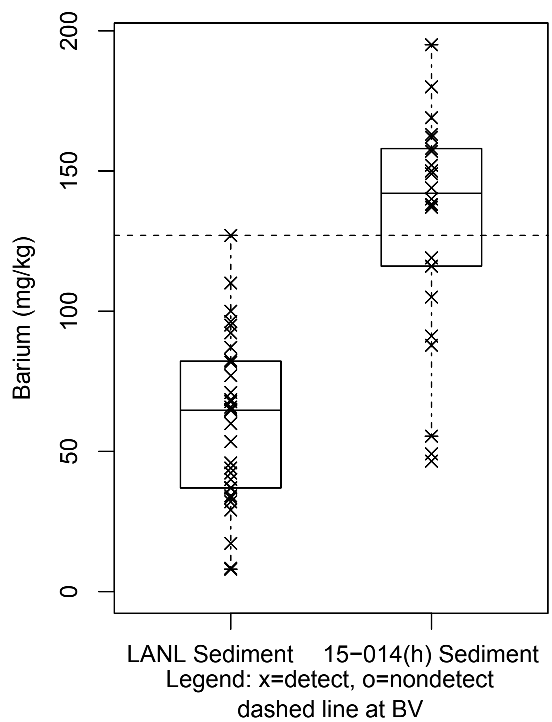


**Figure G-154  Box plot for barium in sediment at AOC 15-014(h)**

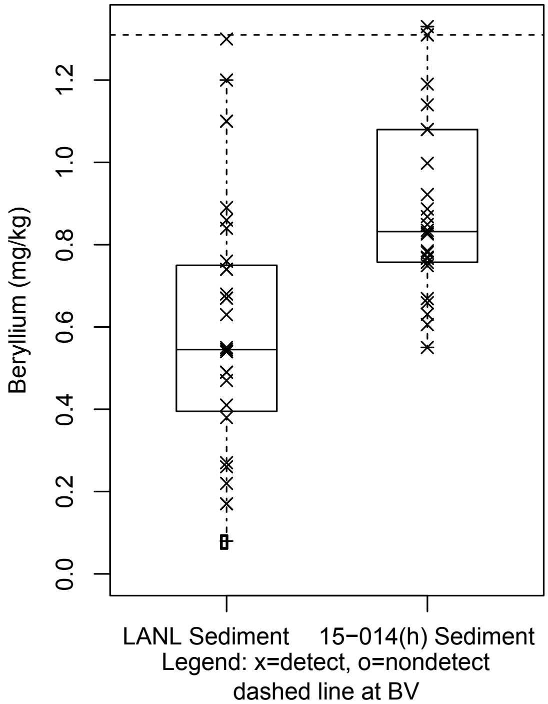


**Figure G-155 Box plot for beryllium in sediment at AOC 15-014(h)**

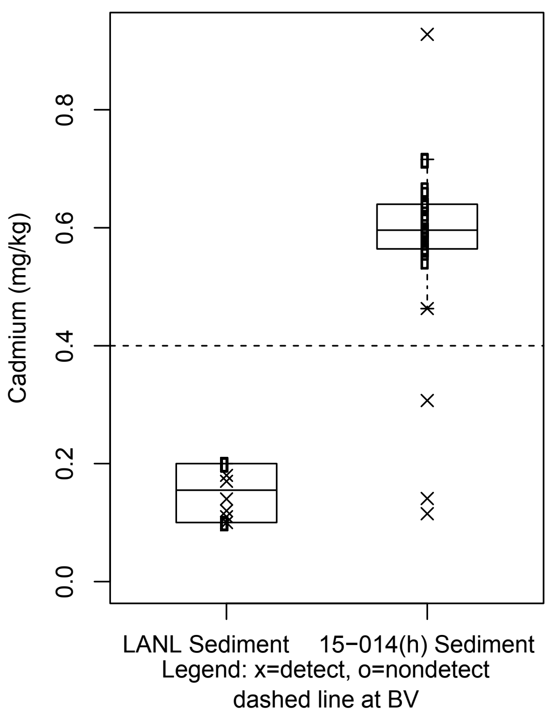


**Figure G-156 Box plot for cadmium in sediment at AOC 15-014(h)**

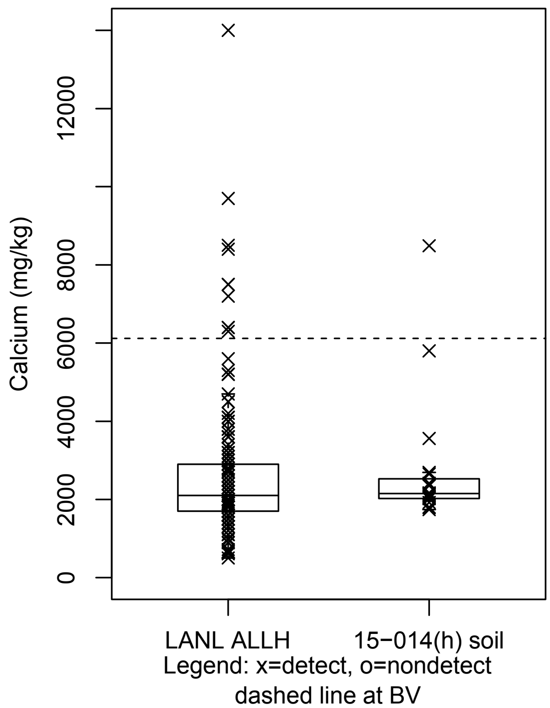


**Figure G-157 Box plot for calcium in sediment at AOC 15-014(h)**

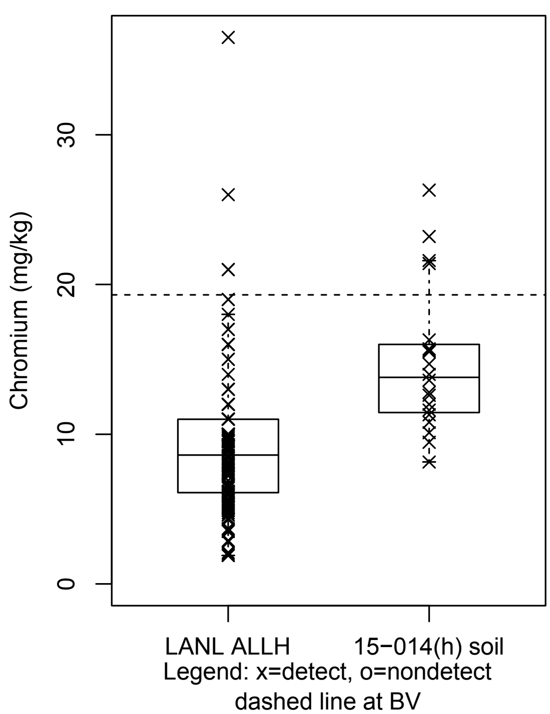


**Figure G-158 Box plot for chromium in soil at AOC 15-014(h)**

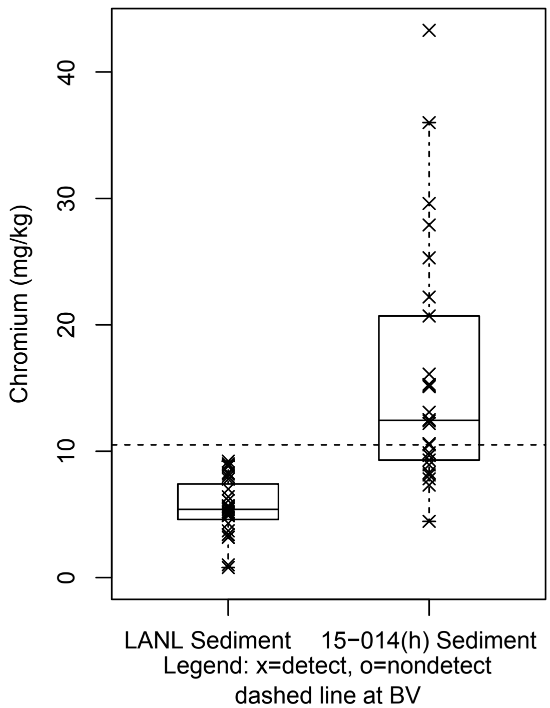


**Figure G-159 Box plot for chromium in sediment at AOC 15-014(h)**

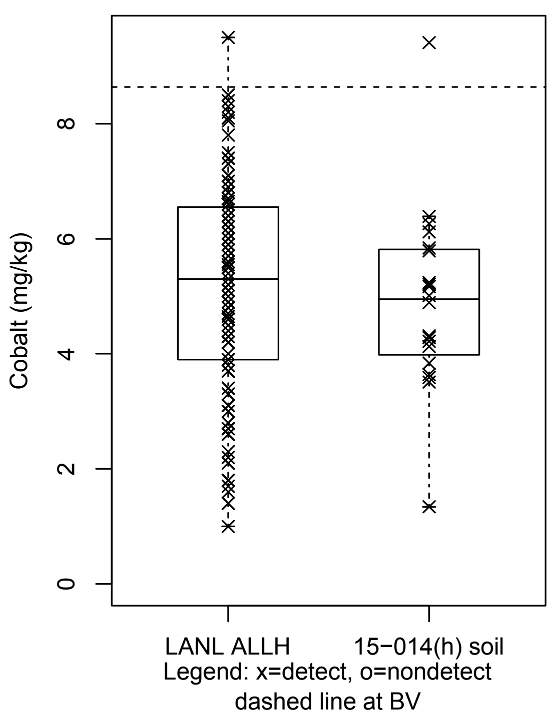


**Figure G-160 Box plot for cobalt in soil at AOC 15-014(h)**

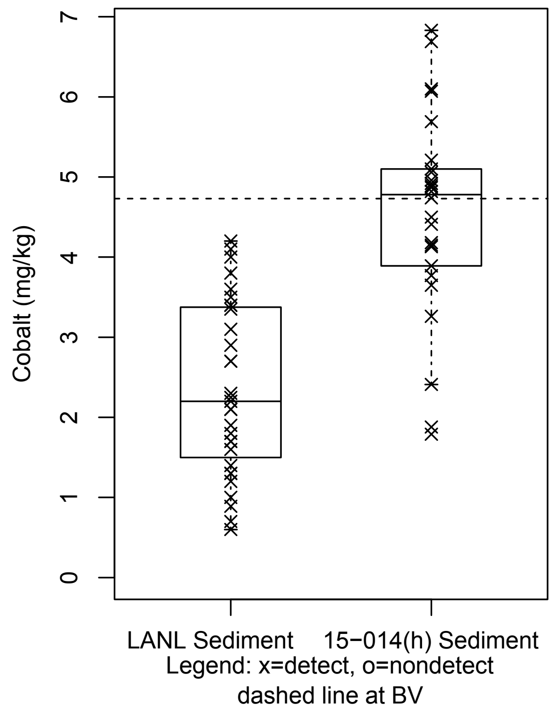


**Figure G-161 Box plot for cobalt in sediment at AOC 15-014(h)**

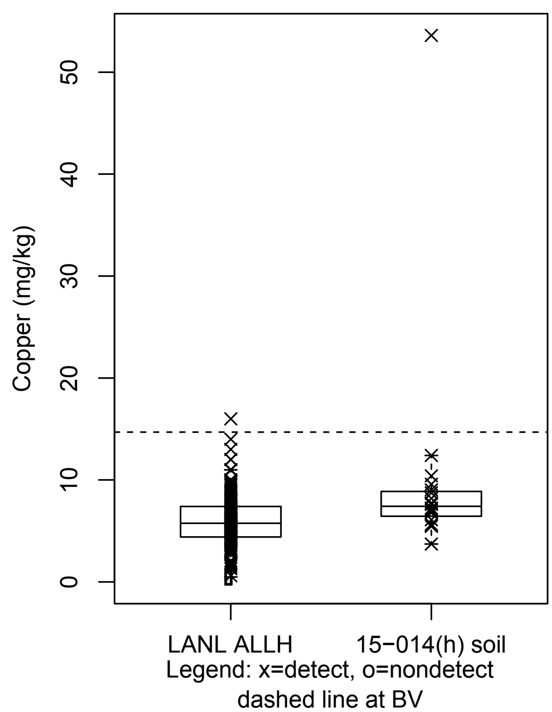


**Figure G-162 Box plot for copper in soil at AOC 15-014(h)**

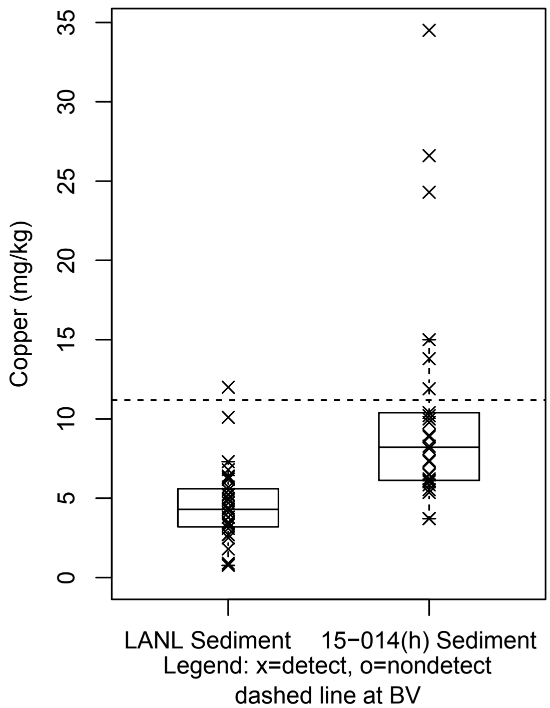


**Figure G-163 Box plot for copper in sediment at AOC 15-014(h)**

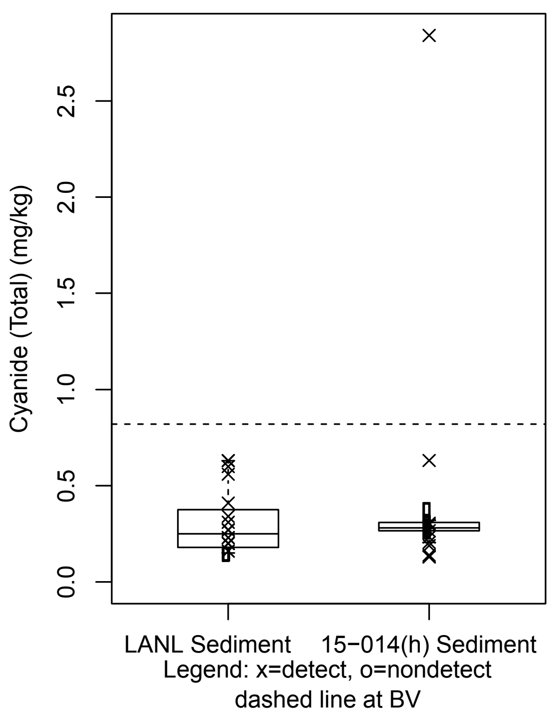


**Figure G-164 Box plot for cyanide in sediment at AOC 15-014(h)**

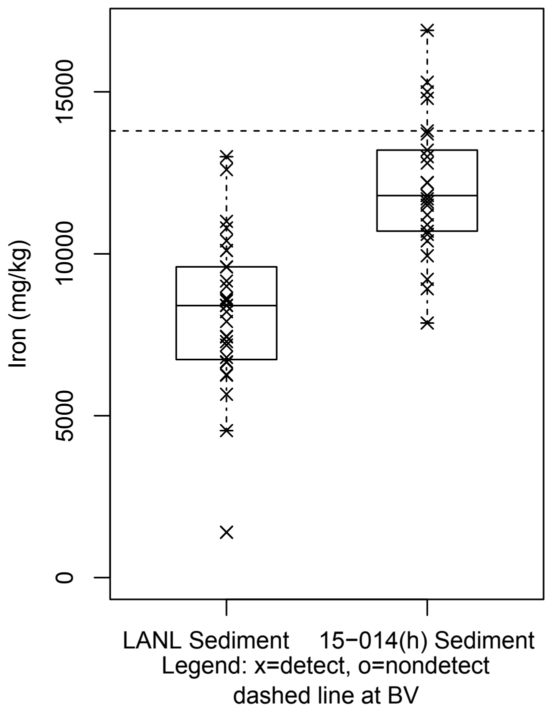


**Figure G-165 Box plot for iron in sediment at AOC 15-014(h)**

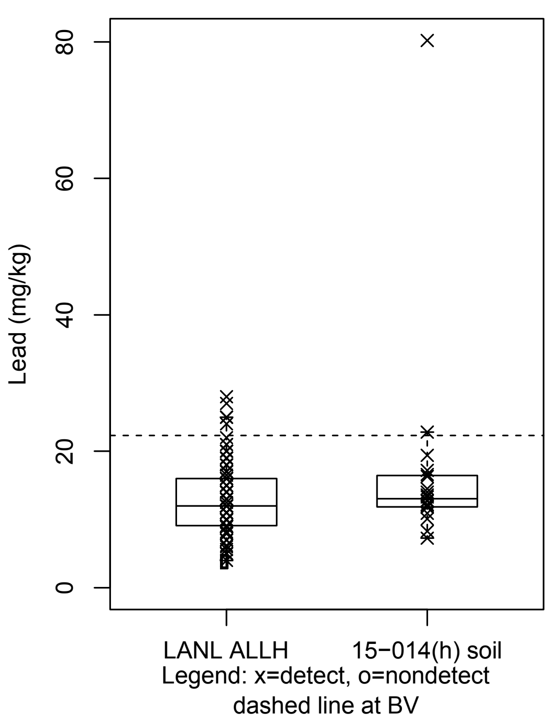


**Figure G-166 Box plot for lead in soil at AOC 15-014(h)**

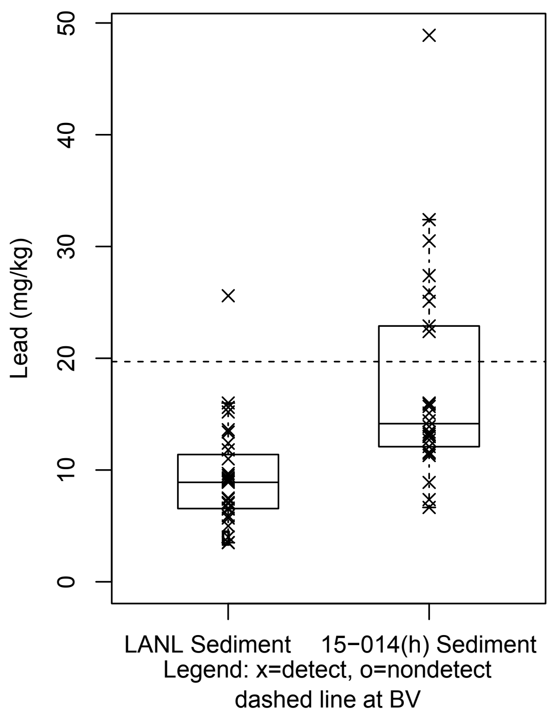


**Figure G-167 Box plot for lead in sediment at AOC 15-014(h)**

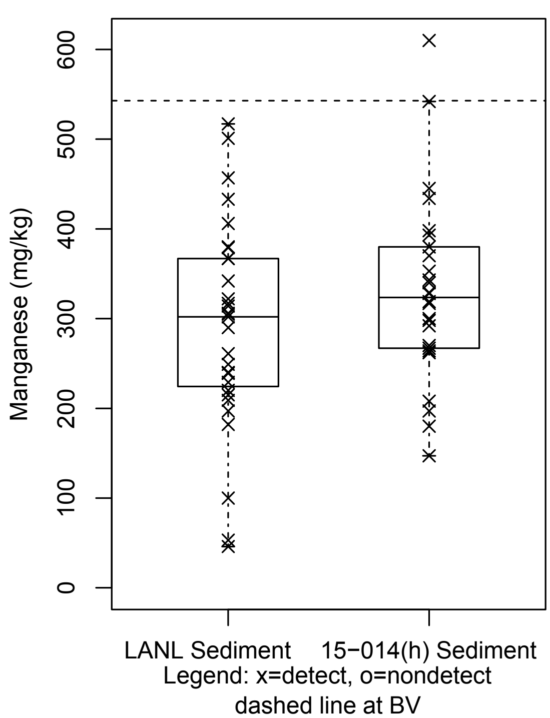


**Figure G-168 Box plot for manganese in sediment at AOC 15-014(h)**

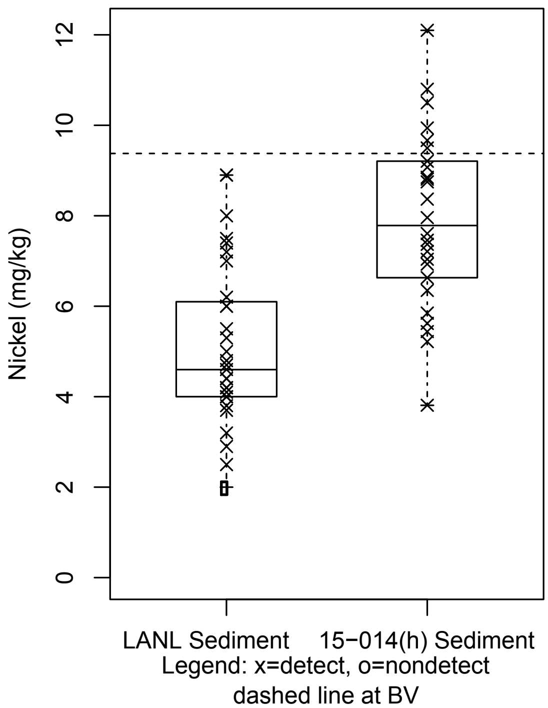


**Figure G-169 Box plot for nickel in sediment at AOC 15-014(h)**

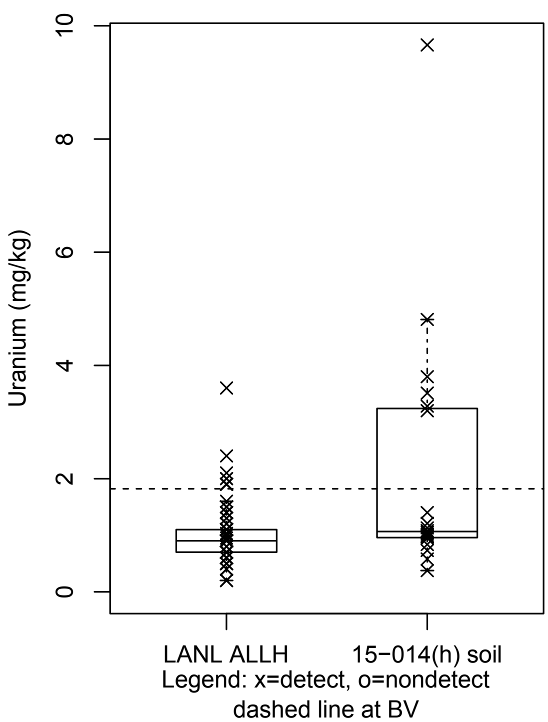


**Figure G-170 Box plot for uranium in soil at AOC 15-014(h)**

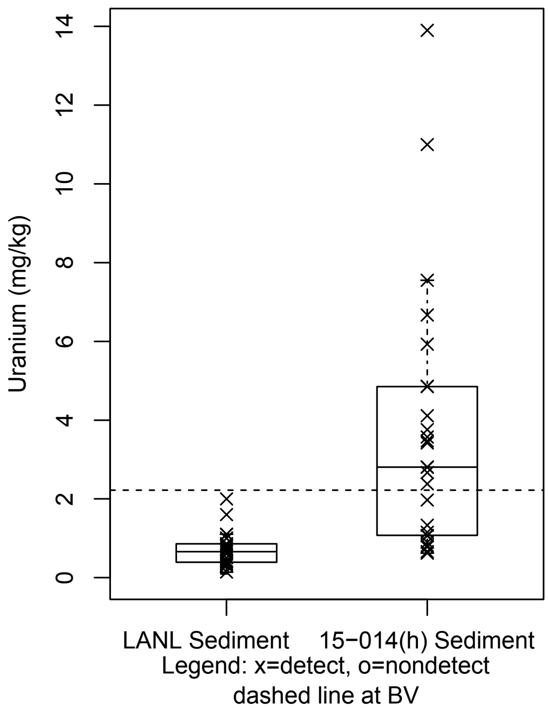


**Figure G-171 Box plot for uranium in sediment at AOC 15-014(h)**

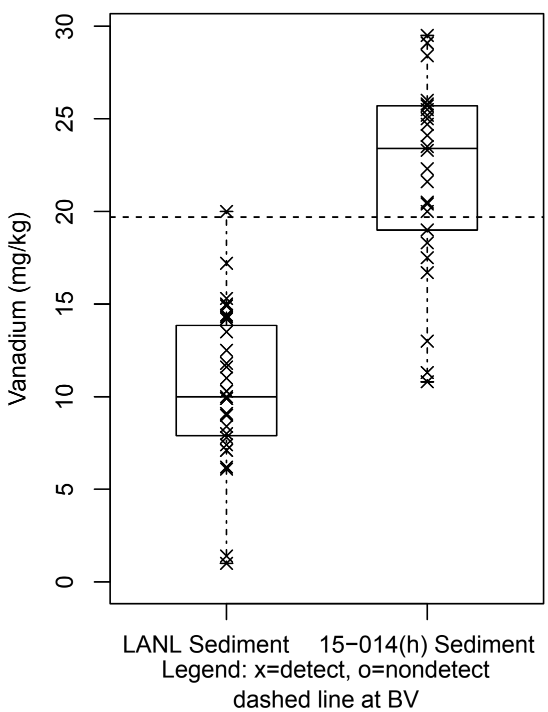


**Figure G-172 Box plot for vanadium in sediment at SWMU 15-014(h)**

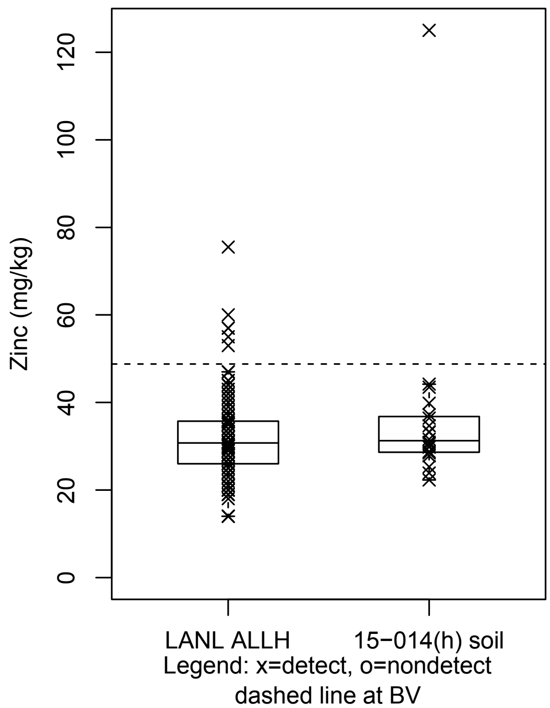


**Figure G-173 Box plot for zinc in soil at AOC 15-014(h)**

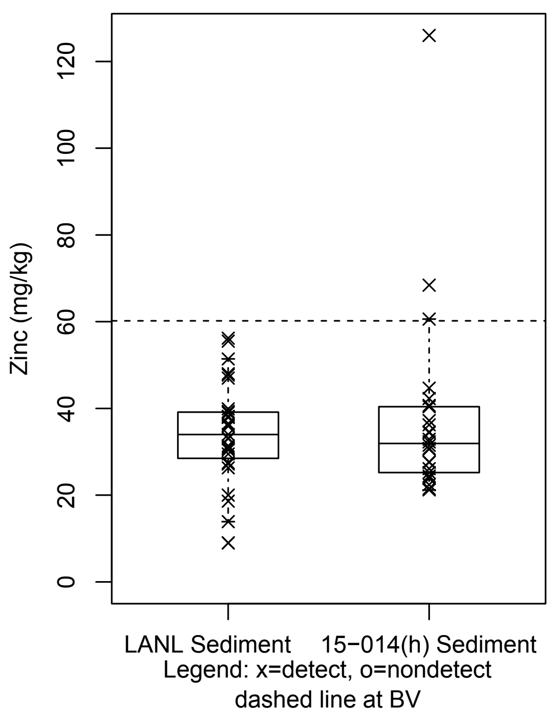


**Figure G-174 Box plot for zinc in sediment at AOC 15-014(h)**

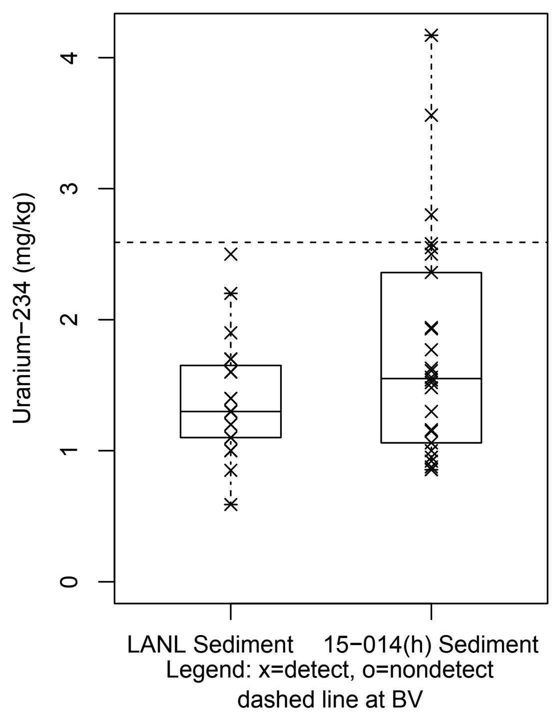


**Figure G-175 Box plot for uranium-234 in sediment at AOC 15-014(h)**

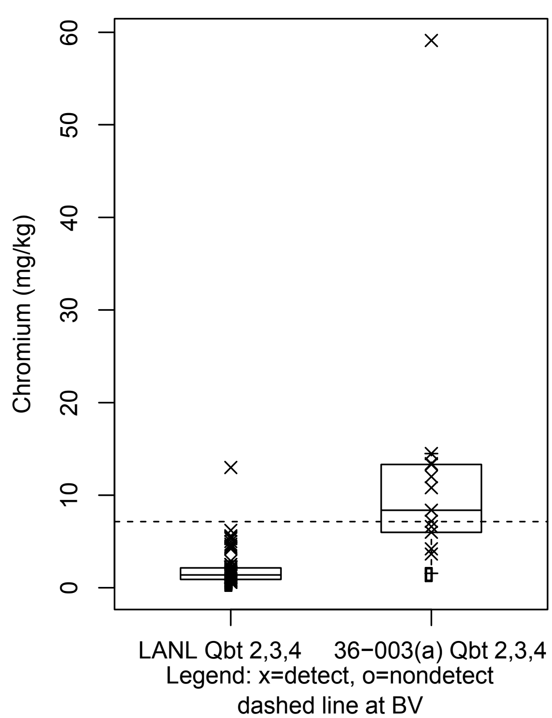


**Figure G-176 Box plot for chromium in tuff at SWMU 36-003(a)**

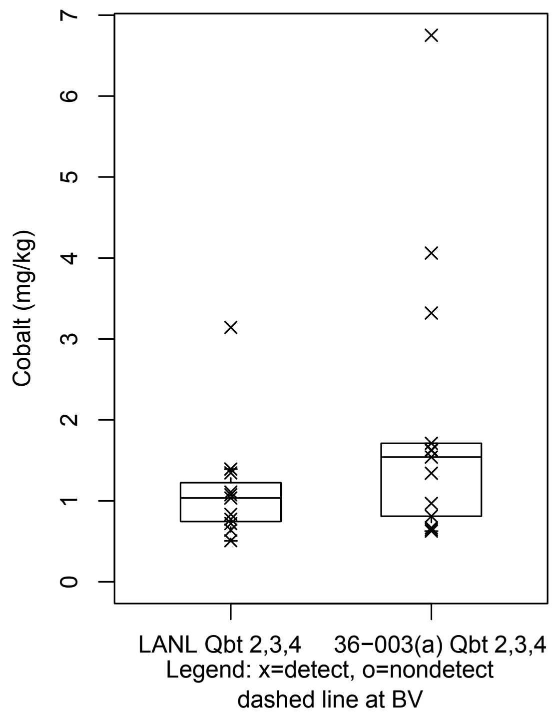


**Figure G-177 Box plot for cobalt in tuff at SWMU 36-003(a)**

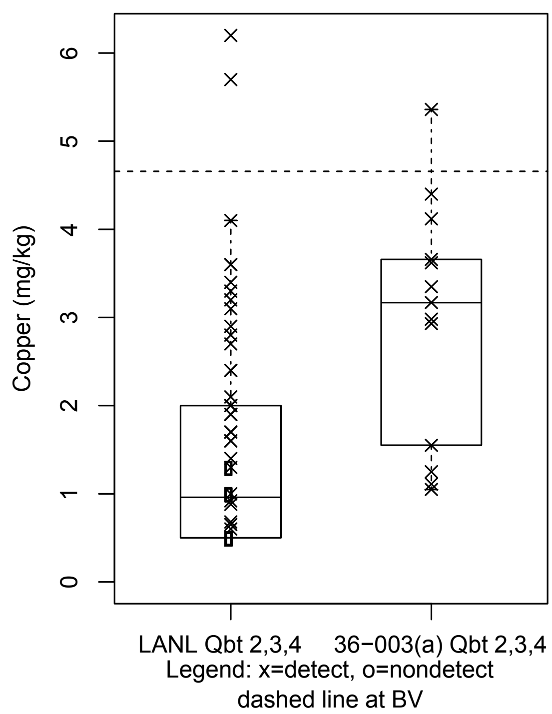


**Figure G-178 Box plot for copper in tuff at SWMU 36-003(a)**

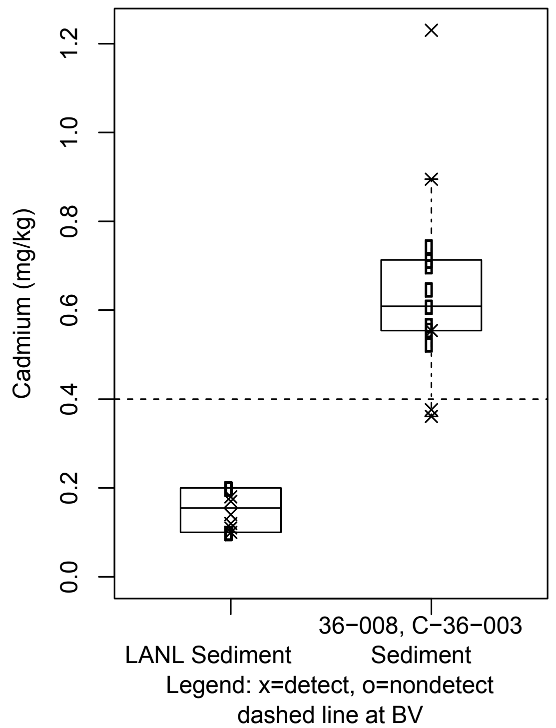


**Figure G-179 Box plot for cadmium in sediment at SWMUs 36-008 and C-36-003**

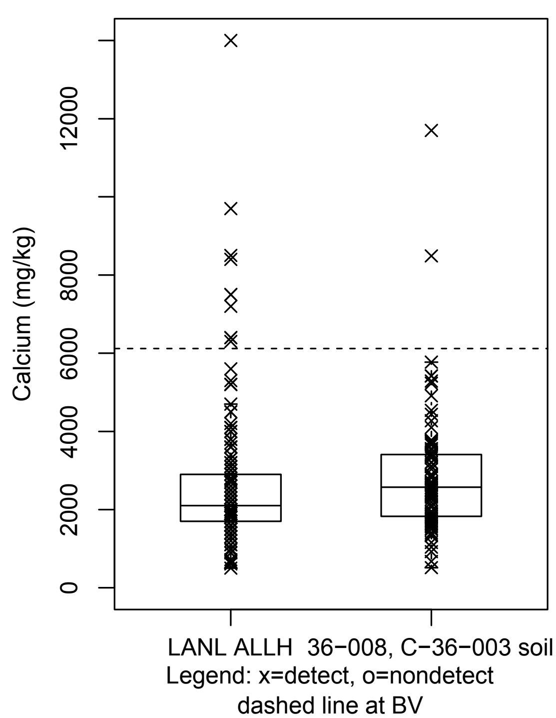


**Figure G-180 Box plot for calcium in soil at SWMUs 36-008 and C-36-003**

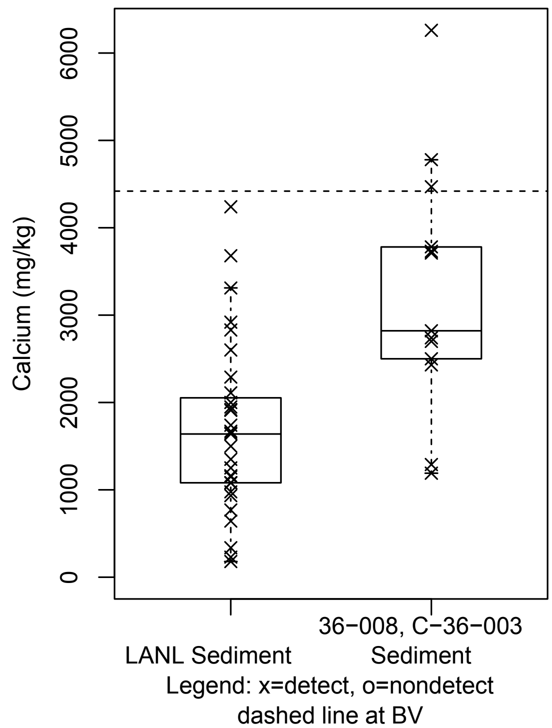


**Figure G-181 Box plot for calcium in sediment at SWMUs 36-008 and C-36-003**

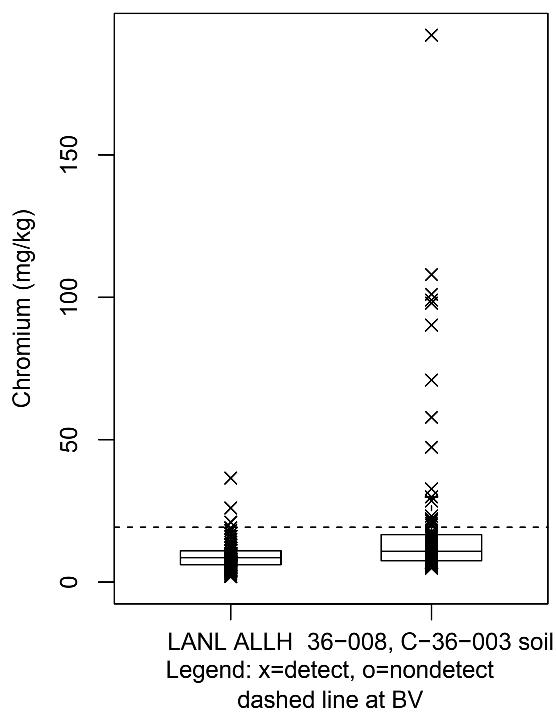


**Figure G-182 Box plot for chromium in soil at SWMUs 36-008 and C-36-003**

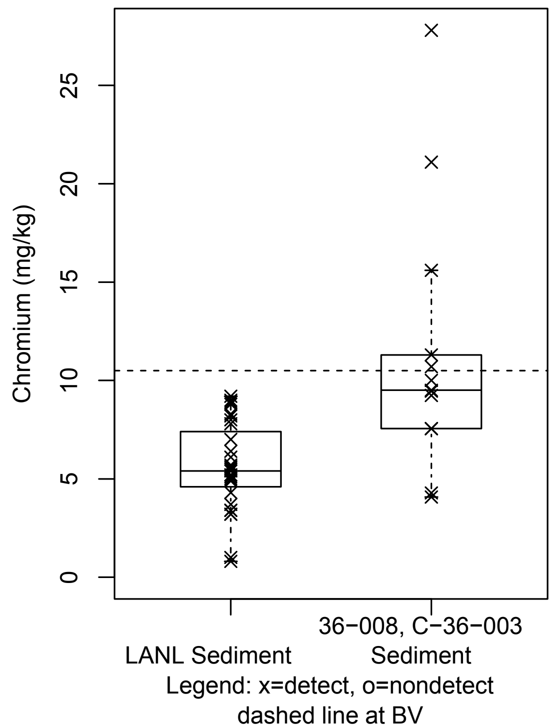


**Figure G-183 Box plot for chromium in sediment at SWMUs 36-008 and C-36-003**

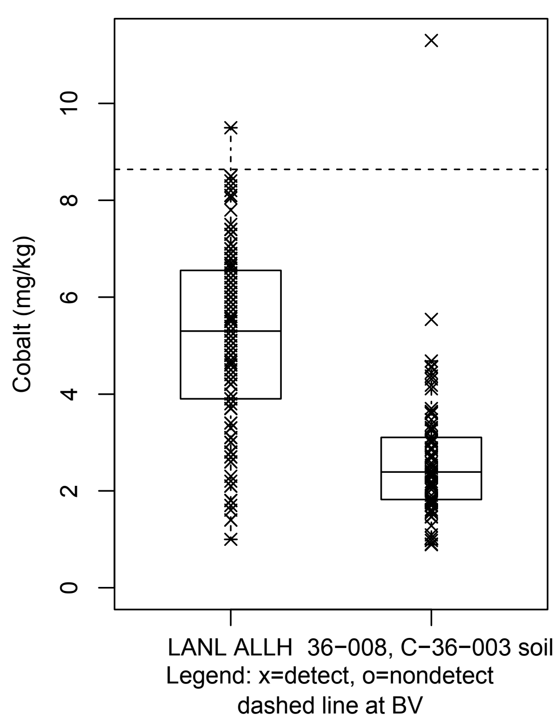


**Figure G-184 Box plot for cobalt in soil at SWMUs 36-008 and C-36-003**

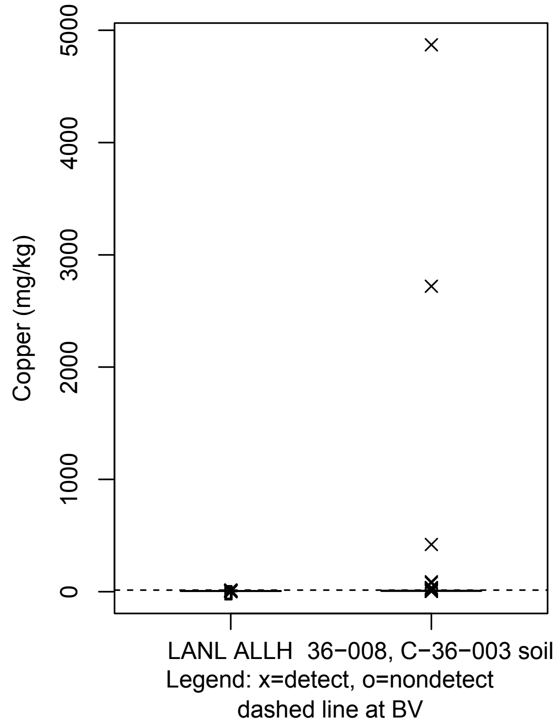


**Figure G-185    Box plot for copper in soil at SWMUs 36-008 and C-36-003**

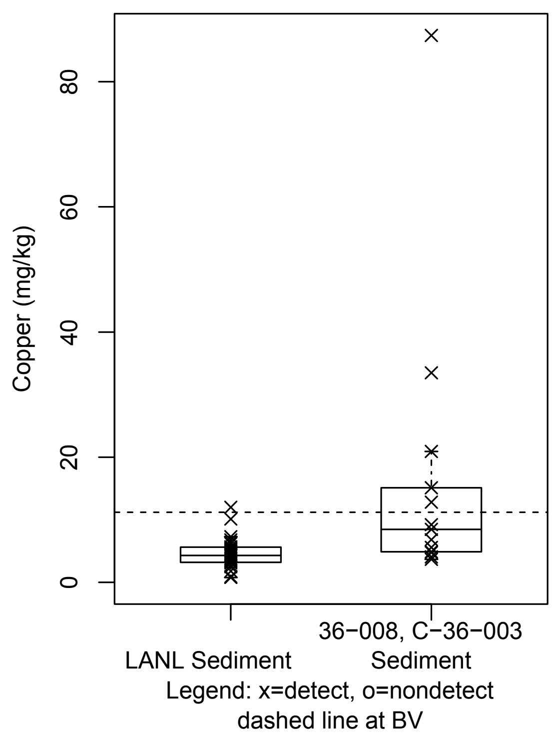


**Figure G-186    Box plot for copper in sediment at SWMUs 36-008 and C-36-003**

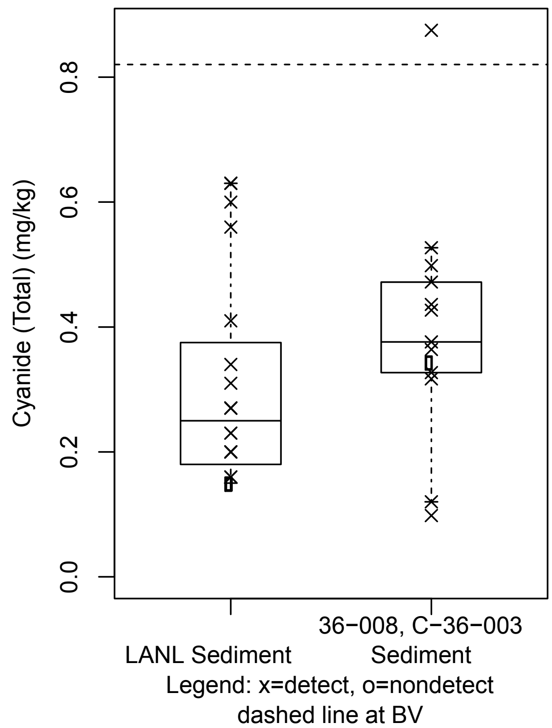


**Figure G-187 Box plot for cyanide in sediment at SWMUs 36-008 and C-36-003**

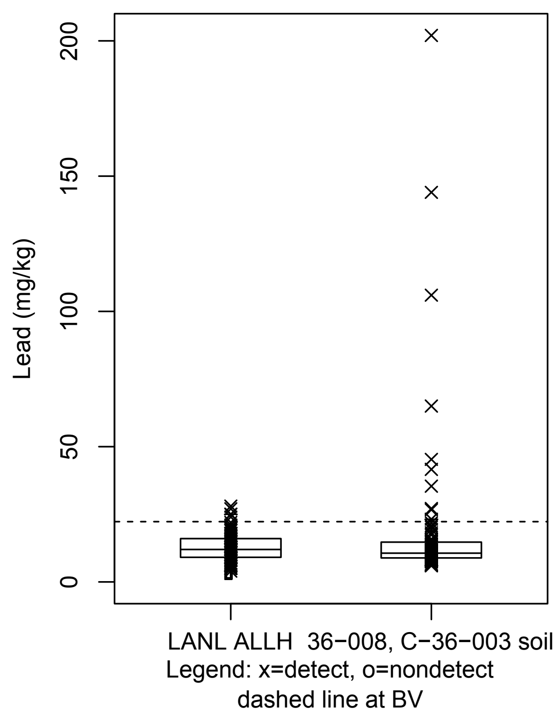


**Figure G-188 Box plot for lead in soil at SWMUs 36-008 and C-36-003**

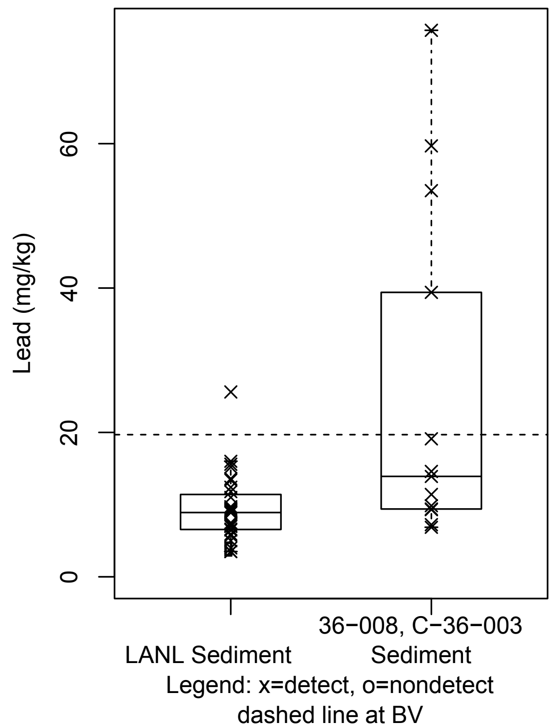


**Figure G-189 Box plot for lead in sediment at SWMUs 36-008 and C-36-003**

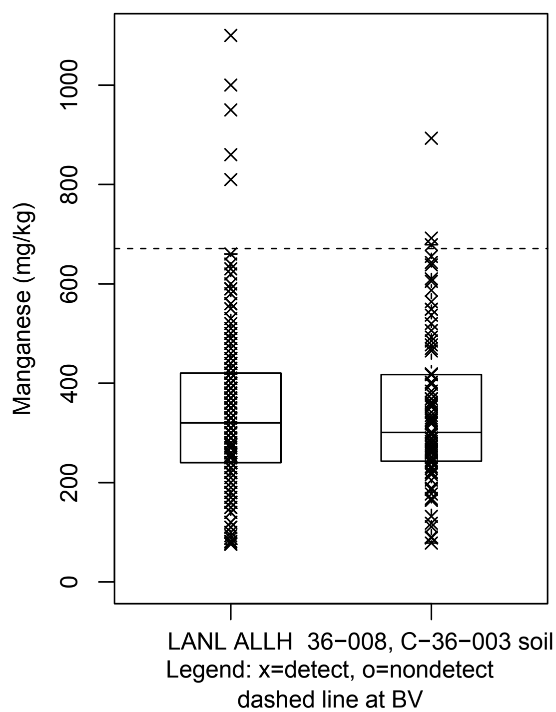


**Figure G-190 Box plot for manganese in soil at SWMUs 36-008 and C-36-003**

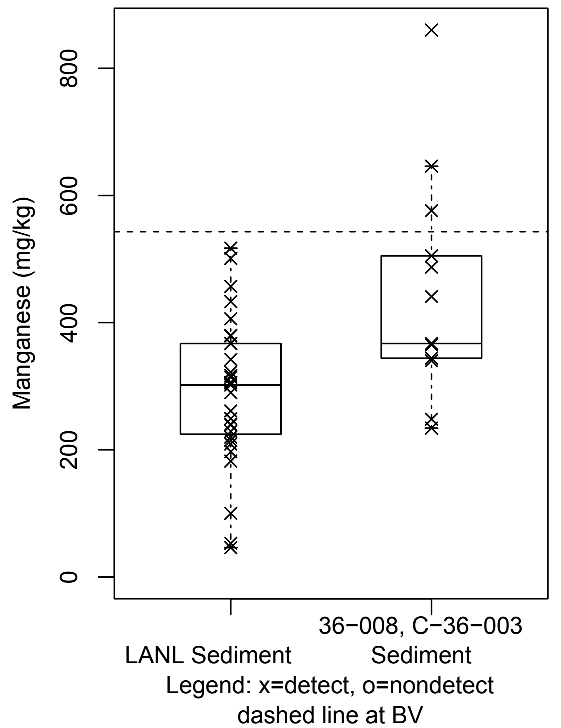


**Figure G-191 Box plot for manganese in sediment at SWMUs 36-008 and C-36-003**

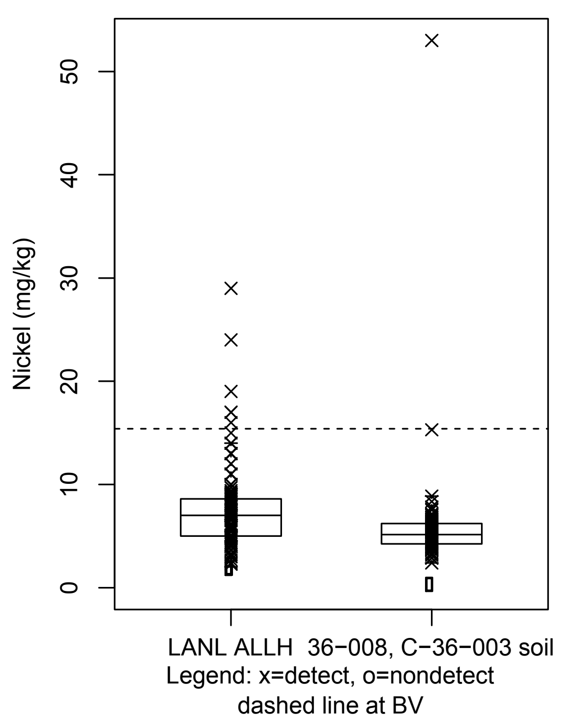


**Figure G-192 Box plot for nickel in soil at SWMUs 36-008 and C-36-003**

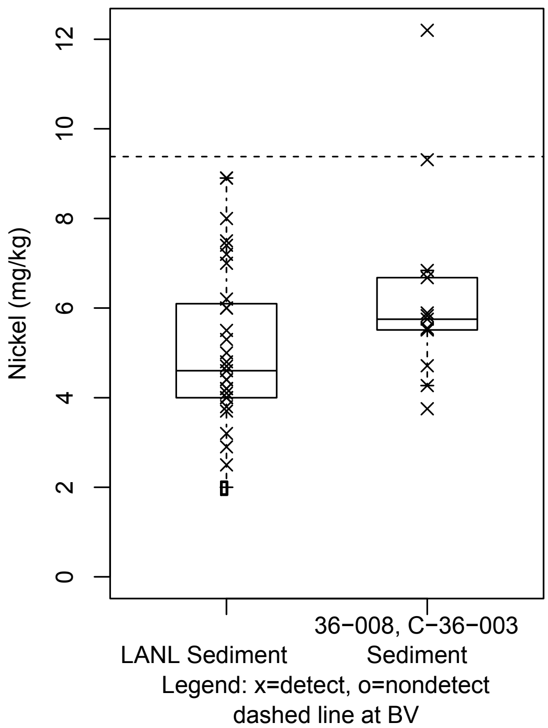


**Figure G-193 Box plot for nickel in sediment at SWMUs 36-008 and C-36-003**

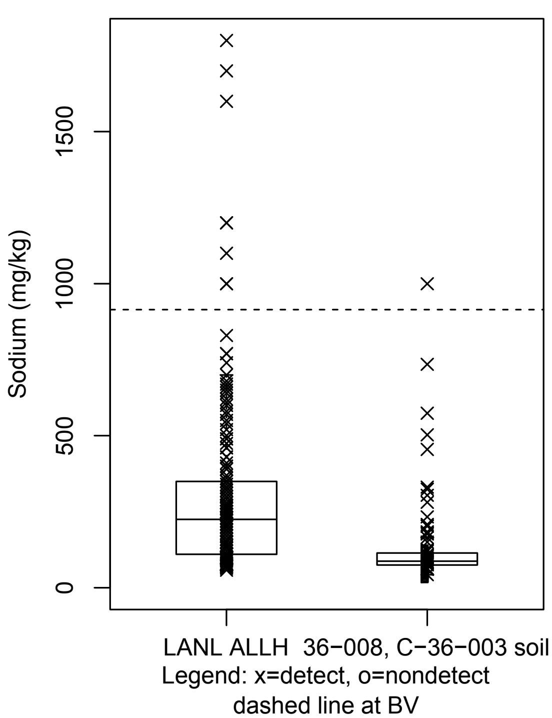


**Figure G-194 Box plot for sodium in soil at SWMUs 36-008 and C-36-003**

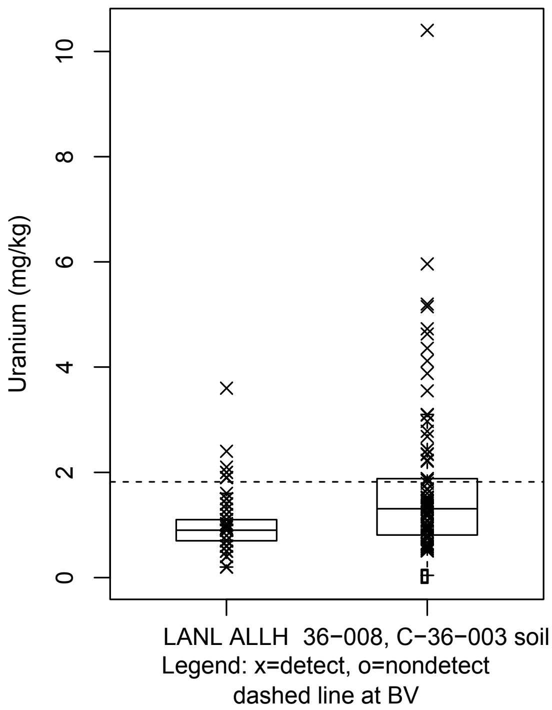


**Figure G-195    Box plot for uranium in soil at SWMUs 36-008 and C-36-003**

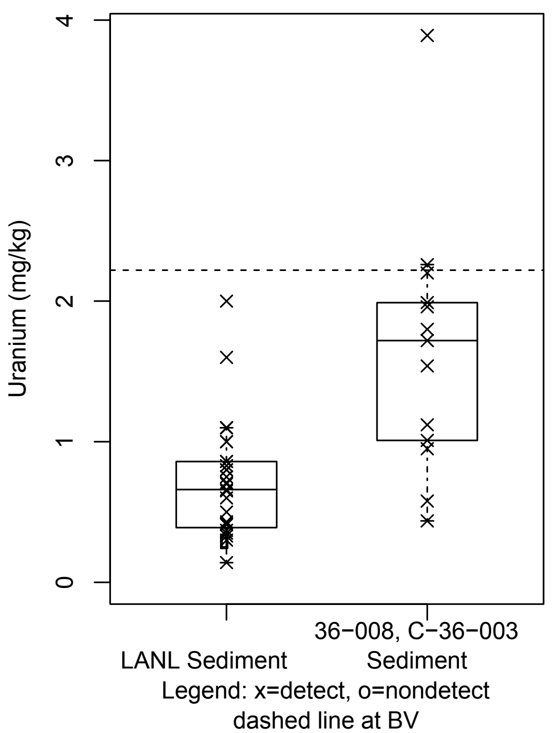


**Figure G-196    Box plot for uranium in sediment at SWMUs 36-008 and C-36-003**

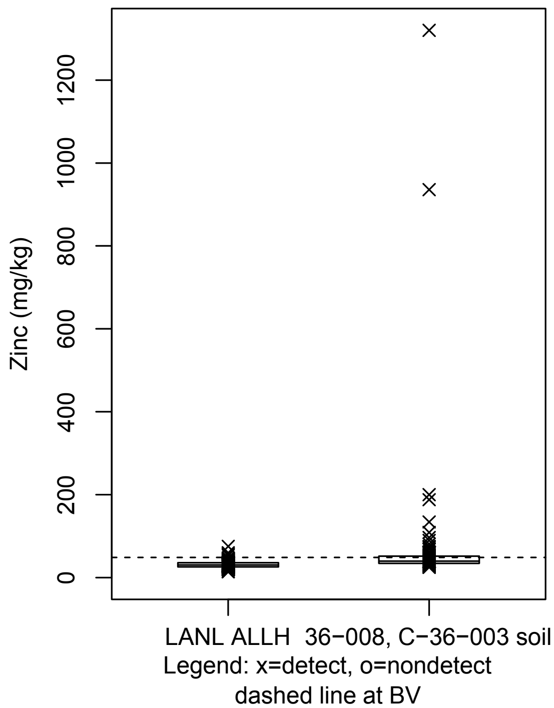


**Figure G-197 Box plot for zinc in soil at SWMUs 36-008 and C-36-003**

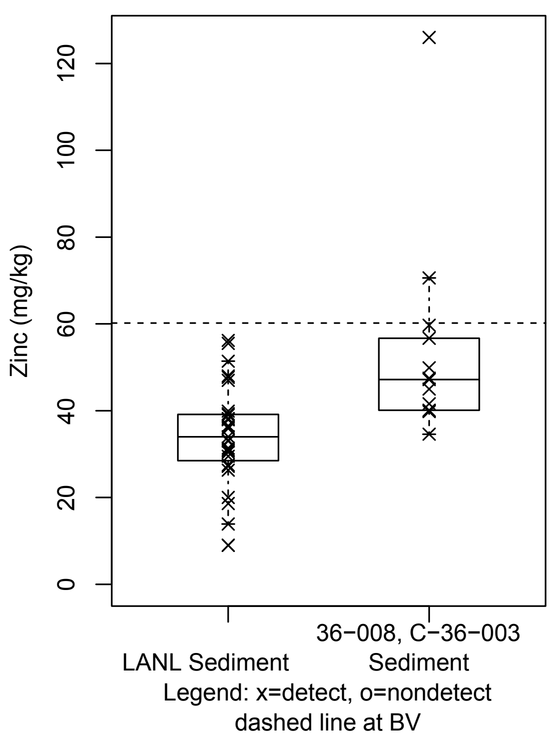


**Figure G-198 Box plot for zinc in sediment at SWMUs 36-008 and C-36-003**

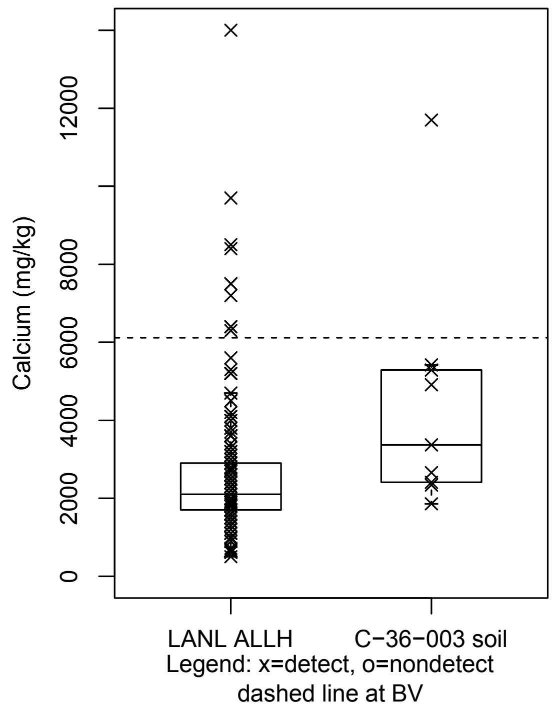


**Figure G-199 Box plot for calcium in soil at SWMU C-36-003**

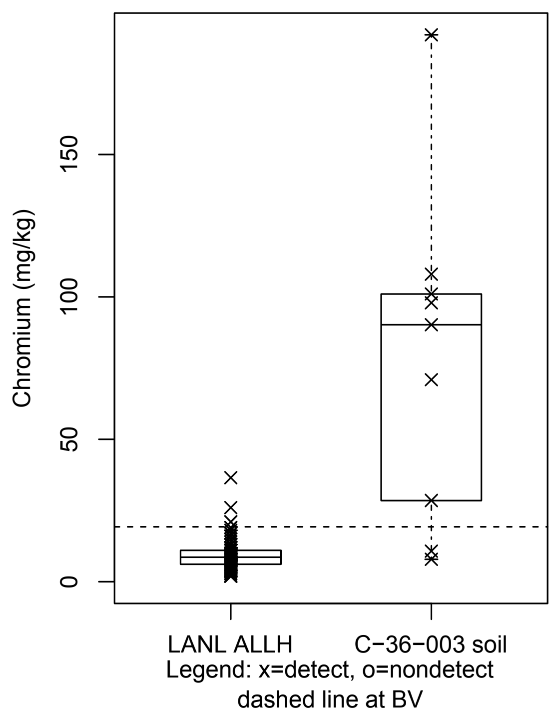


**Figure G-200 Box plot for chromium in soil at SWMU C-36-003**

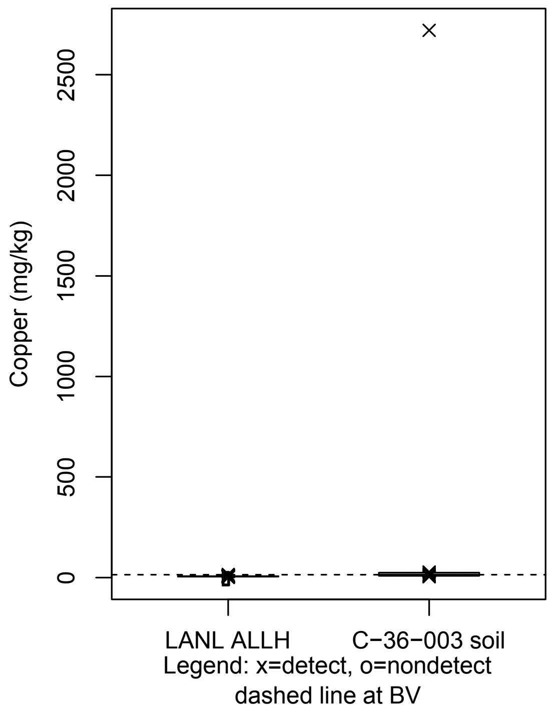


**Figure G-201 Box plot for copper in soil at SWMU C-36-003**

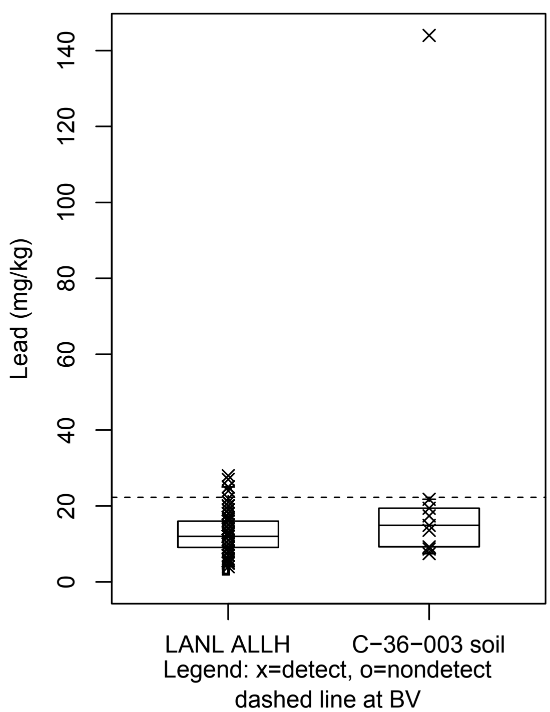


**Figure G-202 Box plot for lead in soil at SWMU C-36-003**

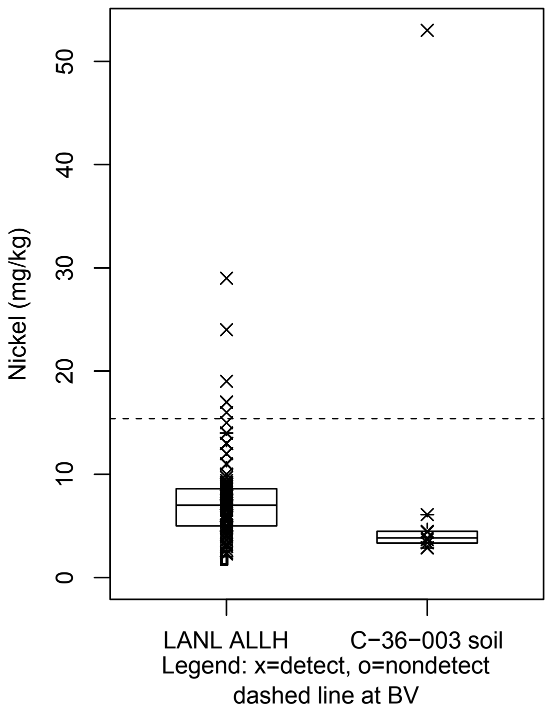


**Figure G-203 Box plot for nickel in soil at SWMU C-36-003**

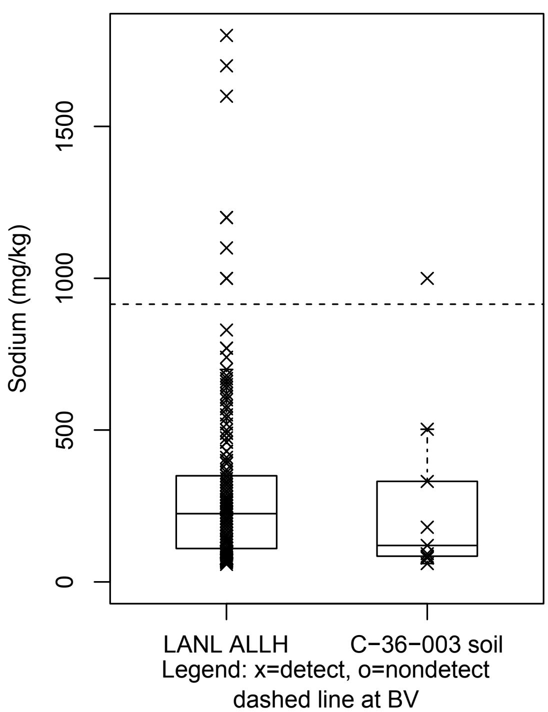


**Figure G-204 Box plot for sodium in soil at SWMU C-36-003**

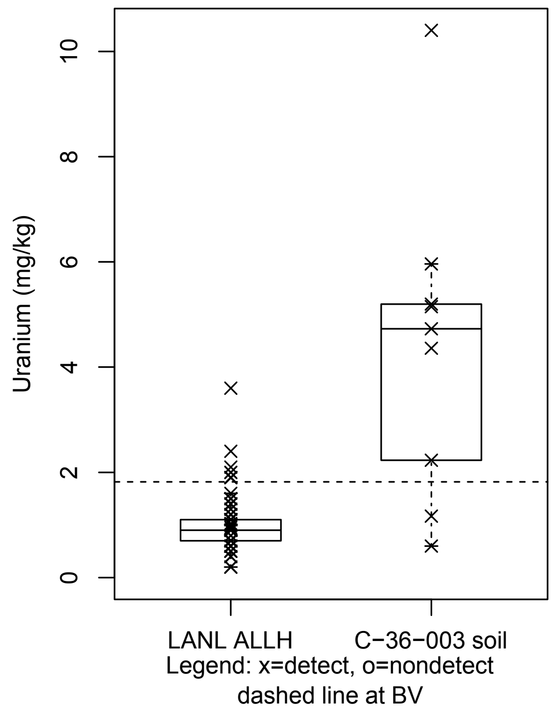


**Figure G-205 Box plot for uranium in soil at SWMU C-36-003**

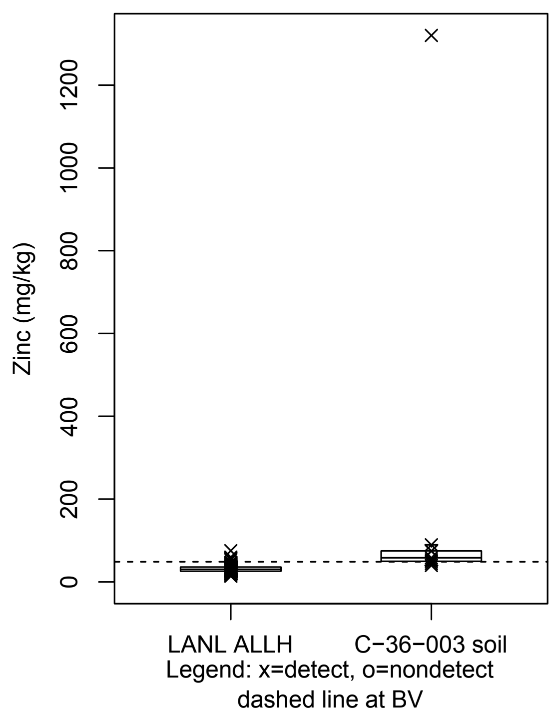


**Figure G-206 Box plot for zinc in soil at SWMU C-36-003**

**Table G-1**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMUs 12-001(a) and 12-001(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Aluminum | <0.001 | 0.019 | n/a* | Yes |
| Barium | <0.001 | 0.0024 | n/a | Yes |
| Calcium | 0.002 | 0.017 | n/a | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 0.036 | 0.035 | n/a | Yes |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Iron | <0.001 | 0.017 | n/a | Yes |
| Lead | 0.12 | 0.091 | n/a | No |
| Magnesium | <0.001 | 0.017 | n/a | Yes |
| Nickel | n/a | <0.001 | 0.017 | Yes |
| Vanadium | <0.001 | 0.0035 | n/a | Yes |

* n/a = Not applicable.

**Table G-2**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMUs 12-001(a) and 12-001(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Barium | <0.001 | 0.0064 | n/a* | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 0.067 | 0.85 | n/a | No |
| Copper | <0.001 | 0.026 | n/a | Yes |
| Iron | <0.001 | 0.021 | n/a | Yes |
| Lead | 0.0061 | 0.96 | 0.28 | No |
| Manganese | <0.001 | 0.036 | n/a | Yes |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | 0.46 | 0.67 | n/a | No |

* n/a = Not applicable.

**Table G-3**
**Results for Statistical Tests**
**for Inorganic Chemicals in Tuff at AOC 12-004(a)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Aluminum | <0.001 | 0.028 | n/a* | Yes |
| Arsenic | <0.001 | 0.0054 | n/a | Yes |
| Barium | <0.001 | <0.001 | n/a | Yes |
| Calcium | 0.0062 | 0.026 | n/a | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 0.0043 | 0.072 | 0.02 | Yes |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Lead | <0.001 | 0.26 | 0.22 | No |
| Magnesium | <0.001 | 0.026 | n/a | Yes |
| Nickel | n/a | <0.001 | 0.0018 | Yes |
| Uranium | 0.29 | 0.75 | n/a | No |
| Vanadium | <0.001 | 0.0089 | n/a | Yes |

* n/a = Not applicable.

**Table G-4**
**Results for Statistical Tests**
**for Inorganic Chemicals in Soil at AOC 12-004(a)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | 0.053 | 0.1 | n/a* | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | 0.19 | 0.024 | 1.00 | No |

* n/a = Not applicable.

**Table G-5**
**Results for Statistical Tests**
**for Inorganic Chemicals in Tuff at AOC 12-004(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Aluminum | 0.0015 | 0.006 | n/a* | Yes |
| Arsenic | <0.001 | 0.008 | n/a | Yes |
| Barium | <0.001 | <0.001 | n/a | Yes |
| Beryllium | 0.1 | 0.21 | n/a | No |
| Calcium | <0.001 | 0.01 | n/a | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | <0.001 | 0.058 | <0.001 | Yes |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Lead | 0.017 | 0.043 | n/a | Yes |
| Magnesium | <0.001 | 0.0056 | n/a | Yes |
| Nickel | n/a | <0.001 | <0.001 | Yes |
| Vanadium | <0.001 | 0.0056 | n/a | Yes |

* n/a = Not applicable.

**Table G-6**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at AOC C-12-002**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | 0.0015 | 0.0086 | n/a* | Yes |
| Cobalt | 0.18 | 0.85 | n/a | No |
| Manganese | 0.46 | 0.84 | n/a | No |
| Uranium | 0.041 | 0.2 | 1.00 | No |

* n/a = Not applicable.

**Table G-7**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at AOC C-12-005**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | <0.001 | 0.0053 | n/a* | Yes |
| Lead | 0.021 | 0.57 | 0.055 | No |
| Uranium | 0.0011 | 0.035 | n/a | Yes |

* n/a = Not applicable.

**Table G-8**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at AOC C-14-006**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Antimony | n/a* | <0.001 | 0.0072 | Yes |
| Chromium | 0.0018 | 0.027 | n/a | Yes |
| Uranium | 0.04 | 0.12 | 1.00 | No |

*n/a = Not applicable.

**Table G-9**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at AOC 15-005(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Antimony | n/a* | <0.001 | 0.1 | Yes |
| Cobalt | 0.2 | 0.83 | n/a | No |
| Lead | 0.011 | 0.49 | 0.0052 | Yes |
| Manganese | 0.12 | 0.81 | n/a | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

**Table G-10**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMU 15-007(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Aluminum | 0.96 | 0.55 | n/a* | No |
| Arsenic | 0.48 | 0.11 | n/a | No |
| Barium | 0.87 | 0.35 | n/a | No |
| Beryllium | 0.58 | 0.18 | n/a | No |
| Calcium | 0.92 | 0.53 | n/a | No |
| Chromium | <0.001 | 0.0016 | n/a | Yes |
| Cobalt | 0.99 | 0.63 | n/a | No |
| Copper | <0.001 | 0.077 | <0.001 | Yes |
| Iron | <0.001 | 0.73 | 1.00 | No |
| Lead | 0.57 | 0.19 | n/a | No |
| Magnesium | 0.61 | 0.53 | n/a | No |
| Manganese | 0.04 | 0.41 | 1.00 | No |
| Nickel | n/a* | 0.55 | 0.0075 | Yes |
| Vanadium | 0.089 | 0.53 | n/a | No |

* n/a = Not applicable.

**Table G-11**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU 15-007(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | <0.001 | <0.001 | n/a* | Yes |
| Lead | <0.001 | 0.08 | <0.001 | Yes |
| Nickel | 0.0078 | <0.001 | n/a | Yes |
| Zinc | 0.021 | 0.22 | 0.0052 | Yes |

* n/a = Not applicable.

**Table G-12**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMU 15-007(d)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Beryllium | 0.95 | 0.89 | n/a* | No |
| Chromium | 0.0018 | 0.49 | 0.26 | No |

* n/a = Not applicable.

**Table G-13**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMU 15-008(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Aluminum | 0.0013 | 0.17 | 0.24 | No |
| Arsenic | <0.001 | 0.03 | n/a* | Yes |
| Barium | <0.001 | <0.001 | n/a | Yes |
| Beryllium | 0.019 | 0.0025 | n/a | Yes |
| Calcium | 0.0018 | 0.01 | n/a | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | <0.001 | 0.08 | <0.001 | Yes |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Iron | <0.001 | 0.16 | 0.49 | No |
| Lead | <0.001 | <0.001 | n/a | Yes |
| Magnesium | <0.001 | 0.16 | 1.00 | No |
| Nickel | n/a | <0.001 | <0.001 | Yes |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Vanadium | <0.001 | 0.016 | n/a | Yes |

* n/a = Not applicable.

**Table G-14**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU 15-008(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Antimony | n/a* | 0.0021 | <0.001 | Yes |
| Barium | 1.00 | 1.00 | n/a | No |
| Beryllium | <0.001 | <0.001 | n/a | Yes |
| Calcium | 1.00 | 1.00 | n/a | No |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 1.00 | 1.00 | n/a | No |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Lead | <0.001 | <0.001 | n/a | Yes |
| Manganese | 1.00 | 1.00 | n/a | No |
| Nickel | 0.85 | 0.65 | n/a | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

**Table G-15**
**Results for Statistical Tests for**
**Inorganic Chemicals in Sediment at SWMU 15-008(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Arsenic | 0.18 | 0.12 | n/a* | No |
| Beryllium | <0.001 | <0.001 | n/a | Yes |
| Cadmium | n/a | <0.001 | <0.001 | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 0.23 | 0.58 | n/a | No |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Iron | 0.0011 | 0.026 | n/a | Yes |
| Lead | <0.001 | <0.001 | n/a | Yes |
| Magnesium | 0.1 | 0.58 | n/a | No |
| Manganese | 0.58 | 0.93 | n/a | No |
| Nickel | 0.09 | 0.3 | n/a | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Vanadium | 0.049 | 0.3 | 0.017 | Yes |
| Zinc | 0.0015 | 0.026 | n/a | Yes |

* n/a = Not applicable.

**Table G-16**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU 15-009(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Calcium | 0.41 | 0.84 | n/a* | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

**Table G-17**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU 15-009(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Beryllium | 1.00 | 0.99 | n/a* | No |
| Calcium | 1.00 | 0.74 | n/a | No |
| Lead | 1.00 | 0.93 | n/a | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | 0.023 | 0.1 | 1.00 | No |

* n/a = Not applicable.

**Table G-18**
**Results for Statistical Tests for**
**Inorganic Chemicals in Sediment at SWMU 15-009(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | 0.07 | 0.028 | <0.001 | Yes |
| Uranium | <0.001 | <0.001 | n/a* | Yes |

* n/a = Not applicable.

**Table G-19**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMU 15-009(c)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | <0.001 | <0.001 | n/a* | Yes |
| Uranium | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

**Table G-20**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU 15-009(h)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Calcium | 0.33 | 0.92 | n/a* | No |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | 0.1 | 0.43 | n/a | No |

* n/a = Not applicable.

**Table G-21**
**Results for Statistical Tests for**
**Inorganic Chemicals and Radionuclides in Sediment at SWMU 15-010(b)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Barium | 0.48 | 0.62 | n/a* | No |
| Calcium | 0.66 | 0.62 | n/a | No |
| Chromium | 0.0011 | 0.11 | 0.0084 | Yes |
| Copper | 0.11 | 0.02 | 0.33 | No |
| Iron | <0.001 | 0.0029 | n/a | Yes |
| Manganese | 0.82 | 0.97 | n/a | No |
| Uranium | <0.001 | 0.0029 | n/a | Yes |
| Vanadium | 0.0023 | 0.023 | n/a | Yes |
| Zinc | 0.014 | 0.62 | 0.1 | No |
| Cesium-137 | n/a | 0.24 | 0.38 | No |
| Plutonium-239/240 | n/a | 0.58 | 0.39 | No |
| Uranium-234 | 0.87 | 0.24 | n/a | No |
| Uranium-235/236 | n/a | 0.96 | 0.38 | No |
| Uranium-238 | 0.13 | 0.024 | 0.017 | Yes |

* n/a = Not applicable.

**Table G-22**
**Results for Statistical Tests for**
**Inorganic Chemicals and Radionuclides in Sediment at AOC 15-014(h)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Arsenic | 0.41 | 0.98 | n/a* | No |
| Barium | <0.001 | <0.001 | n/a | Yes |
| Beryllium | <0.001 | 0.16 | 0.09 | No |
| Cadmium | n/a* | 0.69 | 0.01 | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | <0.001 | <0.001 | n/a | Yes |
| Copper | <0.001 | 0.0088 | n/a | Yes |
| Cyanide (Total) | n/a | 1.00 | 0.27 | No |
| Iron | <0.001 | 0.0088 | n/a | Yes |
| Lead | <0.001 | 0.0088 | n/a | Yes |
| Manganese | 0.1 | 0.37 | n/a | No |
| Nickel | <0.001 | 0.0088 | n/a | Yes |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Vanadium | <0.001 | <0.001 | n/a | Yes |
| Zinc | 0.66 | 0.63 | n/a | No |
| Uranium-234 | 0.13 | 0.05 | 0.031 | Yes |

* n/a = Not applicable.

**Table G-23**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at AOC 15-014(h)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Calcium | 0.22 | 0.8 | n/a* | No |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Cobalt | 0.83 | 0.99 | n/a | No |
| Copper | <0.001 | 0.06 | 0.1 | No |
| Lead | 0.13 | 0.51 | n/a | No |
| Uranium | 0.005 | 0.019 | n/a | Yes |
| Zinc | 0.16 | 0.43 | n/a | No |

* n/a = Not applicable.

**Table G-24**
**Results for Statistical Tests for**
**Inorganic Chemicals in Tuff at SWMU 36-003(a)**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Chromium | <0.001 | <0.001 | n/a* | Yes |
| Cobalt | 0.091 | 0.36 | n/a | No |
| Copper | <0.001 | 0.0024 | n/a | Yes |

* n/a = Not applicable.

**Table G-25**
**Results for Statistical Tests for**
**Inorganic Chemicals in Sediment at SWMUs 36-008 and C-36-003**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Cadmium | n/a* | 0.04 | <0.001 | Yes |
| Calcium | <0.001 | 0.0048 | n/a | Yes |
| Chromium | <0.001 | <0.001 | n/a | Yes |
| Copper | <0.001 | 0.0048 | n/a | Yes |
| Cyanide (Total) | 0.069 | 0.8 | n/a | No |
| Lead | 0.002 | 0.037 | n/a | Yes |
| Manganese | 0.0025 | 0.037 | n/a | Yes |
| Nickel | 0.036 | 0.76 | 0.082 | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | <0.001 | 0.037 | n/a | Yes |

* n/a = Not applicable.

**Table G-26**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMUs 36-008 and C-36-003**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Calcium | 0.018 | 0.24 | 1.00 | No |
| Chromium | <0.001 | <0.001 | n/a* | Yes |
| Cobalt | 1.00 | 1.00 | n/a | No |
| Copper | 0.002 | 0.023 | n/a | Yes |
| Lead | 0.9 | 0.82 | n/a | No |
| Manganese | 0.52 | 0.24 | n/a | No |
| Nickel | 1.00 | 1.00 | n/a | No |
| Sodium | n/a | 1.00 | 1.00 | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

**Table G-27**
**Results for Statistical Tests for**
**Inorganic Chemicals in Soil at SWMU C-36-003**

| Analyte | Gehan Test p-Value | Quantile Test p-Value | Slippage p-Value | COPC? |
|---|---|---|---|---|
| Calcium | 0.00536 | 0.0776 | 1 | No |
| Chromium | <0.001 | <0.001 | n/a* | Yes |
| Copper | <0.001 | <0.001 | n/a | Yes |
| Lead | 0.121 | 0.0708 | n/a | No |
| Nickel | 0.987 | 0.85 | n/a | No |
| Sodium | 0.867 | 0.576 | n/a | No |
| Uranium | <0.001 | <0.001 | n/a | Yes |
| Zinc | <0.001 | <0.001 | n/a | Yes |

* n/a = Not applicable.

# Appendix H

*Risk Assessments*

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## H-1.0 INTRODUCTION

This appendix presents the results of the human health and ecological risk-screening evaluations conducted in support of the environmental characterization of sites within the Threemile Canyon Aggregate Area, located in the western portion of Los Alamos National Laboratory (LANL or the Laboratory). The evaluations of potential risk at 25 solid waste management units (SWMUs) and areas of concern (AOCs) are based on decision-level data from historical (1994 and 1998) and 2009–2010 investigations.

## H-2.0 BACKGROUND

Brief descriptions of the Threemile Canyon Aggregate Area SWMUs and AOCs assessed for potential risk and dose are presented below.

### H-2.1 Site Descriptions and Operational History

Former Technical Area 12 (TA-12), also known as L-Site, was constructed during World War II and used as an explosives testing facility. An open area was used as the firing site where a number of shots were detonated, including one 70-kg charge (LANL 1996, 054086, p. 1-1). In 1950, a radiation test bunker was constructed at former TA-12 to conduct radiation experiments on animals using a radioactive lanthanum-140 source. Because of these radiation experiments, a section of the perimeter became contaminated. In 1951, DE-1 began using the area, firing several shots per month (LANL 1994, 034755). By 1960, the entire site was vacated, and activities ceased. Activities at former TA-12 ceased in the early 1950s. In 1960, the structures were decontaminated, decommissioned, and intentionally burned (LANL 1996, 054086, p. 1-1). A Laboratory group used part of the site during the Vietnam War for “Mortar Locator” experiments, which involved using an acetylene gas gun. Former TA-12 is no longer used for Laboratory operations (LANL 1994, 034755, p. 1-8). In 1989, the Laboratory redefined TA boundaries. Most of former TA-12 is now within the boundary of TA-67, and the remaining area is within the boundary of TA-15. Two former TA-12 sites in this investigation [AOCs 12-004(a) and 12-004(b)] are located in the northeast corner of TA-15. The other eight former TA-12 sites are located in the western portion of TA-67. In 2000, the Cerro Grande fire moved through former TA-12, damaging or destroying vegetation and remaining surface debris (LANL 1994, 034755, p. 1-8).

TA-14 was established during World War II and used by X Division to test explosives beginning in 1944 (LANL 1996, 054086, p. 1-1). This site was used primarily for close-observation work on small explosives charges. Tests were conducted in open and closed firing chambers (LANL 1996, 054086, p. 1-1). Some of these tests used radioactive materials (LANL 1994, 034755). In 1994, experimental high explosive (HE) was subjected to performance testing. TA-14 remains active with scheduled tests at the firing area and bullet test facility (LANL 1994, 034755, p. 1-11). In May 2000, the Cerro Grande fire moved through this area, and surface structures were damaged or destroyed, along with surface and over-story vegetation.

TA-15 was established in 1945 as a firing site area. Current activities at TA-15 consist of HE research, development, and testing, mainly through hydrodynamic testing and dynamic experimentation. Many large explosive tests have taken place with the concurrent scattering of large amounts of natural uranium or depleted uranium (DU) and, to a lesser extent, beryllium and lead (LANL 1994, 040595).

TA-36 is located east of TA-15 and south of Pajarito Road. TA-36 contains four active firing sites (Eenie, Meenie, Minie, and Lower Slobovia) that support explosives testing. The firing sites and associated buildings are used for a wide variety of nonnuclear ordinance tests for the U.S. Department of Defense. Activities include shipping, receiving, transporting, and testing HE; developing diagnostic techniques; testing armor/anti-armor systems; and testing weapons components and guns (LANL 1993, 015313, p. 2-5). TA-36 operations associated with the Threemile Canyon Aggregate Area include a laboratory and an experiment facility located on a mesa top south of Threemile Canyon and west of TA-18.

#### H-2.1.1 SWMUs 12-001(a) and 12-001(b)

SWMU 12-001(a) is a belowground, steel-lined firing pit and aboveground steel cover (structure 12-4). The firing pit is located on the north side of Redondo Road. The firing pit began operation in 1944 (LANL 1994, 034755, p. 5-1-1). The hexagonal steel structure is 10.5 ft long × 10.5 ft wide × 11.5 ft deep. A steel cover, a large box filled with soil, is 20 ft long × 22 ft wide × 5 ft high. The base of the cover is at ground level and has 1-ft-high × 7-ft-long openings on four sides. The cover has a 5-ft × 5-ft hole in the center used to lower explosives into the firing area. Recovery shots, which used uranium, were conducted in the pit. Activities ceased in 1953, but the pit remains in place (LANL 1996, 055073, p. 1). SWMU 12-001(a) was evaluated with a drainage located within Consolidated Unit 12-001(a)-99 in the area below SWMU 12-001(a).

SWMU 12-001(b) is a firing pit located on the north side of Redondo Road. The open pit was 21 ft long × 17 ft wide × 3 ft deep, and the pit was used for calorimetric experiments but only for a short period in 1945. Following World War II, the pit was used to fire HE shots using lead and uranium. This site ceased operations in the 1950s (LANL 1994, 034755, p. 5-1-5).

#### H-2.1.2 SWMU 12-002

SWMU 12-002 is a small area approximately 3 $ft^2$ that was used on one occasion to burn scrap HE. In 1962, a can containing approximately 0.5 lb of HE was discovered during a property survey and burned to destroy the HE (Anderson 1962, 004860; LANL 1994, 034755, p. 6-3). The location of SWMU 12-002 now lies beneath the asphalt pavement of Redondo Road.

#### H-2.1.3 AOC 12-004(a)

AOC 12-004(a) consists of the lanthanum radiation experiment site at former TA-12 and the surrounding area, including a drainage (LANL 1994, 034755, p. 5.2-1). The site contains a soil-bermed radiation shelter (structure 12-8) and three vertical poles. The shelter and poles are constructed in a line parallel to a drainage channel that flows southwest from Redondo Road into Threemile Canyon. The northernmost pole is located in a drainage 30 ft south of Redondo Road. The second pole is located 58 ft south of the first pole. The radiation shelter and the third pole are located 40 ft south of the second pole (LANL 1996, 054086, pp. 5-18–5-24).

#### H-2.1.4 AOC 12-004(b)

AOC 12-004(b) was an aluminum pipe at the edge of Redondo Road, about 78 ft north of a radiation shelter (structure 12-8). The pipe was set vertically in the ground and protruded 8 in. aboveground without a cover. The pipe's outer opening diameter was 25.5 in., its inner diameter was 18 in., and its length was 3 ft. The inside of the pipe was filled with soil. Remnant fragments of HE were observed at the site in 1959 (Blackwell 1959, 005773). The pipe was removed during the 2009–2010 investigation.

#### H-2.1.5 AOC C-12-001

AOC C-12-001 is an area of potential soil contamination at former TA-12, associated with the former trim building 12-1. The trim building was built in 1944 and was used to prepare HE for detonation. The building was 16 ft long × 16 ft wide × 9 ft high and of wood-frame construction with soil on three sides and on top. Activities at former TA-12 ceased in the early 1950s. Building 12-1 was destroyed in 1960 by intentional burning. Some noncombustible debris was in place when the Operable Unit 1085 work plan was written (LANL 1994, 034755) but has since been removed.

#### H-2.1.6 AOC C-12-002

AOC C-12-002 is an area of potential soil contamination associated with former control building 12-2. Built in 1945 of wood-frame construction, the building measured 8 ft long × 8 ft wide × 8 ft high, with soil on three sides and on top. The structure was located south of Redondo Road. Activities at former TA-12 ceased in the early 1950s, and the control building was destroyed in 1960 by intentional burning.

#### H-2.1.7 AOC C-12-003

AOC C-12-003 is an area of potential soil contamination at former TA-12 associated with a former HE-storage magazine (building 12-3) for the former TA-12 firing sites. The magazine, built in 1944 of wood-frame construction, was 6 ft long × 6 ft wide × 7 ft high, with soil on three sides and on top. The building was located north of Redondo Road. Activities at former TA-12 ceased in the early 1950s. In 1960, intentional burning destroyed building 12-3.

#### H-2.1.8 AOC C-12-004

AOC C-12-004 is an area of potential soil contamination at former TA-12 associated with former generator building 12-5. The generator building was built of wood-frame construction and was originally located next to a former junction box (structure 12-6). In 1952, the generator building was relocated 10 ft north of the former control building 12-2. Activities at former TA-12 ceased in the early 1950s. The building was destroyed in 1960 by intentional burning (LANL 1996, 054086, pp. 5-12–5-15).

#### H-2.1.9 AOC C-12-005

AOC C-12-005 is the location of a former junction box (structure 12-6) at former TA-12. The junction box was used to support experiments at the SWMUs 12-001(a) and 12-001(b) firing sites. The junction box was 3 ft long × 3 ft wide × 4 ft high and was surrounded on three sides by a soil berm. The junction box served as a relay between former control building 12-2 and the two firing sites and housed diagnostic equipment, signal cables, and electrical power equipment. Approximately 750 ft of detonation wire connected the junction box to building 12-2. The junction box, constructed in 1945, was not used after 1953; it was intentionally burned in 1960 (LANL 1994, 034755, p. 5-1-5).

#### H-2.1.10 AOC C-14-006

AOC C-14-006 is an area of potential soil contamination at TA-14 associated with an HE-storage magazine, former building 14-9, located 60 ft northwest of building 14-22. The magazine, which was constructed of wood, was 6 ft long × 6 ft wide × 6 ft high. A soil berm surrounded three sides, and soil covered the top of the structure. The magazine was built in 1945 and removed in 1952. The former magazine location is covered with loose fill. An asphalt road that circled the magazine is still visible (LANL 1996, 054086, pp. 5-61–5-64).

#### H-2.1.11 AOC 15-005(c)

AOC 15-005(c) consists of an outdoor container storage area for explosives, located near storage building 15-41 in the central portion of TA-15 near Firing Site C. The ground surface on the northern, western, and eastern sides of the building is unpaved, and an asphalt road (Priscilla Road) runs along the southern side. The operational period of this site is not known (LANL 1993, 020946, p. 10-18).

#### H-2.1.12 SWMU 15-007(c)

SWMU 15-007(c) is an underground shaft (structure 15-264) at TA-15 that was used to conduct a single test involving approximately 2 tons of HE in 1972. This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft, which was filled with layers of magnetite, cement, sand grout, bentonite, sand, and gravel. HE was the only material used in the underground test (LANL 1993, 020946, p. 5-9). Pieces of 0.25-in.-diameter lead shot were scattered on the concrete pad at the surface of the shaft. The source of this lead was probably the bags of lead shot used for instrument shielding during the experiment. Lead shot is also present on the soil on three sides of the pad (LANL 1997, 056562, p. 1).

#### H-2.1.13 SWMU 15-007(d)

The SWMU 15-007(d) shaft (structure 15-265) was used in 1972 to conduct a single test involving beryllium, HE, and tritium. This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft, which was filled with layers of magnetite, cement, sand grout, bentonite, sand, and gravel. Pieces of 0.25-in.-diameter lead shot were scattered on the concrete pad at the surface of the shaft. The source of this lead was probably the bags of lead shot used for instrument shielding during the experiment. Lead shot is also present on the soil on three sides of the pad (LANL 1997, 056562, p. 1).

#### H-2.1.14 SWMU 15-008(b)

SWMU 15-008(b) is a surface disposal area at TA-15, located north of Firing Site R-44 [SWMU 15-006(c)] and extending along the edge of the mesa and downslope into Threemile Canyon. The surface disposal area covers approximately 8.5 acres. Firing Site R-44 was built in 1951 for diagnostic tests of weapons components and used extensively until 1978 and sporadically until 1992 (LANL 1993, 020946, p. 6-8; LANL 1995, 050294, p. 4-73). Soil and debris from the firing site activities were disposed of at SWMU 15-008(b).

#### H-2.1.15 AOC 15-008(g)

AOC 15-008(g) is the location of a former pile of broken sandbags located in TA-15 at Firing Site R-45 [SWMU 15-006(d)]. The sandbags were used as shielding for the explosives tests carried out at the firing site (LANL 1996, 054977, p. 5-103). Firing Site R-45 was constructed in 1951 and used until 1992 for experiments involving small amounts of explosives. A site visit in 2008 determined the sandbags had been removed.

#### H-2.1.16 SWMU 15-009(b)

SWMU 15-009(b) is a septic system located at TA-15 Firing Site R-45. The septic system consists of a tank (structure 15-61), a seepage pit, associated drainlines, and a former outfall (LANL 2003, 102118). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity (LANL 1990, 007512). This septic system received effluent from restroom facilities in the firing site control building 15-45 (LANL 1990, 007512). The septic tank originally discharged to an outfall. In the 1970s, a 4-ft-diameter × 50-ft-deep seepage pit was constructed to receive effluent from the tank, and the outfall pipe was plugged (LANL 2003, 102118).

#### H-2.1.17 SWMU 15-009(c)

SWMU 15-009(c) is a septic system located at TA-15 Firing Site R-44. The septic system consists of a tank (structure 15-62), its associated drainlines, and an outfall (LANL 2003, 102119). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity (LANL 1990, 007512). The septic system received effluent from restroom facilities in the firing site control building 15-44 (LANL 1994, 040595, p. 7). The drainlines were constructed of cast iron and discharged to an outfall into the south fork of Threemile Canyon. The outfall is located approximately 25 ft downgradient of the tank (LANL 2003, 102119). An engineering drawing showed that the outfall has been plugged (LANL 2003, 102119).

#### H-2.1.18 SWMU 15-009(h)

SWMU 15-009(h) is a septic system located at the Ector firing site on the eastern side of TA-15 (LANL 2003, 102117). The septic system consists of a tank (structure 15-282), associated drainlines, and a drain field. The septic tank was constructed in the late 1970s of reinforced concrete with a 905-gal. capacity and flowed to a drain field (LANL 1990, 007512; LANL 1994, 040595, p. 8). The septic system received effluent from restroom facilities in the Ector firing site control building 15-280 (LANL 1990, 007512). In the 1990s, the sanitary waste drainlines that served this septic system were rerouted to the SWSC plant and are currently active (LANL 2003, 102117).

#### H-2.1.19 SWMU 15-010(b)

SWMU 15-010(b) is a settling tank (structure 15-147) (LANL 2004, 102120) located in the northwest corner of TA-15 near former shop building 15-8. The tank is constructed of concrete and measures 5 ft long × 5 ft wide × 5.5 ft deep with an approximate 900-gal. capacity (LANL 1990, 007512). The settling tank served former building 15-8, which housed HE-machining operations during the 1950s, and discharged to an outfall at the edge of Threemile Canyon (LANL 1993, 020946, p. 10-25). The tank was constructed in 1947 and was originally designed to be a septic tank; however, subsequent engineering records confirm the tank was also used as an HE settling tank.

#### H-2.1.20 AOC 15-014(h)

AOC 15-014(h) consists of three outfalls located in the northwest corner of TA-15. The outfalls served a former laboratory and office (former building 15-40). All three outfalls daylight north of former building 15-40 and discharge to Threemile Canyon (LANL 1990, 007512; LANL 1993, 020946, p. 10-22).

The western-most outfall is a former National Pollutant Discharge Elimination System– (NPDES-) permitted outfall that received industrial effluent, including wastewater from a photographic laboratory from former building 15-40. This outfall consists of an 8-in.-diameter vitrified-clay pipe (VCP) that daylights approximately 75 ft north of the northwest corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1994 (Dale 1998, 057524).

The middle outfall is a former NPDES-permitted outfall that received noncontact cooling water, roof runoff, and floor-drain effluent from former building 15-40. The floor drains received water from drain valves in a potable water system. This outfall consists of an 8-in.-diameter VCP that daylights approximately 100 ft north of the northeast corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1990 (EPA 1990, 012454).

The eastern-most outfall receives storm water from yard drains and is located north and east of former building 15-40. This outfall consists of a 12-in.-diameter corrugated metal pipe that daylights approximately 75 ft northeast of the northeast corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). From the outfall, an approximately 60-ft-long ditch connects to a 30-ft-long, 12-in.-diameter corrugated metal pipe that accommodates drainage beneath a security fence.

### H-2.1.21 SWMU 36-002

SWMU 36-002 is a former sump (former structure 36-49) located at TA-36, approximately 40 ft northwest of building 36-48 near the edge of Threemile Canyon (LASL 1965, 102122). The sump consisted of a 4-ft-diameter × 4.5-ft-long section of corrugated metal pipe placed into an unlined 8-ft-deep excavation. The excavation and the interior of the pipe were filled with 3-in.-diameter rocks to a depth of approximately 2 ft belowgrade. The remainder of the excavation outside the pipe was backfilled to grade with soil, and the pipe was covered with a metal cover (LANL 1993, 015313, p. 5-13). The sump had an inlet pipe from building 36-48 that consisted of 4-in.-diameter VCP.

The sump was constructed in 1965 and received water from two sinks in building 36-48 (LANL 1993, 015313, p. 5-13). Building 36-48 was initially used for shot assembly and for controlled-temperature experiments. DU was cut, lapped, and polished in the building. One of the sinks connected to the sump had a chemical-resistant coating. The building was used infrequently, less than 10 times per year (LANL 1993, 015313, p. 5-15). The sinks were disconnected from the sump in 1993, and the sump was removed (LANL 1993, 015313, p. 5-15; LANL 1995, 062839, p. 1-1).

### H-2.1.22 SWMU 36-003(a)

SWMU 36-003(a) is a septic system located at TA-36 approximately 115 ft east of building 36-1. The septic system consists of a septic tank (structure 36-17), associated drainlines, a manhole (structure 36-38), a distribution box/drain field, and a seepage pit (LASL 1965, 102122; LANL 2004, 102121). The septic tank is a single-chamber tank constructed of reinforced concrete with an 1160-gal. capacity. The drain field consists of four 200-ft-long perforated tile pipes spaced 10 ft apart. The drain field was replaced with the seepage pit in late 1973 or early 1974.

This septic system was constructed in 1949 and received effluent from the restroom facilities in an office and laboratory in building 36-1. In addition to sanitary wastes, spent photoprocessing chemicals from x-ray developing may have been discharged to the septic system (LANL 1993, 015313, pp. 5-24, 5-27). The main guard station at TA-36 (building 36-22) was later added to the septic system. In 1988, the guard station was disconnected from the septic tank and rerouted to an adjacent septic system. In 1992, the sanitary waste drainlines that previously served SWMU 36-003(a) were rerouted to the SWSC plant and are currently active (LANL 1993, 015313, pp. 5-22–5-23). In 1995, the septic tank was decontaminated by steam cleaning and the tank was filled with concrete.

#### H-2.1.23 SWMU 36-008

SWMU 36-008 is a surface disposal area located at TA-36 on the south rim of Threemile Canyon behind building 36-1. The disposal area covers an estimated 1 to 2 acres and extends below the building over the steeply sloping edge of the mesa. The dates the site was used for disposal are not known, but the site appears to be associated with building 36-1 (an office and laboratory), which was constructed in 1949. Materials disposed of at the site included laboratory glassware, metal cans, metal pipe, miscellaneous metal pieces, and other debris. This disposal area was revealed in June 2000 after the Cerro Grande fire burned the vegetation surrounding the site. As part of the emergency response actions associated with the fire, approximately 5 $yd^3$ of debris was collected from the site, segregated, and staged for disposal. Also, as part of the emergency response action, storm water best management practices were implemented to prevent erosion (LANL 2000, 068656).

#### H-2.1.24 SWMU C-36-003

SWMU C-36-003 is a former NPDES-permitted outfall located at TA-36 on the south rim of Threemile Canyon, north of office and laboratory building 36-1. The outfall received effluent from a floor drain and spent photoprocessing chemicals from a sink in building 36-1 (an office and laboratory). The outfall became operational shortly after building 36-1 was constructed in 1949. During its operation, the outfall discharged a steady stream of liquid that ran downstream for approximately 35 ft (LANL 1993, 015313, pp. 5-63 to 5-64). During a July 1994 sampling effort, it was found that the photoprocessing unit was no longer plumbed to the outfall; instead, a floor drain in room 6 of building 36-1 was plumbed to the outfall (LANL 1995, 053985, p. 1-16). This outfall was removed from the NPDES permit by 2001 (EPA 2001, 082282). SWMU C-36-003 is entirely contained within the footprint of SWMU 36-008, so risk is evaluated for these sites as a single unit.

### H-2.2 Investigation Sampling

The final data set used to identify chemicals of potential concern (COPCs) for the Threemile Canyon Aggregate Area and used in this appendix to evaluate the potential risks to human health and the environment are the qualified analytical results from historical sampling activities (1994 and 1999) and the 2009–2010 investigation. Only those data determined to be of decision-level quality following the data quality assessment (Appendix D) are included in the final data set evaluated in this appendix.

### H-2.3 Determination of COPCs

Section 5.0 of the supplemental investigation report summarizes the COPC selection process. Only COPCs detected above background (inorganic chemicals and naturally occurring radionuclides), with detection limits greater than background values (BVs) (inorganic chemicals), and detected (organic chemicals, inorganic chemicals with no BVs, and fallout radionuclides were retained. The industrial scenario and the ecological screening used data for samples collected from 0.0–1.0 ft and 0.0–5.0 ft below ground surface (bgs), respectively. The recreational scenario also used data for samples collected from 0.0–1.0 ft bgs. The residential scenario used data for samples collected from 0.0–10.0 ft bgs. However, sampling depths often overlapped because of multiple investigations; therefore, samples with a starting depth less than the lower bound of the interval were included in the risk-screening assessments for a given scenario, as appropriate.

Tables H-2.3-1 to H-2.3-53 summarize the COPCs evaluated for potential risk for each site in the Threemile Canyon Aggregate Area. Some of the COPCs identified in this report may not be evaluated for potential risk under one or more scenarios because they were not within the specified depth intervals associated with a given scenario.

## H-3.0 CONCEPTUAL SITE MODEL

The primary mechanisms of release related to historical contaminant sources are described in detail in the historical investigation report (LANL 2008, 102244) and summarized in section 2.0 of the approved investigation work plan (LANL 2008, 105673; NMED 2008, 104256). Releases from sites within the Threemile Canyon Aggregate Area may have occurred as a result of air emissions, surface releases, subsurface leaks, or effluent discharges. Previous sampling results indicated contamination from inorganic chemicals, organic chemicals, and radionuclides (LANL 2010, 111324.14; NMED 2010, 111458).

### H-3.1 Receptors and Exposure Pathways

The primary exposure pathway for human receptors is surface soil and subsurface soil/tuff that may be brought to the surface through intrusive activities. Migration of contamination to groundwater through the vadose zone is unlikely given the depth to groundwater (greater than 1000 ft bgs). Human receptors may be exposed through direct contact with soil or suspended particulates by ingestion, inhalation, dermal contact, and external irradiation pathways. Direct contact exposure pathways from subsurface contamination to human receptors are complete for the resident, where appropriate. Migration of contamination to groundwater through the vadose zone is unlikely given the depth to groundwater (greater than 1000 ft bgs) at the site. The exposure pathways are the same as those for surface soil. Sources, exposure pathways, and receptors are shown in the conceptual site model (CSM) (Figure H-3.1-1).

New Mexico Environment Department (NMED) guidance (NMED 2015, 600915) requires that sites larger than 2 acres be evaluated to determine if beef ingestion is a plausible and complete exposure pathway. The SWMUs and AOCs within the Threemile Canyon Aggregate Area are generally smaller than 2 acres. The exceptions are SWMUs 12-001(a), 12-001(b), and 15-008(b), and AOC 15-014(h). In addition, grazing is not allowed on Laboratory property. Therefore, further evaluation of the beef ingestion pathway is not necessary.

Many of the sites in the Threemile Canyon Aggregate Area are in industrial areas on Laboratory property. The developed sites provide minimal or no potential habitat for ecological receptors, especially where the sites are covered with asphalt. Some sites [SWMUs 15-007(d), 15-009(h), and 36-002] were not evaluated for industrial exposure because samples were not collected from the 0.0−1.0 ft depth interval. Weathering of tuff is the only viable natural process that may result in the exposure of receptors to COPCs in tuff. However, because of the slow rate of weathering expected for tuff, exposure to COPCs in tuff is negligible, although it is included in the assessments. Exposure pathways to subsurface contamination below 5.0 ft (ecological) or 10.0 ft (human health) are not complete unless contaminated soil or tuff was excavated and brought to the surface.

Considering unpaved sites or areas where potential habitat is present, exposure pathways are complete to surface soil and tuff for ecological receptors. The potential pathways are root uptake by plants, inhalation of vapors (burrowing animals only), inhalation of dust, dermal contact, incidental ingestion of soil, external irradiation, and food web transport. Pathways from subsurface releases may be complete for plants. Surface water exposure was not evaluated because surface water features do not exist. Sources, exposure pathways, and receptors are presented in the CSM (Figure H-3.1-1).

### H-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of chemicals in the environment, and the evaluation of transport addresses the physical processes affecting mobility along a migration pathway. Migration into soil and tuff depends on precipitation or snowmelt, soil moisture content, depth of soil, soil hydraulic properties, and properties of the COPCs. Migration into and through tuff also depends on the unsaturated flow properties of the tuff and the presence of joints and fractures.

The most important factor with respect to the potential for COPCs to migrate to groundwater is the presence of saturated conditions. Downward migration in the vadose zone is also limited by a lack of hydrostatic pressure as well as the lack of a source for the continued release of contamination. Without sufficient moisture and a source, little or no potential migration of materials through the vadose zone to groundwater occurs.

Contamination at depth is addressed in the discussion of nature and extent in the supplemental investigation report. Results from the deepest samples collected at most sites showed either no detected concentrations of COPCs or low- to trace-level concentrations of only a few inorganic, radionuclide, and/or organic COPCs in tuff. The limited extent of contamination is related to the absence of the key factors that facilitate migration, as discussed above. Given how long the contamination has been present in the subsurface, the physical and chemicals properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to groundwater is very low.

NMED guidance (NMED 2015, 600915) contains screening levels that consider the potential for contaminants in soil to result in groundwater contamination. These screening levels consider equilibrium partitioning of contaminants among solid, aqueous, and vapor phases and account for dilution and attenuation in groundwater through the use of dilution attenuation factors (DAFs). These DAF soil screening levels (SSLs) may be used to identify chemical concentrations in soil that have the potential to contaminate groundwater (EPA 1996, 059902). Screening contaminant concentrations in soil against these DAF SSLs does not, however, provide an indication of the potential for contaminants to migrate to groundwater. The assumptions used in the development of these DAF SSLs include an assumption of uniform contaminant concentrations from the contaminant source to the water table (i.e., it is assumed that migration to groundwater has already occurred). Furthermore, this assumption is inappropriate for cases such as these Threemile Canyon Aggregate Area sites where sampling has shown that contamination is vertically bounded near the surface and the distance from the surface to the water table is large. For these reasons, screening of contaminant concentrations in soil against the DAF SSLs was not performed.

The relevant release and transport processes of the COPCs are a function of chemical-specific properties that include the relationship between the physical form of the constituents and the nature of the constituent transport processes in the environment. Specific properties include the degree of saturation and the potential for ion exchange (barium and other inorganic chemicals) or sorption and the potential for natural bioremediation. The transport of volatile organic compounds (VOCs) occurs primarily in the vapor phase by diffusion or advection in subsurface air.

Current potential transport mechanisms that may lead to exposure include

- dissolution and/or particulate transport of surface contaminants during precipitation and runoff events,
- airborne transport of contaminated surface soil,

- continued dissolution and advective/dispersive transport of chemical contaminants contained in subsurface soil and tuff as a result of past operations,
- disturbance of contaminants in shallow soil and subsurface tuff by Laboratory operations, and
- disturbance and uptake of contaminants in shallow soil by plants and animals.

Contaminant distributions at the sites indicate that after the initial deposition of contaminants from operational activities and historical remediation efforts, elevated levels of COPCs tend to remain concentrated in the vicinity of the original release points. The primary potential release and transport mechanisms identified for Threemile Canyon Aggregate Area include direct discharge; precipitation, sorption, and mechanical transport; dissolution and advective transport in water; and volatilization, diffusion, and dispersion. Less significant transport mechanisms include wind entrainment and, given the asphalt pavement covering most sites, dispersal of surface soil and uptake of contaminants from soil and water by biota.

Gas or vapor-phase contaminants such as VOCs are likely to volatilize to the atmosphere from near-surface soil and sediment and/or migrate by diffusion through air-filled pores in the vadose zone. Migration of vapor-phase contaminants from tuff into ambient air may occur by diffusion or advection driven by barometric pressure changes.

### H-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate, inorganic chemicals are not highly soluble or mobile in the environment, although there are exceptions. The physical and chemical factors that determine the distribution of inorganic COPCs within the soil and tuff at the Threemile Canyon Aggregate Area are the soil-water partition coefficient ($K_d$) of the inorganic chemicals, the pH of the soil, soil characteristics (such as sand or clay content), and oxidation-reduction potential (Eh). The interaction of these factors is complex, but the $K_d$ values provides a general assessment of the potential for migration through the subsurface; chemicals with higher $K_d$ values are less likely to be mobile than those with lower ones. Chemicals with $K_d$ values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270). Table H-3.2-1 presents the $K_d$ values and water solubility for the inorganic COPCs for the Threemile Canyon Aggregate Area. Based on this criterion, the following COPCs have a low potential to mobilize and migrate through soil and the vadose zone: aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, thallium, vanadium, and zinc. The $K_d$ values for arsenic, copper, cyanide, iron, perchlorate, selenium, silver, and uranium are less than 40 and may indicate a greater potential to mobilize and migrate through soil and the vadose zone beneath the sites.

It is important to note that other factors besides the $K_d$ values (e.g., speciation in soil, oxidation-reduction potential, pH, and soil mineralogy) also play significant roles in the likelihood that inorganic chemicals will migrate. The COPCs with $K_d$ values less than 40 are discussed further below. Information about the fate and transport properties of inorganic chemicals was obtained from individual chemical profiles published by the Agency for Toxic Substances and Disease Registry (ATSDR) (ATSDR 1997, 056531, and http://www.atsdr.cdc.gov/toxprofiles/index.asp).

Arsenic may undergo a variety of reactions, including oxidation-reduction reactions, ligand exchange, precipitation, and biotransformation. Arsenic forms insoluble complexes with iron, aluminum, and magnesium oxides found in soil and in this form, arsenic is relatively immobile. However, under low pH and reducing conditions, arsenic can become soluble and may potentially leach into groundwater or result in runoff of arsenic into surface waters. Arsenic is expected to have low mobility under the environmental conditions (neutral to slightly alkaline soil pH and oxidizing near-surface conditions) present at the Threemile Canyon Aggregate Area.

Copper movement in soil is determined by physical and chemical interactions with the soil components. Most copper deposited in soil will be strongly adsorbed and remains in the upper few centimeters of soil. Copper will adsorb to organic matter, carbonate minerals, clay minerals, or hydrous iron, and manganese oxides. In most temperate soil, pH, organic matter, and ionic strength of the soil solutions are the key factors affecting adsorption. Soil in the area is neutral to slightly alkaline, so the leaching of copper is not a concern at this site. Copper binds to soil much more strongly than other divalent cations, and the distribution of copper in the soil solution is less affected by pH than other metals. Copper is expected to be bound to the soil and move in the system by way of transport of soil particles by water as opposed to movement as dissolved species.

Cyanide tends to adsorb onto various natural media, including clay and sediment; however, sorption is insignificant relative to the potential for cyanide to volatilize and/or biodegrade. At soil surfaces, volatilization of hydrogen cyanide is a significant mechanism for cyanide loss. Cyanide at low concentrations in subsurface soil is likely to biodegrade under both aerobic and anaerobic conditions. Cyanide is present at the site in trace to low levels and is not expected to be mobile.

Iron is naturally occurring in soil and tuff and may be relatively mobile under reducing conditions. Iron is sensitive to soil pH conditions, occurring in two oxidation states, iron(III), the insoluble oxidized form, and iron(II), the reduced soluble form. Most iron in well-drained neutral-to-alkaline soil is present as precipitates of iron(III) hydroxides and oxides. With time, these precipitates are mineralized and form various iron minerals, such as lepidcrocite, hematite, and goethite. Iron is not expected to be mobile in the neutral to slightly alkaline, well-drained soil at the Threemile Canyon Aggregate Area.

Perchlorate is somewhat soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the sites has low moisture content, which inhibits the mobility of nitrate and perchlorate as well as most other inorganic chemicals.

Selenium is not often found in the environment in its elemental form but is usually combined with sulfide minerals or with silver, copper, lead, and nickel minerals. In soil, pH and Eh are determining factors in the transport and partitioning of selenium. In soil with a pH of greater than 7.5, selenates, which have high solubility and a low tendency to adsorb onto soil particles, are the major selenium species and are very mobile. The soil pH in the Threemile Canyon Aggregate Area is neutral to slightly alkaline, indicating that selenium is not likely to migrate.

Natural processes, such as the weathering of rock and the erosion of soil release silver to air and water. Silver sorbs onto soil and sediment and tends to form complexes with inorganic chemicals and humic substances in soil. Organic matter complexes with silver and reduces its mobility. Silver compounds tend to leach from well-drained soil so that they may potentially migrate into the subsurface. Site conditions are neutral to slightly alkaline and silver is not expected to be mobile.

Uranium is a natural and commonly occurring radioactive element that is present in nearly all rock and soil. The mobility of uranium in soil and its vertical transport to groundwater depend on properties of the soil such as pH, Eh, concentration of complexing anions, porosity of the soil, soil-particle size, and sorption properties as well as the amount of water available. In general, the actinide nuclides form comparatively insoluble compounds in the environment and therefore are not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces; and tend to accumulate in soil and sediment, which ultimately serve as strong reservoirs. Subsequent movement is largely associated with geological processes such as erosion and sometimes leaching.

#### H-3.2.2 Organic Chemicals

Table H-3.2-2 presents the physical and chemical properties (organic carbon-water partition coefficient [$K_{oc}$], logarithm to the base 10 octanol/water partition coefficient [log $K_{ow}$], and solubility) of the organic COPCs identified for the Threemile Canyon Aggregate Area. The physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following physiochemical property information illustrates some aspects of the fate and transport of COPCs at the Threemile Canyon Aggregate Area. The information is summarized from Ney (1995, 058210).

Water solubility may be the most important chemical characteristic used to assess mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility greater than 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. Several detected at the Threemile Canyon Aggregate Area sites have water solubilities greater than 1000 mg/L, including acetone; benzoic acid; bromodichloromethane; 2-butanone; chlorodibromomethane; chloroform; chloromethane; 2-chloronaphthalene; di-n-butylphthalate; 1,1-dichloroethene; 2-hexanone; HMX (1,3,5,7-tetranitro-1,3,5,7-tetrazocine); methylene chloride; trichloroethene; and 2,4,6-trinitrotoluene.

The lower the water solubility of a chemical, especially below 10 mg/L the more likely it will be immobilized by adsorption. Chemicals with lower water solubilities are more likely to accumulate or bioaccumulate and persist in the environment, are slightly prone to biodegradation, and are metabolized in plants and animals. The COPCs identified as having water solubilities less than 10 mg/L are anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; dibenzofuran; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene.

Vapor pressure is a chemical characteristic used to evaluate the tendency of organic chemicals to volatize. Chemicals with vapor pressure greater than 0.01 mmHg are likely to volatilize and, therefore, concentrations at the site are reduced over time; vapors of these chemicals are more likely to travel toward the atmosphere and not migrate towards groundwater. Acetone; bromodichloromethane; 2-butanone; chlorodibromomethane; chloroform; chloromethane; 4-chlorotoluene; 1,1-dichloroethene; ethylbenzene; 2-hexanone; 4-isopropyltoluene; methylene chloride; styrene; tetrachloroethene; toluene; trichloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene have vapor pressures greater than 0.01 mmHg.

Chemicals with vapor pressures less than 0.000001 mm Hg are less likely to volatilize and, therefore, tend to remain immobile. Many of the polycyclic aromatic hydrocarbons (PAHs); bis(2-ethylhexyl)phthalate; di-n-octylphthalate; HMX; PETN (pentaerythritol tetranitrate); RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine); TATB (triaminotrinitrobenzene); and tetryl have vapor pressures less than 0.000001 mm Hg.

The $K_{ow}$ is an indicator of a chemical's potential to bioaccumulate or bioconcentrate in the fatty tissues of living organisms. The unitless $K_{ow}$ value is an indicator of water solubility, mobility, sorption, and bioaccumulation. The higher the $K_{ow}$ above 1000, the greater the affinity the chemical has for bioaccumulation/bioconcentration in the food chain, the greater the potential for sorption in the soil, and the lower the mobility (Ney 1995, 058210). Butylbenzenes, ethylbenzene, HMX, isopropylbenzene, 4-isopropyltoluene, PAHs, phthalates, tetrachloroethene, trimethylbenzenes, and xylenes all have a $K_{ow}$ greater than 1000. A $K_{ow}$ of less than 500 indicates high water solubility, mobility, little to no affinity for bioaccumulation, and degradability by microbes, plants, and animals. Acetone; benzoic acid;

bromodichloromethane; 2-butanone; chlorodibromomethane; chloroform; chloromethane; 1,1-dichloroethene; 2-hexanone; methylene chloride; PETN; TATB; tetryl; and trichloroethene all have a $K_{ow}$ much less than 500.

The $K_{oc}$ measures the tendency of a chemical to adsorb to organic carbon in soil. $K_{oc}$ values above 500 $cm^3/g$ indicate a strong tendency to adsorb to soil, leading to low mobility (NMED 2015, 600915). Most organic COPCs have $K_{oc}$ values above 500 $cm^3/g$, indicating a very low potential to migrate toward groundwater. The organic COPCs with $K_{oc}$ values less than 500 $cm^3/g$ include acetone; 4-amino-2,6-dinitrotoluene; benzoic acid; bromodichloromethane; 2-butanone; chlorodibromomethane; chloroform; chloromethane; 2-chloronaphthalene; 4-chlorotoluene; di-n-butylphthalate; 1,1-dichloroethene; 2-hexanone; HMX; methylene chloride; RDX; tetrachloroethene; toluene; trichloroethene; 2,4,6-trinitrotoluene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Aroclors, PAHs, and phthalates are the least mobile and the most likely to bioaccumulate. Acetone; benzoic acid; 1,1-dichloroethene; methylene chloride; tetrachloroethene; and toluene are more soluble and volatile and are more likely to travel toward the atmosphere and not migrate toward groundwater. Because the organic COPCs were detected at low concentrations and extent is defined, they are not likely to migrate to groundwater.

### H-3.2.3 Radionuclides

Radionuclides are generally not highly soluble or mobile in the environment, particularly in the semiarid climate of the Laboratory. The physical and chemical factors that determine the distribution of radionuclides within soil and tuff are the $K_d$, the pH of the soil and other soil characteristics (e.g., sand or clay content), and the Eh. The interaction of these factors is complex, but $K_d$ values provide a general assessment of the potential for migration through the subsurface: chemicals with higher $K_d$ values are less likely to be mobile than those with lower values. Radionuclides with $K_d$ values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270).

Table H-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at the Threemile Canyon Aggregate Area sites. Based on $K_d$ values, americium-241, cesium-137, plutonium-238, and plutonium-239 have a very low potential to migrate towards groundwater at the sites within the Threemile Canyon Aggregate Area. The $K_d$ values for tritium, uranium-234, uranium-235/236, and uranium-238 are less than 40 and indicate a potential to migrate towards groundwater.

Uranium is a natural and commonly occurring radioactive element that is present in nearly all rock and soil. The mobility of uranium in soil and its vertical transport to groundwater depend on properties of the soil such as pH, Eh, concentration of complexing anions, porosity of the soil, soil-particle size, and sorption properties as well as the amount of water available. In general, the actinide nuclides form comparatively insoluble compounds in the environment and therefore are not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces; and tend to accumulate in soil and sediment, which ultimately serve as strong reservoirs. Subsequent movement is largely associated with geological processes such as erosion and sometimes leaching.

Tritium's initial behavior in the environment is determined by the source. If it is released as a gas or vapor to the atmosphere, substantial dispersion can be expected, and the rapidity of deposition is dependent on climatic factors. If tritium is released in liquid form, it is diluted in surface water and is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 058209, p. 147). Tritium activities in the subsurface at the area of elevated radioactivity are low (generally <1 pCi/g), indicating the area of elevated radioactivity is not a significant source of tritium, although this radionuclide is relatively mobile. Because tritium migrates in association with moisture, the low moisture content of the subsurface limits the potential for tritium to migrate to groundwater.

### H-3.3 Exposure Point Concentration Calculations

The exposure point concentrations (EPCs) represent upper bound concentrations of COPCs. For comparison to risk-screening levels, the upper confidence limit (UCL) of the arithmetic mean was calculated when possible and used as the EPC. The UCLs were calculated using all available decision-level data within the depth range of interest. If an appropriate UCL of the mean could not be calculated or if the UCL exceeded the maximum concentration, the maximum detected concentration of the COPC was used as the EPC (maximum detection limits were used as the EPCs for some inorganic COPCs). The summary statistics, including the EPC for each COPC for the human health and the ecological risk-screening assessments and the distribution used for the calculation, are presented in Tables H-2.3-1 to H-2.3-53.

Calculation of UCLs of the mean concentrations was done using the EPA ProUCL 5.0.00 software (EPA  2013, 251074), which is based on EPA guidance (EPA 2002, 085640). The ProUCL program calculates 95%, 97.5%, and 99% UCLs and recommends a distribution and UCL. The 95% UCL for the recommended calculation method was used as the EPC. The ProUCL software performs distributional tests on the data set for each COPC and calculates the most appropriate UCL based on the distribution of the data set. Environmental data may have a normal, lognormal, or gamma distribution but are often nonparametric (no definable shape to the distribution). The ProUCL documentation strongly recommends against using the maximum detected concentration for the EPC. The maximum detected concentration was used to represent the EPC for COPCs only when the detects were too few to calculate a UCL. Input and output data files for ProUCL calculations are provided on CD as Attachment H-1.

## H-4.0 HUMAN HEALTH RISK-SCREENING EVALUATIONS

The human health risk-screening assessments were conducted for each site within the Threemile Canyon Aggregate Area. All sites were screened for the residential scenario using data from 0.0–10.0 ft bgs. Sites were also screened for the industrial scenario using data from 0.0–1.0 ft bgs, where available. SWMUs 12-001(a),12-001(b), and 12-002 and AOC C-12-005 were evaluated for the recreational scenario using data from 0.0–1.0 ft bgs. The human health risk-screening assessments compared either the 95% UCL of the mean concentration, the maximum detected concentration, or the maximum detection limit of each COPC with SSLs for chemicals and screening action levels (SALs) for radionuclides.

For most constituents, the residential exposure scenario is the most protective, and the residential scenario is used for evaluating whether a site is appropriate for corrective action complete without controls. Although potential exposure to construction workers is not expected at Threemile Canyon Aggregate Area based on current and foreseeable land use, sites being recommended for corrective action complete without controls must not pose an unacceptable risk to construction workers. For some constituents, the construction worker SSL is less than the residential SSL and the residential exposure scenario may not also be protective of construction workers. Therefore, sites posing no potential unacceptable risk under the residential scenario were evaluated to determine whether the residential exposure scenario was also protective of construction workers. If not, the construction worker scenario was evaluated to determine whether the site could be recommended for corrective action complete without controls.

### H-4.1 Human Health SSLs and SALs

Human health risk-screening assessments were conducted using SSLs for the industrial and residential scenarios obtained from NMED guidance (NMED 2015, 600915). The NMED SSLs are based on a target hazard quotient (HQ) of 1 and a target cancer risk of $1 \times 10^{-5}$ (NMED 2015, 600915). If SSLs were not available from NMED guidance, the EPA regional screening tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables) were used. The EPA regional screening levels for carcinogens were multiplied by 10 to adjust from a $10^{-6}$ cancer risk level to the NMED target cancer risk level of $10^{-5}$. Recreational SSLs were obtained from Laboratory guidance (LANL 2015, 600336) and are based on the same target risk levels as the NMED SSLs. Surrogate chemicals were also used for some COPCs without an SSL based on structural similarity or because the COPC is a breakdown product (NMED 2003, 081172). Exposure parameters used to calculate the industrial, recreational, and residential SSLs are presented in Table H-4.1-1.

Radionuclide SALs were used for comparison with radionuclide COPC EPCs and were derived using the RESRAD model, Version 7.0 (LANL 2015, 600929). The SALs are based on a 25-mrem/yr dose as authorized by U.S. Department of Energy (DOE) Order 458.1. Exposure parameters used to calculate the residential, industrial, and recreational SALs are presented in Tables H-4.1-2, H-4.1-3, and H-4.1-4, respectively.

### H-4.2 Results of Human Health Screening Evaluation

The EPC of each COPC was compared with the SSLs for the industrial, recreational, and residential scenarios, as appropriate. For carcinogenic chemicals, the EPCs were divided by the SSL and multiplied by $1 \times 10^{-5}$. The sum of the carcinogenic risks was compared with the NMED target cancer risk level of $1 \times 10^{-5}$. For noncarcinogenic chemicals, an HQ was generated for each COPC by dividing the EPC by the SSL. The HQs were summed to generate a hazard index (HI). The HI was compared with the NMED target HI of 1. The radionuclide EPCs were divided by the SAL and multiplied by 25 mrem/yr. The total doses were compared with the DOE target level of 25 mrem/yr, as authorized by DOE Order 458.1. The results are presented in Tables H-4.2-1 to H-4.2-110 and are described below for each SWMU and AOC evaluated.

Sites posing no unacceptable risk under the residential scenario may be recommended for corrective action complete if the residential scenario is also protective of construction workers. For the sites at Threemile Canyon Aggregate Area, the following COPCs have construction worker SSLs less than residential SSLs: aluminum; barium; manganese; nickel; 1,1-dichloroethene; 1,2-xylene; and 1,3-xylene+1,4-xylene. The maximum EPC for of each of these COPCs was compared with the construction worker SSL. The ratio of the maximum EPC to the construction worker SSL (i.e., the maximum HQ) was 0.98 for manganese, 0.36 for aluminum, and less than 0.05 for all other COPCs. Thus, manganese is the only COPC that could potentially pose an unacceptable construction worker risk. If manganese is a COPC at a site, the construction worker scenario was evaluated to determine whether the site can be recommended for corrective action complete without controls. Because manganese is associated with noncarcinogenic risk, only the construction worker HI was evaluated and the residential scenario is protective of construction worker cancer risk at all sites. All construction worker SALs are equal to or greater than residential SALs and the residential scenario is protective of construction workers for all sites.

#### H-4.2.1 SWMUs 12-001(a) and 12-001(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-1, H-4.2-2, and H-4.2-3. The total excess cancer risk for the industrial scenario is $8 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.09 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-4, H-4.2-5, and H-4.2-6. The total excess cancer risk for the recreational scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The recreational HI is 0.07, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-7, H-4.2-8, and H-4.2-9. The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at SWMUs 12-001(a) and 12-001(b) and may potentially pose an unacceptable noncarcinogenic risk to the construction worker. Construction worker risk for SWMUs 12-001(a) and 12-001(b) was evaluated using the EPCs for the residential scenario (Table H-2.3-2) since both residential and construction worker scenarios consider the 0.0 ft to 10.0 ft bgs interval. The noncarcinogenic risk screening results for the construction worker at SWMUs 12-001(a) and 12-001(b) are presented in Table H-4.2-10. The construction worker HI is 2, which is greater than the NMED target of 1 (NMED 2015, 600915). The primary contributor to construction worker noncarcinogenic risk is manganese. The residential scenario is protective of the construction worker for cancer risk and total dose.

#### H-4.2.2 SWMU 12-002

The results of the risk-screening assessment for the industrial scenario are presented in Table H-4.2-11. No carcinogenic COPCs were identified. The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the recreational scenario are presented in Table H-4.2-12. No carcinogenic COPCs were identified. The recreational HI is 0.08, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-13 and H-4.2-14. The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at SWMU 12-002 and the residential exposure scenario is also protective of construction workers.

### H-4.2.3 AOC 12-004(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-15, H-4.2-16, and H-4.2-17. The total excess cancer risk for the industrial scenario is $5 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-18, H-4.2-19, and H-4.2-20. The total excess cancer risk for the residential scenario is $7 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 12-004(a) and the residential exposure scenario is also protective of construction workers.

### H-4.2.4 AOC 12-004(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-21 and H-4.2-22. The total excess cancer risk for the industrial scenario is $1 \times 10^{-8}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.07, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-23 and H-4.2-24. The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC 12-004(b) and the residential exposure scenario is also protective of construction workers.

### H-4.2.5 AOC C-12-001

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-25 and H-4.2-26. The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-27 and H-4.2-28. The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-12-001 and the residential exposure scenario is also protective of construction workers.

### H-4.2.6 AOC C-12-002

The results of the risk-screening assessment for the industrial scenario are presented in Table H-4.2-29. No carcinogenic COPCs were identified. The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-30 and H-4.2-31. The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-12-002 and the residential exposure scenario is also protective of construction workers.

### H-4.2.7 AOC C-12-003

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-32 and H-4.2-33. The total excess cancer risk for the industrial scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.005, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-34 and H-4.2-35 The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-12-003 and the residential exposure scenario is also protective of construction workers.

### H-4.2.8 AOC C-12-004

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-36 and H-4.2-37. The total excess cancer risk for the industrial scenario is $7 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-38 and H-4.2-39. The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-12-004 and the residential exposure scenario is also protective of construction workers.

### H-4.2.9 AOC C-12-005

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-40 and H-4.2-41. The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.008, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H 4.2-42 and H-4.2-43. The total excess cancer risk for the recreational scenario is $7 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-44 and H-4.2-45. The total excess cancer risk for the residential scenario is $1 \times 10^{-5}$, which is equivalent to the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-12-005 and the residential exposure scenario is also protective of construction workers.

### H-4.2.10 AOC C-14-006

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-46 and H-4.2-47. The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-48 and H-4.2-49. The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.03, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at AOC C-14-006 and the residential exposure scenario is also protective of construction workers.

### H-4.2.11 AOC 15-005(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-50, H-4.2-51, and H-4.2-52. The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-53, H-4.2-54, and H-4.2-55. The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 15-005(c) and the residential exposure scenario is also protective of construction workers.

### H-4.2.12 SWMU 15-007(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-56 and H-4.2-57. The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 20, which is greater than the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead. No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-58, H-4.2-59, and H-4.2-60. The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 26, which is greater than the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead and antimony. The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

SWMU 15-007(c) poses potential unacceptable risk for the industrial and residential scenarios and will not be recommended for corrective action complete without controls. Therefore, it was not necessary to evaluate construction worker risk to determine whether the site could be recommended for corrective action complete without controls.

### H-4.2.13 SWMU 15-007(d)

The samples at SWMU 15-007(d) were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-61 and H-4.2-62. No carcinogenic COPCs were identified. The residential HI is 0.03, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.09 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 15-007(d) and the residential exposure scenario is also protective of construction workers.

### H-4.2.14 SWMU 15-008(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-63, H-4.2-64, and H-4.2-65. The total excess cancer risk for the industrial scenario is $9 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 11, which is greater than the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is from lead. The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-66, H-4.2-67, and H-4.2-68. The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 12, which is greater than the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is primarily from lead. The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

SWMU 15-008(b) poses potential unacceptable risk for the industrial and residential scenarios and will not be recommended for corrective action complete without controls. Therefore, it was not necessary to evaluate construction worker risk to determine whether the site could be recommended for corrective action complete without controls.

#### H-4.2.15 AOC 15-008(g)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-69 and H-4.2-70. No carcinogenic COPCs were identified. The industrial HI is 0.5, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-71 and H-4.2-72. No carcinogenic COPCs were identified. The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 15-008(g) and the residential exposure scenario is also protective of construction workers.

#### H-4.2.16 SWMU 15-009(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-73, H-4.2-74, and H-4.2-75. The total excess cancer risk for the industrial scenario is $3 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.2, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 18 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-76, H-4.2-77, and H-4.2-78. The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 2, which is greater than the NMED target HI of 1 (NMED 2015, 600915). The elevated HI is primarily from uranium. The total dose is 46 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The dose is primarily from isotopic uranium.

SWMU 15-009(b) poses potential unacceptable risk for the residential scenario and will not be recommended for corrective action complete without controls. Therefore, it was not necessary to evaluate construction worker risk to determine whether the site could be recommended for corrective action complete without controls.

#### H-4.2.17 SWMU 15-009(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-79, H-4.2-80, and H-4.2-81. The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-82, H-4.2-83, and H-4.2-84. The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 15-009(c) and the residential exposure scenario is also protective of construction workers.

#### H-4.2.18 SWMU 15-009(h)

The samples at SWMU 15-009(h) were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-85, H-4.2-86, and H-4.2-87. The total excess cancer risk for the residential scenario is $2 \times 10^{-10}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.07, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 15-009(h) and the residential exposure scenario is also protective of construction workers.

#### H-4.2.19 SWMU 15-010(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4 2-88, H-4.2-89, and H-4.2-90. The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-91, H-4.2-92, and H-4.2-93. The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 15-010(b) and the residential exposure scenario is also protective of construction workers.

#### H-4.2.20 AOC 15-014(h)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4 2-94, H-4.2-95, and H-4.2-96. The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.07, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-97, H-4.2-98, and H-4.2-99. The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 15-014(h) and the residential exposure scenario is also protective of construction workers.

### H-4.2.21 SWMU 36-002

The samples at SWMU 36-002 were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

The results of the risk-screening assessment for the residential scenario are presented in Tables H 4.2-100, H-4.2-101, and H-4.2-102. The total excess cancer risk for the residential scenario is $6 \times 10^{-11}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 36-002 and the residential exposure scenario is also protective of construction workers.

### H-4.2.22 SWMU 36-003(a)

The results of the risk-screening assessment for the industrial scenario are presented in Table H-4 2-103. No carcinogenic COPCs were identified. The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-104 and H-4.2-105. The total excess cancer risk for the residential scenario is $3 \times 10^{-8}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2015, 600915). No radionuclide COPCs were identified.

Manganese is not a COPC at SWMU 36-003(a) and the residential exposure scenario is also protective of construction workers.

### H-4.2.23 SWMU 36-008

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-106, H-4.2-107, and H-4.2-108. The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-109, H-4.2-110, and H-4.2-111. The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 0.9, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 36-008 and the residential exposure scenario is also protective of construction workers.

### H-4.2.24 SWMU C-36-003

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-112, H-4.2-113, and H-4.2-114. The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The industrial HI is 0.2, which is less than the NMED target HI of 1 (NMED 2015, 600915). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-115, H-4.2-116, and H-4.2-117. The total excess cancer risk for the residential scenario is $1 \times 10^{-5}$, which is equivalent to the NMED target risk level of $1 \times 10^{-5}$ (NMED 2015, 600915). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2015, 600915). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at SWMU C-36-003 and may potentially pose an unacceptable noncarcinogenic risk to the construction worker. Construction worker risk for SWMU C-36-003 was evaluated using the EPCs for the residential scenario (Table H-2.3-53) since both residential and construction worker scenarios consider the 0.0 ft to 10.0 ft bgs interval. The noncarcinogenic risk-screening results for the construction worker at SWMU C-36-003 are presented in Table H-4.2-118. The construction worker HI is 2, which is greater than the NMED target of 1 (NMED 2015, 600915). The primary contributor to construction worker noncarcinogenic risk is manganese. The residential scenario is protective of the construction worker for cancer risk and total dose.

### H-4.3 Vapor Intrusion Pathway

NMED guidance (NMED 2015, 600915) requires an evaluation of the vapor intrusion pathway. The vapor intrusion pathway of VOCs into a building was evaluated where appropriate. The evaluation can be qualitative for a potentially complete pathway if the following criteria are met:

- Volatile and toxic compounds are minimally detected.
- Concentrations are below NMED's vapor intrusion screening levels for soil-gas and/or groundwater. There is no suspected source(s) for volatile and toxic compounds.
- Concentrations are decreasing with depth (for soil).

Because only bulk soil data are available for these subaggregates, the vapor intrusion screening levels are not applicable for the evaluation. Residential soil screening values were calculated using the Johnson and Ettinger model (http://www.epa.gov/swerrims/riskassessment/airmodel/johnson_ettinger.htm) for subsurface vapor intrusion into buildings (EPA 2002, 094114). Because only soil data are available for these Threemile Canyon Aggregate Area sites, the advanced soil model (SL-ADV-REV2-4.xls) was used to calculate risk-based soil concentrations for VOCs at sites, where appropriate. The maximum detected concentration of VOC COPCs was compared with the risk-based concentration generated by the model for each site. The model inputs and risk-based concentrations generated are provided on CD as Attachment H-2. HQs and HIs were calculated for noncarcinogenic COPCs and total excess cancer risks for carcinogenic COPCs. The NMED target risk level of $1 \times 10^{-5}$ and NMED target HI of 1 were applied.

The vapor intrusion pathway was qualitatively evaluated as part of the residential scenario for some of the sites in this report. Among the factors to consider for the vapor intrusion pathway to be relevant to human health risk is the current extent of structures and their proximity to the VOC source. One may also consider if construction of buildings is possible or proposed in the reasonably foreseeable future. Structures exist in the Threemile Canyon Aggregate Area but they differ considerably in whether they are actively used.

SWMUs 36-008 and C-36-003 are located on the south rim and slope of Threemile Canyon and not suitable for placement of a structure. Therefore, the vapor intrusion pathway was not evaluated for these sites.

No VOCs were detected at SWMUs 12-001(a) and 12-001(b), 12-002, 15-007(c), 15-007(d), and 15-008(b), AOCs 12-004(a), 12-004(b), C-12-001, C-12-002, C-12-003, C-12-004, C-12-005, and 15-008(g). Therefore, the vapor intrusion pathway is incomplete for these sites. The potential for the vapor intrusion pathway is discussed for each of the remaining sites.

None of the site descriptions indicated that solvents were used at these sites, and in most cases these sites are inactive or removed. Therefore, there are no suspected sources of VOCs other than small quantities possibly used in photographic laboratories.

#### H-4.3.1 AOC C-14-006

AOC C-14-006 is an area of potential soil contamination at TA-14 associated with an HE-storage magazine. The magazine was built in 1945 and removed in 1952. The site description does not indicate a history of solvent usage.

The VOCs were minimally detected at this site. Three VOCs (acetone, 4-isopropyltoluene, and toluene) were detected in 2 samples each. The detected concentrations were less than or slightly greater than the EQLs and decreased with depth. The site description indicated that solvents were not used so no sources of VOCs are present. In addition, the structure has been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.2 AOC 15-005(c)

AOC 15-005(c) consists of an outdoor container storage area for explosives, located near storage building 15-41 in the central portion of TA-15 near Firing Site C. The operational period of this site is not known, but it has not been active since the 1990s. This site description does not indicate a history of solvent usage.

Six of seven VOCs were minimally detected at this site with one or two detected concentrations. Xylene[1,3-1,4-xylene had 5 detected concentrations. The detected concentrations of ethylbenzene, 2-methylnaphthalene, naphthalene, toluene, and 1,3-xylene+1,4-xylene were less than the estimated quantitation limits (EQLs). Acetone and 4-isopropyltouene had one or two concentrations greater than the EQLs, and the concentrations decreased with depth. The site description indicated that solvents were not used at the site and thus no sources of VOCs are present. In addition, the structure has been removed and the site is inactive.

Acetone was detected in two samples from 0.0−0.5 ft bgs (0.0144 mg/kg and 0.0188 mg/kg) and was not detected in the samples collected at 2.0−3.0 ft bgs at these locations. Isopropyltoluene[4-] was detected in two samples from 0.0−0.5 ft bgs (0.00049 mg/kg and 0.00151 mg/kg) and was not detected in the samples collected at 2.0−3.0 ft bgs at these locations. Xylene[1,3-]+1,4-xylene was detected in five samples. Two of the detected concentrations were at location 15-610556 at similar concentrations (0.000474 mg/kg and 0.000556 mg/kg) and below the EQLs. The other three detected concentrations were in the surface samples (0.0–0.5 ft bgs), and 1,3-xylene+1,4-xylene was not detected in the deeper samples.

Because acetone and 4-isopropyltoluene had concentrations exceeding EQLs these VOCs were evaluated in the screening assessment. The result of the residential vapor intrusion screening assessment is presented in Table H-4.3-1. The HI is approximately 0.003, which is less than the NMED target HI of 1 (NMED 2015, 600915). The result does not change the HI calculated as a result of exposure to soil, discussed in section H-4.2.

The screening of the bulk soil data using the Johnson and Ettinger model indicates that the soil has not been impacted. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.3 SWMU 15-009(b)

SWMU 15-009(b) is a septic system located at Firing Site R-45. The septic system consists of a tank (structure 15-61), a seepage pit, associated drainlines, and a former outfall. This septic system received effluent from restroom facilities in the firing site control building 15-45. The site description does not indicate a history of solvent usage.

Seven of 10 VOCs were minimally detected at this site with 1 or 2 detected concentrations. The detected concentrations of 2-butanone; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xyene+1,4-xylene were less than the EQLs. Acetone, 4-isopropyltoluene, and toluene had several concentrations greater than the EQLs.

Acetone was detected in seven samples. Two locations had two detected concentrations each and the higher concentrations were at the shallower depth (location 15-610834: 0.0226 mg/kg from 15.0–17.0 ft bgs and 0.00428 mg/kg from 17.0–18.0 ft bgs; location 15-610835: 0.036 mg/kg from 7.0-8.0 ft bgs and 0.0221 mg/kg from 12.0–13.0 ft bgs). For each of the other three detected concentrations, there was a single detection per location and acetone was not detected in the deeper samples.

Isopropyltoluene[4-] was detected in nine samples. Two locations had two detected concentrations, each and the higher concentrations were at the shallower depth (location 15-610830: 0.00316 mg/kg from 7.0−8.0 ft bgs and 0.000314 mg/kg from 12.0–13.0 ft bgs; location 15-610835: 0.0061 mg/kg from 7.0–8.0 ft bgs and 0.00159 mg/kg from 12.0–13.0 ft bgs). For each of the other five detected concentrations there was a single detect per location in the shallow samples, and 4-isopropyltoluene was not detected in the deeper samples.

Toluene was detected in eight samples. Three locations had two detected concentrations each and the higher concentrations were at the shallower depth (location 15-610830: 0.0102 mg/kg from 7.0–8.0 ft bgs and 0.000504 mg/kg from 12.0–13.0 ft bgs; location 15-610834: 0.000704 mg/kg from 15.0–16.0 ft bgs and 0.000321 mg/kg from 17.0–18.0 ft bgs; location 15-610835: 0.00445 mg/kg from 7.0–8.0 ft bgs and 0.00276 mg/kg from 12.0–13.0 ft bgs). At location 15-610331, there was a detected concentration at the shallower depth, and toluene was not detected in the deeper sample. At location 15-610836, toluene was only detected in the deeper sample (0.000323 mg/kg at 12.0–13.0 ft bgs) below the EQL.

Because acetone, 4-isopropyltoluene, and toluene had concentrations exceeding EQLs, these VOCs were evaluated in the screening assessment. The result of the residential vapor intrusion screening assessment is presented in Table H-4.3-2. The HI is approximately 0.002, which is less than the NMED target HI of 1 (NMED 2015, 600915). The result does not change the HIs calculated as a result of exposure to soil, discussed in section H-4.2.

The screening of the bulk soil data using the Johnson and Ettinger model indicates that the soil has not been impacted. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.4 SWMU 15-009(c)

SWMU 15-009(c) is a septic system located at TA-15 Firing Site R-44. The septic system consists of a tank (structure 15-62), its associated drainlines, and an outfall. The septic system received effluent from restroom facilities in the firing site control building 15-44. The site description does not indicate a history of solvent usage.

Two of five VOCs were minimally detected at this site with one or two detections of 1,2,4-trimethylbenzene and 1,3-xylene+1,4-xylene. The detected concentrations were less than the EQLs. Acetone, 4-isopropyltoluene, and toluene had several concentrations greater than the EQLs.

Acetone was detected in five samples. The detected concentrations were at five different locations and were in the deeper samples at four locations. Three of the four concentrations in the deeper samples were above the EQLs. The other detected concentration was in a surface sample and decreased with depth.

Isopropyltoluene[4-] was detected in five samples. Two locations had two detected concentrations and the higher concentration was at the shallower depth or the concentrations were similar (location 15-610839: 0.000477 mg/kg from 0.0–0.8 ft bgs and 0.000553 mg/kg from 1.0–2.5 ft bgs; location 15-610851: 0.00428 mg/kg from 0.0–0.7 ft bgs and 0.00128 mg/kg from 1.0–2.0 ft bgs). The other detected concentration was in a surface sample and decreased with depth.

Toluene was detected in seven samples. One location had two detected concentrations and the higher concentration was at the shallower depth (location 15-610851: 0.0122 mg/kg from 0.0–0.7 ft bgs and 0.00206 mg/kg from 1.0–2.0 ft bgs). Two detected concentrations were in surface samples and decreased with depth and three concentrations were only detected in the deeper samples below the EQLs.

Because acetone, 4-isopropyltoluene, and toluene had concentrations exceeding EQLs, these VOCs were evaluated in the screening assessment. The result of the residential vapor intrusion screening assessment is presented in Table H-4.3-3. The HI is approximately 0.0001, which is less than the NMED target HI of 1 (NMED 2015, 600915). The result does not change the HIs calculated as a result of exposure to soil, discussed in section H-4.2.

The screening of the bulk soil data using the Johnson and Ettinger model indicates that the soil has not been impacted. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.5 SWMU 15-009(h)

SWMU 15-009(h) is a septic system located at the Ector firing site on the eastern side of TA-15 (LANL 2003, 102117). The septic system consists of a tank (structure 15-282), associated drainlines, and a drain field. The septic system received effluent from restroom facilities in the Ector firing site control building 15-280. In the 1990s, the sanitary waste drainlines that served this septic system were rerouted to the SWSC plant and are currently active. The site description does not indicate a history of solvent usage.

The VOCs were minimally detected at this site with 1 or 2 detected concentrations of acetone, ethylbenzene, and 2-hexanone. The detected concentrations were less than or slightly greater than the EQLs. The site description indicated that solvents were not used so no sources of VOCs are present. In addition, the structure is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

### H-4.3.6 SWMU 15-010(b)

SWMU 15-010(b) is a settling tank (structure 15-147) located in the northwest corner of TA-15 near former shop building 15-8. The settling tank served former building 15-8, which housed HE-machining operations during the 1950s, and discharged to an outfall at the edge of Threemile Canyon. The tank was constructed in 1947 and originally designed to be a septic tank; however, subsequent engineering records confirm the tank was also used as an HE settling tank. The site description does not indicate a history of solvent usage.

Four of seven VOCs were minimally detected at this site with one or two detected concentrations of 1,1-dichloroethene, styrene, tetrachloroethene, and 1,3-xylene+1,4-xylene. Acetone, methylene chloride, and toluene were detected in seven, five, and six samples, respectively. The detected concentrations of 1,1-dichloroethene, methylene chloride, styrene, tetrachloroethene, and 1,3-xylene+1,4-xylene were less than the EQLs. Acetone and toluene had several concentrations greater than the EQLs.

Acetone was detected in seven samples. Two locations had two detected concentrations with the higher concentration at the shallower depth at one location and the higher concentration at the deeper depth at the other location. Acetone was detected in the surface sample at location 15-610869 and decreased with depth and was detected only in the deeper samples at two locations (concentration at location 15-610871 was below the EQL).

Toluene was detected in six samples. The detected concentrations were at six different locations with concentrations decreasing with depth at three locations and the concentration detected only in the deeper sample at three locations.

Because acetone and toluene had concentrations exceeding EQLs, these VOCs were evaluated in the screening assessment. The result of the residential vapor intrusion screening assessment is presented in Table H-4.3-4. The HI is approximately 0.0002, which is less than the NMED target HI of 1 (NMED 2015, 600915). The result does not change the HIs calculated as a result of exposure to soil, discussed in section H-4.2.

The screening of the bulk soil data using the Johnson and Ettinger model indicates that the soil has not been impacted. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

### H-4.3.7 AOC 15-014(h)

AOC 15-014(h) consists of three outfalls located in the northwest corner of TA-15. The outfalls served a former laboratory and office (former building 15-40). The building and therefore the potential sources of VOCs have been removed. All three outfalls daylight north of former building 15-40 and discharge to Threemile Canyon. The majority of the samples are from the drainage below the outfalls on the slope of Threemile Canyon in an area not suitable for the placement of a structure. Locations 15-610503, 15-610522, and 15-610526 are on the mesa top below the drainlines and are evaluated for the vapor intrusion pathway. The site description does not indicate a history of solvent usage, but it is possible solvents were used as part of photographic processing.

The VOCs were minimally detected in the mesa top samples at this site with 1 to 2 detected concentrations of acetone, toluene, 1,2-xylene, and 1,3-+1,4-xylene. The detected concentrations at the three locations were less than the EQLs. The site description indicated that solvents were not used so no sources of VOCs are present. In addition, the building has been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.8 SWMU 36-002

SWMU 36-002 is a former sump (former structure 36-49) located at TA-36, approximately 40 ft northwest of building 36-48 near the edge of Threemile Canyon. The sump was constructed in 1965 and received water from two sinks in building 36-48. Building 36-48 was initially used for shot assembly and for controlled-temperature experiments. DU was cut, lapped, and polished in the building. One of the sinks connected to the sump had a chemical-resistant coating. The building was used infrequently, less than 10 times per year. The sinks were disconnected from the sump in 1993, and the sump was removed. The site description does not indicate a history of solvent usage.

The VOCs were minimally detected at this site with one detected concentration of ethylbenzene. The detected concentration was less than the EQLs and decreased with depth. The site description indicated that solvents were not used so no sources of VOCs are present. In addition, the structure has been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

#### H-4.3.9 SWMU 36-003(a)

SWMU 36-003(a) is a septic system located at TA-36 approximately 115 ft east of building 36-1. The septic system consists of a septic tank (structure 36-17), associated drainlines, a manhole (structure 36-38), a distribution box/drain field, and a seepage pit. This septic system was constructed in 1949 and received effluent from the restroom facilities in an office and laboratory in building 36-1. In addition to sanitary wastes, spent photoprocessing chemicals from x-ray developing may have been discharged to the septic system. The main guard station at TA-36 (building 36-22) was later added to the septic system. In 1988, the guard station was disconnected from the septic tank and rerouted to an adjacent septic system. In 1992, the sanitary waste drainlines that previously served SWMU 36-003(a) were rerouted to the SWSC plant and are currently active (LANL 1993, 015313, pp. 5-22–5-23). In 1995, the septic tank was decontaminated by steam cleaning and the tank was filled with concrete. The site description does not indicate a history of solvent usage, but it is possible that solvents were used as part of photographic processing.

The VOCs were minimally detected at this site with 1 or 2 detected concentrations of 4-isopropyltoluene and 1,2,4-trimethylbenzene. The detected concentrations were less than the EQLs, except for one concentration of 4-isopropyltoluene.

Because of the potential for VOC sources, the detected VOCs were evaluated in the screening assessment. The result of the residential vapor intrusion screening assessment is presented in Table H-4.3-5. The HI is approximately 0.0004, which is less than the NMED target HI of 1 (NMED 2015, 600915). The result does not change the HIs calculated as a result of exposure to soil, as discussed in section H-4.2.

The screening of the bulk soil data using the Johnson and Ettinger model indicates that the soil has not been impacted. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2015, 600915) but no additional evaluation is necessary.

### H-4.4 Essential Nutrients

NMED guidance (NMED 2015, 600915) has SSLs for evaluation of essential nutrients. The maximum concentrations of calcium and magnesium were compared with the appropriate NMED essential nutrient SSLs at those sites where they were identified as COPCs. The results of the comparisons found calcium and magnesium to be substantially less than their respective SSLs, as presented in Table H-4.4-1. Further evaluation of calcium and magnesium at these sites is not necessary.

### H-4.5 Uncertainty Analysis

#### H-4.5.1 Data Evaluation and COPC Identification Process

A primary uncertainty associated with the COPC identification process is the possibility that a chemical may be inappropriately identified as a COPC when it is actually not a COPC or that a chemical may not be identified as a COPC when it actually should be identified as a COPC. Inorganic chemicals are appropriately identified as COPCs because only the chemicals detected or that have detection limits above background are retained for further analysis. No established BVs for organic chemicals, and all detected organic chemicals are identified as COPCs and are retained for further analysis. Other uncertainties may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening evaluations include those detected below the estimated quantitation limits and nondetects above BVs, data evaluation uncertainties are expected to have little effect on the risk-screening results.

#### H-4.5.2 Exposure Evaluation

The current and reasonably foreseeable future land use for the Threemile Canyon Aggregate Area is industrial. To the degree actual activity patterns are not represented by those activities assumed by the industrial scenario, uncertainties are introduced in the assessment, and the evaluation presented in this assessment overestimates potential risk. An individual may be subject to exposures in a different manner than the exposure assumptions used to derive the industrial SSLs. For the sites evaluated, individuals might not be on-site at present or in the future for that frequency and duration. The industrial assumptions for the SSLs are that the potentially exposed individual is outside on-site for 8 h/d, 225 d/yr, and 25 yr (NMED 2015, 600915). The residential SSLs are based on an exposure of 24 h/d, 350 d/yr, and 30 yr (NMED 2015, 600915). As a result, the industrial and residential scenarios evaluated at these sites likely overestimate the exposure and risk. The recreational scenario assumes 1 h/event, 200 events per year, for 30 yr and overestimates the exposure for a visitor to SWMUs 12-001(a) and 12-001(b), SWMU 12-002, and AOC C-12-005. In addition, the child exposure assumed for this scenario is not likely because of the current and reasonably foreseeable future land use and the access restrictions in place for these sites, except for the proposed Manhattan Project National Historical Park.

A number of assumptions are made relative to exposure pathways, including input parameters, completeness of a given pathway, the contaminated media to which an individual may be exposed, and intake rates for different routes of exposure. In the absence of site-specific data, the exposure assumptions used were consistent with default values (NMED 2015, 600915). When several upper-bound values (as are found in NMED 2015, 600915) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99$^{th}$ percentile, and therefore, can exceed the range of risk that may be reasonably expected. Also, the assumption that residual concentrations of chemicals in the tuff are available and result in exposure in the same manner as if they were in soil overestimates the potential exposure and risk to receptors.

Uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at a site. Risk from a single location or area with relatively high COPC concentrations may be underestimated by using a representative site-wide value. The use of a UCL is intended to provide a protective upper-bound (i.e., conservative) COPC concentration and is assumed to be representative of the average exposure to a COPC across the entire site. Potential risk and exposure from a single location or area with relatively high COPC concentrations may be overestimated if a representative site-wide value is used. The use of the maximum detected concentration for the EPC overestimates the exposure to contamination because receptors are not consistently exposed to the maximum detected concentration across the site. In addition, the maximum detection limit was used as the EPC for some inorganic COPCs with elevated detection limits above BVs.

Several sites within the Threemile Canyon Aggregate Area have potential risks that are equivalent to or exceed NMED target levels. The potential risks are overestimated for some of these sites because of uncertainties associated with the EPCs and/or the COPCs.

**SWMUs 12-001(a) and 12-001(b)**

The construction worker HI was 2, primarily from manganese (HQ = 0.98). The EPC for manganese is 456 mg/kg, which is approximately equal to the construction worker SSL of 464 mg/kg. Manganese was detected above the soil BV (671 mg/kg) in 3 of 67 soil samples with a maximum concentration of 2150 mg/kg, and was not detected above the Qbt 2,3,4 BV in 10 tuff samples or above the sediment BV in 3 sediment samples. The construction worker SSL is less than the soil BV, that is, it is comparable with naturally occurring manganese levels. Although site concentrations of manganese in soil are statistically different from background, the distribution of concentrations, other than the maximum concentration, is similar to background (Figure G-16). Thus, the construction worker risk due to potential exposure to manganese is similar to background and the site contribution to construction worker risk is overestimated. The construction worker HI without manganese is 0.9. No other COPC has a HQ greater than 0.3. Note also that SWMUs 12-001(a) and 12-001(b) are located in a buffer area and there are no active Laboratory operations in this area. The potential for future construction projects and exposure to construction workers is minimal.

**SWMU 12-002**

The residential HI at SWMU 12-002 was approximately 1 (1.27) primarily from cobalt (HQ = 0.62) and iron (HQ = 0.345). The EPC for iron was 18,900 mg/kg, which was the maximum of two concentrations with the other being below the Qbt 2,3,4 BV (14,500 mg/kg). The maximum concentration was below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg) and overestimated the risk. Given the other concentration was background it is highly likely that the maximum concentration was also background and was not the result of site operations. Without iron the residential HI is 0.9.

**AOC C-12-005**

The residential total excess cancer risk at AOC C-12-005 was approximately $1 \times 10^{-5}$ ($1.18 \times 10^{-5}$) from chromium. The EPC was a 95% UCL (114 mg/kg), which was strongly biased by the maximum concentration (196 mg/kg). The other nine concentrations were below the soil BV or below or close to the maximum soil background concentration (36.5 mg/kg). In addition, the AOC was the location of a former junction box, which served as a relay between former control building 12-2 and the two firing sites and housed diagnostic equipment, signal cables, and electrical power equipment. Any chromium that might be associated with the junction box is trivalent chromium. If the trivalent chromium residential SSL

(117,000 mg/kg) is compared to the EPC the HQ is 0.001; there is no excess cancer risk as trivalent chromium is a noncarcinogen.

**SWMU 15-007(c)**

The industrial and residential HIs at SWMU 15-007(c) are greater than 1 (20 and 26), with lead being the only contributor (industrial) or primary contributor (residential) with HQs of 19.4 and 18.2, respectively. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPCs at SWMU 15-007(c) (residential 7290 mg/kg and industrial 15,500 mg/kg) are substantially above the SSLs. Without lead, the industrial HI is reduced to approximately 0.5, which is less than the NMED target HI but the residential HI without lead is approximately 8, which is greater than the NMED target HI. Almost all of the remaining residential HI is from antimony (HQ = 7.8).

**SWMU 15-008(b)**

The industrial and residential HIs at SWMU 15-008(b) are greater than 1 (11 and 12), with lead being the only contributor (industrial) or primary contributor (residential) with HQs of 10.8 and 11, respectively. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPCs at SWMU 15-008(b) (residential 4400 mg/kg and industrial 8610 mg/kg) are substantially above the SSLs. Without lead, the industrial HI is reduced to approximately 0.1, which is less than the NMED target HI and the residential HI without lead is approximately 1, which is equivalent to the NMED target HI. The residential HI is also from copper (HQ = 0.45) and uranium (HQ = 0.39).

**AOC 15-008(g)**

The residential HI at AOC 15-008(g) was approximately 1 (HI = 1.36), with lead being the primary contributor with an HQ of 0.77. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC was 309 mg/kg, which is less than the residential SSL. Without lead, the HI is reduced to approximately 0.6, which is less than the NMED target HI.

**AOC 15-014(h)**

The residential HI at AOC 15-014(h) was approximately 1 (HI =1.48), with Aroclor-1254 being the primary contributor (HQ = 0.6). Minor contributors to the HI included lead, antimony, and selenium. The EPC for Aroclor-1254 was the maximum concentration (0.704 mg/kg) of four detected concentrations, which overestimated the risk. If the 95% UCL is calculated for the data set, a 95% UCL of approximately 0.15 mg/kg is obtained. Using the 95% UCL results in a HQ of 0.13 for Aroclor-1254 and reduces the residential HI to 0.99. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC was 19.3 mg/kg, which was less than the residential SSL. Without lead, the HI is further reduced to 0.94, which is below the NMED target HI. In addition, the EPCs for antimony and selenium were the maximum detection limits (i.e., neither were detected in any samples). This also serves to overestimate the residential risk. Therefore, the residential HI is less than 1.

**SWMU C-36-003**

The construction worker HI at SWMU C-36-003 was 2, with manganese being the primary contributor (HQ = 0.97). The EPC for manganese was 452 mg/kg, which is approximately equal to the construction worker SSL of 464 mg/kg. Manganese was detected above the sediment BV (543 mg/kg) in 2 of 6 sediment samples with a maximum concentration of 860 mg/kg, and was not detected above the soil BV in 9 soil samples or above the Qbt 2,3,4 BV in 1 tuff sample. The construction worker SSL is less than the soil BV (671 mg/kg) and sediment BV, that is, it is comparable with naturally occurring manganese levels. The sediment samples at SWMU C-36-003 were collected from a drainage on a canyon slope rather than in the canyon bottom, whereas the sediment BVs are for canyon sediments (LANL 1998, 059730). The sediment samples collected at SWMU C-36-003 may be more similar to soil than to canyon sediment and the maximum concentration was less than or equivalent to the 4 highest manganese soil background concentrations (1100 mg/kg, 1000 mg/kg, 950 mg/kg, and 860 mg/kg). Thus, the construction worker risk due to potential exposure to manganese is similar to background and the site contribution to construction worker risk is overestimated. The construction worker HI without manganese is approximately 1. Note also that SWMU C-36-003 is located on a steep canyon slope and the potential for future construction projects and exposure to construction workers at this location is minimal. The next largest HQ contributor to the construction worker scenario after manganese is total chromium (HQ=0.68). The chromium EPC is greater than background and 6 of the 16 samples are also greater than the maximum chromium soil background concentration (36.5 mg/kg). So given that 10 of the 16 samples are within the range of background, risks to the construction worker from chromium are somewhat overstated.

### H-4.5.3 Toxicity Evaluation

The primary uncertainty associated with the SSLs is related to the derivation of toxicity values used in their calculation. Toxicity values (reference doses [RfDs] and slope factors [SFs]) were used to derive the SSLs used in this risk-screening evaluation (NMED 2015, 600915). Uncertainties were identified in five areas with respect to the toxicity values: (1) extrapolation from other animals to humans, (2) interindividual variability in the human population, (3) the derivation of RfDs and SFs, (4) the chemical form of the COPC, and (5) the use of surrogate chemicals.

*Extrapolation from Animals to Humans.* The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist in chemical absorption, metabolism, excretion, and toxic responses between animals and humans. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in each of these steps, resulting in the overestimation of potential risk.

*Individual Variability in the Human Population.* For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no observed adverse effect level (NOAEL). The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk evaluation; this factor of 10 is generally considered to result in a conservative estimate of risk to noncarcinogenic COPCs.

*Derivation of RfDs and SFs.* The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision that could lead to an over- or underestimation of the risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen. Toxicity values with high uncertainties may change as new information is evaluated.

*Chemical Form of the COPC.* COPCs may be bound to the environment matrix and not available for absorption into the human body. However, it is assumed that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

*Use of Surrogate Chemicals***.** The use of surrogates for chemicals that do not have EPA-approved or provisional toxicity values also contributes to uncertainty in the risk assessment. Surrogates were used to provide SSLs for acenaphthylene; Aroclor-1268; benzo(g,h,i)perylene; 4-isopropyltoluene; TATB; and 1,3-xylene+1,4-xylene based on structural similarity. The overall impact of surrogates on the risk assessment is minimal because these COPCs were generally detected at low concentrations (less than 1 mg/kg).

#### H-4.5.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown, and possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms or by different modes of action but are addressed additively.

### H-4.6 Interpretation of Human Health Risk-Screening Results

#### H-4.6.1 SWMUs 12-001(a) and 12-001(b)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $8 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.03, which is less than the NMED target HI of 1. The total dose is 0.09 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $2 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Recreational Scenario**

The total excess cancer risk for the recreational scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The recreational HI is 0.07, which is less than the NMED target HI of 1. The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of $3 \times 10^{-7}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 1, which is equivalent to the NMED target HI of 1. The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $1 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

**Construction Worker Scenario**

The residential exposure scenario is protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is 0.9 (see section H-4.5.2, Uncertainty Analysis), which is less than the NMED target HI of 1.

### H-4.6.2 SWMU 12-002

**Industrial Scenario**

No carcinogenic COPCs were identified. The industrial HI is 0.04, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Recreational Scenario**

No carcinogenic COPCs were identified. The recreational HI is 0.08, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.9 (see section H-4.5.2, Uncertainty Analysis), which is less than the NMED target HI of 1. No radionuclide COPCs were identified. The residential exposure scenario is also protective of construction workers.

### H-4.6.3 AOC 12-004(a)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $5 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.02, which is less than the NMED target HI of 1. The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $7 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $7 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.3, which is less than the NMED target HI of 1. The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $2 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.4 AOC 12-004(b)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $1 \times 10^{-8}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.07, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.6, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

### H-4.6.5 AOC C-12-001

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.003, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.5, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

### H-4.6.6 AOC C-12-002

**Industrial Scenario**

No carcinogenic COPCs were identified. The industrial HI is 0.04, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.6, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.7 AOC C-12-003

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.005, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.3, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.8 AOC C-12-004

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $7 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.1, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.6, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.9 AOC C-12-005

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.008, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Recreational Scenario**

The total excess cancer risk for the recreational scenario is $7 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The recreational HI is 0.02, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is approximately $1 \times 10^{-5}$ (see Uncertainty Analysis, section H-4.5.2), which is equivalent to the NMED target risk level of $1 \times 10^{-5}$. There is no excess cancer risk if the chromium EPC is compared to the trivalent chromium SSL. The residential HI is 0.1, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

### H-4.6.10 AOC C-14-006

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.002, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.03, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

### H-4.6.11 AOC 15-005(c)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.1, which is less than the NMED target HI of 1. The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $5 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.8, which is less than the NMED target HI of 1. The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $2 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.12 SWMU 15-007(c)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 20, which is greater than the NMED target HI of 1. The elevated HI is from lead. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 26, which is greater than the NMED target HI of 1. The elevated HI is primarily from lead and antimony. The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $1 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

### H-4.6.13 SWMU 15-007(d)

**Industrial Scenario**

The samples at SWMU 15-007(d) were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

**Residential Scenario**

No carcinogenic COPCs were identified. The residential HI is 0.03, which is less than the NMED target HI of 1. The total dose is 0.09 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $9 \times 10^{-7}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.14 SWMU 15-008(b)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $9 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 11, which is greater than the NMED target HI of 1. The elevated HI is from lead. The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $4 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $8 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 12, which is greater than the NMED target HI of 1. The elevated HI is primarily from lead. The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $1 \times 10^{-4}$, based on conversion from dose using RESRAD Version 7.0.

### H-4.6.15 AOC 15-008(g)

**Industrial Scenario**

No carcinogenic COPCs were identified. The industrial HI is 0.5, which is less than the NMED target HI of 1. The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $3 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

No carcinogenic COPCs were identified. The residential HI is approximately 1 (see Uncertainty Analysis, section H-4.5.2), which is equivalent to the NMED target HI of 1. The HI is primarily from lead. The lead EPC is less than the residential SSL and the HI without lead is 0.6. The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $7 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.16 SWMU 15-009(b)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $3 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.2, which is less than the NMED target HI of 1. The total dose is 18 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $3 \times 10^{-4}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 2, which is greater than the NMED target HI of 1. The elevated HI is primarily from uranium. The total dose is 46 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The dose is primarily from isotopic uranium. The total dose for the residential scenario is equivalent to a total risk of $6 \times 10^{-4}$, based on conversion from dose using RESRAD Version 7.0.

### H-4.6.17 SWMU 15-009(c)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.02, which is less than the NMED target HI of 1. The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $2 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $5 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.2, which is less than the NMED target HI of 1. The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $1 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.18 SWMU 15-009(h)

**Industrial Scenario**

The samples at SWMU 15-009(h) were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $2 \times 10^{-10}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.07, which is less than the NMED target HI of 1. The total dose is 0.7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $9 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.19 SWMU 15-010(b)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $2 \times 10^{-7}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.02, which is less than the NMED target HI of 1. The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $1 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.4, which is less than the NMED target HI of 1. The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $3 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

### H-4.6.20 AOC 15-014(h)

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.07, which is less than the NMED target HI of 1. The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $7 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 1 (see section H-4.5.2, Uncertainty Analysis), which is equivalent to the NMED target HI of 1. Using the 95% UCL for Aroclor-1254 reduces the residential HI to 0.99. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC was less than the residential SSL, and without lead the HI is further reduced to 0.94, which is below the NMED target HI. The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $2 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.21 SWMU 36-002

**Industrial Scenario**

The samples at SWMU 36-002 were collected from depths greater than 0.0−1.0 ft bgs; therefore, no complete exposure pathways exist for the industrial scenario.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $6 \times 10^{-11}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.4, which is less than the NMED target HI of 1. The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $1 \times 10^{-8}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.22 SWMU 36-003(a)

**Industrial Scenario**

No carcinogenic COPCs were identified. The industrial HI is 0.002, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-8}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.2, which is less than the NMED target HI of 1. No radionuclide COPCs were identified.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.23 SWMU 36-008

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $1 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.1, which is less than the NMED target HI of 1. The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $9 \times 10^{-6}$, based on conversion from dose using RESRAD Version 7.0.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $3 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The residential HI is 0.9, which is less than the NMED target HI of 1. The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $2 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

#### H-4.6.24 SWMU C-36-003

**Industrial Scenario**

The total excess cancer risk for the industrial scenario is $4 \times 10^{-6}$, which is less than the NMED target risk level of $1 \times 10^{-5}$. The industrial HI is 0.2, which is less than the NMED target HI of 1. The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of $1 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.

**Residential Scenario**

The total excess cancer risk for the residential scenario is $1 \times 10^{-5}$, which is equivalent to the NMED target risk level of $1 \times 10^{-5}$. The carcinogenic risk is primarily from chromium. The residential HI is 1, which is equivalent to the NMED target HI of 1. The noncarcinogenic risk is primarily from silver, copper, Aroclor-1254, and lead. The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of $3 \times 10^{-5}$, based on conversion from dose using RESRAD Version 7.

**Construction Worker Scenario**

The residential exposure scenario is protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (without manganese, see section H-4.5.2, Uncertainty Analysis), which is equivalent to the NMED target HI of 1.

## H-5.0 ECOLOGICAL RISK-SCREENING EVALUATIONS

The approach for conducting ecological evaluations is described in the “Screening Level Ecological Risk Evaluation Methods, Revision 4” (LANL 2015, 600982). The evaluation consists of four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

### H-5.1 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening evaluation. The ecological scoping checklist is a useful tool for organizing existing ecological information (Attachment H-3). The information was used to determine whether ecological receptors might be affected, identify the types of receptors that might be present, and develop the ecological conceptual site model for the Threemile Canyon Aggregate Area sites (Attachment H-3). Some of the area on the mesa top is developed and provides minimal potential habitat for ecological receptors. The quality of the habitat varies and, in some cases, some sites have native grasses, forbs, and trees that are suitable habitat for ecological receptors.

The scoping evaluation indicated that terrestrial receptors were appropriate for evaluating the concentrations of COPCs in soil and tuff. Exposure is assessed across a site to a depth of 0.0–5.0 ft bgs (LANL 2015, 600982). Aquatic receptors were not evaluated because no aquatic communities and no aquatic habitat or perennial source of water exist at any of the sites. The depth of the regional aquifer (greater than 1000 ft bgs) and the semiarid climate limit transport to groundwater. The potential exposure pathways for terrestrial receptors in soil and tuff are root uptake, inhalation, soil ingestion, dermal contact, and food web transport (Attachment H-3). The weathering of tuff is the only viable natural process that may result in the exposure of receptors to contaminants in tuff. Because of the slow rate of weathering expected for tuff, exposure in tuff is negligible, although it is included in the assessment. Plant exposure in tuff is largely limited to fractures near the surface, which does not produce sufficient biomass to support an herbivore population. Consequently, the contaminants in tuff are unavailable to receptors.

The potential risk was evaluated in the risk-screening assessments for the following ecological receptors representing several trophic levels:

- plants
- soil dwelling invertebrates (represented by the earthworm)
- the deer mouse (mammalian omnivore)
- the montane shrew (mammalian insectivore)
- desert cottontail (mammalian herbivore)
- red fox (mammalian carnivore)
- American robin (avian insectivore, avian omnivore, and avian herbivore)
- American kestrel (avian insectivore and avian carnivore [surrogate for threatened and endangered (T&E) species (primarily the Mexican spotted owl)])

The rationale for using these receptors is presented in “Screening Level Ecological Risk Evaluation Methods, Revision 4” (LANL 2015, 600982). The Mexican spotted owl is the only T&E species known to frequent the area and may use the Threemile Canyon Aggregate Area for foraging.

### H-5.2 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. The endpoints are ecologically relevant and help sustain the natural structure, function, and biodiversity of an ecosystem or its components (EPA 1998, 062809). In a screening-level ecological evaluation, receptors represent the populations and/or communities, and assessment endpoints are any adverse effects on the chosen ecological receptors. The purpose of the ecological evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species and treaty-protected species, when individuals must be protected (EPA 1999, 070086). Populations of protected species tend to be small, and the loss of an individual adversely affects the species as a whole (EPA 1997, 059370).

In accordance with this guidance, the Laboratory developed generic assessment endpoints (LANL 1999, 064137) to ensure that values at all levels of ecological organization are considered in the ecological screening process. These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each functional group. The receptor species were chosen because of their presence at the site, their sensitivity to the COPCs, and their potential for exposure to those COPCs. These categories of effects and the chosen receptor species were used to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values (TRVs). Toxicity studies used in the development of TRVs included only studies in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is designed to be protective of both the representative species used as screening receptors and the other species within their feeding guilds and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures the applicability to the ecosystem of concern.

### H-5.3 Ecological Risk Screening Evaluation

The ecological screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs (95% UCLs, maximum detected concentrations, or maximum detection limits) to ecological screening levels (ESLs). The EPCs used in the assessments for the Threemile Canyon Aggregate Area are presented in Tables H-2.3-1 through Table H-2.3-51.

The ESLs were obtained from the ECORISK Database, Version 3.3 (LANL 2015, 600921) and are presented in Table H-5.3-1. The ESLs are based on similar species and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and TRVs, are presented in the ECORISK Database, Version 3.3 (LANL 2015, 600921).

The analysis begins with a comparison of the minimum ESL for a given COPC to the EPC. The HQ is defined as the ratio of the EPC to the concentration that has been determined to be acceptable to a given ecological receptor (i.e., the ESL). The higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. The HQs greater than 0.3 are used to identify COPECs requiring additional evaluation (LANL 2015, 600982). Individual HQs for a receptor are summed to derive an HI; COPCs without ESLs are retained as COPECs and evaluated further in the uncertainty section. An HI greater than 1 indicates further assessment may be needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

### H-5.3.1 SWMUs 12-001(a) and 12-001(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-2. Antimony, barium, chromium, cobalt, copper, manganese, nickel, selenium, vanadium, and RDX are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium, iron, magnesium, and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-3. The HI analysis indicates that the robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the kestrel (intermediate carnivore) was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.2 SWMU 12-002

The results of the minimum ESL comparisons are presented in Table H-5.3-4. Antimony, barium, chromium, cobalt, copper, nickel, selenium, and vanadium are retained as COPECs because the HQs were greater than 0.3.

Calcium and iron do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-5. The HI analysis indicates that the robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The HI for the kestrel (intermediate carnivore), cottontail, and earthworm were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.3 AOC 12-004(a)

The results of the minimum ESL comparisons are presented in Table H-5.3-6. Barium, chromium, cobalt, copper, nickel, selenium, vanadium, benzoic acid, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium, magnesium, and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-7. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.4 AOC 12-004(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-8. Arsenic, barium, chromium, cobalt, copper, lead, nickel, selenium, vanadium, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium, magnesium, and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-9. The HI analysis indicates that the robin (all feeding guilds), shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the kestrel (intermediate carnivore) was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.5 AOC C-12-001

The results of the minimum ESL comparisons are presented in Table H-5.3-10. Barium, chromium, cobalt, nickel, selenium, Aroclor-1242, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium and perchlorate, do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-11. The HI analysis indicates that the robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The HI for the kestrel (intermediate carnivore) was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.6 AOC C-12-002

The results of the minimum ESL comparisons are presented in Table H-5.3-12. Antimony, barium, chromium, cobalt, copper, nickel, selenium, vanadium are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium and perchlorate, do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-13. The HI analysis indicates that the robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The HIs for the kestrel (intermediate carnivore), cottontail, and earthworm were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.7 AOC C-12-003

The results of the minimum ESL comparisons are presented in Table H-5.3-14. Antimony, barium, chromium, cobalt, and selenium are retained as COPECs because the HQs were greater than 0.3.

Perchlorate does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-15. The HI analysis indicates that the robin (all feeding guilds), cottontail, shrew, deer mouse, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.8 AOC C-12-004

The results of the minimum ESL comparisons are presented in Table H-5.3-16. Antimony, barium, chromium, cobalt, copper, lead, nickel, selenium, silver, and vanadium are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Calcium, iron, and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-17. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The HIs for the cottontail and earthworm were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.9 AOC C-12-005

The results of the minimum ESL comparisons are presented in Table H-5.3-18. Antimony and chromium are retained as COPECs because the HQs were greater than 0.3.

Perchlorate does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-19. The HI analysis indicates that the robin (all feeding guilds), cottontail, shrew, and deer mouse have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.10 AOC C-14-006

The results of the minimum ESL comparisons are presented in Table H-5.3-20. Antimony and chromium are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, 4-isopropyltoluene, and TATB do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-21. The HI analysis indicates that all receptors have HIs less than 1.

### H-5.3.11 AOC 15-005(c)

The results of the minimum ESL comparisons are presented in Table H-5.3-22. Antimony, barium, chromium, cobalt, copper, lead, selenium, vanadium, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Iron, perchlorate, ethylbenzene, 4-isopropyltoluene, and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-23. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The HIs for the cottontail and earthworm were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.12 SWMU 15-007(c)

The results of the minimum ESL comparisons are presented in Table H-5.3-24. Antimony, chromium, copper, lead, nickel, selenium, silver, and zinc are retained as COPECs because the HQs were greater than 0.3.

Perchlorate and TATB do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-25. The HI analysis indicates that the red fox, kestrel (both feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.13 SWMU 15-007(d)

The results of the minimum ESL comparisons are presented in Table H-5.3-26. Antimony and selenium are retained as COPECs because the HQs were greater than 0.3.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-27. The HI analysis indicates that the shrew, deer mouse, and plant have HIs greater than 1. The HIs for the robin (all feeding guilds) were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.14 SWMU 15-008(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-28. Antimony, barium, beryllium, cadmium, chromium, copper, lead, manganese, nickel, selenium, uranium, vanadium, zinc, Aroclor-1242, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

Calcium, iron, perchlorate, Aroclor-1268, and TATB do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-29. The HI analysis indicates that the red fox, kestrel (both feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.15 AOC 15-008(g)

The results of the minimum ESL comparisons are presented in Table H-5.3-30. Antimony, cobalt, copper, lead, and selenium are retained as COPECs because the HQs were greater than 0.3.

Calcium and TATB do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-31. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.16 SWMU 15-009(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-32. Antimony, barium, cadmium, chromium, copper, cyanide, lead, selenium, uranium, uranium-234, and uranium-238 are retained as COPECs because the HQs were greater than 0.3.

Perchlorate and 4-isopropyltoluene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-33. The HI analysis indicates that the kestrel (all feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, and plant have HIs greater than 1. The HI for the earthworm was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.17 SWMU 15-009(c)

The results of the minimum ESL comparisons are presented in Table H-5.3-34. Chromium, cyanide, selenium, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, 1,2,4-trimethylbenzene, 4-isopropyltoluene, and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-35. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), shrew, deer mouse, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.18 SWMU 15-009(h)

The results of the minimum ESL comparisons are presented in Table H-5.3-36. Antimony is retained as a COPEC because the HQs were greater than 0.3.

Perchlorate does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-37. The HI analysis indicates that all receptors have HIs less than 1.

#### H-5.3.19 SWMU 15-010(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-38. Antimony, cadmium, chromium, mercury, selenium, vanadium, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Iron, perchlorate, and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-39. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the cottontail was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.20 AOC 15-014(h)

The results of the minimum ESL comparisons are presented in Table H-5.3-40. Antimony, barium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, vanadium, Aroclor-1254, benzoic acid, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and di-n-octylphthalate are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Iron, perchlorate, ethylbenzene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, 1,2-xylene, and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-41. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.21 SWMU 36-002

The results of the minimum ESL comparisons are presented in Table H-5.3-42. Antimony, barium, cobalt, copper, nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

Magnesium and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-43. The HI analysis indicates that the robin (omnivore and insectivore), shrew, deer mouse, and plant have HIs greater than 1. The HI for the robin (herbivore) was equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.22 SWMU 36-003(a)

The results of the minimum ESL comparisons are presented in Table H-5.3-44. Antimony, beryllium, nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, 4-isopropyltoluene, and 1,2,4-trimethylbenzene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-45. The HI analysis indicates that the robin (omnivore and insectivore), shrew, deer mouse, and plant have HIs greater than 1. The HIs for the robin (herbivore) and cottontail were equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.3.23 SWMU 36-008

The results of the minimum ESL comparisons are presented in Table H-5.3-46. Antimony, barium, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, silver, vanadium, zinc, Aroclor-1254, benzoic acid, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Threemile Canyon Aggregate Area is neutral to slightly alkaline.

Magnesium; perchlorate; bromodichloromethane; chlorodibromomethane; chloromethane; 2-chloronaphthalene; 4-chlorotoluene; 4-isopropyltoluene; TATB; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-47. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

#### H-5.3.24 SWMU C-36-003

The results of the minimum ESL comparisons are presented in Table H-5.3-48. Antimony, cadmium, chromium, copper, cyanide, lead, manganese, mercury, nickel, selenium, silver, zinc, Aroclor-1254, benzoic acid, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Calcium, nitrate, perchlorate, bromodichloromethane, chlorodibromomethane, isopropyltoluene[4-], trimethylbenzene[1,2,4-], and xylene[1,3-]+xylene[1,4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-49. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

### H-5.4 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening evaluations. This analysis can result in either adding or removing chemicals from the list of COPECs for sites. The following narrative contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at these Threemile Canyon Aggregate Area sites.

#### H-5.4.1 Chemical Form

The assumptions used in the ESL derivations were conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. Most of these factors tend to result in conservative estimates of the ESLs, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an over- or underestimation of the potential risk to receptors.

The chemical form of the individual COPCs was not determined as part of the investigation, largely a limitation on analytical quantitation of individual chemical species. Toxicological data are typically based on the most toxic and bioavailable chemical species not likely found in the environment. The inorganic, organic, and radionuclide, COPECs are generally not 100% bioavailable to receptors in the natural environment because of the adsorption of chemical constituents to matrix surfaces (e.g., soil), or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2015, 600982) , and the values were biased toward overestimating the potential risk to receptors.

#### H-5.4.2 Exposure Assumptions

The EPCs used in the calculations of HQs were the 95% UCL, the maximum detected concentration, or the maximum detection limit to a depth of 5.0 ft, thereby conservatively estimating the exposure to each COPC. As a result, the exposure of individuals within a population was evaluated using this specific concentration, which was assumed constant throughout the exposure area. The sampling also focused on areas of known contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. The assumptions made regarding exposure for terrestrial receptors results in an overestimation of the potential exposure and risk because COPECs varied across the site and were infrequently detected.

#### H-5.4.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels; actual risk for a given COPEC/receptor combination occurs at a higher level, somewhere between the NOAEL-based threshold and the threshold based on the LOAEL. The use of NOAELs leads to an overestimation of potential risk to ecological receptors. ESLs are based on laboratory studies requiring extrapolation to wildlife receptors. Laboratory studies are typically based on "artificial" and maintained populations with genetically similar individuals and are limited to single chemical exposures in isolated and controlled conditions using a single exposure pathway. Wild species are concomitantly exposed to a variety of chemical and environmental stressors, potentially rendering them more susceptible to chemical stress. On the other hand, wild populations are likely more genetically diverse than laboratory populations, making wild populations, as a whole, less sensitive to chemical exposure than laboratory populations. The uncertainties associated with the ESLs may result in an under- or overestimation of potential risk.

#### H-5.4.4 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUF) are used to account for the amount of time a receptor is likely to spend within the contaminated areas based on the size of the receptor's home range (HR). The AUF for individual organisms is calculated by dividing the size of the site by the HR for that receptor. Because T&E species must be assessed on an individual basis (EPA 1999, 070086), the AUF is used for the Mexican spotted owl. The HR for the Mexican spotted owl is 366 ha (EPA 1993, 059384). The site areas and AUFs for each site are presented in Table H-5.4-1. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl.

Eight sites had HIs for the kestrel (top carnivore) equivalent to or above 1. Application of the AUFs for the Mexican spotted owl to the HIs for the kestrel (top carnivore) resulted in adjusted HIs ranging from 0.00009 to 0.07. Therefore, there are no potential adverse impacts to the Mexican spotted owl at any of the sites.

#### H-5.4.5 Population Area Use Factors

EPA guidance is to manage the ecological risk to populations rather than to individuals, with the exception of T&E species (EPA 1999, 070086). One approach to address the potential effects on populations at these Threemile Canyon Aggregate Area sites is to estimate the spatial extent of the area inhabited by the local population that overlaps with the contaminated area. The population area for a receptor is based on the individual receptor HR and its dispersal distance. Bowman et al. (2002, 073475) estimate that the median dispersal distance for mammals is 7 times the linear dimension of the HR (i.e., the square root of the HR area). If only the dispersal distances for the mammals with HRs within the range of the screening receptors are used (Bowman et al. 2002, 073475), the median dispersal distance becomes 3.6 times the square root of the HR ($R^2$=0.91). If it is assumed that the receptors can disperse the same distance in any direction, the population area is circular and the dispersal distance is the radius of the circle. Therefore, the population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40HR.

##### H-5.4.5.1 SWMUs 12-001(a) and 12-001(b)

The area of SWMUs 12-001(a) and 12-001(b) is approximately 1.82 ha. The population area use factors (PAUFs) are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-2). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMUs 12-001(a) and 12-001(b) are less than 1 for all receptors, except for the deer mouse, which had an adjusted HI of 2, and the robin (insectivore), which had an adjusted HI equivalent to 1. The plant had an unadjusted HI of 8 and the earthworm had an unadjusted HI of 3 (Table H-5.4-3).

#### H-5.4.5.2 SWMU 12-002

The area of SWMU 12-002 is approximately 0.000232 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-4). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 12-002 are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI equivalent to 1 (Table H-5.4-5).

#### H-5.4.5.3 AOC 12-004(a)

The area of AOC 12-004(a) is approximately 0.271 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-6). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 12-004(a) are less than 1 for all receptors. The plant had an unadjusted HI of 4 and the earthworm had an unadjusted HI of 0.7 (Table H-5.4-7).

#### H-5.4.5.4 AOC 12-004(b)

The area of AOC 12-004(b) is approximately 0.000513 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-8). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 12-004(b) are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI of 2 (Table H-5.4-9).

#### H-5.4.5.5 AOC C-12-001

The area of AOC C-12-001 is approximately 0.00353 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-10). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC C-12-001 are less than 1 for all receptors. The plant had an unadjusted HI of 4 and the earthworm had an unadjusted HI of 0.7 (Table H-5.4-11).

#### H-5.4.5.6 AOC C-12-002

The area of AOC C-12-002 is approximately 0.00422 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-12). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC C-12-002 are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI equivalent to 1 (Table H-5.4-13).

#### H-5.4.5.7 AOC C-12-003

The area of AOC C-12-003 is approximately 0.0101 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-14). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC C-12-003 are less than 1 for all receptors. The plant had an unadjusted HI of 4 and the earthworm had an unadjusted HI of 0.7 (Table H-5.4-15).

#### H-5.4.5.8 AOC C-12-004

The area of AOC C-12-004 is approximately 0.00391 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-16). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC C-12-004 are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI equivalent to 1 (Table H-5.4-17).

#### H-5.4.5.9 AOC C-12-005

The area of AOC C-12-005 is approximately 0.00261 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-18). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC C-12-005 are less than 1 for all receptors. The plant had an unadjusted HI of 0.4 and the earthworm had an unadjusted HI of 0.05 (Table H-5.4-19).

#### H-5.4.5.10 AOC 15-005(c)

The area of AOC 15-005(c) is approximately 0.111 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-20). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 15-005(c) are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI equivalent to 1 (Table H-5.4-21).

#### H-5.4.5.11 SWMU 15-007(c)

The area of the SWMU 15-007(c) is approximately 0.0508 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-22). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-007(c) are less than 1 for all receptors, except for the robin (insectivore) and deer mouse, which had adjusted HIs of 2 and 3, respectively, and the robin (herbivore and omnivore), which had an adjusted HIs equivalent to 1 (Table H-5.4-23). The plant had an unadjusted HI of 84 and the earthworm had an unadjusted HI of 8 (Table H-5.4-23).

#### H-5.4.5.12 SWMU 15-007(d)

The area of SWMU 15-007(d) is approximately 0.0267 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-24). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-007(d) are less than 1 for all receptors. The plant had an unadjusted HI of 2 and the earthworm had an unadjusted HI of 0.3 (Table H-5.4-25).

#### H-5.4.5.13 SWMU 15-008(b)

The area of the SWMU 15-008(b) is approximately 3.12 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-26). The HQs and HIs are recalculated using the PAUFs. The HI for the deer mouse is not adjusted because the PAUF is 1. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-008(b) are less than 1 for all receptors, except for the robin (herbivore, omnivore, and insectivore), shrew, and deer mouse which had adjusted HIs of 47, 65, 80, 22, and 67, respectively (Table H-5.4-27). The plant had an unadjusted HI of 69 and the earthworm had an unadjusted HI of 25 (Table H-5.4-27).

#### H-5.4.5.14 AOC 15-008(g)

The area of AOC 15-008(g) is approximately 0.00254 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-28). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 15-008(g) are less than 1 for all receptors. The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI of 0.9 (Table H-5.4-29).

#### H-5.4.5.15 SWMU 15-009(b)

The area of SWMU 15-009(b) is approximately 0.0165 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-30). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-009(b) are less than 1 for all receptors. The plant had an unadjusted HI of 22 and the earthworm had an unadjusted HI equivalent to 1 (Table H-5.4-31).

#### H-5.4.5.16 SWMU 15-009(c)

The area of SWMU 15-009(c) is approximately 0.273 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-32). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-009(c) are less than 1 for all receptors. The plant had an unadjusted HI of 3 and the earthworm had an unadjusted HI of 0.3 (Table H-5.4-33).

#### H-5.4.5.17 SWMU 15-010(b)

The area of the SWMU 15-010(b) is approximately 0.267 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-34). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 15-010(b) are less than 1 for all receptors, except for the robin (insectivore), which had adjusted HI of 2, and the robin (omnivore), which had an adjusted HI equivalent to 1 (Table H-5.4-35). The plant had an unadjusted HI of 2 and the earthworm had an unadjusted HI of 6 (Table H-5.4-35).

#### H-5.4.5.18 AOC 15-014(h)

The area of the AOC 15-014(h) is approximately 1.36 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-36). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 15-014(h) are less than 1 for all receptors, except for the robin (omnivore and insectivore), and deer mouse, which had adjusted HIs of 4, 7, and 3, respectively, and the robin (herbivore) and shrew, which had adjusted HIs equivalent to 1 (Table H-5.4-37). The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI of 8 (Table H-5.4-37).

#### H-5.4.5.19 SWMU 36-002

The area of SWMU 36-002 is approximately 0.00356 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-38). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 36-002 are less than 1 for all receptors. The plant had an unadjusted HI of 3 and the earthworm had an unadjusted HI of 0.6 (Table H-5.4-39).

#### H-5.4.5.20 SWMU 36-003(a)

The area of SWMU 36-003(a) is approximately 0.0591 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-40). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 36-003(a) are less than 1 for all receptors. The plant had an unadjusted HI of 4 and the earthworm had an unadjusted HI of 0.5 (Table H-5.4-41).

#### H-5.4.5.21 SWMU 36-008

The area of the SWMU 36-008 is approximately 0.452 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-42). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 36-008 are less than 1 for all receptors, except for the robin (all feeding guilds), and deer mouse, which had adjusted HIs of 2, 5, 8, and 2, respectively (Table H-5.4-43). The plant had an unadjusted HI of 9 and the earthworm had an unadjusted HI of 52 (Table H-5.4-43).

#### H-5.4.5.22 SWMU C-36-003

The area of SWMU C-36-003 is approximately 0.0165 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-44). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU C-36-003 are less than 1 for all receptors. The plant had an unadjusted HI of 21 and the earthworm had an unadjusted HI of 24 (Table H-5.4-45).

### H-5.4.6 LOAEL Analysis

Some of these sites has HIs greater than 1 for one or more receptors. To address the HIs and reduce the associated uncertainty, analyses were conducted using ESLs calculated based on a LOAEL rather than an NOAEL. The LOAEL-based ESLs were calculated based on toxicity information in the ECORISK Database, Release 3.3 (LANL 2015, 600921) and are presented in Table H-5.4-44. The analyses address some of the uncertainties and conservativeness of the ESLs used in the initial screening assessments. HI analyses and adjusted HI analyses were conducted using the LOAEL-based ESLs.

### H-5.4.7 Site Discussions

#### H-5.4.7.1 SWMUs 12-001(a) and 12-001(b)

The HIs for SWMUs 12-001(a) and 12-001(b) are greater than 1 for the robin (insectivore), deer mouse, earthworm, and plant, with barium, cobalt, manganese, selenium, vanadium, and RDX being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 2 for the robin (insectivore), approximately 1 for the deer mouse, 0.5 for the earthworm, and 2 for the plant (Table H-5.4-45). The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of less than 1 for the robin (insectivore) and the deer mouse (Table H-5.4-46).

Barium was detected in all 80 samples in the 0.0−5.0 ft depth interval with an EPC of 213 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Manganese was detected in all 80 samples in the 0.0−5.0-ft depth interval with an EPC of 456 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil and Qbt 2,3,4 background concentrations. The plant LOAEL-based ESL for manganese is 1100 mg/kg, which the same as the maximum soil background concentration. Selenium was not detected in any of the 80 samples and the EPC (1.34 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. Vanadium was detected in all 80 samples in the 0.0−5.0-ft depth interval with an EPC of 27.6 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The data indicate the exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is not developed, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.2 SWMU 12-002

The HIs for SWMU 12-002 are equivalent to or greater than 1 for the earthworm and plant, with barium, cobalt, selenium, and vanadium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.06 for the earthworm and 2 for the plant (Table H-5.4-47).

Barium was detected in both samples from the 0.0−5.0-ft depth interval with an EPC of 191 mg/kg, the maximum concentration of two samples. The use of the maximum concentration overestimates the potential risk and is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Selenium was not detected in either sample and the EPC (1.1 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. Vanadium was detected in both samples in the 0.0−5.0 ft-depth interval with an EPC of 27.1 mg/kg, the maximum concentration of two samples. The use of the maximum concentration overestimates the potential risk and is within the range of soil background concentrations. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is not developed, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.3 AOC 12-004(a)

The HI for AOC 12-004(a) is greater than 1 for the plant, with barium, cobalt, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.8 for the plant (Table H-5.4-48).

#### H-5.4.7.4 AOC 12-004(b)

The HIs for AOC 12-004(b) are greater than 1 for the earthworm and plant, with barium, cobalt, selenium, and vanadium being the primary COPECs for the plant and arsenic and barium being the primary COPECs for the earthworm. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.1 for the earthworm and 2 for the plant (Table H-5.4-49).

Barium was detected in all eight samples in the 0.0−5.0-ft depth interval with an EPC of 246 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration (the maximum concentration is also below the maximum soil background concentration). Selenium was detected in four of the eight samples and the EPC (1.1 mg/kg) was the maximum concentration. The use of the maximum concentration overestimates the potential risk and is below the maximum soil background concentration (1.7 mg/kg). Vanadium was detected in all eight samples in the 0.0−5.0-ft depth interval with an EPC of 30.3 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is not developed, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.5 AOC C-12-001

The HI for AOC C-12-001 is greater than 1 for the plant, with barium, cobalt, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI equivalent to 1 (0.97) for the plant (Table H-5.4-50).

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is within an industrially developed area, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.6 AOC C-12-002

The HIs for AOC C-12-002 are equivalent to for the earthworm and greater than 1 for the plant, with barium, cobalt, selenium, and vanadium being the primary COPECs for the plant and barium being the primary COPEC for the earthworm. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.07 for the earthworm and 2 for the plant (Table H-5.4-51).

Barium was detected in all 10 samples in the 0.0−5.0-ft depth interval with an EPC of 223 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Selenium was not detected in any of the 13 samples and the EPC (1.15 mg/kg) is the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. Vanadium was detected in all 10 samples in the 0.0−5.0-ft depth interval with an EPC of 28.2 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is within an industrially developed area, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.7 AOC C-12-003

The HI for AOC C-12-003 is greater than 1 for the plant, with barium, cobalt, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.9 for the plant (Table H-5.4-52).

#### H-5.4.7.8 AOC C-12-004

The HIs for AOC C-12-004 are equivalent to 1 for the earthworm and greater than 1 for the plant, with barium, cobalt, lead, selenium, and vanadium being the primary COPECs for the plant. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.07 for the earthworm and 2 for the plant (Table H-5.4-53).

Barium was detected in all 10 samples in the 0.0−5.0-ft depth interval with an EPC of 214 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Selenium was not detected in any of the 10 samples and the EPC (1.14 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. Vanadium was detected in all 10 samples in the 0.0−5.0-ft depth interval with an EPC of 28.1 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). Field observations indicated the site is within an industrially developed area, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.9 AOC 15-005(c)

The HIs for AOC 15-005(c) are greater than 1 for the earthworm and plant, with barium, cobalt, lead, selenium, and vanadium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.1 for the earthworm and 2 for the plant (Table H-5.4-54).

Barium was detected in all 20 samples in the 0.0−5.0-ft depth interval with an EPC of 205 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Selenium was not detected in any of the 20 samples and the EPC (1.48 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. Vanadium was detected in all 20 samples in the 0.0−5.0-ft depth interval with an EPC of 27.4 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is minimally developed, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.10 SWMU 15-007(c)

The HIs for the SWMU 15-007(c) are equivalent to for the robin (herbivore and omnivore) and greater than 1 for the robin (insectivore), deer mouse, earthworm, and plant, with antimony, lead, selenium, and zinc being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 174 for the robin (herbivore), 221 for the robin (omnivore), 260 for the robin (insectivore), 42 for the deer mouse, 1 for the earthworm, and 18 for the plant (Table H-5.4-55). The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of 0.5 for the robin (herbivore), 0.7 for the robin (omnivore), 0.8 for the robin (insectivore), and 0.7 for the deer mouse (Table H-5.4-56).

The maximum concentrations of antimony (243 mg/kg) and lead (63,700 mg/kg) were reported at location 15-610814 from the 0.0−0.5-ft depth interval. Antimony was detected in two of 47 samples and lead was detected in all 47 samples. The other detected concentration of antimony was 1.76 mg/kg, and the next highest lead concentration was 200 mg/kg. The EPCs without the maximum concentrations are 1.76 mg/kg for antimony and 55.7 mg/kg for lead, which results in HQs of 0.002 and 0.007 for the earthworm and 0.03 and 0.1 for the plant. Therefore, the elevated risks are limited to a small portion of SWMU 15-007(c) and given the area of the SWMU 15-007(c) is approximately 0.0508 ha, the potential for population impacts from elevated antimony and lead is low. Selenium was not detected in any of the 47 samples and the EPC (2.11 mg/kg) was the maximum detection limit. The use of the detection limit as the EPC overestimates the potential exposure to the plant. In addition, there is potential unacceptable risk for human health at this SWMU under the industrial scenario.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is not developed, with habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.11 SWMU 15-007(d)

The HI for SWMU 15-007(d) is greater than 1 for the plant, with selenium being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.3 for the plant (Table H-5.4-57).

#### H-5.4.7.12 SWMU 15-008(b)

The HIs for SWMU 15-008(b) are greater than 1 for the robin (all feeding guilds), shrew, deer mouse, earthworm, and plant, with antimony, barium, beryllium, cadmium, copper, lead, manganese, nickel, selenium, uranium, vanadium, zinc, and Aroclor-1242 being the primary COPECs for one or several receptors. Of these COPECs, only copper and lead are substantially greater background. The HI analysis using LOAEL-based ESLs resulted in HIs of 118 for the robin (herbivore), 156 for the robin (omnivore), 190 for the robin (insectivore), 57 for the shrew, 35 for the deer mouse, 4 for the earthworm, and 13 for the plant (Table H-5.4-58). The adjusted HI analysis of the using LOAEL-based ESLs resulted in HIs of 22 for the robin (herbivore), 29 for the robin (omnivore), 35 for the robin (insectivore), 11 for the shrew, 35 for the deer mouse (Table H-5.4-59). In addition, there is potential unacceptable risk for human health at this SWMU under the industrial scenario.

#### H-5.4.7.13 AOC 15-008(g)

The HI for AOC 15-008(g) is greater than 1 for the plant, with antimony, cobalt, copper, lead, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI equivalent to 1 for the plant (Table H-5.4-60).

Lead was detected in all eight samples in the 0.0−5.0-ft depth interval with an EPC of 309 mg/kg but only the maximum concentration (370 mg/kg) was substantially above background; the only other concentration above the soil BV was 32.7 mg/kg. In addition, AOC 15-008(g) is a small site with an area of 0.00254 ha. Although HR and population area information are not available for plants, it is unlikely that lead at AOC 15-008(g) would have population impacts on plants. Selenium was not detected in any of the eight samples and the EPC (1.28 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

Field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.14 SWMU 15-009(b)

The HIs for SWMU 15-009(b) are greater than 1 for the earthworm and plant, with barium, selenium, uranium, uranium-234, and uranium-238 being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.04 for the earthworm and 3 for the plant (Table H-5.4-61).

Barium was detected in all eight samples in the 0.0−5.0-ft depth interval with an EPC of 94 mg/kg. The EPC is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the EPC and the soil BV and is below the maximum soil background concentration. Selenium was not detected in any of the eight samples and the EPC (1.59 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of a detection limit as the EPC overestimates the potential exposure to the plant. Uranium was detected in all eight samples in the 0.0−5.0-ft depth interval with an EPC of 417 mg/kg. The EPC is heavily influenced by the maximum concentration (615 mg/kg at location 15-610531); the next highest uranium concentration (52 mg/kg) is at the same location as the maximum concentration but in the deeper sample, and the remaining uranium concentrations above BVs are 25% or less than the maximums. Because SWMU 15-009(b) is a small site (0.0165 ha), it is unlikely that the COPECs would have population impacts on plants. The data indicate exposure to COPECs across the site is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). Therefore, the HI does not indicate potential risk to plants.

#### H-5.4.7.15 SWMU 15-009(c)

The HI for SWMU 15-009(c) is greater than 1 for the plant, with selenium being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.4 for the plant (Table H-5.4-62).

#### H-5.4.7.16 SWMU 15-010(b)

The HIs for the SWMU 15-010(b) are equivalent to 1 for the robin (omnivore) and greater than 1 for the robin (insectivore), earthworm, and plant, with mercury, selenium, and di-n-butylphthalate being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 4 for the robin (omnivore), 10 for the robin (insectivore), 0.6 for the earthworm, and 0.2 for the plant (Table H-5.4-63). The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of 0.07 for the robin (omnivore) and 0.2 for the robin (insectivore) (Table H-5.4-64).

#### H-5.4.7.17 AOC 15-014(h)

The HIs for the AOC 15-014(h) are equivalent to 1 for the robin (herbivore) and shrew and greater than 1 for the robin (omnivore and insectivore), deer mouse, earthworm, and plant, with barium, cadmium, cobalt, mercury, selenium, vanadium, Aroclor-1254, benzoic acid, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and di-n-octylphthalate being the primary COPECs for one or several receptors. The HI for the shrew (1.007) has no COPECs with HQs greater than 0.3 and is not evaluated further. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.5 for the robin (herbivore), 4 for the robin (omnivore), 7 for the robin (insectivore), 2 for the deer mouse, 0.8 for the earthworm, and 1 for the plant (Table H-5.4-65). The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of 0.04 for the robin (herbivore), 0.3 for the robin (omnivore), 0.6 for the robin (insectivore), and 0.7 for the deer mouse (Table H-5.4-66).

Barium was detected in all 49 samples in the 0.0−5.0-ft depth interval with an EPC of 142 mg/kg. The EPC, which represents the average exposure concentration, is within the range of soil background concentrations. The plant LOAEL-based ESL for barium is 260 mg/kg, which is similar to the soil BV and is below the maximum soil background concentration. Selenium was not detected in any of the 49 samples and the EPC (1.5 mg/kg) was the maximum detection limit, which is below the maximum soil background concentration (1.7 mg/kg). The use of the detection limit as the EPC overestimates the potential exposure to the plant. The data indicate exposure to COPECs is similar to background and the potential for ecological risk to plants is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is within a former industrially developed area, with habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to plants or other biota.

#### H-5.4.7.18 SWMU 36-002

The HI for SWMU 36-002 is greater than 1 for the plant, with barium and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.7 for the plant (Table H-5.4-67).

#### H-5.4.7.19 SWMU 36-003(a)

The HI for SWMU 35-003(a) is greater than 1 for the plant, with beryllium, nickel, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.6 for the plant (Table H-5.4-68).

#### H-5.4.7.20 SWMU 36-008

The HIs for SWMU 36-008 are greater than 1 for the robin (all feeding guilds), deer mouse, earthworm, and plant, with antimony, barium, copper, mercury, selenium, silver, zinc, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 3 for the robin (herbivore), 18 for the robin (omnivore), 32 for the robin (insectivore), 3 for the deer mouse, 5 for the earthworm, and 1 for the plant (Table H-5.4-69). The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of 0.09 for the robin (herbivore), 0.5 for the robin (omnivore), 0.8 for the robin (insectivore), and 0.5 for the deer mouse (Table H-5.4-70).

Copper was detected in all 107 samples in the 0.0−5.0-ft depth interval with an EPC of 315 mg/kg. The plant LOAEL-based ESL for copper is 490 mg/kg, with only 2 concentrations above the LOAEL-based ESLs. The highest copper concentrations (4870 mg/kg and 2720 mg/kg) were detected at different locations approximately 35 ft apart. Copper concentrations at upgradient and downgradient locations are 2 orders of magnitude less or are not above background. Therefore, the extent of the copper concentrations exceeding the LOAEL-based ESLs is limited to these 2 locations and possibly the area between. Mercury was detected in 104 of 107 samples in the 0.0−5.0-ft depth interval with an EPC of 2.34 mg/kg. The earthworm LOAEL-based ESL for mercury is 0.5 mg/kg, which is only 0.4 mg/kg above the mercury BVs. The highest mercury concentrations (25 mg/kg, 22 mg/kg, 14.8 mg/kg, 10.3 mg/kg, and 2.32 mg/kg) are at three locations (25 mg/kg and 22 mg/kg at location 15-610607; 14.8 mg/kg and

10.3 mg/kg at location 15-610588; and 2.32 mg/kg at location 15-610609). Location 15-610609 is approximately 20 ft downgradient from location 15-610607, and these locations are approximately 60 ft west of location 15-610588. The other mercury concentrations were less than 2 mg/kg with most concentrations being less than 1 mg/kg. The extent of the site potentially impacted by elevated mercury concentrations is limited to only 2 or 3 locations and possibly the area between.

The area in and around SWMU 36-008 encompasses less than 0.5 ha, and only a small fraction of that area contains COPEC concentrations that could potentially impact soil invertebrates and/or plants. Because of the limited area impacted by COPECs, the potential for population effects is highly unlikely. In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). The site is adjacent to an industrially developed area, with habitat present for ecological receptors on the canyon slope. Therefore, the HIs do not indicate potential risks to plants or other biota.

#### H-5.4.7.24 SWMU C-36-003

The HIs for SWMU C-36-003 are greater than 1 for the earthworm and plant, with copper, lead, manganese, mercury, nickel, selenium, and zinc being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the earthworm and an HI of 3 for the plant (Table H-5.4-73). Copper, manganese, mercury, and zinc contributed to the LOAEL-based HI for these receptors.

Copper was detected in all 16 samples in the 0.0−5.0 ft depth interval with an EPC of 936 mg/kg with 6 results above background. The plant LOAEL-based ESL for copper is 490 mg/kg, and 1 out of 16 samples is greater than that level. The four largest results for copper are 2720 mg/kg, 309 mg/kg, 27.8 mg/kg, and 25.2 mg/kg, and no other results were greater than 20 mg/kg. The copper EPC without the maximum concentration is 309 mg/kg, which is less than the copper plant LOAEL-based ESL. The extent of the site that is potentially impacted by elevated copper concentrations is limited to a single location out of 8 locations. Manganese was detected in all 16 samples in the 0.0−5.0 ft depth interval with an EPC of 452 mg/kg with 2 results above background. The plant LOAEL-based ESL for manganese is 1100 mg/kg, and none of the 16 samples are greater than that level. The 3 largest results for manganese are 860 mg/kg, 587 mg/kg, and 576 mg/kg, and no other results were greater than 500 mg/kg. The maximum soil background concentration is 1100 mg/kg, which is greater than the maximum detected concentration. This indicates that the potential for ecological risks to plants from manganese is overestimated. Mercury was detected in 14 of 16 samples in the 0.0−5.0 ft depth interval with an EPC of 0.342 mg/kg with 11 results above background. The invertebrate LOAEL-based ESL for mercury is 0.5 mg/kg, and 2 out of 16 samples are greater than that level. The 3 largest results for mercury are 0.815 mg/kg, 0.582 mg/kg, and 0.461 mg/kg, and no other results were greater than 0.4 mg/kg. The extent of the site that is potentially impacted by elevated mercury concentrations is limited to 1 out of 8 locations. Zinc was detected in all 16 samples in the 0.0−5.0 ft depth interval with an EPC of 490 mg/kg and 8 results above background. The earthworm LOAEL-based ESL for zinc is 930 mg/kg and the plant LOAEL-based ESL for zinc is 810 mg/kg, and 1 out of 16 samples is greater than those levels. The 3 largest results for zinc are 1320 mg/kg, 235 mg/kg, and 89.7 mg/kg, and no other results were greater than 80 mg/kg. The extent of the site that is potentially impacted by elevated zinc concentrations is limited to a single location out of 8 locations.

In addition, AOC C-36-003 is a small site with an area of 0.0165 ha. Although HR and population area information is not available for earthworms and plants, it is unlikely that COPECs at AOC C-36-003 would have population impacts on earthworms and plants. Field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment H-3). Therefore, the HI does not indicate potential risk to plants or other biota.

#### H-5.4.8 Chemicals without ESLs

Several COPECs do not have ESLs for any receptor in version 3.3 of the ECORISK Database (LANL 2015, 600921). In an effort to address this uncertainty and to provide a quantitative assessment of potential ecological risk, several online toxicity databases searches were conducted to determine if any relevant toxicity information is available. The online searches of the following databases were conducted: EPA Ecotox Database, EPA Office of Pesticide Programs Aquatic Life Benchmarks, U.S. Army Corps of Engineers/EPA Environmental Residue-Effects, California Cal/Ecotox Database, Pesticide Action Network Pesticide Database, U.S. Army Wildlife Toxicity Assessment Program, U.S. Department of Agriculture Integrated Pesticide Management Database, American Bird Conservancy Pesticide Toxicity Database, and Oak Ridge National Laboratory Risk Assessment Information System. Some COPECs without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk.

Toxicity data are not available for calcium; iron; magnesium; nitrate; perchlorate; Aroclor-1268; bromodichloromethane; chlorodibromomethane; chloromethane; 2-chloronaphthalene; 4-chlorotoluene; ethylbenzene; 4-isopropyltoluene; TATB; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. For calcium, iron, magnesium, nitrate, perchlorate, bromodichloromethane, chlorodibromomethane, and chloromethane no surrogate or other toxicity information is available. For the other COPECs, surrogates are used based on structural similarity to evaluate the potential toxicity.

Calcium was identified as a COPC from 0.0−5.0 ft at 13 sites with maximum concentrations ranging from 1570 mg/kg to 27,600 mg/kg. As presented in Table H-4.4-1, concentrations of calcium are substantially less than the NMED essential nutrient SSLs. Calcium is eliminated as a COPEC.

Iron was identified as a COPC from 0.0−5.0 ft at seven sites with maximum concentrations ranging from 16,000 mg/kg to 22,300 mg/kg. The concentrations are below or similar to the maximum Qbt 2,3,4 background concentration (19,500 mg/kg) and below the maximum soil background concentration (36,000 mg/kg). The maximum iron concentration is also approximately one-third the NMED residential SSL (54,800 mg/kg). Iron is eliminated as a COPEC.

Magnesium was identified as a COPC from 0.0−5.0 ft at four sites with maximum concentrations ranging from 1730 mg/kg to 2800 mg/kg. As presented in Table H-4.4-1, concentrations of magnesium are substantially less than the NMED essential nutrient SSLs. Magnesium is eliminated as a COPEC.

Nitrate was identified as a COPC from 0.0−5.0 ft at eight sites with maximum concentrations ranging from 1.57 mg/kg to 540 mg/kg. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because nitrate is infrequently detected at elevated concentrations and the potential very low toxicity, nitrate is eliminated as a COPEC.

Perchlorate was identified as a COPC from 0.0−5.0 ft at 23 sites with concentrations ranging from 0.000533 mg/kg to 0.668 mg/kg. After the original preparation of this report in 2015, the LANL ECORISK Database was updated to include soil ESLs for perchlorate (LANL 2017, 602538). The minimum ESL and LOAEL-based ESL for perchlorate in the ECORISK Database Version 4.1 are 0.12 mg/kg and 0.24 mg/kg, respectively, and the receptor is the robin (herbivore diet). Only one perchlorate result is greater than the LOAEL-based ESL at SWMUs C-36-003 and 36-008. The EPC for perchlorate is 0.256 mg/kg at SWMU C-36-003 or slightly greater than the LOAEL-based ESL. The SWMU C-36-003 area is 0.0165 ha compared with a population area of 16.8 for the robin. The EPC for perchlorate is 0.0438 mg/kg at SWMU 36-008 or less than the ESL. The SWMU 36-008 area is 0.452 ha compared with a population area of 16.8 for the robin. Risks to the robin from perchlorate and adjusted by the population area are not likely (adjusted robin HQ at SWMU C-36-003 would be 0.002 and adjusted robin HQ at

SWMU 36-008 would be 0.01). Because of the potential low ecological risk resulting from use of the ECORISK Database Version 4.1 ESLs and LOAEL-based ESLs, perchlorate is eliminated as a COPEC.

Aroclor-1268 was identified as a COPC from 0.0−5.0 ft at one site at a concentration of 0.0205 mg/kg. The minimum ESL for Aroclor-1260 (0.88 mg/kg for the robin insectivore) is used to screen Aroclor-1268 and results in a maximum HQ of 0.02. Because the maximum HQ is less than 0.3, Aroclor-1268 is eliminated as a COPEC.

Bromodichloromethane was identified as a COPC from 0.0−5.0 ft at two sites at a maximum concentration of 0.00117 mg/kg. The NMED residential SSL for bromodichloromethane is 6.19 mg/kg, indicating that potential toxicity is low. Because bromodichloromethane is infrequently detected and the potential toxicity is low, bromodichloromethane is eliminated as a COPEC.

Chlorodibromomethane was identified as a COPC from 0.0−5.0 ft at two sites at a maximum concentration of 0.000635 mg/kg. The NMED residential SSL for chlorodibromomethane is 13.9 mg/kg, indicating that potential toxicity is low. Because chlorodibromomethane is infrequently detected and the potential toxicity is low, chlorodibromomethane is eliminated as a COPEC.

Chloromethane was identified as a COPC from 0.0−5.0 ft at one site at a concentration of 0.000633 mg/kg. The NMED residential SSL for chloromethane is 6260 mg/kg, indicating that potential toxicity is very low. Because chloromethane is infrequently detected and the potential toxicity is very low, chloromethane is eliminated as a COPEC.

Chloronaphthalene[2-] was identified as a COPC from 0.0−5.0 ft at one site at a concentration of 0.0215 mg/kg. The minimum ESL for naphthalene (1 mg/kg for the plant) is used to screen the 2-chloronaphthalene concentration and results in a maximum HQ of 0.02. Because the maximum HQ is less than 0.3, 2-chloronaphthalene is eliminated as a COPEC.

Chlorotoluene[4-] was identified as a COPC from 0.0−5.0 ft at one site at a concentration of 0.000496 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen 4-chlorotoluene and results in a maximum HQ of 0.00002. Because the maximum HQ is less than 0.3, 4-chlorotoluene is eliminated as a COPEC.

Ethylbenzene was identified as a COPC from 0.0−5.0 ft at two sites with concentrations ranging from 0.000395 mg/kg to 0.00076 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the ethylbenzene concentrations and results in a maximum HQ of 0.00003. Because the maximum HQ is less than 0.3, ethylbenzene is eliminated as a COPEC.

Isopropyltoluene[4-] was identified as a COPC from 0.0−5.0 ft at eight sites with concentrations ranging from 0.000343 mg/kg to 0.0893 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen 4-isopropyltoluene and results in a maximum HQ of 0.004. Because the maximum HQ is less than 0.3, 4-isopropyltoluene is eliminated as a COPEC.

TATB was identified as a COPC from 0.0−5.0 ft at nine sites with concentrations ranging from 0.303 mg/kg to 28.6 mg/kg. The minimum ESL for 1,3,5-trinitrobenzene (10 mg/kg for the earthworm) is used to screen TATB and results in a maximum HQ of approximately 3. The earthworm LOAEL-based ESL for 1,3,5-trinitrobenzene is 28 mg/kg and results in an HQ of approximately 1 using the overall maximum concentration. The potential risk to the earthworm is overestimated by the maximum concentration. TATB is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was identified as a COPC from 0.0−5.0 ft at six sites with concentrations ranging from 0.000343 mg/kg to 0.00499 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen 1,2,4-trimethylbenzene and results in a maximum HQ of 0.0002. Because the maximum HQ is less than 0.3, 1,2,4-trimethylbenzene is eliminated as a COPEC.

Trimethylbenzene[1,3,5-] was identified as a COPC from 0.0−5.0 ft at one site with a maximum concentration of 0.00569 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen 1,3,5-trimethylbenzene and results in a maximum HQ of 0.0002. Because the maximum HQ is less than 0.3, 1,3,5-trimethylbenzene is eliminated as a COPEC.

Xylene[1,2-] was identified as a COPC from 0.0−5.0 ft at three sites with concentrations ranging from 0.000349 mg/kg to 0.000616 mg/kg. The minimum ESL for total xylene (1.4 mg/kg for the shrew) is used to screen the 1,2-xylene concentrations and results in a maximum HQ of 0.0004. Because the maximum HQ is less than 0.3, 1,2-xylene is eliminated as a COPEC.

Xylene[1,3-]+1,4-xylene was identified as a COPC from 0.0−5.0 ft at seven sites with concentrations ranging from 0.000369 mg/kg to 0.00114 mg/kg. The minimum ESL for total xylene (1.4 mg/kg for the shrew) is used to screen the 1,3-xylene+1,4-xylene concentrations and results in a maximum HQ of 0.0008. Because the maximum HQ is less than 0.3, 1,3-xylene+1,4-xylene is eliminated as a COPEC.

### H-5.5 Interpretation of Ecological Risk Screening Results

#### H-5.5.1 Receptor Lines of Evidence

Based on the ecological risk-screening assessments, several COPECs (including COPECs without an ESL) were identified for the Threemile Canyon Aggregate Area sites. Receptors were evaluated using several lines of evidence: minimum ESL comparisons, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of EPCs and detection limits to background concentrations.

**Plant**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the plant, were less than 0.3.
- The HIs were greater than 1 for the plant at all sites, except at AOCs C-12-005 and C-14-006.
- The HI analyses using the LOAEL-based ESLs resulted in HIs less than or equivalent to 1 for all sites, except for SWMUs 12-001(a) and 12-001(b), 12-002, 15-007(c), 15-008(b), 15-009(b), and 15-009(h) and AOCs 12-004(b), and 15-005(c).
- Field observations made during the site visits found no indication of adverse effects on the plant community from COPECs. In addition, many of the areas in and/or around the TA-15 and TA-36 sites are industrially developed with structures, roads, and other paved areas and do not provide good quality habitat.
- As discussed in section H-5.4.7, the potential risks to the plant are overestimated and/or are not representative of most sites.
- The potential risks to the plants are limited to a small portion of SWMU 15-007(c) and given the area is approximately 0.0508 ha, the potential for population impacts is low. There is the potential for adverse effects to the plants at SWMU 15-008(b).

These lines of evidence support the conclusion no potential ecological risk to the plants exists at the Threemile Canyon Aggregate Area, except potentially at SWMU 15-008(b).

**Earthworm (Invertebrate)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the earthworm, were less than 0.3.
- The HIs were greater than or equivalent to 1 for the earthworm at all sites, except at SWMUs 15-007(d), 15-009(c), 15-009(h), and 36-002 and AOCs 12-004(a), C-12-001, C-12-003, C-12-005, C-14-006, and 15-008(g).
- The HI analyses using the LOAEL-based ESLs resulted in HIs less than or equivalent to 1 for all sites, except SWMUs 15-008(b), 36-008, and C-36-003.
- As discussed in section H-5.4.7.20, the potential risks to the earthworm are overestimated and/or not representative.
- There is the potential for adverse effects to the earthworm at SWMU 15-008(b).

These lines of evidence support the conclusion no potential ecological risk to the earthworm exists at the Threemile Canyon Aggregate Area, except potentially at SWMU 15-008(b).

**Montane Shrew (Insectivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the shrew, were less than 0.3.
- The HIs were greater than 1 for the shrew at all sites, except at AOC C-14-006 and SWMU 15-009(h), which had HIs less than 1.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the shrew's population area. The adjusted HIs were less than or equivalent to 1 for all sites, except for SWMU 15-008(b).
- The LOAEL-based ESL analyses adjusted by the PAUF resulted in HIs less than 1, except for SWMU 15-008(b).

These lines of evidence support the conclusion that no potential ecological risk to the montane shrew exists at the Threemile Canyon Aggregate Area, except potentially at SWMU 15-008(b).

**Deer Mouse (Omnivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the deer mouse, were less than 0.3.
- The HIs were greater than 1 for the deer mouse at all sites, except at AOC C-14-006 and SWMU 15-009(h), which had HIs less than 1.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the deer mouse's population area. The adjusted HIs were less than 1 at all sites, except at SWMUs 12-001(a) and 12-001(b), 15-007(c), 15-008(b), and 36-008 and AOC 15-014(h), which had HIs greater than 1.
- The LOAEL-based ESL analyses adjusted by the PAUF resulted in HIs less than 1, except for SWMU 15-008(b).

- These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists at the Threemile Canyon Aggregate Area, except potentially at SWMU 15-008(b).

**Desert Cottontail (Herbivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the cottontail, were less than 0.3.
- The HIs were equivalent to or greater than 1 for the cottontail at all sites except at SWMUs 15-007(d), 15-009(c), 15-009(h), and 36-002 and AOCs 12-004(a), 12-004(b), C-12-001, and C-14-006.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the cottontail's population area. The adjusted HIs were less than 1 for all sites.

These lines of evidence support the conclusion that no potential ecological risk to the cottontail exists at the Threemile Canyon Aggregate Area.

**Red Fox (Carnivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the fox, were less than 0.3.
- The HIs were greater than or equivalent to 1 for the red fox at SWMUs 15-007(c) and 15-008(b).
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the red fox's population area. The adjusted HIs were less than 1 for all sites.

These lines of evidence support the conclusion that no potential ecological risk to the red fox exists at the Threemile Canyon Aggregate Area.

**Robin (All Feeding Guilds)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the robin, were less than 0.3.
- The HIs were greater than or equivalent to 1 for the robin (all feeding guilds) at all sites, except at AOC C-14-006 and SWMU 15-009(h), which had HIs less than 1.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the robin's population area. The adjusted HIs were less than 1 at all sites, except at SWMUs 15-007(c), 15-008(b), 15-010(b), and 36-008 and AOC 15-014(h), which had HIs greater than 1. The adjusted HI for the robin (insectivore) was equivalent to 1 at SWMUs 12-001(a) and 12-001(b).
- The LOAEL-based ESL analyses adjusted by the PAUFs resulted in HIs less than 1, except for SWMU 15-008(b).

These lines of evidence support the conclusion that no potential ecological risk to the robin (all feeding guilds) exists at the Threemile Canyon Aggregate Area, except potentially at SWMU 15-008(b).

**Kestrel (Intermediate Carnivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the kestrel (intermediate carnivore), were less than 0.3.
- The HIs were greater than or equivalent to 1 for the kestrel (intermediate carnivore) at all sites, except at SWMUs 15-007(d), 15-009(h), 36-002, and 36-003(a) and AOCs C-12-003, C-12-005, and C-14-006, which had HIs less than 1.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel's population area. The adjusted HIs were less than 1 for all sites.

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (intermediate carnivore) exists at the Threemile Canyon Aggregate Area.

**Kestrel (Top Carnivore)**

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the kestrel (top carnivore), were less than 0.3.
- The HIs were less than 1 for the kestrel (top carnivore) at all sites, except at SWMUs 15-007(c), 15-008(b), 15-009(b), 15-009(c), 15-010(b), and 36-008, and C-36-003 and AOC 15-014(h), which had HIs greater than 1.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel's population area. The adjusted HIs were less than 1 for all sites.
- The kestrel (top carnivore) is a surrogate for the Mexican spotted owl. The HIs were adjusted by the Mexican spotted owl AUFs. The adjusted HIs were less than 1 at all sites.

These lines of evidence support the conclusion that no potential ecological risks to the kestrel (top carnivore) and the Mexican spotted owl exist at the Threemile Canyon Aggregate Area.

### H-5.5.2 COPECs with No ESLs

COPECs without ESLs were eliminated based on comparisons to surrogate ESLs or human health SSLs. The analysis of COPECs without ESLs supports the conclusion that no potential ecological risk to receptors exists at the Threemile Canyon Aggregate Area sites, except at SWMU 15-008(b).

### H-5.5.3 Summary

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist for the Threemile Canyon Aggregate Area sites. There is the potential for adverse effects to several receptors from copper and lead at SWMU 15-008(b).

# H-6.0 CONCLUSIONS

## H-6.1 Human Health Risk

SWMUs 15-007(d), 15-009(h), and 36-002 were not evaluated for the industrial scenario because no samples were collected from the 0.0–1.0 ft depth interval. The total excess cancer risks for the industrial scenario at the other SWMUs/AOCs were less than the $1 \times 10^{-5}$ target risk level. The HIs were less than or equivalent to the target level of 1 at all SWMUs/AOCs, except at SWMUs 15-007(c) and 15-008(b). The potential unacceptable noncancer risks at these two SWMUs under the industrial scenario were from lead.

The recreational scenario was applicable at SWMUs 12-001(a) and 12-001(b), SWMU 12-002, and AOC C-12-005. There were no potential unacceptable risks or doses for these sites under the recreational scenario. The total excess cancer risks were less than the $1 \times 10^{-5}$ target risk level and the HIs were less than 1.

Most of the SWMUs/AOCs had total excess cancer risks and HIs below or equivalent to the target risk levels under the residential scenario. Three sites had HIs above 1 under the residential scenario; SWMU 15-007(c) (lead and antimony), SWMU 15-008(b) (lead), and SWMU 15-009(b) (uranium).

For SWMUs/AOCs not posing an unacceptable residential risk or dose, the residential scenario was also protective of construction workers, except for potential noncarcinogenic risk at SWMUs 12-001(a) and 12-001(b) and SWMU C-36-003, where manganese was a COPC. Noncarcinogenic construction worker risk was evaluated for SWMUs 12-001(a) and 12-001(b) and SWMU C-36-003, and HIs were equivalent to or below the target level of 1.

The total doses were below the target dose limit of 25 mrem/yr as authorized by DOE Order 458.1 for the industrial, recreational, and residential scenarios at all but one SWMU. The residential total dose was greater than the target dose limit at SWMU 15-009(b) from isotopic uranium. The total doses were equivalent to total risks ranging from $4 \times 10^{-9}$ to $3 \times 10^{-4}$ for the industrial scenario, $3 \times 10^{-7}$ for the recreational scenario, and from $1 \times 10^{-8}$ to $6 \times 10^{-4}$ for the residential scenario, based on conversion from dose using RESRAD Version 7.0.

Sites at former TA-12, TA-14, TA-15, and TA-36 are not accessible by the public and are not planned for release by DOE in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time.

## H-6.2 Ecological Risk

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at most of the Threemile Canyon Aggregate Area sites. There is the potential for adverse effects to the robin, shrew, deer mouse, earthworm, and plant at SWMU 15-008(b).

## H-7.0 REFERENCES

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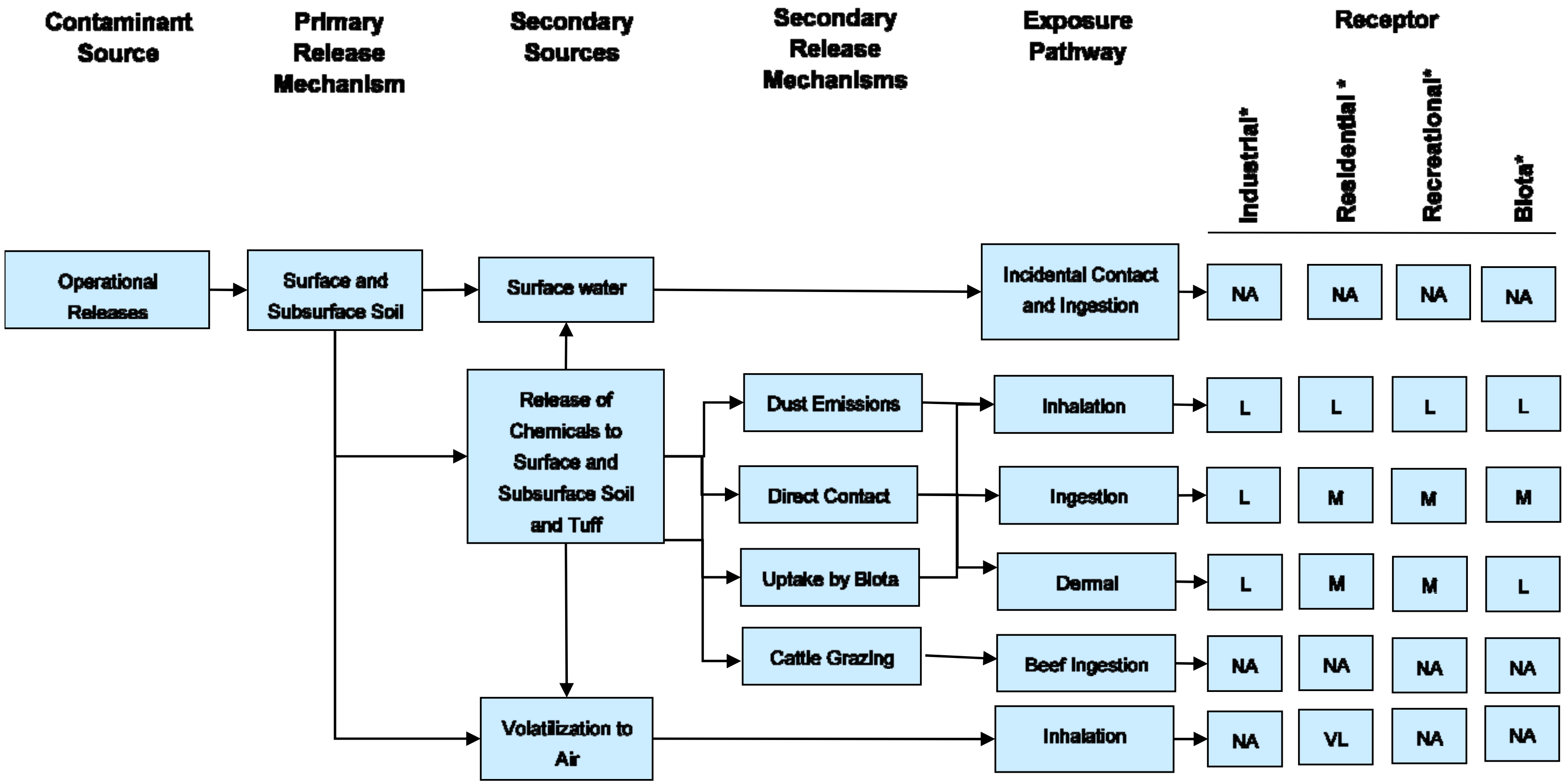


Very Low (VL), Low (L), and Moderate (M) designations indicate the pathway is a potentially complete pathway and is evaluated in the risk assessments.
Not Applicable (NA) indicates the pathway is incomplete and is not evaluated in the risk assessments.

**Figure H-3.1-1 Conceptual site model for the Threemile Canyon Aggregate Area**

## Table H-2.3-1
## EPCs at SWMUs 12-001(a) and 12-001(b) for the Industrial and Recreational Scenarios

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 41 | 0 | 0.433 (U) | 1.45 (U) | n/a* | 1.45 (U) | Maximum detection limit |
| Barium | 41 | 41 | 19.6 | 503 | Nonparametric | 226 | 95% Chebyshev (Mean, Sd) |
| Chromium (Total) | 41 | 41 | 2.33 | 74.3 | Gamma | 25.3 | 95% Adjusted Gamma |
| Cobalt | 41 | 41 | 0.888 | 17.3 | Nonparametric | 7.02 | 95% Chebyshev (Mean, Sd) |
| Copper | 41 | 41 | 2.12 | 29 | Gamma | 9.61 | 95% Adjusted Gamma |
| Manganese | 41 | 41 | 145 | 802 | Normal | 422 | 95% Student's-t |
| Perchlorate | 41 | 8 | 0.000621 | 0.00271 (U) | Normal | 0.00125 | 95% KM (t) |
| Selenium | 41 | 0 | 1.05 (UJ) | 1.34 (U) | n/a | 1.34 (U) | Maximum detection limit |
| Uranium | 41 | 41 | 0.798 | 19.1 | Lognormal | 5.59 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Amino-2,6-dinitrotoluene[4-] | 41 | 1 | 0.127 | 0.5 (U) | n/a | 0.127 | Maximum detected concentration |
| HMX | 41 | 3 | 0.173 | 11.4 | n/a | 11.4 | Maximum detected concentration |
| PETN | 41 | 1 | 1 (U) | 5.82 | n/a | 5.82 | Maximum detected concentration |
| RDX | 41 | 5 | 0.113 | 49.4 | Nonparametric | 7.16 | 95% KM Chebyshev |
| Tetryl | 41 | 1 | 0.333 | 0.5 (UJ) | n/a | 0.333 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Plutonium-239/240 | 41 | 6 | -0.00425 (U) | 0.0682 | Normal | 0.0082 | 95% KM (t) |
| Uranium-234 | 41 | 41 | 0.593 | 4.15 | Gamma | 1.86 | 95% Adjusted Gamma |
| Uranium-238 | 41 | 41 | 0.743 | 4.47 | Lognormal | 2.15 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-2**
**EPCs at SWMUs 12-001(a) and 12-001(b) for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Inorganic Chemicals (mg/kg) | | | | | | | |
| Aluminum | 80 | 80 | 2230 | 23,200 | Normal | 11,900 | 95% Student's-t |
| Antimony | 80 | 1 | 0.372 (U) | 1.45 (U) | n/a* | 1.15 | Maximum detected concentration |
| Barium | 80 | 80 | 19.6 | 503 | Nonparametric | 213 | 95% Chebyshev (Mean, Sd) |
| Chromium (Total) | 80 | 80 | 2.33 | 74.3 | Nonparametric | 24.6 | 95% Chebyshev (Mean, Sd) |
| Cobalt | 80 | 80 | 0.801 | 22.8 | Nonparametric | 7.1 | 95% Chebyshev (Mean, Sd) |
| Copper | 80 | 80 | 1.87 | 29 | Nonparametric | 8.09 | 95% Student's-t |
| Iron | 80 | 80 | 7800 | 22,100 | Nonparametric | 13,900 | 95% Student's-t |
| Manganese | 80 | 80 | 145 | 2150 | Nonparametric | 456 | 95% Student's-t |
| Nickel | 80 | 80 | 1.76 | 12.1 | Nonparametric | 7.67 | 95% Student's-t |
| Perchlorate | 80 | 13 | 0.000546 | 0.00271 (U) | Lognormal | 0.001 | 95% KM (t) |
| Selenium | 80 | 0 | 0.979 (U) | 1.34 (U) | n/a | 1.34 (U) | Maximum detection limit |
| Uranium | 80 | 80 | 0.397 | 19.1 | Nonparametric | 3.52 | 95% Chebyshev (Mean, Sd) |
| Vanadium | 80 | 80 | 5.29 | 35.4 | Nonparametric | 27.6 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Amino-2,6-dinitrotoluene[4-] | 80 | 1 | 0.127 | 0.5 (U) | n/a | 0.127 | Maximum detected concentration |
| HMX | 80 | 6 | 0.173 | 11.4 | Gamma | 0.749 | 95% KM (t) |
| PETN | 80 | 1 | 1 (U) | 5.82 | n/a | 5.82 | Maximum detected concentration |
| RDX | 80 | 8 | 0.113 | 49.4 | Nonparametric | 3.73 | 95% KM (Chebyshev) |
| Tetryl | 80 | 1 | 0.333 | 0.5 (UJ) | n/a | 0.333 | Maximum detected concentration |
| Radionuclides (pCi/g) | | | | | | | |
| Cesium-137 | 79 | 38 | −0.0517 (U) | 0.838 | Nonparametric | 0.234 | 95% KM Chebyshev |
| Plutonium-239/240 | 80 | 7 | −0.0056 (U) | 0.0682 | Normal | 0.00149 | 95% KM (t) |
| Uranium-234 | 80 | 80 | 0.391 | 4.15 | Lognormal | 1.45 | 95% Student's-t |
| Uranium-238 | 80 | 80 | 0.326 | 4.47 | Lognormal | 1.65 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-3**
**EPCs at SWMU 12-002 for the Industrial and Recreational Scenarios**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 1 | 0 | 1.03 (U) | 1.03 (U) | n/a* | 1.03 (U) | Maximum detection limit |
| Barium | 1 | 1 | 74.3 | 74.3 | n/a | 74.3 | Maximum detected concentration |
| Cobalt | 1 | 1 | 13.4 | 13.4 | n/a | 13.4 | Maximum detected concentration |
| Copper | 1 | 1 | 7.83 | 7.83 | n/a | 7.83 | Maximum detected concentration |
| Selenium | 1 | 0 | 1.06 (U) | 1.06 (U) | n/a | 1.06 (U) | Maximum detection limit |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-4**
**EPCs at SWMU 12-002 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 2 | 2 | 6010 | 14,200 | n/a* | 14,200 | Maximum detected concentration |
| Antimony | 2 | 0 | 0.369 (U) | 1.03 (U) | n/a | 1.03 (U) | Maximum detection limit |
| Barium | 2 | 2 | 74.3 | 191 | n/a | 191 | Maximum detected concentration |
| Chromium (Total) | 2 | 2 | 6.97 | 13.5 | n/a | 13.5 | Maximum detected concentration |
| Cobalt | 2 | 2 | 13.4 | 14.2 | n/a | 14.2 | Maximum detected concentration |
| Copper | 2 | 2 | 7.83 | 11.1 | n/a | 11.1 | Maximum detected concentration |
| Iron | 2 | 2 | 13,700 | 18,900 | n/a | 18,900 | Maximum detected concentration |
| Nickel | 2 | 2 | 5.07 | 9.28 | n/a | 9.28 | Maximum detected concentration |
| Selenium | 2 | 0 | 1.06 (U) | 1.1 (U) | n/a | 1.1 (U) | Maximum detection limit |
| Vanadium | 2 | 2 | 12.5 | 27.1 | n/a | 27.1 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-5**
**EPCs at AOC 12-004(a) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 16 | 4 | 0.364 | 1.36 | n/a* | 1.36 | Maximum detected concentration |
| Barium | 16 | 16 | 18.9 | 211 | Normal | 100 | 95% Student's-t |
| Chromium (Total) | 16 | 16 | 1.98 | 60.4 | Normal | 24.9 | 95% Student's-t |
| Cobalt | 16 | 16 | 0.76 | 8.12 | Normal | 4.43 | 95% Student's-t |
| Copper | 16 | 16 | 2.3 | 8.83 | Normal | 6.34 | 95% Student's-t |
| Perchlorate | 16 | 1 | 0.00078 | 0.00255 (U) | n/a | 0.00078 | Maximum detected concentration |
| Selenium | 16 | 0 | 1.08 (UJ) | 1.26 (U) | n/a | 1.26 (U) | Maximum detection limit |
| Uranium | 16 | 16 | 0.709 | 7.12 | Normal | 3.74 | 95% Student's-t |
| Vanadium | 16 | 16 | 4.47 | 30.3 | Normal | 17.2 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Benzoic acid | 16 | 1 | 0.608 | 0.877 (U) | n/a | 0.608 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 16 | 13 | −0.0229 (U) | 0.971 | Normal | 0.468 | 95% KM (t) |
| Uranium-234 | 16 | 16 | 0.859 | 3.81 | Normal | 1.82 | 95% Student's-t |
| Uranium-235/236 | 16 | 8 | 0.0389 (U) | 0.253 | Normal | 0.124 | 95% KM (t) |
| Uranium-238 | 16 | 16 | 0.923 | 6.81 | Normal | 2.92 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

## Table H-2.3-6
## EPCs at AOC 12-004(a) for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 31 | 31 | 1600 | 18,300 | Normal | 6410 | 95% Student's-t |
| Antimony | 31 | 8 | 0.364 | 1.36 | Lognormal | 0.677 | 95% KM (t) |
| Arsenic | 31 | 31 | 0.451 | 3.14 | Normal | 1.83 | 95% Student's-t |
| Barium | 31 | 31 | 10.4 | 214 | Gamma | 88.5 | 95% Adjusted Gamma |
| Chromium (Total) | 31 | 31 | 1.98 | 60.4 | Gamma | 22.1 | 95% Adjusted Gamma |
| Cobalt | 31 | 31 | 0.399 | 8.12 | Gamma | 3.98 | 95% Adjusted Gamma |
| Copper | 31 | 31 | 1.76 | 8.83 | Normal | 5.31 | 95% Student's-t |
| Nickel | 31 | 31 | 0.837 | 12 | Normal | 5.98 | 95% Student's-t |
| Perchlorate | 31 | 2 | 0.000553 | 0.00255 (U) | n/a* | 0.00078 | Maximum detected concentration |
| Selenium | 31 | 0 | 0.996 (U) | 1.26 (U) | n/a | 1.26 (U) | Maximum detection limit |
| Uranium | 31 | 31 | 0.385 | 7.12 | Gamma | 2.64 | 95% Adjusted Gamma |
| Vanadium | 31 | 31 | 2.7 | 30.3 | Normal | 13.8 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Benzoic acid | 31 | 1 | 0.608 | 0.877 (U) | n/a | 0.608 | Maximum detected concentration |
| Di-n-butylphthalate | 31 | 1 | 0.121 | 0.438 (U) | n/a | 0.121 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 31 | 17 | −0.0388 (U) | 0.971 | Normal | 0.263 | 95% KM (t) |
| Uranium-234 | 31 | 31 | 0.705 | 3.81 | Lognormal | 1.44 | 95% Student's-t |
| Uranium-235/236 | 31 | 16 | 0.0302 (U) | 0.253 | Normal | 0.0956 | 95% KM (t) |
| Uranium-238 | 31 | 31 | 0.709 | 6.81 | Nonparametric | 2.79 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

## Table H-2.3-7
## EPCs at AOC 12-004(b) for the Industrial Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 4 | 0 | 0.21 (U) | 1.05 (U) | n/a* | 1.05 (U) | Maximum detection limit |
| Cobalt | 4 | 4 | 5.12 | 9.62 | n/a | 9.62 | Maximum detected concentration |
| Lead | 4 | 4 | 11.2 | 23.4 | n/a | 23.4 | Maximum detected concentration |
| Uranium | 4 | 4 | 1.5 | 5.8 | n/a | 5.8 | Maximum detected concentration |
| Vanadium | 4 | 4 | 20 | 47.5 | n/a | 47.5 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 2 | 1 | 0.00366 (U) | 0.015 | n/a | 0.015 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

**Table H-2.3-8**
**EPCs at AOC 12-004(b) for the Residential Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 12 | 12 | 1580 | 16,400 | Normal | 10,700 | 95% Student's-t |
| Antimony | 12 | 1 | 0.094 (U) | 1.05 (U) | n/a* | 0.373 | Maximum detected concentration |
| Arsenic | 12 | 12 | 0.772 | 3.8 | Normal | 2.74 | 95% Student's-t |
| Barium | 12 | 12 | 22.9 | 406 | Normal | 188 | 95% Student's-t |
| Chromium (Total) | 12 | 12 | 2.42 | 21.3 | Normal | 13.7 | 95% Student's-t |
| Cobalt | 12 | 12 | 1.1 | 9.62 | Normal | 6.79 | 95% Student's-t |
| Copper | 12 | 12 | 2.14 | 18 | Normal | 10.4 | 95% Student's-t |
| Lead | 12 | 11 | 3 | 23.4 | Normal | 15.2 | 95% KM (t) |
| Nickel | 12 | 12 | 2.35 | 13.9 | Normal | 8.44 | 95% Student's-t |
| Perchlorate | 12 | 1 | 0.000832 | 0.006 (U) | n/a | 0.000832 | Maximum detected concentration |
| Selenium | 12 | 6 | 0.69 | 1.3 | Normal | 1.03 | 95% KM (t) |
| Uranium | 12 | 12 | 0.42 | 5.8 | Lognormal | 2.57 | 95% BCA Bootstrap |
| Vanadium | 12 | 12 | 3.62 | 47.5 | Gamma | 29.2 | 95% Adjusted Gamma |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 6 | 1 | 0.00342 (U) | 0.04 (U) | n/a | 0.015 | Maximum detected concentration |
| Aroclor-1260 | 6 | 1 | 0.00342 (U) | 0.039 (U) | n/a | 0.011 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-9**
**EPCs at AOC 12-004(b) for Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 8 | 1 | 0.21 (U) | 1.05 (U) | n/a* | 0.373 | Maximum detected concentration |
| Arsenic | 8 | 8 | 1.76 | 3.5 | Normal | 2.92 | 95% Student's-t |
| Barium | 8 | 8 | 113 | 406 | Normal | 246 | 95% Student's-t |
| Chromium (Total) | 8 | 8 | 7.7 | 18.7 | Normal | 13.3 | 95% Student's-t |
| Cobalt | 8 | 8 | 5.12 | 9.62 | Normal | 7.49 | 95% Student's-t |
| Copper | 8 | 8 | 4.12 | 12.1 | Normal | 9.38 | 95% Student's-t |
| Lead | 8 | 8 | 7.83 | 23.4 | Normal | 18.5 | 95% Student's-t |
| Nickel | 8 | 8 | 4.94 | 8.5 | Normal | 7.82 | 95% Student's-t |
| Selenium | 8 | 4 | 0.69 | 1.1 | n/a | 1.1 | Maximum detected concentration |
| Uranium | 8 | 8 | 0.42 | 5.8 | Normal | 2.97 | 95% Student's-t |
| Vanadium | 8 | 8 | 12.7 | 47.5 | Lognormal | 30.3 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 4 | 1 | 0.00366 (U) | 0.039 (U) | n/a | 0.015 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Plutonium-238 | 8 | 1 | −0.00124 (U) | 0.043 | n/a | 0.043 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-10**
**EPCs at AOC C-12-001 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentratio n | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 0 | 1.08 (U) | 1.25 (U) | n/a* | 1.25 (U) | Maximum detection limit |
| Uranium | 5 | 5 | 1.29 | 4.07 | n/a | 4.07 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 2 | 1 | 0.00375 (U) | 0.114 | n/a | 0.114 | Maximum detected concentration |
| Aroclor-1254 | 2 | 1 | 0.00375 (U) | 0.109 | n/a | 0.109 | Maximum detected concentration |
| Aroclor-1260 | 2 | 1 | 0.00375 (U) | 0.0477 | n/a | 0.0477 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-11**
**EPCs at AOC C-12-001 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 10 | 10 | 7200 | 11,500 | Normal | 9750 | 95% Student's-t |
| Antimony | 10 | 1 | 0.426 | 1.25 (U) | n/a* | 0.426 | Maximum detected concentration |
| Barium | 10 | 10 | 66.8 | 161 | Normal | 132 | 95% Student's-t |
| Chromium (Total) | 10 | 10 | 6.73 | 27 | Gamma | 16.3 | 95% Adjusted Gamma |
| Cobalt | 10 | 10 | 2.46 | 6.26 | Normal | 4.97 | 95% Student's-t |
| Nickel | 10 | 10 | 5.23 | 9.28 | Normal | 7.75 | 95% Student's-t |
| Perchlorate | 10 | 2 | 0.000754 | 0.00252 (U) | n/a | 0.00241 | Maximum detected concentration |
| Selenium | 10 | 0 | 1.03 (U) | 1.26 (U) | n/a | 1.26 (U) | Maximum detection limit |
| Uranium | 10 | 10 | 0.398 | 4.07 | Normal | 1.96 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 4 | 1 | 0.00358 (U) | 0.114 | n/a | 0.114 | Maximum detected concentration |
| Aroclor-1254 | 4 | 1 | 0.00358 (U) | 0.109 | n/a | 0.109 | Maximum detected concentration |
| Aroclor-1260 | 4 | 1 | 0.00358 (U) | 0.0477 | n/a | 0.0477 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-12**
**EPCs at AOC C-12-002 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 0 | 1.03 (U) | 1.11 (U) | n/a* | 1.11 (U) | Maximum detection limit |
| Cobalt | 5 | 5 | 4.66 | 12.1 | n/a | 12.1 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-13**
**EPCs at AOC C-12-002 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 10 | 10 | 6790 | 12,800 | Normal | 11,100 | 95% Student's-t |
| Antimony | 10 | 0 | 1.03 (U) | 1.11 (U) | n/a* | 1.11 (U) | Maximum detection limit |
| Barium | 10 | 10 | 95.5 | 275 | Normal | 223 | 95% Student's-t |
| Chromium (Total) | 10 | 10 | 8.79 | 23 | Normal | 15 | 95% Student's-t |
| Cobalt | 10 | 10 | 4.66 | 12.1 | Lognormal | 7.49 | 95% Student's-t |
| Copper | 10 | 10 | 5.04 | 8.7 | Normal | 7.65 | 95% Student's-t |
| Nickel | 10 | 10 | 5.73 | 10.2 | Normal | 7.8 | 95% Student's-t |
| Perchlorate | 10 | 2 | 0.000655 | 0.00233 (U) | n/a | 0.00164 | Maximum detected concentration |
| Selenium | 10 | 0 | 1.04 (U) | 1.15 (U) | n/a | 1.15 (U) | Maximum detection limit |
| Vanadium | 10 | 10 | 18.8 | 30.8 | Normal | 28.2 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-14**
**EPCs at AOC C-12-003 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 0 | 1.79 (U) | 2.61 (U) | n/a* | 2.61 (U) | Maximum detection limit |
| Chromium (Total) | 5 | 5 | 11.8 | 104 | n/a | 104 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-15**
**EPCs at AOC C-12-003 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 10 | 1 | 1.02 (U) | 2.74 | n/a* | 2.74 | Maximum detected concentration |
| Barium | 10 | 10 | 36.2 | 161 | Normal | 117 | 95% Student's-t |
| Chromium (Total) | 10 | 10 | 4.82 | 104 | Normal | 45 | 95% Student's-t |
| Cobalt | 10 | 10 | 1.92 | 6.66 | Normal | 4.99 | 95% Student's-t |
| Perchlorate | 10 | 1 | 0.0019 | 0.00233 (U) | n/a | 0.0019 | Maximum detected concentration |
| Selenium | 10 | 0 | 0.997 (UJ) | 1.12 (UJ) | n/a | 1.12 (UJ) | Maximum detection limit |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-16**
**EPCs at AOC C-12-004 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 0 | 0.649 (U) | 1.21 (UJ) | n/a* | 1.21 (UJ) | Maximum detection limit |
| Chromium (Total) | 5 | 5 | 9.16 | 33.5 | n/a | 33.5 | Maximum detected concentration |
| Copper | 5 | 5 | 7.65 | 28.1 | n/a | 28.1 | Maximum detected concentration |
| Lead | 5 | 5 | 8.61 | 58.6 | n/a | 58.6 | Maximum detected concentration |
| Silver | 5 | 5 | 0.431 | 2.56 | n/a | 2.56 | Maximum detected concentration |
| Uranium | 5 | 1 | 1.33 (U) | 3.86 | n/a | 3.86 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-17
## EPCs at AOC C-12-004 for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 10 | 10 | 5470 | 18,500 | Normal | 15,100 | 95% Student's-t |
| Antimony | 10 | 0 | 0.649 (U) | 1.21 (UJ) | n/a* | 1.21 (UJ) | Maximum detection limit |
| Barium | 10 | 10 | 143 | 279 | Nonparametric | 214 | 95% Student's-t |
| Chromium (Total) | 10 | 10 | 9.16 | 33.5 | Nonparametric | 18.4 | 95% Student's-t |
| Cobalt | 10 | 10 | 4.56 | 7.27 | Normal | 5.85 | 95% Student's-t |
| Copper | 10 | 10 | 5.77 | 28.1 | Nonparametric | 13.7 | 95% Student's-t |
| Lead | 10 | 10 | 7.8 | 58.6 | Nonparametric | 39.2 | 95% Chebyshev (Mean, Sd) |
| Nickel | 10 | 10 | 6.25 | 9.29 | Normal | 8.38 | 95% Student's-t |
| Perchlorate | 10 | 3 | 0.00104 | 0.00243 (U) | n/a | 0.0012 | Maximum detected concentration |
| Selenium | 10 | 0 | 0.949 (U) | 1.14 (U) | n/a | 1.14 (U) | Maximum detection limit |
| Silver | 10 | 10 | 0.431 | 2.56 | Nonparametric | 1.63 | 95% Chebyshev (Mean, Sd) |
| Uranium | 10 | 1 | 0.578 (U) | 3.86 | n/a | 3.86 | Maximum detected concentration |
| Vanadium | 10 | 10 | 19.2 | 30.9 | Normal | 28.1 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-18
## EPCs at AOC C-12-005 for the Industrial and Recreational Scenarios

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 1 | 1.08 (U) | 3.89 | n/a* | 3.89 | Maximum detected concentration |
| Chromium (Total) | 5 | 5 | 11.8 | 196 | n/a | 196 | Maximum detected concentration |
| Perchlorate | 5 | 1 | 0.00197 | 0.00267 (U) | n/a | 0.00197 | Maximum detected concentration |
| Uranium | 5 | 5 | 1.15 | 2.77 | n/a | 2.77 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-19**
**EPCs at AOC C-12-005 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 10 | 1 | 1.08 (U) | 3.89 | n/a* | 3.89 | Maximum detected concentration |
| Chromium (Total) | 10 | 10 | 8.68 | 196 | Nonparametric | 114 | 95% Chebyshev (Mean, Sd) |
| Perchlorate | 10 | 2 | 0.00124 | 0.00267 (U) | n/a | 0.00197 | Maximum detected concentration |
| Uranium | 10 | 10 | 0.828 | 2.77 | Normal | 1.81 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-20**
**EPCs at AOC C-14-006 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 5 | 3 | 0.548 | 1.27 (UJ) | n/a* | 1.1 | Maximum detected concentration |
| Chromium (Total) | 5 | 5 | 9.33 | 20.7 | n/a | 20.7 | Maximum detected concentration |
| Nitrate | 5 | 2 | 1.18 (U) | 1.82 | n/a | 1.82 | Maximum detected concentration |
| Perchlorate | 5 | 1 | 0.00135 | 0.00273 (U) | n/a | 0.00135 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 5 | 2 | 0.00363 | 0.00973 | n/a | 0.00973 | Maximum detected concentration |
| Isopropyltoluene[4-] | 5 | 2 | 0.00075 | 0.00229 | n/a | 0.00229 | Maximum detected concentration |
| TATB | 5 | 5 | 0.404 | 11.3 | n/a | 11.3 | Maximum detected concentration |
| Toluene | 5 | 2 | 0.00067 | 0.00129 (U) | n/a | 0.000887 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-21
## EPCs at AOC C-14-006 for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 10 | 8 | 0.399 | 1.27 (UJ) | Normal | 0.933 | 95% KM (t) |
| Chromium (Total) | 10 | 10 | 9.33 | 20.7 | Normal | 13.9 | 95% Student's-t |
| Nitrate | 10 | 7 | 1.18 (U) | 1.82 | Normal | 1.54 | 95% KM (t) |
| Perchlorate | 10 | 4 | 0.00125 | 0.00273 (U) | n/a* | 0.00188 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 10 | 2 | 0.00363 | 0.00973 | n/a | 0.00973 | Maximum detected concentration |
| Isopropyltoluene[4-] | 10 | 2 | 0.00075 | 0.00229 | n/a | 0.00229 | Maximum detected concentration |
| TATB | 10 | 5 | 0.404 | 11.3 | Normal | 4.63 | 95% KM (t) |
| Toluene | 10 | 2 | 0.00067 | 0.0013 (U) | n/a | 0.000887 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-22**
**EPCs at AOC 15-005(c) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 10 | 5 | 0.503 | 1.38 (U) | Normal | 0.836 | 95% KM (t) |
| Barium | 10 | 10 | 102 | 214 | Normal | 198 | 95% Student's-t |
| Chromium (Total) | 10 | 10 | 5.94 | 13.9 | Normal | 11.9 | 95% Student's-t |
| Cobalt | 10 | 10 | 2.93 | 9.87 | Normal | 6.81 | 95% Student's-t |
| Copper | 10 | 10 | 8.11 | 30.6 | Lognormal | 16.3 | 95% Student's-t |
| Iron | 10 | 10 | 7940 | 14,800 | Normal | 13,900 | 95% Student's-t |
| Lead | 10 | 10 | 13.3 | 69.6 | Nonparametric | 55.6 | 95% Chebyshev (Mean, Sd) |
| Perchlorate | 10 | 1 | 0.00149 | 0.00311 (U) | n/a* | 0.00149 | Maximum detected concentration |
| Selenium | 10 | 0 | 1.17 (U) | 1.48 (U) | n/a | 1.48 (U) | Maximum detection limit |
| Uranium | 10 | 10 | 3.95 | 17.4 | Normal | 9.48 | 95% Student's-t |
| Vanadium | 10 | 10 | 14.3 | 31.8 | Normal | 27.9 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 10 | 2 | 0.00564 (UJ) | 0.0188 | n/a | 0.0188 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 10 | 1 | 0.0995 | 0.514 (U) | n/a | 0.0995 | Maximum detected concentration |
| Ethylbenzene | 10 | 1 | 0.000395 | 0.00149 (U) | n/a | 0.000395 | Maximum detected concentration |
| Isopropyltoluene[4-] | 10 | 2 | 0.00049 | 0.00151 | n/a | 0.00151 | Maximum detected concentration |
| Toluene | 10 | 2 | 0.000538 | 0.00148 (U) | n/a | 0.000754 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 10 | 4 | 0.000406 | 0.00299 (U) | n/a | 0.000984 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Uranium-234 | 10 | 10 | 1.82 | 7.59 | Normal | 4.55 | 95% Student's-t |
| Uranium-235/236 | 10 | 10 | 0.108 | 0.405 | Normal | 0.252 | 95% Student's-t |
| Uranium-238 | 10 | 10 | 2.95 | 7.77 | Normal | 5.6 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-23**
**EPCs at AOC 15-005(c) for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 20 | 9 | 0.503 | 1.41 (U) | Normal | 0.855 | 95% KM (t) |
| Barium | 20 | 20 | 102 | 216 | Nonparametric | 199 | 95% Student's-t |
| Chromium (Total) | 20 | 20 | 5.94 | 13.9 | Normal | 11.3 | 95% Student's-t |
| Cobalt | 20 | 20 | 2.93 | 9.87 | Normal | 6.13 | 95% Student's-t |
| Copper | 20 | 20 | 4.9 | 30.6 | Gamma | 12 | 95% Adjusted Gamma |
| Iron | 20 | 20 | 7940 | 16,000 | Normal | 13,800 | 95% Student's-t |
| Lead | 20 | 20 | 9.03 | 69.6 | Nonparametric | 35.3 | 95% Chebyshev (Mean, Sd) |
| Perchlorate | 20 | 4 | 0.000618 | 0.00311 (U) | n/a* | 0.00149 | Maximum detected concentration |
| Selenium | 20 | 0 | 1.07 (U) | 1.48 (U) | n/a | 1.48 (U) | Maximum detection limit |
| Uranium | 20 | 20 | 0.843 | 17.4 | Gamma | 6.35 | 95% Adjusted Gamma |
| Vanadium | 20 | 20 | 14.3 | 31.8 | Normal | 27.4 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 20 | 2 | 0.00513 (UJ) | 0.0188 | n/a | 0.0188 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 20 | 1 | 0.0995 | 0.514 (U) | n/a | 0.0995 | Maximum detected concentration |
| Ethylbenzene | 20 | 2 | 0.000395 | 0.00149 (U) | n/a | 0.00063 | Maximum detected concentration |
| Isopropyltoluene[4-] | 20 | 2 | 0.00049 | 0.00151 | n/a | 0.00151 | Maximum detected concentration |
| Toluene | 20 | 2 | 0.000538 | 0.00148 (U) | n/a | 0.000754 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 20 | 5 | 0.000406 | 0.00299 (U) | Normal | 0.000787 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Uranium-234 | 20 | 20 | 0.984 | 7.59 | Gamma | 3.15 | 95% Adjusted Gamma |
| Uranium-235/236 | 20 | 14 | 0.0405 (U) | 0.405 | Normal | 0.169 | 95% KM (t) |
| Uranium-238 | 20 | 20 | 1.07 | 7.77 | Nonparametric | 4.96 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-24**
**EPCs at SWMU 15-007(c) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 22 | 1 | 0.646 (U) | 243 | n/a* | 243 | Maximum detected concentration |
| Chromium (Total) | 22 | 22 | 6.34 | 41.4 | Normal | 18.9 | 95% Student's-t |
| Lead | 22 | 22 | 5.89 | 63,700 | Nonparametric | 15,500 | 95% Chebyshev (Mean, Sd) |
| Perchlorate | 22 | 1 | 0.000831 | 0.00314 (U) | n/a | 0.000831 | Maximum detected concentration |
| Selenium | 22 | 0 | 1.07 (U) | 1.48 (U) | n/a | 1.48 (U) | Maximum detection limit |
| Silver | 22 | 12 | 0.188 | 14.7 | Nonparametric | 3.9 | 95% KM Chebyshev |
| Zinc | 22 | 22 | 23.5 | 206 | Nonparametric | 58.1 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 3 | 1 | 0.00397 (U) | 0.0055 | n/a | 0.0055 | Maximum detected concentration |
| TATB | 22 | 3 | 0.36 | 1 (U) | n/a | 0.496 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-25
## EPCs at SWMU 15-007(c) for the Residential Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 47 | 2 | 0.414 (U) | 243 | n/a* | 243 | Maximum detected concentration |
| Chromium (Total) | 47 | 47 | 1.66 | 151 | Nonparametric | 31.8 | 95% Chebyshev (Mean, Sd) |
| Copper | 47 | 47 | 0.784 | 10.8 | Nonparametric | 8.17 | 95% Student's-t |
| Lead | 47 | 47 | 3.68 | 63,700 | Nonparametric | 7290 | 95% Chebyshev (Mean, Sd) |
| Nickel | 47 | 45 | 0.849 (U) | 16.8 | Normal | 8.79 | 95% KM (t) |
| Perchlorate | 47 | 5 | 0.000576 | 0.00314 (U) | Normal | 0.00122 | 95% KM (t) |
| Selenium | 47 | 0 | 0.946 (U) | 2.11 (U) | n/a | 2.11 (U) | Maximum detection limit |
| Silver | 47 | 23 | 0.153 | 14.7 | Nonparametric | 1.15 | 95% KM (t) |
| Zinc | 47 | 47 | 23.5 | 206 | Nonparametric | 46.7 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 9 | 1 | 0.00337 (U) | 0.0043 (U) | n/a | 0.0034 | Maximum detected concentration |
| Aroclor-1254 | 9 | 1 | 0.00334 (U) | 0.0055 | n/a | 0.0055 | Maximum detected concentration |
| TATB | 47 | 3 | 0.36 | 1 (U) | n/a | 0.496 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 3 | 2 | 1.42 | 7.45 | n/a | 7.45 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-26**
**EPCs at SWMU 15-007(c) for Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 47 | 2 | 0.414 (U) | 243 | n/a* | 243 | Maximum detected concentration |
| Chromium (Total) | 47 | 47 | 1.66 | 151 | Nonparametric | 31.8 | 95% Chebyshev (Mean, Sd) |
| Copper | 47 | 47 | 0.784 | 10.8 | Nonparametric | 8.17 | 95% Student's-t |
| Lead | 47 | 47 | 3.68 | 63,700 | Nonparametric | 7290 | 95% Chebyshev (Mean, Sd) |
| Nickel | 47 | 45 | 0.849 (U) | 16.8 | Normal | 8.79 | 95% KM (t) |
| Selenium | 47 | 0 | 0.946 (U) | 2.11 (U) | n/a | 2.11 (U) | Maximum detection limit |
| Silver | 47 | 23 | 0.153 | 14.7 | Nonparametric | 1.15 | 95% KM (t) |
| Zinc | 47 | 47 | 23.5 | 206 | Nonparametric | 46.7 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 9 | 1 | 0.00337 (U) | 0.0043 (U) | n/a | 0.0034 | Maximum detected concentration |
| Aroclor-1254 | 9 | 1 | 0.00334 (U) | 0.0055 | n/a | 0.0055 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 3 | 2 | 1.42 | 7.45 | n/a | 7.45 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-27**
**EPCs at SWMU 15-007(d) for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 2 | 0 | 0.991 (UJ) | 0.998 (U) | n/a* | 0.998 (U) | Maximum detection limit |
| Selenium | 2 | 0 | 0.965 (U) | 1 (U) | n/a | 1 (U) | Maximum detection limit |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 2 | 2 | 1.64 | 6.11 | n/a | 6.11 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-28
## EPCs at SWMU 15-008(b) for the Industrial Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 87 | 29 | 0.56 (U) | 256 | Lognormal | 10.3 | 95% KM (BCA) |
| Barium | 87 | 87 | 17.2 | 195 | Normal | 85.3 | 95% Student's-t |
| Beryllium | 87 | 87 | 0.325 | 47.5 | Nonparametric | 6.95 | 95% Chebyshev (Mean, Sd) |
| Cadmium | 87 | 39 | 0.12 | 7.98 | Nonparametric | 0.569 | 95% KM (t) |
| Chromium (Total) | 87 | 87 | 3.69 | 55.8 | Lognormal | 14.3 | 95% Bootstrap-t |
| Copper | 79 | 79 | 1.73 | 36,400 | Nonparametric | 2710 | 95% Chebyshev (Mean, Sd) |
| Iron | 87 | 87 | 5260 | 22,300 | Lognormal | 10,700 | 95% Student's-t |
| Lead | 87 | 87 | 2.48 | 138,000 | Lognormal | 8610 | 95% Chebyshev (Mean, Sd) |
| Manganese | 87 | 87 | 102 | 765 | Lognormal | 292 | 95% Student's-t |
| Nickel | 87 | 85 | 2.67 | 21 | Lognormal | 7.17 | 95% KM (BCA) |
| Perchlorate | 83 | 1 | 0.000629 | 0.00383 (U) | Gamma | 0.000629 | Maximum detected concentration |
| Selenium | 87 | 1 | 0.54 (U) | 1.86 (UJ) | n/a* | 0.696 | Maximum detected concentration |
| Silver | 87 | 45 | 0.129 | 6.95 | Lognormal | 0.69 | 95% KM (t) |
| Uranium | 87 | 87 | 0.638 | 659 | Lognormal | 107 | 95% Bootstrap-t |
| Vanadium | 87 | 84 | 2.59 | 34.9 | Normal | 16.4 | 95% KM (t) |
| Zinc | 87 | 87 | 13.1 | 13,300 | Nonparametric | 862 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 20 | 1 | 0.00369 (U) | 0.282 | n/a | 0.282 | Maximum detected concentration |
| Aroclor-1254 | 20 | 13 | 0.0034 | 0.143 | Lognormal | 0.0478 | 95% KM Chebyshev |
| Aroclor-1260 | 20 | 11 | 0.00369 (U) | 0.0608 | Lognormal | 0.0182 | 95% KM (t) |
| Aroclor-1268 | 2 | 2 | 0.0079 | 0.0205 | n/a | 0.0205 | Maximum detected concentration |
| HMX | 83 | 13 | 0.193 | 35.3 | Gamma | 2.22 | 95% KM (t) |
| RDX | 83 | 4 | 0.242 | 7.72 | n/a | 7.72 | Maximum detected concentration |

**Table H-2.3-28 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| TATB | 83 | 10 | 0.5 | 28.6 | Normal | 2.15 | 95% KM (t) |
| Trinitrotoluene[2,4,6-] | 83 | 2 | 0.185 | 0.5 (U) | n/a | 0.205 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Americium-241 | 83 | 6 | −0.0108 (U) | 0.0769 | Normal | 0.000676 | 95% KM (Percentile Bootstrap) |
| Cesium-137 | 79 | 51 | −0.0263 (U) | 1.96 | Gamma | 0.338 | 95% KM (Percentile Bootstrap) |
| Plutonium-239/240 | 83 | 34 | −0.00287 (U) | 0.333 | Nonparametric | 0.049 | 95% KM Chebyshev |
| Tritium | 83 | 73 | 0.00436 (U) | 73.2 | Lognormal | 11.4 | 95% KM Chebyshev |
| Uranium-234 | 83 | 83 | 0.597 | 43.4 | Lognormal | 10.5 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 83 | 79 | 0.0432 (U) | 6.57 | Lognormal | 1.31 | 95% KM (Chebyshev) |
| Uranium-238 | 83 | 83 | 0.652 | 291 | Lognormal | 50 | 95% Bootstrap-t |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

## Table H-2.3-29

## EPCs at SWMU 15-008(b) for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 171 | 42 | 0.41 (U) | 256 | Lognormal | 5.63 | 95% KM (BCA) |
| Arsenic | 171 | 167 | 0.469 | 6.6 | Lognormal | 2.01 | 95% KM (BCA) |
| Barium | 171 | 169 | 8.66 | 344 | Gamma | 73.2 | 95% KM (BCA) |
| Beryllium | 171 | 168 | 0.18 | 47.5 | Lognormal | 4.46 | 95% KM (Chebyshev) |
| Cadmium | 171 | 50 | 0.102 | 7.98 | Nonparametric | 0.394 | 95% KM (t) |
| Chromium (Total) | 171 | 169 | 1.8 (U) | 55.8 | Lognormal | 13.6 | 95% KM (BCA) |
| Copper | 156 | 153 | 1.73 | 36,400 | Lognormal | 1410 | 95% KM Chebyshev |
| Iron | 171 | 171 | 4250 | 22,300 | Gamma | 10,500 | 95% Approximate Gamma |
| Lead | 171 | 170 | 2.48 | 138,000 | Lognormal | 4400 | 95% KM Chebyshev |
| Manganese | 171 | 171 | 102 | 765 | Lognormal | 266 | 95% Student's-t |
| Nickel | 171 | 166 | 2.22 | 21 | Gamma | 6.58 | 95% KM (BCA) |
| Perchlorate | 163 | 15 | 0.000569 | 0.00383 (U) | Gamma | 0.0011 | 95% KM (t) |
| Selenium | 171 | 4 | 0.54 (U) | 1.86 (UJ) | n/a* | 0.696 | Maximum detected concentration |
| Silver | 171 | 77 | 0.111 | 6.95 | Lognormal | 0.51 | 95% KM (t) |
| Uranium | 171 | 169 | 0.438 | 659 | Lognormal | 90.4 | 95% KM Chebyshev |
| Vanadium | 171 | 164 | 1.99 | 34.9 | Normal | 13.3 | 95% KM (t) |
| Zinc | 171 | 171 | 13.1 | 13,300 | Nonparametric | 457 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1242 | 40 | 1 | 0.00344 (U) | 0.282 | n/a | 0.282 | Maximum detected concentration |
| Aroclor-1254 | 40 | 20 | 0.0021 | 0.143 | Lognormal | 0.0168 | 95% KM (BCA) |
| Aroclor-1260 | 40 | 16 | 0.0024 | 0.0608 | Lognormal | 0.0105 | 95% KM (t) |
| Aroclor-1268 | 3 | 3 | 0.0045 | 0.0205 | n/a | 0.0205 | Maximum detected concentration |
| HMX | 163 | 17 | 0.158 | 35.3 | Nonparametric | 1.98 | 95% KM (Chebyshev) |
| RDX | 163 | 6 | 0.135 | 7.72 | Normal | 0.475 | 95% KM (t) |
| TATB | 163 | 13 | 0.331 | 28.6 | Normal | 1.43 | 95% KM (t) |
| Trinitrotoluene[2,4,6-] | 163 | 2 | 0.185 | 0.5 (U) | n/a | 0.205 | Maximum detected concentration |

### Table H-2.3-29 (continued)

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Radionuclides (pCi/g)** | | | | | | | |
| Americium-241 | 163 | 7 | −0.0173 (U) | 0.0769 | Normal | 0.00575 | 95% Student's-t |
| Cesium-137 | 156 | 59 | −0.0473 (U) | 1.96 | Gamma | 0.161 | 95% KM (t) |
| Plutonium-239/240 | 163 | 36 | −0.00734 (U) | 0.333 | Nonparametric | 0.0254 | 95% KM Chebyshev |
| Tritium | 163 | 143 | −0.00664 (U) | 199 | Nonparametric | 10.6 | 95% KM Chebyshev |
| Uranium-234 | 163 | 163 | 0.249 | 43.4 | Nonparametric | 6.53 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 163 | 130 | 0.0141 (U) | 6.57 | Lognormal | 0.795 | 95% KM (Chebyshev) |
| Uranium-238 | 163 | 163 | 0.254 | 291 | Nonparametric | 38.4 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

### Table H-2.3-30
### EPCs at AOC 15-008(g) for the Industrial Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 4 | 1 | 1.02 (U) | 3.77 | n/a* | 3.77 | Maximum detected concentration |
| Cobalt | 4 | 4 | 0.966 | 14 | n/a | 14 | Maximum detected concentration |
| Copper | 4 | 4 | 7.13 | 41.3 | n/a | 41.3 | Maximum detected concentration |
| Lead | 4 | 4 | 4.33 | 370 | n/a | 370 | Maximum detected concentration |
| Uranium | 4 | 4 | 1.27 | 3.8 | n/a | 3.8 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| TATB | 4 | 2 | 0.327 | 20.8 | n/a | 20.8 | Maximum detected concentration |
| Radionuclides (pCi/g) | | | | | | | |
| Tritium | 4 | 1 | 0.00533 (U) | 0.031 (U) | n/a | 0.0162 | Maximum detected concentration |
| Uranium-238 | 4 | 4 | 1.14 | 4.14 | n/a | 4.14 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-31
## EPCs at AOC 15-008(g) for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 8 | 2 | 1.01 (U) | 3.77 | n/a* | 3.77 | Maximum detected concentration |
| Cobalt | 8 | 8 | 0.958 | 14 | Gamma | 9.43 | 95% Adjusted Gamma |
| Copper | 8 | 8 | 3.15 | 41.3 | Normal | 25.7 | 95% Student's-t |
| Lead | 8 | 8 | 3.67 | 370 | Gamma | 309 | 95% Adjusted Gamma |
| Selenium | 8 | 0 | 1.01 (U) | 1.28 (U) | n/a | 1.28 (U) | Maximum detection limit |
| Uranium | 8 | 8 | 1.08 | 7.77 | Normal | 4.95 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| TATB | 8 | 6 | 0.327 | 27.3 | Normal | 16.5 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 8 | 3 | 0.00533 (U) | 0.0374 | n/a | 0.0374 | Maximum detected concentration |
| Uranium-238 | 8 | 8 | 1.14 | 4.14 | Normal | 2.8 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-32**
**EPCs at SWMU 15-009(b) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 4 | 0 | 0.571 (U) | 1.44 (UJ) | n/a* | 1.44 (UJ) | Maximum detection limit |
| Barium | 4 | 4 | 18.7 | 134 | n/a | 134 | Maximum detected concentration |
| Cadmium | 4 | 0 | 0.621 (U) | 0.757 (U) | n/a | 0.757 (U) | Maximum detection limit |
| Chromium (Total) | 4 | 4 | 5.82 | 14 | n/a | 14 | Maximum detected concentration |
| Copper | 4 | 4 | 2.3 | 17.8 | n/a | 17.8 | Maximum detected concentration |
| Cyanide (Total) | 4 | 1 | 0.278 (U) | 1.22 | n/a | 1.22 | Maximum detected concentration |
| Lead | 4 | 4 | 2.74 | 28.2 | n/a | 28.2 | Maximum detected concentration |
| Nitrate | 4 | 1 | 1.37 (UJ) | 2.76 | n/a | 2.76 | Maximum detected concentration |
| Selenium | 4 | 0 | 1.26 (U) | 1.59 (U) | n/a | 1.59 (U) | Maximum detection limit |
| Uranium | 4 | 4 | 1.5 | 615 | n/a | 615 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 4 | 2 | 0.00635 (UJ) | 0.0141 | n/a | 0.0141 | Maximum detected concentration |
| Isopropyltoluene[4-] | 4 | 3 | 0.000942 | 0.0167 | n/a | 0.0167 | Maximum detected concentration |
| Toluene | 4 | 1 | 0.00112 | 0.00144 (U) | n/a | 0.00112 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 4 | 3 | −0.0378 (U) | 2.54 | n/a | 2.54 | Maximum detected concentration |
| Plutonium-239/240 | 4 | 3 | 0.00997 (U) | 0.134 | n/a | 0.134 | Maximum detected concentration |
| Tritium | 4 | 1 | 0 (U) | 0.101 | n/a | 0.101 | Maximum detected concentration |
| Uranium-234 | 4 | 4 | 1.11 | 303 | n/a | 303 | Maximum detected concentration |
| Uranium-235/236 | 4 | 4 | 0.0937 | 20.3 | n/a | 20.3 | Maximum detected concentration |
| Uranium-238 | 4 | 4 | 1.41 | 311 | n/a | 311 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-33
## EPCs at SWMU 15-009(b) for the Residential Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 11 | 0 | 0.498 (U) | 1.44 (UJ) | n/a* | 1.44 (UJ) | Maximum detection limit |
| Barium | 11 | 11 | 18.7 | 134 | Normal | 80.8 | 95% Student's-t |
| Cadmium | 11 | 3 | 0.112 | 0.757 (U) | n/a | 0.257 | Maximum detected concentration |
| Chromium (Total) | 11 | 11 | 2.16 | 19.1 | Normal | 10.5 | 95% Student's-t |
| Copper | 11 | 10 | 2.3 | 17.8 | Normal | 8.97 | 95% KM (t) |
| Cyanide (Total) | 11 | 1 | 0.24 (U) | 1.22 | n/a | 1.22 | Maximum detected concentration |
| Lead | 11 | 11 | 2.74 | 28.2 | Gamma | 15.8 | 95% Adjusted Gamma |
| Nitrate | 11 | 3 | 1.03 (U) | 2.76 | n/a | 2.76 | Maximum detected concentration |
| Perchlorate | 11 | 2 | 0.000892 | 0.00325 (U) | n/a | 0.00247 | Maximum detected concentration |
| Selenium | 11 | 0 | 0.669 (U) | 1.59 (U) | n/a | 1.59 (U) | Maximum detection limit |
| Uranium | 11 | 11 | 1.37 | 615 | Nonparametric | 305 | 95% Chebyshev (Mean, Sd) |
| Zinc | 11 | 11 | 31 | 114 | Nonparametric | 60.7 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 11 | 4 | 0.00514 (U) | 0.131 | n/a | 0.131 | Maximum detected concentration |
| Aroclor-1242 | 3 | 1 | 0.00354 (U) | 0.0272 | n/a | 0.0272 | Maximum detected concentration |
| Aroclor-1254 | 3 | 1 | 0.00354 (U) | 0.0312 | n/a | 0.0312 | Maximum detected concentration |
| Aroclor-1260 | 3 | 1 | 0.00354 (U) | 0.0131 | n/a | 0.0131 | Maximum detected concentration |
| Butanone[2-] | 11 | 1 | 0.0024 | 0.00811 (UJ) | n/a | 0.0024 | Maximum detected concentration |
| Isopropyltoluene[4-] | 11 | 6 | 0.000427 | 0.0167 | Normal | 0.0065 | 95% KM (t) |
| Methylene chloride | 11 | 1 | 0.0024 | 0.00811 (U) | n/a | 0.0024 | Maximum detected concentration |
| Toluene | 11 | 3 | 0.00103 (U) | 0.0102 | n/a | 0.0102 | Maximum detected concentration |
| Trimethylbenzene[1,2,4-] | 11 | 2 | 0.000538 | 0.00162 (U) | n/a | 0.000651 | Maximum detected concentration |
| Xylene[1,2-] | 11 | 2 | 0.000349 | 0.00162 (U) | n/a | 0.000574 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 11 | 2 | 0.00047 | 0.00325 (U) | n/a | 0.000702 | Maximum detected concentration |

**Table H-2.3-33 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 11 | 7 | −0.0378 (U) | 2.54 | Gamma | 0.831 | 95% KM (BCA) |
| Plutonium-239/240 | 11 | 3 | −0.00344 (U) | 0.134 | n/a | 0.134 | Maximum detected concentration |
| Tritium | 11 | 7 | 0 (U) | 0.151 | Normal | 0.151 | 95% KM (t) |
| Uranium-234 | 11 | 11 | 0.913 | 303 | Nonparametric | 158 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 11 | 7 | 0.0553 (U) | 20.3 | Gamma | 6.06 | 95% KM (BCA) |
| Uranium-238 | 11 | 11 | 0.866 | 311 | Lognormal | 163 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

## Table H-2.3-34
## EPCs at SWMU 15-009(b) for the Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 8 | 0 | 0.571 (U) | 1.44 (UJ) | n/a* | 1.44 (UJ) | Maximum detection limit |
| Barium | 8 | 8 | 18.7 | 134 | Normal | 94 | 95% Student's-t |
| Cadmium | 8 | 0 | 0.506 (U) | 0.757 (U) | n/a | 0.757 (U) | Maximum detection limit |
| Chromium (Total) | 8 | 8 | 5.82 | 19.1 | Gamma | 14.4 | 95% Adjusted Gamma |
| Copper | 8 | 8 | 2.3 | 17.8 | Normal | 10 | 95% Student's-t |
| Cyanide (Total) | 8 | 1 | 0.242 (U) | 1.22 | n/a | 1.22 | Maximum detected concentration |
| Lead | 8 | 8 | 2.74 | 28.2 | Normal | 16.2 | 95% Student's-t |
| Selenium | 8 | 0 | 0.669 (U) | 1.59 (U) | n/a | 1.59 (U) | Maximum detection limit |
| Uranium | 8 | 8 | 1.5 | 615 | Lognormal | 417 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 8 | 2 | 0.00532 (UJ) | 0.0141 | n/a | 0.0141 | Maximum detected concentration |
| Toluene | 8 | 1 | 0.00106 (U) | 0.00144 (U) | n/a | 0.00112 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 8 | 5 | −0.0378 (U) | 2.54 | Gamma | 1.04 | 95% KM (BCA) |
| Plutonium-239/240 | 8 | 3 | 0.00113 (U) | 0.134 | n/a | 0.134 | Maximum detected concentration |
| Tritium | 8 | 4 | 0 (U) | 0.123 | n/a | 0.123 | Maximum detected concentration |
| Uranium-234 | 8 | 8 | 1.11 | 303 | Lognormal | 215 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 8 | 7 | 0.0585 (U) | 20.3 | Gamma | 14.4 | 95% KM (Chebyshev) |
| Uranium-238 | 8 | 8 | 1.41 | 311 | Lognormal | 221 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-35
## EPCs at SWMU 15-009(c) for the Industrial Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 17 | 0 | 0.534 (U) | 11 (U) | n/a* | 11 (U) | Maximum detection limit |
| Chromium (Total) | 17 | 17 | 1.6 | 21.9 | Normal | 10.9 | 95% Student's-t |
| Perchlorate | 13 | 1 | 0.000642 | 0.00276 (U) | n/a | 0.000642 | Maximum detected concentration |
| Selenium | 17 | 0 | 1 (U) | 1.3 (U) | n/a | 1.3 (U) | Maximum detection limit |
| Silver | 17 | 3 | 0.171 | 2.1 (U) | n/a | 0.272 | Maximum detected concentration |
| Uranium | 13 | 13 | 0.77 | 8.8 | Normal | 4.18 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 15 | 1 | 0.00586 (UJ) | 0.0527 | n/a | 0.0527 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 16 | 1 | 0.105 | 0.457 (U) | n/a | 0.105 | Maximum detected concentration |
| Isopropyltoluene[4-] | 17 | 3 | 0.000477 | 0.0053 (U) | n/a | 0.00428 | Maximum detected concentration |
| Toluene | 16 | 3 | 0.000438 | 0.0122 | n/a | 0.0122 | Maximum detected concentration |
| Trimethylbenzene[1,2,4-] | 16 | 1 | 0.00049 | 0.0053 (U) | n/a | 0.00049 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 13 | 2 | 0.000422 | 0.00276 (U) | n/a | 0.000572 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 17 | 6 | −0.01 (U) | 0.169 | Normal | 0.0504 | 95% KM (t) |
| Uranium-234 | 17 | 17 | 0.495 | 2.75 | Normal | 1.53 | 95% Student's-t |
| Uranium-238 | 17 | 17 | 0.879 | 3.93 | Normal | 2.39 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

## Table H-2.3-36
## EPCs at SWMU 15-009(c) for the Residential Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 40 | 2 | 0.386 | 11 (U) | n/a* | 0.602 | Maximum detected concentration |
| Chromium (Total) | 40 | 40 | 1.6 | 23.6 | Gamma | 9.73 | 95% Adjusted Gamma |
| Cyanide (Total) | 31 | 1 | 0.118 (U) | 1.69 | n/a | 1.69 | Maximum detected concentration |
| Nitrate | 31 | 6 | 1.04 (U) | 2.24 | Normal | 1.26 | 95% KM (t) |
| Perchlorate | 31 | 6 | 0.000562 | 0.00276 (U) | Lognormal | 0.00105 | 95% KM (t) |
| Selenium | 40 | 0 | 0.945 (UJ) | 1.3 (U) | n/a | 1.3 (U) | Maximum detection limit |
| Silver | 40 | 9 | 0.132 | 2.2 (U) | Normal | 0.202 | 95% KM (t) |
| Uranium | 31 | 31 | 0.728 | 8.8 | Normal | 3.43 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 38 | 5 | 0.00213 | 0.0527 | Normal | 0.00765 | 95% KM (t) |
| Anthracene | 38 | 1 | 0.0128 | 0.36 (U) | n/a | 0.0128 | Maximum detected concentration |
| Benzo(a)anthracene | 38 | 3 | 0.0183 | 0.36 (U) | n/a | 0.0626 | Maximum detected concentration |
| Benzo(a)pyrene | 38 | 3 | 0.0117 | 0.36 (U) | n/a | 0.0384 | Maximum detected concentration |
| Benzo(b)fluoranthene | 38 | 4 | 0.0153 | 0.36 (U) | n/a | 0.072 | Maximum detected concentration |
| Benzo(g,h,i)perylene | 37 | 1 | 0.0226 | 0.35 (U) | n/a | 0.0226 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 38 | 1 | 0.105 | 0.457 (U) | n/a | 0.105 | Maximum detected concentration |
| Chrysene | 38 | 2 | 0.0202 | 0.36 (U) | n/a | 0.0527 | Maximum detected concentration |
| Fluoranthene | 38 | 4 | 0.023 | 0.36 (U) | n/a | 0.127 | Maximum detected concentration |
| Indeno(1,2,3-cd)pyrene | 38 | 1 | 0.0208 | 0.36 (U) | n/a | 0.0208 | Maximum detected concentration |
| Isopropyltoluene[4-] | 40 | 5 | 0.000477 | 0.0054 (U) | Normal | 0.00101 | 95% KM (t) |
| Phenanthrene | 38 | 3 | 0.0165 | 0.36 (U) | n/a | 0.0812 | Maximum detected concentration |
| Pyrene | 38 | 4 | 0.0169 | 0.36 (U) | n/a | 0.0783 | Maximum detected concentration |
| Toluene | 39 | 7 | 0.000328 | 0.0122 | Normal | 0.00143 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 39 | 1 | 0.00049 | 0.0054 (U) | n/a | 0.00049 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 31 | 2 | 0.000422 | 0.00276 (U) | n/a | 0.000572 | Maximum detected concentration |

**Table H-2.3-36 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 40 | 21 | −0.01 (U) | 0.173 | Gamma | 0.0399 | 95% KM (t) |
| Uranium-234 | 40 | 40 | 0.495 | 13.9 | Nonparametric | 2.93 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 40 | 27 | 0.0317 | 0.78 | Lognormal | 0.121 | 95% KM (BCA) |
| Uranium-238 | 40 | 40 | 0.734 | 15.1 | Nonparametric | 3.93 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

**Table H-2.3-37**
**EPCs at SWMU 15-009(c) for Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 37 | 1 | 0.386 | 11 (U) | n/a* | 0.386 | Maximum detected concentration |
| Chromium (Total) | 37 | 37 | 1.6 | 23.6 | Gamma | 10.3 | 95% Adjusted Gamma |
| Cyanide (Total) | 28 | 1 | 0.118 (U) | 1.69 | n/a | 1.69 | Maximum detected concentration |
| Selenium | 37 | 0 | 0.945 (UJ) | 1.3 (U) | n/a | 1.3 (U) | Maximum detection limit |
| Silver | 37 | 8 | 0.138 | 2.2 (U) | Normal | 0.209 | 95% KM (t) |
| Uranium | 28 | 28 | 0.728 | 8.8 | Gamma | 3.73 | 95% Adjusted Gamma |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 35 | 5 | 0.00213 | 0.0527 | Normal | 0.00811 | 95% KM (t) |
| Anthracene | 35 | 1 | 0.0128 | 0.36 (U) | n/a | 0.0128 | Maximum detected concentration |
| Benzo(a)anthracene | 35 | 2 | 0.0292 | 0.36 (U) | n/a | 0.0626 | Maximum detected concentration |
| Benzo(a)pyrene | 35 | 2 | 0.0149 | 0.36 (U) | n/a | 0.0384 | Maximum detected concentration |
| Benzo(b)fluoranthene | 35 | 2 | 0.0286 | 0.36 (U) | n/a | 0.072 | Maximum detected concentration |
| Benzo(g,h,i)perylene | 34 | 1 | 0.0226 | 0.35 (U) | n/a | 0.0226 | Maximum detected concentration |

**Table H-2.3-37 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 35 | 1 | 0.105 | 0.457 (U) | n/a | 0.105 | Maximum detected concentration |
| Chrysene | 35 | 2 | 0.0202 | 0.36 (U) | n/a | 0.0527 | Maximum detected concentration |
| Fluoranthene | 35 | 2 | 0.0345 (U) | 0.36 (U) | n/a | 0.127 | Maximum detected concentration |
| Indeno(1,2,3-cd)pyrene | 35 | 1 | 0.0208 | 0.36 (U) | n/a | 0.0208 | Maximum detected concentration |
| Phenanthrene | 35 | 2 | 0.0345 (U) | 0.36 (U) | n/a | 0.0812 | Maximum detected concentration |
| Pyrene | 35 | 2 | 0.0345 (U) | 0.36 (U) | n/a | 0.0783 | Maximum detected concentration |
| Toluene | 36 | 7 | 0.000328 | 0.0122 | Normal | 0.00152 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 37 | 18 | −0.01 (U) | 0.173 | Gamma | 0.0413 | 95% KM (t) |
| Uranium-234 | 37 | 37 | 0.495 | 13.9 | Nonparametric | 3.09 | 95% Chebyshev (Mean, Sd) |
| Uranium-235/236 | 37 | 26 | 0.0317 | 0.78 | Lognormal | 0.13 | 95% KM (BCA) |
| Uranium-238 | 37 | 37 | 0.734 | 15.1 | Nonparametric | 4.14 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

**Table H-2.3-38**
**EPCs at SWMU 15-009(h) for the Residential Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 12 | 0 | 0.992 (UJ) | 1.11 (UJ) | n/a* | 1.11 (UJ) | Maximum detection limit |
| Barium | 12 | 12 | 39.1 | 164 | Normal | 124 | 95% Student's-t |
| Nickel | 12 | 12 | 4.65 | 9.68 | Normal | 7.91 | 95% Student's-t |
| Nitrate | 12 | 6 | 1.05 (UJ) | 9.71 | Nonparametric | 5.22 | 95% KM Chebyshev |
| Perchlorate | 12 | 6 | 0.000631 | 0.0025 (U) | Normal | 0.0012 | 95% KM (t) |
| Selenium | 12 | 0 | 0.919 (UJ) | 1.23 (UJ) | n/a | 1.23 (UJ) | Maximum detection limit |
| Uranium | 12 | 12 | 0.507 | 6.41 | Normal | 4.03 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 12 | 2 | 0.00523 (UJ) | 0.00919 | n/a | 0.00919 | Maximum detected concentration |
| Ethylbenzene | 12 | 1 | 0.00105 (U) | 0.00125 (U) | n/a | 0.00117 | Maximum detected concentration |
| Hexanone[2-] | 12 | 1 | 0.00201 | 0.00626 (U) | n/a | 0.00201 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Plutonium-239/240 | 12 | 1 | −0.00246 (U) | 0.0286 | n/a | 0.0286 | Maximum detected concentration |
| Tritium | 12 | 6 | −0.0271 (U) | 19.6 | Nonparametric | 9.09 | 95% KM Chebyshev |
| Uranium-234 | 12 | 12 | 0.419 | 2.74 | Normal | 1.58 | 95% Student's-t |
| Uranium-235/236 | 12 | 7 | 0.0166 (U) | 0.291 | Normal | 0.13 | 95% KM (t) |
| Uranium-238 | 12 | 12 | 0.46 | 3.96 | Normal | 2.14 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-39
## EPCs at SWMU 15-009(h) for Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 3 | 0 | 1.03 (UJ) | 1.09 (UJ) | n/a* | 1.09 (UJ) | Maximum detection limit |
| Uranium | 3 | 3 | 1.12 | 4.06 | n/a | 4.06 | Maximum detected concentration |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Hexanone[2-] | 3 | 1 | 0.00201 | 0.00574 (U) | n/a | 0.00201 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Tritium | 3 | 2 | 0.0282 (U) | 0.0424 | n/a | 0.0424 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-40**
**EPCs at SWMU 15-010(b) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 9 | 0 | 1.07 (U) | 1.35 (U) | n/a* | 1.35 (U) | Maximum detection limit |
| Cadmium | 9 | 0 | 0.534 (U) | 0.673 (U) | n/a | 0.673 (U) | Maximum detection limit |
| Chromium (Total) | 9 | 9 | 3.87 | 12.8 | Normal | 9.19 | 95% Student's-t |
| Iron | 9 | 9 | 8680 | 14,600 | Normal | 11,900 | 95% Student's-t |
| Mercury | 9 | 9 | 0.0203 | 0.688 | Gamma | 0.422 | 95% Adjusted Gamma |
| Nitrate | 9 | 2 | 1.07 (UJ) | 1.65 | n/a | 1.65 | Maximum detected concentration |
| Perchlorate | 9 | 1 | 0.000598 | 0.00286 (U) | n/a | 0.000598 | Maximum detected concentration |
| Selenium | 9 | 1 | 0.72 | 1.38 (U) | n/a | 0.72 | Maximum detected concentration |
| Uranium | 9 | 9 | 0.663 | 13.3 | Normal | 5.94 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 9 | 3 | 0.00285 | 0.0133 | n/a | 0.0133 | Maximum detected concentration |
| Aroclor-1254 | 2 | 1 | 0.00443 (U) | 0.0046 | n/a | 0.0046 | Maximum detected concentration |
| Aroclor-1260 | 2 | 1 | 0.0025 | 0.00443 (U) | n/a | 0.0025 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 9 | 2 | 0.117 | 0.474 (U) | n/a | 0.17 | Maximum detected concentration |
| Di-n-butylphthalate | 9 | 3 | 0.206 | 3.64 | n/a | 3.64 | Maximum detected concentration |
| Dichloroethene[1,1-] | 9 | 1 | 0.00037 | 0.00143 (U) | n/a | 0.00037 | Maximum detected concentration |
| Methylene chloride | 9 | 3 | 0.00275 | 0.00716 (U) | n/a | 0.00371 | Maximum detected concentration |
| Tetrachloroethene | 9 | 1 | 0.000584 | 0.00143 (U) | n/a | 0.000584 | Maximum detected concentration |
| Toluene | 9 | 3 | 0.000501 | 0.00723 | n/a | 0.00723 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 9 | 1 | 0.0004 | 0.00286 (U) | n/a | 0.0004 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 9 | 9 | 0.0717 | 2.34 | Normal | 1.03 | 95% Student's-t |
| Plutonium-239/240 | 9 | 3 | 0.00466 (U) | 0.121 | n/a | 0.121 | Maximum detected concentration |
| Uranium-238 | 9 | 9 | 1.03 | 6.93 | Gamma | 3.78 | 95% Adjusted Gamma |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-41
## EPCs at SWMU 15-010(b) for the Residential Scenario and Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 17 | 0 | 1.01 (U) | 1.35 (U) | n/a* | 1.35 (U) | Maximum detection limit |
| Cadmium | 17 | 0 | 0.505 (U) | 0.673 (U) | n/a | 0.673 (U) | Maximum detection limit |
| Chromium (Total) | 17 | 17 | 3.87 | 18.2 | Normal | 10 | 95% Student's-t |
| Iron | 17 | 17 | 8350 | 19,100 | Gamma | 13,100 | 95% Adjusted Gamma |
| Mercury | 17 | 17 | 0.00744 | 0.688 | Lognormal | 0.292 | 95% Chebyshev (Mean, Sd) |
| Nitrate | 17 | 3 | 1.04 (UJ) | 1.65 | n/a | 1.65 | Maximum detected concentration |
| Perchlorate | 17 | 2 | 0.000598 | 0.00286 (U) | n/a | 0.000762 | Maximum detected concentration |
| Selenium | 17 | 2 | 0.579 | 1.38 (U) | n/a | 0.72 | Maximum detected concentration |
| Uranium | 17 | 17 | 0.395 | 13.3 | Gamma | 4.21 | 95% Adjusted Gamma |
| Vanadium | 17 | 17 | 7.19 | 23.7 | Normal | 15.7 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 17 | 7 | 0.00217 | 0.689 | Gamma | 0.121 | 95% KM (t) |
| Aroclor-1254 | 4 | 2 | 0.00393 (U) | 0.0065 | n/a | 0.0065 | Maximum detected concentration |
| Aroclor-1260 | 4 | 1 | 0.0025 | 0.00443 (U) | n/a | 0.0025 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 17 | 2 | 0.117 | 0.474 (U) | n/a | 0.17 | Maximum detected concentration |
| Di-n-butylphthalate | 17 | 5 | 0.206 | 3.64 | Normal | 0.86 | 95% KM (t) |
| Dichloroethene[1,1-] | 17 | 1 | 0.00037 | 0.00143 (U) | n/a | 0.00037 | Maximum detected concentration |
| Methylene chloride | 17 | 5 | 0.00275 | 0.00716 (U) | Normal | 0.00414 | 95% KM (t) |
| Styrene | 17 | 1 | 0.000555 | 0.00143 (U) | n/a | 0.000555 | Maximum detected concentration |
| Tetrachloroethene | 17 | 1 | 0.000584 | 0.00143 (U) | n/a | 0.000584 | Maximum detected concentration |
| Toluene | 17 | 6 | 0.000501 | 0.0185 | Normal | 0.00421 | 95% KM (t) |
| Xylene[1,3-]+1,4-Xylene | 17 | 2 | 0.0004 | 0.00286 (U) | n/a | 0.000732 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 17 | 12 | −0.0134 (U) | 2.34 | Normal | 0.626 | 95% KM (t) |
| Plutonium-239/240 | 17 | 5 | 0 (U) | 0.121 | Gamma | 0.0281 | 95% KM (t) |
| Uranium-238 | 17 | 17 | 0.739 | 6.93 | Lognormal | 2.68 | 95% BCA Bootstrap |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-42**
**EPCs at AOC 15-014(h) for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 23 | 0 | 0.439 (U) | 1.57 (U) | n/a* | 1.57 (U) | Maximum detection limit |
| Barium | 23 | 23 | 49.1 | 195 | Normal | 152 | 95% Student's-t |
| Cadmium | 23 | 6 | 0.141 | 0.928 | Normal | 0.39 | 95% KM (t) |
| Chromium (Total) | 23 | 23 | 4.45 | 29.6 | Normal | 15.1 | 95% Student's-t |
| Cobalt | 23 | 23 | 2.41 | 6.83 | Normal | 4.93 | 95% Student's-t |
| Copper | 23 | 23 | 3.71 | 34.5 | Nonparametric | 17.6 | 95% Chebyshev (Mean, Sd) |
| Iron | 23 | 23 | 7860 | 15,300 | Normal | 12,200 | 95% Student's-t |
| Lead | 23 | 23 | 8.89 | 48.9 | Gamma | 22.9 | 95% Adjusted Gamma |
| Mercury | 23 | 23 | 0.00927 | 1.54 | Nonparametric | 0.521 | 95% Chebyshev (Mean, Sd) |
| Nickel | 23 | 23 | 3.81 | 10.8 | Normal | 8.43 | 95% Student's-t |
| Perchlorate | 23 | 2 | 0.014 | 0.349 (U) | Normal | 0.00118 | 95% KM (t) |
| Selenium | 23 | 0 | 0.969 (UJ) | 1.5 (U) | n/a | 1.5 (U) | Maximum detection limit |
| Silver | 23 | 15 | 0.196 | 21 | Nonparametric | 6.07 | 95% KM Chebyshev |
| Uranium | 23 | 23 | 0.624 | 13.9 | Gamma | 5.72 | 95% Adjusted Gamma |
| Vanadium | 23 | 23 | 11.3 | 29.5 | Normal | 23.8 | 95% Student's-t |

**Table H-2.3-42 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 23 | 3 | 0.00335 | 0.0295 | n/a | 0.0295 | Maximum detected concentration |
| Aroclor-1254 | 7 | 2 | 0.00412 (U) | 0.704 | n/a | 0.704 | Maximum detected concentration |
| Aroclor-1260 | 7 | 2 | 0.00412 (U) | 0.258 | n/a | 0.258 | Maximum detected concentration |
| Benzoic acid | 23 | 3 | 0.392 | 6.99 (UJ) | n/a | 1.01 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 23 | 2 | 0.0959 | 3.49 (U) | n/a | 0.343 | Maximum detected concentration |
| Di-n-butylphthalate | 23 | 1 | 0.129 | 3.49 (U) | n/a | 0.129 | Maximum detected concentration |
| Di-n-octylphthalate | 23 | 1 | 0.36 (U) | 3.49 (U) | n/a | 1.43 | Maximum detected concentration |
| Dichloroethene[1,1-] | 23 | 1 | 0.000772 | 0.00152 (U) | n/a | 0.000772 | Maximum detected concentration |
| Ethylbenzene | 23 | 1 | 0.00076 | 0.00152 (U) | n/a | 0.00076 | Maximum detected concentration |
| Isopropyltoluene[4-] | 23 | 5 | 0.000447 | 0.0425 | Gamma | 0.00604 | 95% KM (t) |
| Methylene chloride | 23 | 6 | 0.00319 | 0.00941 | Normal | 0.00508 | 95% KM (t) |
| Tetrachloroethene | 23 | 7 | 0.000452 | 0.00155 | Normal | 0.000948 | 95% KM (t) |
| Toluene | 23 | 7 | 0.000466 | 0.00152 (U) | Normal | 0.000802 | 95% KM (t) |
| Xylene[1,3-]+1,4-Xylene | 23 | 5 | 0.00046 | 0.00305 (U) | Normal | 0.00108 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 23 | 19 | −0.0227 (U) | 1.53 | Normal | 0.549 | 95% KM (t) |
| Plutonium-238 | 23 | 1 | −0.00215 (U) | 0.0599 | n/a | 0.0599 | Maximum detected concentration |
| Plutonium-239/240 | 23 | 11 | 0.00287 (U) | 0.0622 | Normal | 0.0243 | 95% KM (t) |
| Tritium | 23 | 4 | −0.0186 (U) | 0.0901 | n/a | 0.0901 | Maximum detected concentration |
| Uranium-234 | 23 | 23 | 0.856 | 4.17 | Normal | 2.24 | 95% Student's-t |
| Uranium-238 | 23 | 23 | 0.775 | 5.21 | Normal | 2.86 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

**Table H-2.3-43**
**EPCs at AOC 15-014(h) for the Residential Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 52 | 52 | 3840 | 16,100 | Normal | 9740 | 95% Student's-t |
| Antimony | 52 | 0 | 0.357 (U) | 1.57 (U) | n/a* | 1.57 (U) | Maximum detection limit |
| Barium | 52 | 52 | 46.5 | 195 | Normal | 140 | 95% Student's-t |
| Cadmium | 52 | 9 | 0.115 | 1.54 | Normal | 0.344 | 95% KM (t) |
| Chromium (Total) | 52 | 52 | 4.45 | 48.9 | Lognormal | 18.2 | 95% Student's-t |
| Cobalt | 52 | 52 | 1.07 | 9.41 | Normal | 4.99 | 95% Student's-t |
| Copper | 52 | 52 | 2.2 | 53.6 | Nonparametric | 14.7 | 95% Chebyshev (Mean, Sd) |
| Iron | 52 | 52 | 7860 | 16,900 | Normal | 13,100 | 95% Student's-t |
| Lead | 52 | 52 | 6.65 | 80.2 | Nonparametric | 19.3 | 95% Student's-t |
| Mercury | 52 | 52 | 0.00851 | 1.54 | Nonparametric | 0.322 | 95% Chebyshev (Mean, Sd) |
| Nickel | 52 | 52 | 2.85 | 12.1 | Normal | 8.25 | 95% Student's-t |
| Perchlorate | 52 | 18 | 0.000616 | 0.00305 (U) | Normal | 0.00113 | 95% KM (t) |
| Selenium | 52 | 0 | 0.969 (UJ) | 1.5 (U) | n/a | 1.5 (U) | Maximum detection limit |
| Silver | 52 | 35 | 0.196 | 21 | Nonparametric | 3.57 | 95% KM (Chebyshev) |
| Uranium | 52 | 52 | 0.261 | 13.9 | Nonparametric | 4.41 | 95% Chebyshev (Mean, Sd) |
| Vanadium | 52 | 52 | 7.65 | 31.2 | Normal | 23.9 | 95% Student's-t |

## Table H-2.3-43 (continued)

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 52 | 6 | 0.00335 | 0.0295 | Gamma | 0.0059 | 95% KM (t) |
| Aroclor-1254 | 16 | 4 | 0.00359 (U) | 0.704 | n/a | 0.704 | Maximum detected concentration |
| Aroclor-1260 | 16 | 4 | 0.0033 | 0.258 | n/a | 0.258 | Maximum detected concentration |
| Benzoic acid | 52 | 3 | 0.392 | 6.99 (UJ) | n/a | 1.01 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 52 | 3 | 0.0793 | 3.49 (U) | n/a | 0.343 | Maximum detected concentration |
| Chloroform | 52 | 1 | 0.000687 | 0.00152 (U) | n/a | 0.000687 | Maximum detected concentration |
| Di-n-butylphthalate | 52 | 2 | 0.093 | 3.49 (U) | n/a | 0.129 | Maximum detected concentration |
| Di-n-octylphthalate | 52 | 1 | 0.357 (U) | 3.49 (U) | n/a | 1.43 | Maximum detected concentration |
| Dichloroethene[1,1-] | 52 | 1 | 0.000772 | 0.00152 (U) | n/a | 0.000772 | Maximum detected concentration |
| Ethylbenzene | 52 | 2 | 0.000489 | 0.00152 (U) | n/a | 0.00076 | Maximum detected concentration |
| Isopropyltoluene[4-] | 52 | 6 | 0.000447 | 0.0425 | Lognormal | 0.00538 | 95% KM (Chebyshev) |
| Methylene chloride | 52 | 7 | 0.00319 | 0.00941 | Normal | 0.00477 | 95% KM (t) |
| Tetrachloroethene | 52 | 14 | 0.000404 | 0.00155 | Normal | 0.000721 | 95% KM (t) |
| Toluene | 52 | 15 | 0.000394 | 0.00244 | Normal | 0.000771 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 52 | 1 | 0.000383 | 0.00152 (UJ) | n/a | 0.000383 | Maximum detected concentration |
| Xylene[1,2-] | 52 | 2 | 0.00036 | 0.00152 (U) | n/a | 0.000371 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 52 | 19 | 0.000369 | 0.00305 (U) | Normal | 0.000748 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 51 | 25 | −0.0337 (U) | 1.53 | Normal | 0.291 | 95% KM (t) |
| Plutonium-238 | 52 | 1 | −0.00483 (U) | 0.0599 | n/a | 0.0599 | Maximum detected concentration |
| Plutonium-239/240 | 52 | 13 | −0.00868 (U) | 0.0622 | Normal | 0.00605 | 95% KM (t) |
| Tritium | 52 | 11 | −0.0233 (U) | 0.883 | Nonparametric | 0.0882 | 95% KM Chebyshev |
| Uranium-234 | 52 | 52 | 0.46 | 4.17 | Gamma | 1.68 | 95% Approximate Gamma |
| Uranium-238 | 52 | 52 | 0.393 | 5.21 | Lognormal | 2.1 | 95% Bootstrap-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-44
## EPCs at AOC 15-014(h) for Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 49 | 0 | 0.357 (U) | 1.57 (U) | n/a* | 1.57 (U) | Maximum detection limit |
| Barium | 49 | 49 | 46.5 | 195 | Normal | 142 | 95% Student's-t |
| Cadmium | 49 | 9 | 0.115 | 1.54 | Normal | 0.348 | 95% KM (t) |
| Chromium (Total) | 49 | 49 | 4.45 | 48.9 | Lognormal | 18.4 | 95% Student's-t |
| Cobalt | 49 | 49 | 1.79 | 9.41 | Normal | 5.08 | 95% Student's-t |
| Copper | 49 | 49 | 3.71 | 53.6 | Nonparametric | 15.2 | 95% Chebyshev (Mean, Sd) |
| Lead | 49 | 49 | 6.65 | 80.2 | Nonparametric | 19.8 | 95% Student's-t |
| Mercury | 49 | 49 | 0.00851 | 1.54 | Nonparametric | 0.34 | 95% Chebyshev (Mean, Sd) |
| Nickel | 49 | 49 | 3.81 | 12.1 | Normal | 8.35 | 95% Student's-t |
| Selenium | 49 | 0 | 0.969 (UJ) | 1.5 (U) | n/a | 1.5 (U) | Maximum detection limit |
| Silver | 49 | 32 | 0.196 | 21 | Nonparametric | 3.72 | 95% KM (Chebyshev) |
| Uranium | 49 | 49 | 0.581 | 13.9 | Nonparametric | 4.62 | 95% Chebyshev (Mean, Sd) |
| Vanadium | 49 | 49 | 10.8 | 31.2 | Normal | 24.2 | 95% Student's-t |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 49 | 6 | 0.00335 | 0.0295 | Gamma | 0.00598 | 95% KM (t) |
| Aroclor-1254 | 15 | 4 | 0.00359 (U) | 0.704 | n/a | 0.704 | Maximum detected concentration |
| Aroclor-1260 | 15 | 4 | 0.0033 | 0.258 | n/a | 0.258 | Maximum detected concentration |
| Benzoic acid | 49 | 3 | 0.392 | 6.99 (UJ) | n/a | 1.01 | Maximum detected concentration |
| Bis(2-ethylhexyl)phthalate | 49 | 3 | 0.0793 | 3.49 (U) | n/a | 0.343 | Maximum detected concentration |
| Chloroform | 49 | 1 | 0.000687 | 0.00152 (U) | n/a | 0.000687 | Maximum detected concentration |
| Di-n-butylphthalate | 49 | 2 | 0.093 | 3.49 (U) | n/a | 0.129 | Maximum detected concentration |
| Di-n-octylphthalate | 49 | 1 | 0.357 (U) | 3.49 (U) | n/a | 1.43 | Maximum detected concentration |
| Dichloroethene[1,1-] | 49 | 1 | 0.000772 | 0.00152 (U) | n/a | 0.000772 | Maximum detected concentration |
| Ethylbenzene | 49 | 2 | 0.000489 | 0.00152 (U) | n/a | 0.00076 | Maximum detected concentration |
| Isopropyltoluene[4-] | 49 | 6 | 0.000447 | 0.0425 | Lognormal | 0.00566 | 95% KM (Chebyshev) |

**Table H-2.3-44 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 49 | 7 | 0.00319 | 0.00941 | Normal | 0.00478 | 95% KM (t) |
| Tetrachloroethene | 49 | 14 | 0.000404 | 0.00155 | Normal | 0.000723 | 95% KM (t) |
| Toluene | 49 | 15 | 0.000394 | 0.00244 | Normal | 0.000778 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 49 | 1 | 0.000383 | 0.00152 (UJ) | n/a | 0.000383 | Maximum detected concentration |
| Xylene[1,2-] | 49 | 2 | 0.00036 | 0.00152 (U) | n/a | 0.000371 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 49 | 19 | 0.000369 | 0.00305 (U) | Normal | 0.000749 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 48 | 25 | −0.0337 (U) | 1.53 | Normal | 0.31 | 95% KM (t) |
| Plutonium-238 | 49 | 1 | −0.00483 (U) | 0.0599 | n/a | 0.0599 | Maximum detected concentration |
| Plutonium-239/240 | 49 | 13 | −0.00868 (U) | 0.0622 | Normal | 0.00693 | 95% KM (t) |
| Tritium | 49 | 10 | −0.0233 (U) | 0.1 | Gamma | 0.00467 | 95% KM (BCA) |
| Uranium-234 | 49 | 49 | 0.477 | 4.17 | Lognormal | 1.74 | 95% Student's-t |
| Uranium-238 | 49 | 49 | 0.573 | 5.21 | Lognormal | 2.54 | 95% Chebyshev (Mean, Sd) |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-45**
**EPCs at SWMU 36-002 for the Residential Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 4 | 4 | 1730 | 13,800 | n/a* | 13,800 | Maximum detected concentration |
| Antimony | 4 | 0 | 0.913 (UJ) | 1.07 (UJ) | n/a | 1.07 (UJ) | Maximum detection limit |
| Barium | 4 | 4 | 20.4 | 84.6 | n/a | 84.6 | Maximum detected concentration |
| Beryllium | 4 | 4 | 0.512 | 2.69 | n/a | 2.69 | Maximum detected concentration |
| Cobalt | 4 | 4 | 0.657 | 4.2 | n/a | 4.2 | Maximum detected concentration |
| Copper | 4 | 3 | 2.18 (U) | 9.92 | n/a | 9.92 | Maximum detected concentration |
| Nickel | 4 | 4 | 1.87 | 10.6 | n/a | 10.6 | Maximum detected concentration |
| Perchlorate | 4 | 3 | 0.00127 | 0.00377 | n/a | 0.00377 | Maximum detected concentration |
| Selenium | 4 | 0 | 0.922 (UJ) | 1.02 (UJ) | n/a | 1.02 (UJ) | Maximum detection limit |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Ethylbenzene | 4 | 1 | 0.000482 | 0.00108 (U) | n/a | 0.000482 | Maximum detected concentration |
| Radionuclides (pCi/g) | | | | | | | |
| Plutonium-238 | 4 | 1 | 0.00265 (U) | 0.033 | n/a | 0.033 | Maximum detected concentration |
| Tritium | 4 | 1 | −0.00145 (U) | 0.0101 | n/a | 0.0101 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

## Table H-2.3-46
## EPCs at SWMU 36-002 for Ecological Risk

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 1 | 0 | 0.913 (UJ) | 0.913 (UJ) | n/a* | 0.913 (UJ) | Maximum detection limit |
| Barium | 1 | 1 | 84.6 | 84.6 | n/a | 84.6 | Maximum detected concentration |
| Cobalt | 1 | 1 | 4.2 | 4.2 | n/a | 4.2 | Maximum detected concentration |
| Copper | 1 | 1 | 5.98 | 5.98 | n/a | 5.98 | Maximum detected concentration |
| Nickel | 1 | 1 | 6.82 | 6.82 | n/a | 6.82 | Maximum detected concentration |
| Selenium | 1 | 0 | 0.922 (UJ) | 0.922 (UJ) | n/a | 0.922 (UJ) | Maximum detection limit |
| **Radionuclides (pCi/g)** | | | | | | | |
| Plutonium-238 | 1 | 1 | 0.033 | 0.033 | n/a | 0.033 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.



## Table H-2.3-47
## EPCs at SWMU 36-003(a) for the Industrial Scenario

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 1 | 0 | 1.11 (U) | 1.11 (U) | n/a* | 1.11 (U) | Maximum detection limit |
| Nitrate | 1 | 1 | 1.92 | 1.92 | n/a | 1.92 | Maximum detection limit |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-48**
**EPCs at SWMU 36-003(a) for the Residential Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 16 | 0 | 0.984 (U) | 1.29 (UJ) | n/a* | 1.29 (UJ) | Maximum detection limit |
| Beryllium | 16 | 16 | 0.43 | 5.57 | Nonparametric | 2.23 | 95% Chebyshev (Mean, Sd) |
| Cobalt | 16 | 16 | 0.732 | 6.75 | Lognormal | 2.89 | 95% Jackknife |
| Nickel | 16 | 16 | 2.46 | 39.9 | Nonparametric | 15.9 | 95% Chebyshev (Mean, Sd) |
| Nitrate | 16 | 10 | 1.02 (UJ) | 2.38 | Normal | 1.71 | 95% KM (t) |
| Perchlorate | 16 | 5 | 0.000631 | 0.00229 (U) | Lognormal | 0.00101 | 95% KM (t) |
| Selenium | 16 | 0 | 0.986 (U) | 1.28 (U) | n/a | 1.28 (U) | Maximum detection limit |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Isopropyltoluene[4-] | 16 | 2 | 0.000603 | 0.00811 | n/a | 0.00811 | Maximum detected concentration |
| RDX | 16 | 1 | 0.184 | 0.5 (U) | n/a | 0.184 | Maximum detected concentration |
| Trimethylbenzene[1,2,4-] | 16 | 1 | 0.000343 | 0.00131 (U) | n/a | 0.000343 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-49**
**EPCs at SWMU 36-003(a) for Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 13 | 0 | 0.984 (U) | 1.29 (UJ) | n/a* | 1.29 (UJ) | Maximum detection limit |
| Beryllium | 13 | 13 | 0.452 | 5.57 | Nonparametric | 2.63 | 95% Chebyshev (Mean, Sd) |
| Cobalt | 13 | 13 | 0.732 | 6.75 | Lognormal | 2.81 | 95% Jackknife |
| Nickel | 13 | 13 | 2.46 | 39.9 | Nonparametric | 18.6 | 95% Chebyshev (Mean, Sd) |
| Selenium | 13 | 0 | 1.02 (U) | 1.28 (U) | n/a | 1.28 (U) | Maximum detection limit |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Isopropyltoluene[4-] | 13 | 1 | 0.000603 | 0.00131 (U) | n/a | 0.000603 | Maximum detected concentration |
| RDX | 13 | 1 | 0.184 | 0.5 (U) | n/a | 0.184 | Maximum detected concentration |
| Trimethylbenzene[1,2,4-] | 13 | 1 | 0.000343 | 0.00131 (U) | n/a | 0.000343 | Maximum detected concentration |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-50**
**EPCs at SWMU 36-008 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 57 | 0 | 0.581 (U) | 5.62 (U) | n/a* | 5.62 (U) | Maximum detection limit |
| Cadmium | 57 | 21 | 0.149 | 1.36 | Normal | 0.41 | 95% KM (t) |
| Chromium (Total) | 57 | 57 | 4.07 | 192 | Nonparametric | 38.6 | 95% Chebyshev (Mean, Sd) |
| Copper | 57 | 57 | 1.79 | 4870 | Nonparametric | 567 | 95% Chebyshev (Mean, Sd) |
| Cyanide (Total) | 57 | 43 | 0.0826 | 2.88 | Gamma | 0.678 | 95% KM (BCA) |
| Lead | 57 | 57 | 4.82 | 202 | Nonparametric | 41 | 95% Chebyshev (Mean, Sd) |
| Mercury | 57 | 57 | 0.00856 | 25 | Nonparametric | 3.09 | 95% Chebyshev (Mean, Sd) |
| Nickel | 57 | 56 | 0.43 (U) | 53 | Lognormal | 10.1 | 95% KM (Chebyshev) |
| Nitrate | 57 | 41 | 1.15 (UJ) | 540 | Nonparametric | 55.7 | 95% KM (Chebyshev) |
| Perchlorate | 57 | 38 | 0.000689 | 0.688 | Lognormal | 0.0715 | 95% KM Chebyshev |
| Selenium | 57 | 0 | 0.971 (U) | 2.03 (U) | n/a | 2.03 (U) | Maximum detection limit |
| Silver | 57 | 31 | 0.126 | 348 | Nonparametric | 44.7 | 95% KM Chebyshev |
| Uranium | 57 | 56 | 0.043 (U) | 10.4 | Gamma | 2.44 | 95% KM (BCA) |
| Zinc | 57 | 57 | 24.9 | 1320 | Nonparametric | 208 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 57 | 9 | 0.00286 | 0.0394 | Nonparametric | 0.00596 | 95% KM (t) |
| Aroclor-1254 | 16 | 13 | 0.0043 | 1.03 | Gamma | 0.378 | 95% KM (Chebyshev) |
| Aroclor-1260 | 16 | 9 | 0.00401 (U) | 0.617 | Gamma | 0.138 | 95% KM (BCA) |
| Benzoic acid | 57 | 9 | 0.355 | 36.3 (UJ) | Lognormal | 0.671 | 95% KM (t) |
| Bis(2-ethylhexyl)phthalate | 57 | 2 | 0.112 | 18.1 (U) | n/a | 0.436 | Maximum detected concentration |
| Bromodichloromethane | 57 | 1 | 0.00107 (UJ) | 0.00204 (U) | n/a | 0.00117 | Maximum detected concentration |
| Chlorodibromomethane | 57 | 1 | 0.000635 | 0.00204 (U) | n/a | 0.000635 | Maximum detected concentration |
| Chloroform | 57 | 1 | 0.00107 (UJ) | 0.00982 | n/a | 0.00982 | Maximum detected concentration |
| Chloromethane | 57 | 1 | 0.000633 | 0.00204 (U) | n/a | 0.000633 | Maximum detected concentration |
| Di-n-butylphthalate | 57 | 10 | 0.0913 | 8.07 | Lognormal | 0.705 | 95% KM (BCA) |

## Table H-2.3-50 (continued)

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Dibenzofuran | 57 | 5 | 0.341 | 18.1 (U) | Lognormal | 0.493 | 95% KM (t) |
| Dichloroethene[1,1-] | 57 | 4 | 0.000495 | 0.00246 | n/a | 0.00246 | Maximum detected concentration |
| Isopropyltoluene[4-] | 57 | 24 | 0.000399 | 0.149 (UJ) | Nonparametric | 0.016 | 95% KM (Chebyshev) |
| Methylene chloride | 57 | 7 | 0.00268 | 0.0102 (U) | Normal | 0.00419 | 95% KM (t) |
| RDX | 57 | 1 | 0.106 | 0.5 (U) | n/a | 0.106 | Maximum detected concentration |
| Styrene | 57 | 1 | 0.00107 (UJ) | 0.00197 | n/a | 0.00197 | Maximum detected concentration |
| TATB | 57 | 2 | 0.303 | 1 (U) | n/a | 0.331 | Maximum detected concentration |
| Toluene | 57 | 23 | 0.000334 | 0.00552 | Lognormal | 0.00133 | 95% KM (t) |
| Trichloroethene | 57 | 5 | 0.000605 | 0.00204 (U) | Normal | 0.00079 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 57 | 4 | 0.000406 | 0.00499 | n/a | 0.00499 | Maximum detected concentration |
| Trimethylbenzene[1,3,5-] | 57 | 1 | 0.00107 (UJ) | 0.00279 | n/a | 0.00279 | Maximum detected concentration |
| Xylene[1,2-] | 57 | 2 | 0.000513 | 0.00204 (U) | n/a | 0.000616 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 57 | 8 | 0.00043 | 0.00362 (U) | Normal | 0.000764 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Americium-241 | 57 | 6 | −0.00142 (U) | 0.0465 | Normal | 0.00385 | 95% KM (t) |
| Cesium-137 | 56 | 53 | 0.00741 (U) | 3.31 | Gamma | 0.833 | 95% KM (BCA) |
| Plutonium-239/240 | 57 | 39 | −0.00455 (U) | 0.0953 | Gamma | 0.0355 | 95% KM (Percentile Bootstrap) |
| Tritium | 57 | 8 | −0.0584 (U) | 0.98 | Nonparametric | 0.0639 | 95% KM Chebyshev |
| Uranium-234 | 57 | 57 | 0.682 | 6.1 | Nonparametric | 1.73 | 95% Student's-t |
| Uranium-235/236 | 57 | 22 | 0.0226 (U) | 0.278 | Normal | 0.08 | 95% KM (t) |
| Uranium-238 | 57 | 57 | 1 | 5.17 | Nonparametric | 1.93 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-51**
**EPCs at SWMU 36-008 for the Residential Scenario and Ecological Risk**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Aluminum | 107 | 107 | 1680 | 14,100 | Lognormal | 6080 | 95% Student's-t |
| Antimony | 107 | 0 | 0.581 (U) | 5.62 (U) | n/a* | 5.62 (U) | Maximum detection limit |
| Barium | 107 | 107 | 15.5 | 184 | Gamma | 77.6 | 95% Approximate Gamma |
| Beryllium | 107 | 106 | 0.108 (U) | 2.44 | Lognormal | 0.654 | 95% KM (BCA) |
| Cadmium | 107 | 36 | 0.102 | 3.35 | Lognormal | 0.397 | 95% KM (t) |
| Chromium (Total) | 107 | 107 | 4.07 | 192 | Nonparametric | 30.3 | 95% Chebyshev (Mean, Sd) |
| Copper | 107 | 107 | 1.79 | 4870 | Nonparametric | 315 | 95% Chebyshev (Mean, Sd) |
| Cyanide (Total) | 107 | 74 | 0.0718 | 4.24 | Gamma | 0.538 | 95% KM (Percentile Bootstrap) |
| Lead | 107 | 107 | 4.41 | 202 | Nonparametric | 29.7 | 95% Chebyshev (Mean, Sd) |
| Mercury | 107 | 104 | 0.00598 | 25 | Lognormal | 2.34 | 95% KM Chebyshev |
| Nickel | 107 | 106 | 0.43 (U) | 53 | Lognormal | 6.79 | 95% KM (BCA) |
| Nitrate | 107 | 76 | 1.01 | 540 | Nonparametric | 32.7 | 95% KM (Chebyshev) |
| Perchlorate | 107 | 71 | 0.000602 | 0.688 | Lognormal | 0.0438 | 95% KM Chebyshev |
| Selenium | 107 | 1 | 0.635 | 2.03 (U) | n/a | 0.635 | Maximum detected concentration |
| Silver | 107 | 58 | 0.107 | 348 | Lognormal | 41.7 | 95% KM Chebyshev |
| Uranium | 107 | 106 | 0.043 (U) | 10.4 | Lognormal | 1.89 | 95% KM (BCA) |
| Vanadium | 107 | 107 | 2.46 | 26.6 | Gamma | 13.9 | 95% Approximate Gamma |
| Zinc | 107 | 107 | 24.9 | 1320 | Nonparametric | 135 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Acetone | 107 | 14 | 0.00218 (U) | 0.0394 | Nonparametric | 0.00444 | 95% KM (t) |
| Aroclor-1254 | 31 | 19 | 0.00356 (U) | 1.03 | Gamma | 0.124 | 95% KM (BCA) |
| Aroclor-1260 | 31 | 15 | 0.0031 | 0.617 | Gamma | 0.0725 | 95% KM (t) |
| Benzoic acid | 107 | 13 | 0.245 | 36.3 (UJ) | Lognormal | 0.63 | 95% KM (t) |
| Bis(2-ethylhexyl)phthalate | 107 | 5 | 0.112 | 18.1 (U) | Normal | 0.236 | 95% KM (t) |
| Bromodichloromethane | 107 | 1 | 0.00106 (U) | 0.00204 (U) | n/a | 0.00117 | Maximum detected concentration |
| Butylbenzylphthalate | 107 | 1 | 0.214 | 18.1 (U) | n/a | 0.214 | Maximum detected concentration |
| Chlorodibromomethane | 107 | 1 | 0.000635 | 0.00204 (U) | n/a | 0.000635 | Maximum detected concentration |

**Table H-2.3-51 (continued)**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Chloroform | 107 | 2 | 0.00052 | 0.00982 | n/a | 0.00982 | Maximum detected concentration |
| Chloromethane | 107 | 1 | 0.000633 | 0.00204 (U) | n/a | 0.000633 | Maximum detected concentration |
| Chloronaphthalene[2-] | 107 | 1 | 0.0215 | 1.81 (U) | n/a | 0.0215 | Maximum detected concentration |
| Chlorotoluene[4-] | 107 | 1 | 0.000496 | 0.00204 (U) | n/a | 0.000496 | Maximum detected concentration |
| Di-n-butylphthalate | 107 | 13 | 0.0913 | 8.07 | Lognormal | 0.448 | 95% KM (BCA) |
| Dibenzofuran | 107 | 6 | 0.341 | 18.1 (U) | Lognormal | 0.421 | 95% KM (t) |
| Dichloroethene[1,1-] | 107 | 4 | 0.000495 | 0.00246 | n/a | 0.00246 | Maximum detected concentration |
| Isopropyltoluene[4-] | 107 | 40 | 0.000399 | 0.149 (UJ) | Nonparametric | 0.00711 | 95% KM (BCA) |
| Methylene chloride | 107 | 8 | 0.0026 | 0.0102 (U) | Normal | 0.00384 | 95% KM (t) |
| RDX | 107 | 1 | 0.106 | 0.5 (U) | n/a | 0.106 | Maximum detected concentration |
| Styrene | 107 | 1 | 0.00106 (U) | 0.00197 | n/a | 0.00197 | Maximum detected concentration |
| TATB | 107 | 2 | 0.303 | 1 (U) | n/a | 0.331 | Maximum detected concentration |
| Toluene | 107 | 42 | 0.000331 | 0.015 | Lognormal | 0.00127 | 95% KM (t) |
| Trichloroethene | 107 | 7 | 0.000448 | 0.00204 (U) | Normal | 0.000729 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 107 | 7 | 0.000388 | 0.00499 | Gamma | 0.000826 | 95% KM (t) |
| Trimethylbenzene[1,3,5-] | 107 | 2 | 0.00106 (U) | 0.00569 | n/a | 0.00569 | Maximum detected concentration |
| Xylene[1,2-] | 107 | 4 | 0.000366 | 0.00204 (U) | n/a | 0.000616 | Maximum detected concentration |
| Xylene[1,3-]+1,4-Xylene | 107 | 15 | 0.000343 | 0.00362 (U) | Normal | 0.000658 | 95% KM (t) |
| **Radionuclides (pCi/g)** | | | | | | | |
| Americium-241 | 107 | 7 | −0.00335 (U) | 0.0465 | Normal | 0.000591 | 95% KM (Percentile Bootstrap) |
| Cesium-137 | 104 | 85 | −0.0496 (U) | 3.31 | Gamma | 0.559 | 95% KM (BCA) |
| Plutonium-239/240 | 107 | 43 | −0.00455 (U) | 0.0953 | Gamma | 0.0186 | 95% KM (t) |
| Tritium | 107 | 13 | −0.0584 (U) | 0.98 | Nonparametric | 0.0125 | 95% KM Chebyshev |
| Uranium-234 | 107 | 107 | 0.682 | 6.1 | Nonparametric | 1.55 | 95% Student's-t |
| Uranium-235/236 | 107 | 42 | 0.0226 (U) | 0.278 | Normal | 0.0699 | 95% KM (t) |
| Uranium-238 | 107 | 107 | 0.857 | 5.17 | Nonparametric | 1.69 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-2.3-52**
**EPCs at SWMU C-36-003 for the Industrial Scenario**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 8 | 0 | 1 (U) | 1.49 (U) | n/a* | 1.49 (U) | Maximum detection limit |
| Cadmium | 8 | 4 | 0.324 | 1.36 | n/a | 1.36 | Maximum detected concentration |
| Calcium | 8 | 8 | 2430 | 11,700 | Normal | 6830 | 95% Student's-t |
| Copper | 8 | 8 | 4.75 | 2720 | Nonparametric | 1830 | 95% Chebyshev (Mean, Sd) |
| Cyanide (Total) | 8 | 8 | 0.364 | 2.18 | Normal | 1.47 | 95% Student's-t |
| Lead | 8 | 8 | 9.31 | 144 | Nonparametric | 101 | 95% Chebyshev (Mean, Sd) |
| Manganese | 8 | 8 | 88.4 | 860 | Normal | 597 | 95% Student's-t |
| Mercury | 8 | 8 | 0.0531 | 0.582 | Normal | 0.403 | 95% Student's-t |
| Nickel | 8 | 8 | 3.36 | 53 | Nonparametric | 37.2 | 95% Chebyshev (Mean, Sd) |
| Nitrate | 8 | 7 | 1.67 (U) | 540 | Gamma | 370 | 95% KM (Chebyshev) |
| Perchlorate | 8 | 6 | 0.000991 | 0.688 | Gamma | 0.474 | 95% KM (Chebyshev) |
| Selenium | 8 | 0 | 0.971 (U) | 1.56 (U) | n/a | 1.56 (U) | Maximum detection limit |
| Silver | 8 | 6 | 0.609 (U) | 348 | Normal | 177 | 95% KM (t) |
| Uranium | 8 | 8 | 1.72 | 10.4 | Normal | 6.06 | 95% Student's-t |
| Zinc | 8 | 8 | 41.6 | 1320 | Nonparametric | 904 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 8 | 5 | 0.00442 | 1.03 | Gamma | 0.392 | 95% KM (BCA) |
| Aroclor-1260 | 8 | 4 | 0.00447 (U) | 0.617 | n/a | 0.617 | Maximum detected concentration |
| Benzoic Acid | 8 | 1 | 0.355 | 36.3 (UJ) | n/a | 0.355 | Maximum detected concentration |
| Bromodichloromethane | 8 | 1 | 0.00107 (UJ) | 0.00167 (U) | n/a | 0.00117 | Maximum detected concentration |
| Chlorodibromomethane | 8 | 1 | 0.000635 | 0.00167 (U) | n/a | 0.000635 | Maximum detected concentration |
| Chloroform | 8 | 1 | 0.00107 (UJ) | 0.00982 | n/a | 0.00982 | Maximum detected concentration |
| Di-n-butylphthalate | 8 | 4 | 0.441 | 8.07 | n/a | 8.07 | Maximum detected concentration |
| Isopropyltoluene[4-] | 8 | 6 | 0.000453 | 0.0124 | Normal | 0.00777 | 95% KM (t) |

## Table H-2.3-52 (continued)

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| Methylene Chloride | 8 | 2 | 0.00315 | 0.00835 (U) | n/a | 0.00378 | Maximum detected concentration |
| RDX | 8 | 1 | 0.106 | 0.5 (UJ) | n/a | 0.106 | Maximum detected concentration |
| Toluene | 8 | 6 | 0.000334 | 0.00139 (U) | Normal | 0.0012 | 95% KM (t) |
| Trimethylbenzene[1,2,4-] | 8 | 1 | 0.001 | 0.00167 (U) | n/a | 0.001 | Maximum detected concentration |
| Xylene[1,3-]+Xylene[1,4-] | 8 | 1 | 0.000822 | 0.00334 (U) | n/a | 0.000822 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 8 | 8 | 0.335 | 2.02 | Lognormal | 1.21 | 95% BCA Bootstrap |
| Plutonium-239/240 | 8 | 7 | 0.0166 (U) | 0.0762 | Normal | 0.053 | 95% KM (t) |
| Tritium | 8 | 3 | −0.0476094 (U) | 0.0913562 | n/a | 0.0914 | Maximum detected concentration |
| Uranium-234 | 8 | 8 | 1.26 | 6.1 | Lognormal | 5.05 | 95% Bootstrap-t |
| Uranium-235/236 | 8 | 6 | 0.0521 (U) | 0.278 | Normal | 0.178 | 95% KM (t) |
| Uranium-238 | 8 | 8 | 1.4 | 4.51 | Normal | 3.29 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

**Table H-2.3-53**
**EPCs at SWMU C-36-003 for the Residential Scenario and Ecological Receptors**

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | |
| Antimony | 16 | 0 | 0.955 (U) | 1.49 (U) | n/a* | 1.49 (U) | Maximum detection limit |
| Cadmium | 16 | 8 | 0.182 | 3.35 | Normal | 1.09 | 95% KM (t) |
| Chromium (Total) | 16 | 16 | 4.28 | 192 | Gamma | 90.4 | 95% Adjusted Gamma |
| Copper | 16 | 16 | 3.67 | 2720 | Nonparametric | 936 | 95% Chebyshev (Mean, Sd) |
| Cyanide (Total) | 16 | 16 | 0.105 | 2.18 | Normal | 1.06 | 95% Student's-t |
| Lead | 16 | 16 | 7.22 | 144 | Lognormal | 58.5 | 95% Chebyshev (Mean, Sd) |
| Manganese | 16 | 16 | 78.1 | 860 | Normal | 452 | 95% Student's-t |
| Mercury | 16 | 14 | 0.00927 (U) | 0.815 | Normal | 0.342 | 95% KM (t) |
| Nickel | 16 | 16 | 2.87 | 53 | Nonparametric | 20.7 | 95% Chebyshev (Mean, Sd) |
| Nitrate | 16 | 14 | 1.07 (U) | 540 | Nonparametric | 197 | 95% KM Chebyshev |
| Perchlorate | 16 | 13 | 0.000642 | 0.688 | Lognormal | 0.256 | 95% KM Chebyshev |
| Selenium | 16 | 1 | 0.635 | 1.56 (U) | n/a | 0.635 | Maximum detected concentration |
| Silver | 16 | 12 | 0.22 (U) | 348 | Normal | 161 | 95% KM (t) |
| Uranium | 16 | 16 | 0.437 | 10.4 | Normal | 4.43 | 95% Student's-t |
| Zinc | 16 | 16 | 39.8 | 1320 | Nonparametric | 490 | 95% Chebyshev (Mean, Sd) |
| **Organic Chemicals (mg/kg)** | | | | | | | |
| Aroclor-1254 | 16 | 8 | 0.00356 (U) | 1.03 | Gamma | 0.209 | 95% KM (t) |
| Aroclor-1260 | 16 | 7 | 0.00356 (U) | 0.617 | Lognormal | 0.132 | 95% KM (BCA) |
| Benzoic Acid | 16 | 1 | 0.355 | 36.3 (UJ) | n/a | 0.355 | Maximum detected concentration |
| Bromodichloromethane | 16 | 1 | 0.00106 (UJ) | 0.00167 (U) | n/a | 0.00117 | Maximum detected concentration |
| Chlorodibromomethane | 16 | 1 | 0.000635 | 0.00167 (U) | n/a | 0.000635 | Maximum detected concentration |
| Chloroform | 16 | 2 | 0.00052 | 0.00982 | n/a | 0.00982 | Maximum detected concentration |
| Di-n-butylphthalate | 16 | 6 | 0.258 | 8.07 | Gamma | 1.84 | 95% KM (t) |
| Isopropyltoluene[4-] | 16 | 8 | 0.000453 | 0.0124 | Normal | 0.00516 | 95% KM (t) |
| Methylene Chloride | 16 | 2 | 0.00315 | 0.00835 (U) | n/a | 0.00378 | Maximum detected concentration |

## Table H-2.3-53 (continued)

| COPC | Number of Analyses | Number of Detects | Minimum Concentration | Maximum Concentration | Distribution | EPC | EPC Method |
|---|---|---|---|---|---|---|---|
| RDX | 16 | 1 | 0.106 | 0.5 (UJ) | n/a | 0.106 | Maximum detected concentration |
| Toluene | 16 | 11 | 0.000331 | 0.00139 (U) | Lognormal | 0.000815 | 95% KM (BCA) |
| Trimethylbenzene[1,2,4-] | 16 | 1 | 0.001 | 0.00167 (U) | n/a | 0.001 | Maximum detected concentration |
| Xylene[1,3-]+Xylene[1,4-] | 16 | 1 | 0.000822 | 0.00334 (U) | n/a | 0.000822 | Maximum detected concentration |
| **Radionuclides (pCi/g)** | | | | | | | |
| Cesium-137 | 16 | 13 | −0.00545 (U) | 2.02 | Gamma | 0.711 | 95% KM (BCA) |
| Tritium | 16 | 5 | −0.0476094 (U) | 0.15437 | Normal | 0.0219 | 95% KM (t) |
| Uranium-234 | 16 | 16 | 0.937 | 6.1 | Gamma | 3.23 | 95% Adjusted Gamma |
| Uranium-235/236 | 16 | 11 | 0.0515 (U) | 0.278 | Normal | 0.144 | 95% KM (t) |
| Uranium-238 | 16 | 16 | 0.857 | 4.51 | Normal | 2.63 | 95% Student's-t |

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

**Table H-3.2-1**
**Physical and Chemical Properties of**
**Inorganic COPCs for the Threemile Canyon Aggregate Area**

| COPC | $K_d$[a] ($cm^3/g$) | Water Solubility[a, b] (g/L) |
|---|---|---|
| Aluminum | 1500 | Insoluble |
| Antimony | 45 | Insoluble |
| Arsenic | 29 | Insoluble |
| Barium | 41 | Insoluble |
| Beryllium | 790 | Insoluble |
| Cadmium | 75 | Insoluble |
| Chromium (Total) | 850 | Insoluble |
| Cobalt | 45 | Insoluble |
| Copper | 35 | Insoluble |
| Cyanide (Total) | 9.9 | na[c] |
| Iron | 25 | Insoluble |
| Lead | 900 | Insoluble |
| Manganese | 65 | Insoluble |
| Mercury | 52 | Insoluble |
| Nickel | 65 | Insoluble |
| Perchlorate | na | 245 |
| Selenium | 5 | Insoluble |
| Silver | 8.3 | Insoluble |
| Thallium | 71 | Insoluble |
| Uranium | 0.4 | Insoluble |
| Vanadium | 1000 | Insoluble |
| Zinc | 62 | Insoluble |

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_search.

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] na = Not available.

**Table H-3.2-2**
**Physical and Chemical Properties of Organic COPCs for the Threemile Canyon Aggregate Area**

| COPC | Water Solubility[a] (mg/L) | Organic Carbon Coefficient $K_{oc}$[a] (L/kg) | Log Octanol-Water Partition Coefficient $K_{ow}$[a] | Vapor Pressure[a] (mm Hg at 25°C) |
|---|---|---|---|---|
| Acetone | 1.00E+06[b] | 1.98E+00 | -2.40E-01[b] | 2.31E+02[b] |
| Amino-2,6-dinitrotoluene[4-] | 1.01E+02 | 1.84E+00 | 1.22E+03 | 3.65E-06 |
| Anthracene | 4.34E-02[b] | 2.04E+04 | 4.45E+00[b] | 2.67E-06[b] |
| Aroclor-1242 | 2.77E-01 | 7.81E+04 | 6.29E+00 | 8.63E-05 |
| Aroclor-1254 | 3.40E-03[b] | 5.30E+05[c] | 6.79E+00[b] | 6.53E-06[b] |
| Aroclor-1260 | 2.84E-04[b] | 5.30E+05[c] | 8.27E+00[b] | 4.05E-05[b] |
| Aroclor-1268 | na[d] | na | na | na |
| Benzo(a)anthracene | 9.40E-03[b] | 2.31E+05 | 5.76+00[b] | 1.90E-06[b] |
| Benzo(a)pyrene | 1.62E-03[b] | 7.87E+05 | 6.13E+00[b] | 5.49E-09[b] |
| Benzo(b)fluoranthene | 1.50E-03[b] | 8.03E+05 | 5.78E+00[b] | 5.00E-07[b] |
| Benzo(g,h,i)perylene | 2.60E-04[b] | 2.68E+06 | 6.63E+00[b] | 1.00E-10[b] |
| Benzo(k)fluoranthene | 8.00E-04[b] | 7.87E+05 | 6.1E+00[b] | 9.65E-10[b] |
| Benzoic acid | 3.40E+03[b] | 1.45E+01 | 1.87E+00[b] | 7.00E-04[b] |
| Bis(2-ethylhexyl)phthalate | 2.70E-01[b] | 1.65E+05 | 7.60E+00[b] | 1.42E-07[b] |
| Bromodichloromethane | 3.03E+03 | 3.18E+01 | 2.00E+00 | 5.00E+01 |
| Butanone[2-] | 2.23E+05 | 3.83E+00 | 2.90E-01 | 9.06E+01 |
| Butylbenzylphthalate | 2.69E+00 | 9.36E+03 | 4.73E+00 | 8.25E-06 |
| Chlorodibromomethane | 2.70E+03 | 3.18E+01 | 2.16E+00 | 1.56E+01 |
| Chloroform | 7.95E+03 | 3.18E+01 | 1.97E+00 | 1.97E+02 |
| Chloromethane | 5.32E+03 | 1.43E+01 | 9.10E-01 | 4.30E+03 |
| Chloronaphthalene[2-] | 2.98E+03 | 3.98E+00 | 1.17E+01 | 9.03E-03 |
| Chlorotoluene[4-] | 1.06E+02[e] | 3.75E+02[e] | 3.33E+00[e] | 2.69E+00[e] |
| Chrysene | 6.30E-03[b] | 2.36E+05 | 5.81E+00[b] | 6.23E-09[b] |
| Di-n-butylphthalate | 1.46E+03 | 4.50E+00 | 4.70E+00[b] | 2.01E-05 |
| Di-n-octylphthalate | 2.20E-02 | 1.45E+05 | 8.10E+00 | 1.00E-07 |
| Dibenzofuran | 3.10E+00 | 1.13E+04 | 4.12E+00 | 2.48E-03 |
| Dichloroethene[1,1-] | 2.42E+03 | 3.18E+01 | 2.13E+00 | 6.34E+02 |
| Ethylbenzene | 1.69E+02 | 5.18E+02 | 3.15E+00 | 9.60E+00 |
| Fluoranthene | 2.06E-01[c] | 7.09E+04[c] | 5.16E+00[c] | 9.22E-06[c] |
| Hexanone[2-] | 1.75E+04 | 1.30E+01 | 1.38E+00 | 1.16E+01 |
| HMX | 1.85E+03[c] | 1.60E-01 | 9.44E+03[c] | 3.30E-14 |
| Indeno(1,2,3-cd)pyrene | 1.90E-04 | 1.95E+06 | 6.70E+00 | 1.25E-12 |
| Isopropyltoluene[4-] | 2.34E+01[b] | na | 4.10E+00[b] | 1.64E+00[b] |
| Methylene chloride | 1.30E+04[b] | 2.37E+01 | 1.30E+00[b] | 4.30E+02[b] |
| PETN | 4.30E+01[e] | 6.48E+02[e] | 2.38E+00[e] | 5.45E-09[e] |
| Phenanthrene | 1.15E+00[b] | 2.08E+04 | 4.46E+00[b] | 1.12E-04[b] |
| Pyrene | 1.35E-01[b] | 6.94E+04 | 4.88E+00[b] | 4.50E-06[b] |

**Table H-3.2-2 (continued)**

| COPC | Water Solubility[a] (mg/L) | Organic Carbon Coefficient $K_{oc}$[a] (L/kg) | Log Octanol-Water Partition Coefficient $K_{ow}$[a] | Vapor Pressure[a] (mm Hg at 25°C) |
|---|---|---|---|---|
| RDX | 1.95E+02[c] | 8.70E-01 | 5.97E+00[c] | 4.10E-09 |
| Styrene | 3.10E+02 | 5.18E+02 | 2.95E+00 | 6.40E+00 |
| TATB | na | na | -2.93E+00 | 8.67E-18 |
| Tetrachloroethene | 2.06E+02 | 9.49E+01 | 3.40E+00 | 1.85E+01 |
| Tetryl | 7.40E+01 | 4.61E+03 | 1.64E+00 | 1.17E-07 |
| Toluene | 5.26E+02 | 2.68E+02 | 2.73E+00 | 2.84E+01 |
| Trichloroethene | 1.28E+03 | 6.07E+01 | 2.42E+00 | 6.90E+01 |
| Trimethylbenzene[1,2,4-] | 5.70E+01 | 7.18E+02 | 3.63E+00 | 2.10E+00 |
| Trimethylbenzene[1,3,5-] | 4.82E+01 | 6.02E+02 | 3.42E+00 | 2.10E+00 |
| Trinitrotoluene[2,4,6-] | 1.85E+03 | 1.60E+00 | 1.38E+02 | 8.02E-06 |
| Xylene[1,2-] | 1.61E+02 | 4.34E+02 | 3.20E+00 | 8.29E+00 |
| Xylene[1,3-]+1,4-Xylene[f] | 1.78E+02 | 3.83E+02 | 3.12E+00 | 7.99E+00 |

[a] Information from http://rais.ornl.gov/cgi-bin/tools/TOX_search.

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] Information from NMED (2015, 600915).

[d] na = Not available.

[e] EPA regional screening tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] Xylenes used as a surrogate.

**Table H-3.2-3**
**Physical and Chemical Properties of**
**Radionuclide COPCs for the Threemile Canyon Aggregate Area**

| COPC | Soil-Water Partition Coefficient, $K_d$[a] ($cm^3/g$) | Water Solubility[b] (g/L) |
|---|---|---|
| Americium-241 | 680 | Insoluble |
| Cesium-137 | 1000 | Insoluble |
| Plutonium-238 | 4500 | Insoluble |
| Plutonium-239/240 | 4500 | Insoluble |
| Tritium | 9.9 | Soluble |
| Uranium-234 | 0.4 | Insoluble |
| Uranium-235/236 | 0.4 | Insoluble |
| Uranium-238 | 0.4 | Insoluble |

[a] Superfund Chemical Data Matrix (EPA 1996, 064708).

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

**Table H-4.1-1**
**Exposure Parameters Used to Calculate**
**Chemical SSLs for the Industrial, Residential, and Recreational Scenarios**

| Parameters | Residential Values | Industrial Values | Recreational Values |
|---|---|---|---|
| Target HQ | 1 | 1 | 1 |
| Target cancer risk | $10^{-5}$ | $10^{-5}$ | $10^{-5}$ |
| Averaging time (carcinogen/mutagen) | 70 yr × 365 d | 70 yr × 365 d | 70 yr × 365 d |
| Averaging time (noncarcinogen) | Exposure duration × 365 d | Exposure duration × 365 d | Exposure duration × 365 d |
| Skin absorption factor | Semivolatile organic compound (SVOC) = 0.1 | SVOC = 0.1 | SVOC = 0.1 |
| | Chemical-specific | Chemical-specific | Chemical-specific |
| Adherence factor–child | 0.2 $mg/cm^2$ | n/a[a] | 0.2 $mg/cm^2$ |
| Body weight–child | 15 kg (0–6 yr of age) | n/a | 31 kg |
| Cancer slope factor–oral (chemical-specific) | $(mg/kg\text{-}d)^{-1}$ | $(mg/kg\text{-}d)^{-1}$ | $(mg/kg\text{-}d)^{-1}$ |
| Inhalation unit risk (chemical-specific) | $(\mu g/m^3)$ | $(\mu g/m^3)$ | $(\mu g/m^3)$ |
| Exposure frequency | 350 d/yr | 225 d/yr | 200 d/yr |
| Exposure time | 24 h/d | 8 h/day | 1 h/d |
| Exposure duration–child | 6 yr[b] | n/a | 6 yr (6 to <12 yr of age) |
| Age-adjusted ingestion factor for carcinogens | 36,750 mg/kg | n/a | n/a |
| Age-adjusted ingestion factor for mutagens | 25,550 mg/kg | n/a | n/a |
| Soil ingestion rate–child | 200 mg/d | n/a | 91 mg/d |
| Particulate emission factor | $6.61 \times 10^9\ m^3/kg$ | $6.61 \times 10^9\ m^3/kg$ | $6.61 \times 10^9\ m^3/kg$ |
| Reference dose–oral (chemical-specific) | (mg/kg-d) | (mg/kg-d) | (mg/kg-d) |
| Reference dose–inhalation (chemical-specific) | (mg/kg-d) | (mg/kg-d) | (mg/kg-d) |
| Exposed surface area–child | 2690 $cm^2/d$ | n/a | 4030 $cm^2$ |
| Age-adjusted skin contact factor for carcinogens | 112,266 mg/kg | n/a | n/a |
| Age-adjusted skin contact factor for mutagens | 166,833 mg/kg | n/a | n/a |
| Volatilization factor for soil (chemical-specific) | $(m^3/kg)$ | $(m^3/kg)$ | $(m^3/kg)$ |
| Body weight–adult | 80 kg | 80 kg | 80 kg[b] |
| Exposure duration[c] | 30 yr[d] | 25 yr | 26 yr (20 yr carcinogens) |
| Adherence factor–adult | 0.07 $mg/cm^2$ | 0.12 $mg/cm^2$ | 0.07 $mg/cm^2$ |
| Soil ingestion rate–adult | 100 mg/d | 100 mg/d | 30 mg/d |
| Exposed surface area–adult | 6032 $cm^2/d$ | 3470 $cm^2/d$ | 6032 $cm^2$ |

Note: Parameter values from NMED (2015, 600915) and LANL (2015, 600336).

[a] n/a = Not applicable.

[b] The child exposure duration for mutagens is subdivided into 0–2 yr and 2–6 yr.

[c] Exposure duration for lifetime resident is 26 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (20 yr).

[d] The adult exposure duration for mutagens is subdivided into 6–16 yr and 16–30 yr.

**Table H-4.1-2**
**Parameter Values Used to Calculate Radionuclide SALs for the Residential Scenario**

| Parameters | Residential, Child | Residential, Adult |
|---|---|---|
| Inhalation rate ($m^3$/yr) | 4712[a] | 7780[b] |
| Mass loading ($g/m^3$) | $1.5 \times 10^{-7}$[c] | $1.5 \times 10^{-7}$[c] |
| Outdoor time fraction | 0.0926[d] | 0.0934[e] |
| Indoor-time fraction | 0.8656[f] | 0.8648[g] |
| Soil ingestion (g/yr) | 73[h] | 36.5[i] |

[a] Calculated as 12.9 $m^3$/d × 365.25 d/yr, where 12.9 $m^3$/d is the mean upper percentile daily inhalation rate of a child (EPA 2011, 208374, Table 6-1).

[b] Calculated as 21.3 $m^3$/d × 365.25 d/yr, where 21.3 $m^3$/d is the mean upper percentile daily inhalation rate of an adult from 21 to less than 61 yr old (EPA 2011, 208374, Table 6-1).

[c] Calculated as (1 / $6.6 \times 10^9$ $m^3$/kg) × 1000 g/kg, where $6.6 \times 10^9$ $m^3$/kg is the particulate emission factor (NMED 2015, 600915).

[d] Calculated as (2.32 h/d × 350 d/yr) / 8766 h/yr, where 2.32 h/d (139 min) is the largest amount of time spent outdoors for child age groups between 1 to less than 3 mo and 3 to less than 6 yr (EPA 2011, 208374, Table 16-1) and is comparable with the adult time spent outdoors at a residence.

[e] Calculated as (2.34 h/d × 350 d/yr) / 8766 h/yr, where 4.68 h/d is the average total time spent outdoors for adults age 18 to less than 65 yr in all environments (EPA 2011, 208374, Table 16-1); 50% of this value (2.34 h/d) was applied to time spent outdoors at a residence and is similar to mean time outdoors at a residence for this age group (EPA 2011, 208374, Table 16-22).

[f] Calculated as [(24 h/d–2.32 h/d) × 350 d/yr] / 8766 h/yr.

[g] Calculated as [(24 h/d–2.34 h/d) × 350 d/yr] / 8766 h/yr.

[h] The soil ingestion rate compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. Calculated as [0.2 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.2 g/d is the upper percentile site-related daily child soil ingestion rate (NMED 2015, 600915; EPA 2011, 208374, Table 5-1).

[i] The soil ingestion rate compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. Calculated as [0.1 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.1 g/d is the site-related daily adult soil ingestion rate (NMED 2015, 600915).

**Table H-4.1-3**
**Parameter Values Used to Calculate Radionuclide SALs for the Industrial Scenario**

| Parameters | Industrial, Adult |
|---|---|
| Inhalation rate ($m^3$/yr) | 7780[a] |
| Mass loading ($g/m^3$) | $1.5 \times 10^{-7}$[b] |
| Outdoor time fraction | 0.2053[c] |
| Indoor time fraction | 0[d] |
| Soil ingestion (g/yr) | 109.6[e] |

[a] Calculated as [21.3 $m^3$/d × 365.25 d/yr], where 21.3 $m^3$/d is the upper percentile daily inhalation rate of an adult from 21 to less than 61 yr old (EPA 2011, 208374, Table 6-1).

[b] Calculated as (1/$6.6 \times 10^9$ $m^3$/kg) x 1000 g/kg, where $6.6 \times 10^9$ $m^3$/kg is the particulate emission factor (NMED 2015, 600915).

[c] Calculated as (8 h/d × 225 d/yr) / 8766 h/yr, where 8 h/d is an estimate of the average length of the work day and 225 d/yr is the exposure frequency (NMED 2015, 600915).

[d] The commercial/industrial worker is defined as someone who “spends most of the work day conducting maintenance or manual labor activities outdoors” (NMED 2015, 600915).

[e] The soil-ingestion rate compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil-ingestion pathway. Calculated as [0.1 g/d × 225 d/yr] / [indoor + outdoor time fractions], where 0.1 g/d is the site-related daily adult soil-ingestion rate (NMED 2015, 600915).

**Table H-4.1-4**
**Parameters Used to Calculate Radionuclide SALs for the Recreational Scenario**

| Parameters | Recreational, Child | Recreational, Adult |
|---|---|---|
| Inhalation rate ($m^3$/yr) | 15,250[a] | 19,460[b] |
| Mass loading ($g/m^3$) | $1.5 \times 10^{-7}$[c] | $1.5 \times 10^{-7}$[c] |
| Outdoor time fraction | 0.0228[d] | 0.0228[d] |
| Indoor time fraction | 0 | 0 |
| Soil ingestion (g/yr) | 797[e] | 244[f] |

[a] Calculated as (0.029 $m^3$/min × 60 min/h × 24 h/d × 365.25 d/yr), where 0.029 $m^3$/min is the upper percentile child inhalation rate for moderate activity for 6 to <11 yr old (EPA 2011, 208374, Table 6-2).

[b] Calculated as (0.037 $m^3$/min × 60 min/h × 24 h/d × 365.25 d/yr), where 0.037 $m^3$/min is the age-weighted upper percentile adult inhalation rate for moderate activity (12 to 35 yr) (EPA 2011, 208374, Table 6-2).

[c] Calculated as (1/6.6 × $10^{+9}$ $m^3$/kg) × 1000 g/kg, where 6.6 × $10^{+9}$ $m^3$/kg is the particulate emission factor used for residential and industrial scenarios (NMED 2015, 600915).

[d] Calculated as (1 h/d × 200 d/yr) / 8766 hr/yr, where 1 h/d is the exposure time for a recreational adult or child and 200 d/yr is the exposure frequency (LANL 2015, 600929).

[e] The soil ingestion rate is defined to compensate for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. 100% of daily soil ingestion is protectively assumed to occur during outdoor activity. Calculated as [(0.2 g/d / 2.2 h/d) × 1 h/d × 200 d/yr)] / [indoor + outdoor time fractions], where 2.2 h/d is the mean time spent outdoors per d for a 6 to <11 yr old child (EPA 2011, 208374, Table 16-1), and where 0.2 g/d is the upper bound child soil ingestion rate (EPA 2011, 208374, Table 5-1; NMED 2015, 600915).

[f] Calculated as [(0.1 g/d / 3.6 h/d) × 1 h/d × 200 d/yr)] / [indoor + outdoor time fractions], where 3.6 h/d is the mean time spent outdoors per d for an adult (12 to 35 yr) (EPA 2011, 208374, Table 16-1) and where 0.1 g/d is the adult soil ingestion rate (NMED 2015, 600915).

**Table H-4.2-1**
**Industrial Carcinogenic Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 25.3 | 505 | 5.01E-07 |
| PETN | 5.82 | 570[b] | 1.02E-07 |
| RDX | 7.16 | 311 | 2.30E-07 |
| | | **Total Excess Cancer Risk** | **8E-07** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-2**
**Industrial Noncarcinogenic Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.45 (U) | 519 | 2.79E-03 |
| Barium | 226 | 255,000 | 8.86E-04 |
| Cobalt | 7.02 | 350[b] | 2.01E-02 |
| Copper | 9.61 | 51,900 | 1.85E-04 |
| Manganese | 422 | 160,000 | 2.64E-03 |
| Perchlorate | 0.00125 | 908 | 1.38E-06 |
| Selenium | 1.34 (U) | 6490 | 2.06E-04 |
| Uranium | 5.59 | 3880 | 1.44E-03 |
| Amino-2,6-dinitrotoluene[4-] | 0.127 | 2300[b] | 5.52E-05 |
| HMX | 11.4 | 63,300 | 1.80E-04 |
| Tetryl | 0.333 | 2590 | 1.29E-04 |
| | | **HI** | **0.03** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-3**
**Industrial Radionuclide Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Plutonium-239/240 | 0.0082 | 1200 | 1.71E-04 |
| Uranium-234 | 1.86 | 3100 | 1.50E-02 |
| Uranium-238 | 2.15 | 710 | 7.57E-02 |
| | | **Total Dose** | **0.09** |

* SALs from LANL (2015, 600929).

**Table H-4.2-4**
**Recreational Carcinogenic Screening**
**Evaluation for SWMsU 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Recreational SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 25.3 | 281 | 9.00E-07 |
| RDX | 7.16 | 399 | 1.79E-07 |
| | | **Total Excess Cancer Risk** | **1E-06** |

*SSLs from LANL (2015, 600336).

**Table H-4.2-5**
**Recreational Noncarcinogenic Screening**
**Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Recreational SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.45 (U) | 248 | 5.85E-03 |
| Barium | 226 | 124,000 | 1.82E-03 |
| Cobalt | 7.02 | 186 | 3.77E-02 |
| Copper | 9.61 | 24,800 | 3.88E-04 |
| Manganese | 422 | 86,200 | 4.90E-03 |
| Perchlorate | 0.00125 | 434 | 2.88E-06 |
| Selenium | 1.34 (U) | 3100 | 4.32E-04 |
| Uranium | 5.59 | 1860 | 3.01E-03 |
| Amino-2,6-dinitrotoluene[4-] | 0.127 | 1150 | 1.10E-04 |
| HMX | 11.4 | 29,400 | 3.88E-04 |
| PETN | 5.82 | 657 | 8.86E-03 |
| Tetryl | 0.333 | 1230 | 2.71E-04 |
| | | **HI** | **0.07** |

* SSLs from LANL (2015, 600336).

**Table H-4.2-6**
**Recreational Radionuclide Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (pCi/g) | Recreational SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Plutonium-239/240 | 0.0082 | 1300 | 1.58E-04 |
| Uranium-234 | 1.86 | 3900 | 1.19E-02 |
| Uranium-238 | 2.15 | 2800 | 1.92E-02 |
| | | **Total Dose** | **0.03** |

* SALs from LANL (2015, 600929).

**Table H-4.2-7**
**Residential Carcinogenic Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 24.6 | 96.6 | 2.55E-06 |
| RDX | 3.73 | 60.4 | 6.18E-07 |
| | | **Total Excess Cancer Risk** | **3E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-8**
**Residential Noncarcinogenic Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 11900 | 78,000 | 1.53E-01 |
| Antimony | 1.15 | 31.3 | 3.67E-02 |
| Barium | 213 | 15,600 | 1.37E-02 |
| Cobalt | 7.1 | 23[b] | 3.09E-01 |
| Copper | 8.09 | 3130 | 2.58E-03 |
| Iron | 13900 | 54,800 | 2.54E-01 |
| Manganese | 456 | 10,500 | 4.34E-02 |
| Nickel | 7.67 | 1560 | 4.92E-03 |
| Perchlorate | 0.001 | 54.8 | 1.82E-05 |
| Selenium | 1.34 (U) | 391 | 3.43E-03 |
| Uranium | 3.52 | 234 | 1.50E-02 |
| Vanadium | 27.6 | 394 | 7.01E-02 |
| Amino-2,6-dinitrotoluene[4-] | 0.127 | 150[b] | 8.47E-04 |
| HMX | 0.749 | 3850 | 1.95E-04 |
| PETN | 5.82 | 130[b] | 4.48E-02 |
| Tetryl | 0.333 | 156 | 2.13E-03 |
| | | **HI** | **1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-9**
**Residential Radionuclide Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.234 | 12 | 4.88E-01 |
| Plutonium-239/240 | 0.00149 | 79 | 4.72E-04 |
| Uranium-234 | 1.45 | 290 | 1.25E-01 |
| Uranium-238 | 1.65 | 150 | 2.75E-01 |
| | | **Total Dose** | **0.9** |

* SALs from LANL (2015, 600929).

**Table H-4.2-10**
**Construction Worker Noncarcinogenic**
**Screening Evaluation for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | Construction Worker SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 11,900 | 41,400 | 2.87E-01 |
| Antimony | 1.15 | 142 | 8.10E-03 |
| Barium | 213 | 4390 | 4.85E-02 |
| Chromium (Total) | 24.6 | 134 | 1.84E-01 |
| Cobalt | 7.1 | 36.6 | 1.94E-01 |
| Copper | 8.09 | 14,200 | 5.70E-04 |
| Iron | 13,900 | 248,000 | 5.60E-02 |
| Manganese | 456 | 464 | 9.83E-01 |
| Nickel | 7.67 | 753 | 1.02E-02 |
| Perchlorate | 0.001 | 248 | 4.03E-06 |
| Selenium | 1.34 (U) | 1750 | 7.66E-04 |
| Uranium | 3.52 | 277 | 1.27E-02 |
| Vanadium | 27.6 | 614 | 4.50E-02 |
| Amino-2,6-dinitrotoluene[4-] | 0.127 | 688[b] | 1.85E-04 |
| HMX | 0.749 | 17,400 | 4.30E-05 |
| PETN | 5.82 | 514[b] | 1.13E-02 |
| Tetryl | 0.333 | 760 | 4.38E-04 |
| | | **HI** | **2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables) and equation and parameters from NMED (2015, 600915).

**Table H-4.2-11**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 12-002**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.03 (U) | 519 | 1.98E-03 |
| Barium | 74.3 | 255,000 | 2.91E-04 |
| Cobalt | 13.4 | 350[b] | 3.83E-02 |
| Copper | 7.83 | 51,900 | 1.51E-04 |
| Selenium | 1.06 (U) | 6490 | 1.63E-04 |
| | | **HI** | **0.04** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-12**
**Recreational Noncarcinogenic Screening Evaluation for SWMU 12-002**

| COPC | EPC (mg/kg) | Recreational SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.03 (U) | 248 | 4.15E-03 |
| Barium | 74.3 | 124,000 | 5.99E-04 |
| Cobalt | 13.4 | 186 | 7.20E-02 |
| Copper | 7.83 | 24,800 | 3.16E-04 |
| Selenium | 1.06 (U) | 3100 | 3.42E-04 |
| | | **HI** | **0.08** |

* SSLs from LANL (2015, 600336).

**Table H-4.2-13**
**Residential Carcinogenic Screening Evaluation for SWMU 12-002**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 13.5 | 96.6 | 1.40E-06 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-14**
**Residential Noncarcinogenic Screening Evaluation for SWMU 12-002**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 14200 | 78,000 | 1.82E-01 |
| Antimony | 1.03 (U) | 31.3 | 3.29E-02 |
| Barium | 191 | 15,600 | 1.22E-02 |
| Cobalt | 14.2 | 23[b] | 6.17E-01 |
| Copper | 11.1 | 3130 | 3.55E-03 |
| Iron | 18900 | 54,800 | 3.45E-01 |
| Nickel | 9.28 | 1560 | 5.95E-03 |
| Selenium | 1.1 (U) | 391 | 2.81E-03 |
| Vanadium | 27.1 | 394 | 6.88E-02 |
| | | **HI** | **1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-15**
**Industrial Carcinogenic Screening Evaluation for AOC 12-004(a)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 24.9 | 505 | 4.93E-07 |
| | | **Total Excess Cancer Risk** | **5E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-16**
**Industrial Noncarcinogenic Screening Evaluation for AOC 12-004(a)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.36 | 519 | 2.62E-03 |
| Barium | 100 | 255,000 | 3.92E-04 |
| Cobalt | 4.43 | 350[b] | 1.27E-02 |
| Copper | 6.34 | 51,900 | 1.22E-04 |
| Perchlorate | 0.00078 | 908 | 8.59E-07 |
| Selenium | 1.26 (U) | 6490 | 1.94E-04 |
| Uranium | 3.74 | 3880 | 9.64E-04 |
| Vanadium | 17.2 | 6530 | 2.63E-03 |
| Benzoic acid | 0.608 | 3,300,000[b] | 1.84E-07 |
| | | **HI** | **0.02** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-17**
**Industrial Radionuclide Screening Evaluation for AOC-12-004(a)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.468 | 41 | 2.85E-01 |
| Uranium-234 | 1.82 | 3100 | 1.47E-02 |
| Uranium-235/236 | 0.124 | 160 | 1.94E-02 |
| Uranium-238 | 2.92 | 710 | 1.03E-01 |
| | | **Total Dose** | **0.4** |

* SALs from LANL (2015, 600929).

**Table H-4.2-18**
**Residential Carcinogenic Screening Evaluation for AOC 12-004(a)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Arsenic | 1.83 | 4.25 | 4.31E-06 |
| Chromium (Total) | 22.1 | 96.6 | 2.29E-06 |
| | | **Total Excess Cancer Risk** | **7E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-19**
**Residential Noncarcinogenic Screening Evaluation for AOC 12-004(a)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 6410 | 78,000 | 8.22E-02 |
| Antimony | 0.677 | 31.3 | 2.16E-02 |
| Barium | 88.5 | 15,600 | 5.67E-03 |
| Cobalt | 3.98 | 23[b] | 1.73E-01 |
| Copper | 5.31 | 3130 | 1.70E-03 |
| Nickel | 5.98 | 1560 | 3.83E-03 |
| Perchlorate | 0.00078 | 54.8 | 1.42E-05 |
| Selenium | 1.26 (U) | 391 | 3.22E-03 |
| Uranium | 2.64 | 234 | 1.13E-02 |
| Vanadium | 13.8 | 394 | 3.50E-02 |
| Benzoic acid | 0.608 | 250,000[b] | 2.43E-06 |
| Di-n-butylphthalate | 0.121 | 6160 | 1.96E-05 |
| | | **HI** | **0.3** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-20**
**Residential Radionuclide Screening Evaluation for AOC 12-004(a)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.263 | 12 | 5.48E-01 |
| Uranium-234 | 1.44 | 290 | 1.24E-01 |
| Uranium-235/236 | 0.0956 | 42 | 5.69E-02 |
| Uranium-238 | 2.79 | 150 | 4.65E-01 |
| | | **Total Dose** | **1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-21**
**Industrial Carcinogenic Screening Evaluation for AOC 12-004(b)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Aroclor-1254 | 0.015 | 11.5 | 1.30E-08 |
| | | **Total Excess Cancer Risk** | **1E-08** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-22**
**Industrial Noncarcinogenic Screening Evaluation for AOC 12-004(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.05 (U) | 519 | 2.02E-03 |
| Cobalt | 9.62 | 350[b] | 2.75E-02 |
| Lead | 23.4 | 800 | 2.93E-02 |
| Uranium | 5.8 | 3880 | 1.49E-03 |
| Vanadium | 47.5 | 6530 | 7.27E-03 |
| | | **HI** | **0.07** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-23**
**Residential Carcinogenic Screening Evaluation for AOC 12-004(b)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Arsenic | 2.74 | 4.25 | 6.45E-06 |
| Chromium (Total) | 13.7 | 96.6 | 1.42E-06 |
| Aroclor-1260 | 0.011 | 2.43 | 4.53E-08 |
| | | **Total Excess Cancer Risk** | **8E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-24**
**Residential Noncarcinogenic Screening Evaluation for AOC 12-004(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 10700 | 78,000 | 1.37E-01 |
| Antimony | 0.373 | 31.3 | 1.19E-02 |
| Barium | 188 | 15,600 | 1.21E-02 |
| Cobalt | 6.79 | 23[b] | 2.95E-01 |
| Copper | 10.4 | 3130 | 3.32E-03 |
| Lead | 15.2 | 400 | 3.80E-02 |
| Nickel | 8.44 | 1560 | 5.41E-03 |
| Perchlorate | 0.000832 | 54.8 | 1.52E-05 |
| Selenium | 1.03 | 391 | 2.63E-03 |
| Uranium | 2.57 | 234 | 1.10E-02 |
| Vanadium | 29.2 | 394 | 7.41E-02 |
| Aroclor-1254 | 0.015 | 1.14 | 1.32E-02 |
| | | **HI** | **0.6** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-25**
**Industrial Carcinogenic Screening Evaluation for AOC C-12-001**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Aroclor-1242 | 0.114 | 11.5 | 9.91E-08 |
| Aroclor-1254 | 0.109 | 11.5 | 9.48E-08 |
| Aroclor-1260 | 0.0477 | 11.5 | 4.15E-08 |
| | | **Total Excess Cancer Risk** | **2E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-26**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-12-001**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.25 (U) | 519 | 2.41E-03 |
| Uranium | 4.07 | 3880 | 1.05E-03 |
| | | **HI** | **0.003** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-27**
**Residential Carcinogenic Screening Evaluation for AOC C-12-001**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 16.3 | 96.6 | 1.69E-06 |
| Aroclor-1242 | 0.114 | 2.43 | 4.69E-07 |
| Aroclor-1260 | 0.0477 | 2.43 | 1.96E-07 |
| | | **Total Excess Cancer Risk** | **2E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-28**
**Residential Noncarcinogenic Screening Evaluation for AOC C-12-001**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 9750 | 78,000 | 1.25E-01 |
| Antimony | 0.426 | 31.3 | 1.36E-02 |
| Barium | 132 | 15,600 | 8.46E-03 |
| Cobalt | 4.97 | 23[b] | 2.16E-01 |
| Nickel | 7.75 | 1560 | 4.97E-03 |
| Perchlorate | 0.00241 | 54.8 | 4.40E-05 |
| Selenium | 1.26 (U) | 391 | 3.22E-03 |
| Uranium | 1.96 | 234 | 8.38E-03 |
| Aroclor-1254 | 0.109 | 1.14 | 9.56E-02 |
| | | **HI** | **0.5** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-29**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-12-002**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.11 (U) | 519 | 2.14E-03 |
| Cobalt | 12.1 | 350[b] | 3.46E-02 |
| | | **HI** | **0.04** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-30**
**Residential Carcinogenic Screening Evaluation for AOC C-12-002**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 15 | 96.6 | 1.55E-06 |
| | | **Total Excess Cancer Risk** | **2E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-31**
**Residential Noncarcinogenic Screening Evaluation for AOC C-12-002**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 11100 | 78,000 | 1.42E-01 |
| Antimony | 1.11 (U) | 31.3 | 3.55E-02 |
| Barium | 223 | 15,600 | 1.43E-02 |
| Cobalt | 7.49 | 23b | 3.26E-01 |
| Copper | 7.65 | 3130 | 2.44E-03 |
| Nickel | 7.8 | 1560 | 5.00E-03 |
| Perchlorate | 0.00164 | 54.8 | 2.99E-05 |
| Selenium | 1.15 (U) | 391 | 2.94E-03 |
| Vanadium | 28.2 | 394 | 7.16E-02 |
| | | **HI** | 0.6 |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.
[b] EPA regional screening level ( http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-32**
**Industrial Carcinogenic Screening Evaluation for AOC C-12-003**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 104 | 505 | 2.06E-06 |
| | | **Total Excess Cancer Risk** | **2E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-33**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-12-003**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 2.61 (U) | 519 | 5.03E-03 |
| | | **HI** | **0.005** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-34**
**Residential Carcinogenic Screening Evaluation for AOC C-12-003**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 45 | 96.6 | 4.66E-06 |
| | | **Total Excess Cancer Risk** | **5E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-35**
**Residential Noncarcinogenic Screening Evaluation for AOC C-12-003**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 2.74 | 31.3 | 8.75E-02 |
| Barium | 117 | 15,600 | 7.50E-03 |
| Cobalt | 4.99 | 23[b] | 2.17E-01 |
| Perchlorate | 0.0019 | 54.8 | 3.47E-05 |
| Selenium | 1.12 (UJ) | 391 | 2.86E-03 |
| | | **HI** | **0.3** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-36**
**Industrial Carcinogenic Screening Evaluation for AOC C-12-004**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 33.5 | 505 | 6.63E-07 |
| | | **Total Excess Cancer Risk** | **7E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-37**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-12-004**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.21 (UJ) | 519 | 2.33E-03 |
| Copper | 28.1 | 51,900 | 5.41E-04 |
| Lead | 58.6 | 800 | 7.33E-02 |
| Silver | 2.56 | 6490 | 3.94E-04 |
| Uranium | 3.86 | 3880 | 9.95E-04 |
| | | **HI** | **0.1** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-38**
**Residential Carcinogenic Screening Evaluation for AOC C-12-004**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 18.4 | 96.6 | 1.90E-06 |
| | | **Total Excess Cancer Risk** | **2E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-39**
**Residential Noncarcinogenic Screening Evaluation for AOC C-12-004**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 15100 | 78,000 | 1.94E-01 |
| Antimony | 1.21 (UJ) | 31.3 | 3.87E-02 |
| Barium | 214 | 15,600 | 1.37E-02 |
| Cobalt | 5.85 | 23[b] | 2.54E-01 |
| Copper | 13.7 | 3130 | 4.38E-03 |
| Lead | 39.2 | 400 | 9.80E-02 |
| Nickel | 8.38 | 1560 | 5.37E-03 |
| Perchlorate | 0.0012 | 54.8 | 2.19E-05 |
| Selenium | 1.14 (U) | 391 | 2.92E-03 |
| Silver | 1.63 | 391 | 4.17E-03 |
| Uranium | 3.86 | 234 | 1.65E-02 |
| Vanadium | 28.1 | 394 | 7.13E-02 |
| | | **HI** | **0.6** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-40**
**Industrial Carcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 196 | 505 | 3.88E-06 |
| | | **Total Excess Cancer Risk** | **4E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-41**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 3.89 | 519 | 7.50E-03 |
| Perchlorate | 0.00197 | 908 | 2.17E-06 |
| Uranium | 2.77 | 3880 | 7.14E-04 |
| | | **HI** | **0.008** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-42**
**Recreational Carcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Recreational SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 196 | 281 | 6.98E-06 |
| | | **Total Excess Cancer Risk** | **7E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-43**
**Recreational Noncarcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Recreational SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 3.89 | 248 | 1.57E-02 |
| Perchlorate | 0.00197 | 434 | 4.54E-06 |
| Uranium | 2.77 | 1860 | 1.49E-03 |
| | | **HI** | **0.02** |

* SSLs from NMED (2015, 600915)..

**Table H-4.2-44**
**Residential Carcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 114 | 96.6 | 1.18E-05 |
| | | **Total Excess Cancer Risk** | **1E-05** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-45**
**Residential Noncarcinogenic Screening Evaluation for AOC C-12-005**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 3.89 | 31.3 | 1.24E-01 |
| Perchlorate | 0.00197 | 54.8 | 3.59E-05 |
| Uranium | 1.81 | 234 | 7.74E-03 |
| | | **HI** | **0.1** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-46**
**Industrial Carcinogenic Screening Evaluation for AOC C-14-006**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 20.7 | 505 | 4.10E-07 |
| | | **Total Excess Cancer Risk** | **4E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-47**
**Industrial Noncarcinogenic Screening Evaluation for AOC C-14-006**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.1 | 519 | 2.12E-03 |
| Nitrate | 1.82 | 2,080,000 | 8.75E-07 |
| Perchlorate | 0.00135 | 908 | 1.49E-06 |
| Acetone | 0.00973 | 960,000 | 1.01E-08 |
| Isopropyltoluene[4-] | 0.00229 | 14,200 | 1.61E-07 |
| TATB | 11.3 | 32,000[b, c] | 3.53E-04 |
| Toluene | 0.000887 | 61,300 | 1.45E-08 |
| | | **HI** | **0.002** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-48**
**Residential Carcinogenic Screening Evaluation for AOC C-14-006**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 13.9 | 96.6 | 1.44E-06 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-49**
**Residential Noncarcinogenic Screening Evaluation for AOC C-14-006**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 0.933 | 31.3 | 2.98E-02 |
| Nitrate | 1.54 | 125,000 | 1.23E-05 |
| Perchlorate | 0.00188 | 54.8 | 3.43E-05 |
| Acetone | 0.00973 | 66,300 | 1.47E-07 |
| Isopropyltoluene[4-] | 0.00229 | 2360 | 9.70E-07 |
| TATB | 4.63 | 2200[b,c] | 2.10E-03 |
| Toluene | 0.000887 | 5230 | 1.70E-07 |
| | | **HI** | **0.03** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-50**
**Industrial Carcinogenic Screening Evaluation for AOC 15-005(c)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 11.9 | 505 | 2.36E-07 |
| Bis(2-ethylhexyl)phthalate | 0.0995 | 1830 | 5.44E-10 |
| Ethylbenzene | 0.000395 | 368 | 1.07E-11 |
| | | **Total Excess Cancer Risk** | **2E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-51**
**Industrial Noncarcinogenic Screening Evaluation for AOC 15-005(c)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 0.836 | 519 | 1.61E-03 |
| Barium | 198 | 255,000 | 7.76E-04 |
| Cobalt | 6.81 | 350[b] | 1.95E-02 |
| Copper | 16.3 | 51,900 | 3.14E-04 |
| Iron | 13900 | 908,000 | 1.53E-02 |
| Lead | 55.6 | 800 | 6.95E-02 |
| Perchlorate | 0.00149 | 908 | 1.64E-06 |
| Selenium | 1.48 (U) | 6490 | 2.28E-04 |
| Uranium | 9.48 | 3880 | 2.44E-03 |
| Vanadium | 27.9 | 6530 | 4.27E-03 |
| Acetone | 0.0188 | 960,000 | 1.96E-08 |
| Isopropyltoluene[4-] | 0.00151 | 14,200 | 1.06E-07 |
| Toluene | 0.000754 | 61,300 | 1.23E-08 |
| Xylene[1,3-]+1,4-Xylene | 0.000984 | 4280[c] | 2.30E-07 |
| | | **HI** | **0.1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-52**
**Industrial Radionuclide Screening Evaluation for AOC-15-005(c)**

| COPC | EPC ( pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Uranium-234 | 4.55 | 3100 | 3.67E-02 |
| Uranium-235/236 | 0.252 | 160 | 3.94E-02 |
| Uranium-238 | 5.6 | 710 | 1.97E-01 |
| | | **Total Dose** | **0.3** |

* SALs from LANL (2015, 600929).

**Table H-4.2-53**
**Residential Carcinogenic Screening Evaluation for AOC 15-005(c)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 11.3 | 96.6 | 1.17E-06 |
| Bis(2-ethylhexyl)phthalate | 0.0995 | 380 | 2.62E-09 |
| Ethylbenzene | 0.00063 | 75.1 | 8.39E-11 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-54**
**Residential Noncarcinogenic Screening Evaluation for AOC 15-005(c)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 0.855 | 31.3 | 2.73E-02 |
| Barium | 199 | 15,600 | 1.28E-02 |
| Cobalt | 6.13 | 23[b] | 2.67E-01 |
| Copper | 12 | 3130 | 3.83E-03 |
| Iron | 13800 | 54,800 | 2.52E-01 |
| Lead | 35.3 | 400 | 8.83E-02 |
| Perchlorate | 0.00149 | 54.8 | 2.72E-05 |
| Selenium | 1.48 (U) | 391 | 3.79E-03 |
| Uranium | 6.35 | 234 | 2.71E-02 |
| Vanadium | 27.4 | 394 | 6.95E-02 |
| Acetone | 0.0188 | 66,300 | 2.84E-07 |
| Isopropyltoluene[4-] | 0.00151 | 2360 | 6.40E-07 |
| Toluene | 0.000754 | 5230 | 1.44E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000787 | 871[c] | 9.04E-07 |
| | | **HI** | **0.8** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-55**
**Residential Radionuclide Screening Evaluation for AOC 15-005(c)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Uranium-234 | 3.15 | 290 | 2.72E-01 |
| Uranium-235/236 | 0.169 | 42 | 1.01E-01 |
| Uranium-238 | 4.96 | 150 | 8.27E-01 |
| | | **Total Dose** | **1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-56**
**Industrial Carcinogenic Screening Evaluation for SWMU 15-007(c)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 18.9 | 505 | 3.74E-07 |
| Aroclor-1254 | 0.0055 | 11.5 | 4.78E-09 |
| | | **Total Excess Cancer Risk** | **4E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-57**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 15-007(c)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 243 | 519 | 4.68E-01 |
| Lead | 15500 | 800 | 1.94E+01 |
| Perchlorate | 0.000831 | 908 | 9.15E-07 |
| Selenium | 1.48 (U) | 6490 | 2.28E-04 |
| Silver | 3.9 | 6490 | 6.01E-04 |
| Zinc | 58.1 | 389,000 | 1.49E-04 |
| TATB | 0.496 | 32,000[b,c] | 1.55E-05 |
| | | **HI** | **20** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-58**
**Residential Carcinogenic Screening Evaluation for SWMU 15-007(c)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 31.8 | 96.6 | 3.29E-06 |
| Aroclor-1242 | 0.0034 | 2.43 | 1.40E-08 |
| | | **Total Excess Cancer Risk** | **3E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-59**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-007(c)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 243 | 31.3 | 7.76E+00 |
| Copper | 8.17 | 3130 | 2.61E-03 |
| Lead | 7290 | 400 | 1.82E+01 |
| Nickel | 8.79 | 1560 | 5.63E-03 |
| Perchlorate | 0.00122 | 54.8 | 2.23E-05 |
| Selenium | 2.11 (U) | 391 | 5.40E-03 |
| Silver | 1.15 | 391 | 2.94E-03 |
| Zinc | 46.7 | 23,500 | 1.99E-03 |
| Aroclor-1254 | 0.0055 | 1.14 | 4.82E-03 |
| TATB | 0.496 | 2200b,c | 2.25E-04 |
| | | **HI** | **26** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-60**
**Residential Radionuclide Screening Evaluation for SWMU 15-007(c)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 7.45 | 1700 | 1.10E-01 |
| | | **Total Dose** | **0.1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-61**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-007(d)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 0.998 (U) | 31.3 | 3.19E-02 |
| Selenium | 1 (U) | 391 | 2.56E-03 |
| | | **HI** | **0.03** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-62**
**Residential Radionuclide Screening Evaluation for SWMU 15-007(d)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 6.11 | 1700 | 8.99E-02 |
| | | **Total Dose** | **0.09** |

* SALs from LANL (2015, 600929).

**Table H-4.2-63**
**Industrial Carcinogenic Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 14.3 | 505 | 2.83E-07 |
| Aroclor-1242 | 0.282 | 11.5 | 2.45E-07 |
| Aroclor-1254 | 0.0478 | 11.5 | 4.16E-08 |
| Aroclor-1260 | 0.0182 | 11.5 | 1.58E-08 |
| Aroclor-1268 | 0.0205 | 11.5b | 1.78E-08 |
| RDX | 7.72 | 311 | 2.48E-07 |
| | | **Total Excess Cancer Risk** | **9E-07** |

[a] SSLs from NMED (2015, 600915).

[b] Aroclor-1260 used as a surrogate based on structural similarity.

**Table H-4.2-64**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 10.3 | 519 | 1.98E-02 |
| Barium | 85.3 | 255,000 | 3.35E-04 |
| Beryllium | 6.95 | 2580 | 2.69E-03 |
| Cadmium | 0.569 | 1110 | 5.13E-04 |
| Copper | 2710 | 51,900 | 5.22E-02 |
| Iron | 10,700 | 908,000 | 1.18E-02 |
| Lead | 8610 | 800 | 1.08E+01 |
| Manganese | 292 | 160,000 | 1.83E-03 |
| Nickel | 7.17 | 25,700 | 2.79E-04 |
| Perchlorate | 0.000629 | 908 | 6.93E-07 |
| Selenium | 0.696 | 6490 | 1.07E-04 |
| Silver | 0.69 | 6490 | 1.06E-04 |
| Uranium | 107 | 3880 | 2.76E-02 |
| Vanadium | 16.4 | 6530 | 2.51E-03 |
| Zinc | 862 | 389,000 | 2.22E-03 |
| HMX | 2.22 | 63,300 | 3.51E-05 |
| TATB | 2.15 | 32,000[b,c] | 6.72E-05 |
| Trinitrotoluene[2,4,6-] | 0.205 | 573 | 3.58E-04 |
| | | **HI** | **11** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-65**
**Industrial Radionuclide Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC ( pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Americium-241 | 0.000676 | 1000 | 1.69E-05 |
| Cesium-137 | 0.338 | 41 | 2.06E-01 |
| Plutonium-239/240 | 0.049 | 1200 | 1.02E-03 |
| Tritium | 11.4 | 2,400,000 | 1.19E-04 |
| Uranium-234 | 10.5 | 3100 | 8.47E-02 |
| Uranium-235/236 | 1.31 | 160 | 2.05E-01 |
| Uranium-238 | 50 | 710 | 1.76E+00 |
| | | **Total Dose** | **2** |

* SALs from LANL (2015, 600929).

**Table H-4.2-66**
**Residential Carcinogenic Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | Cancer Risk |
|---|---|---|---|
| Arsenic | 4.25 | 2.01 | 4.73E-06 |
| Chromium (Total) | 13.6 | 96.6 | 1.41E-06 |
| Aroclor-1242 | 0.282 | 2.43 | 1.16E-06 |
| Aroclor-1260 | 0.0105 | 2.43 | 4.32E-08 |
| Aroclor-1268 | 0.0205 | 2.43[b] | 8.44E-08 |
| RDX | 0.475 | 60.4 | 7.86E-08 |
| | | **Total Excess Cancer Risk** | **8E-06** |

[a] SSLs from NMED (2015, 600915).

[b] Aroclor-1260 used as a surrogate based on structural similarity.

**Table H-4.2-67**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 5.63 | 31.3 | 1.80E-01 |
| Barium | 73.2 | 15,600 | 4.69E-03 |
| Beryllium | 4.46 | 156 | 2.86E-02 |
| Cadmium | 0.394 | 70.5 | 5.59E-03 |
| Copper | 1410 | 3130 | 4.50E-01 |
| Iron | 10,500 | 54,800 | 1.92E-01 |
| Lead | 4400 | 400 | 1.10E+01 |
| Manganese | 266 | 10,500 | 2.53E-02 |
| Nickel | 6.58 | 1560 | 4.22E-03 |
| Perchlorate | 0.0011 | 54.8 | 2.01E-05 |
| Selenium | 0.696 | 391 | 1.78E-03 |
| Silver | 0.51 | 391 | 1.30E-03 |
| Uranium | 90.4 | 234 | 3.86E-01 |
| Vanadium | 13.3 | 394 | 3.38E-02 |
| Zinc | 457 | 23,500 | 1.94E-02 |
| Aroclor-1254 | 0.0168 | 1.14 | 1.47E-02 |
| HMX | 1.98 | 3850 | 5.14E-04 |
| TATB | 1.43 | 2200[b, c] | 6.50E-04 |
| Trinitrotoluene[2,4,6-] | 0.205 | 36 | 5.69E-03 |
| | | **HI** | **12** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-68**
**Residential Radionuclide Screening Evaluation for SWMU 15-008(b)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Americium-241 | 0.00575 | 83 | 1.73E-03 |
| Cesium-137 | 0.161 | 12 | 3.35E-01 |
| Plutonium-239/240 | 0.0254 | 79 | 8.04E-03 |
| Tritium | 10.6 | 1700 | 1.56E-01 |
| Uranium-234 | 6.53 | 290 | 5.63E-01 |
| Uranium-235/236 | 0.795 | 42 | 4.73E-01 |
| Uranium-238 | 38.4 | 150 | 6.40E+00 |
| | | **Total Dose** | **8** |

* SALs from LANL (2015, 600929).

**Table H-4.2-69**
**Industrial Noncarcinogenic Screening Evaluation for AOC 15-008(g)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 3.77 | 519 | 7.26E-03 |
| Cobalt | 14 | 350 | 4.00E-02 |
| Copper | 41.3 | 51,900 | 7.96E-04 |
| Lead | 370 | 800 | 4.63E-01 |
| Uranium | 3.8 | 3880 | 9.79E-04 |
| TATB | 20.8 | 32,000[b,c] | 6.50E-04 |
| | | **HI** | **0.5** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-70**
**Industrial Radionuclide Screening Evaluation for AOC 15-008(g)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 0.0162 | 2,400,000 | 1.69E-07 |
| Uranium-238 | 4.14 | 710 | 1.46E-01 |
| | | **Total Dose** | **0.1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-71**
**Residential Noncarcinogenic Screening Evaluation for AOC 15-008(g)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 3.77 | 31.3 | 1.20E-01 |
| Cobalt | 9.43 | 23 | 4.10E-01 |
| Copper | 25.7 | 3130 | 8.21E-03 |
| Lead | 309 | 400 | 7.73E-01 |
| Selenium | 1.28 (U) | 391 | 3.27E-03 |
| Uranium | 4.95 | 234 | 2.12E-02 |
| TATB | 16.5 | 2200[b,c] | 7.50E-03 |
| | | **HI** | **1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

**Table H-4.2-72**
**Residential Radionuclide Screening Evaluation for AOC 15-008(g)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 0.0374 | 1700 | 5.50E-04 |
| Uranium-238 | 2.8 | 150 | 4.67E-01 |
| | | **Total Dose** | **0.5** |

* SALs from LANL (2015, 600929).

**Table H-4.2-73**
**Industrial Carcinogenic Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 14 | 505 | 2.77E-07 |
| | | **Total Excess Cancer Risk** | **3E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-74**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.44 (UJ) | 519 | 2.77E-03 |
| Barium | 134 | 255,000 | 5.25E-04 |
| Cadmium | 0.757 (U) | 1110 | 6.82E-04 |
| Copper | 17.8 | 51,900 | 3.43E-04 |
| Cyanide (Total) | 1.22 | 63.3 | 1.93E-02 |
| Lead | 28.2 | 800 | 3.53E-02 |
| Nitrate | 2.76 | 2,080,000 | 1.33E-06 |
| Selenium | 1.59 (U) | 6490 | 2.45E-04 |
| Uranium | 615 | 3880 | 1.59E-01 |
| Acetone | 0.0141 | 960,000 | 1.47E-08 |
| Isopropyltoluene[4-] | 0.0167 | 14,200[b] | 1.18E-06 |
| Toluene | 0.00112 | 61,300 | 1.83E-08 |
| | | **HI** | **0.2** |

[a] SSLs from NMED (2015, 600915).

[b] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.2-75**
**Industrial Radionuclide Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 2.54 | 41 | 1.55E+00 |
| Plutonium-239/240 | 0.134 | 1200 | 2.79E-03 |
| Tritium | 0.101 | 2,400,000 | 1.05E-06 |
| Uranium-234 | 303 | 3100 | 2.44E+00 |
| Uranium-235/236 | 20.3 | 160 | 3.17E+00 |
| Uranium-238 | 311 | 710 | 1.10E+01 |
| | | **Total Dose** | **18** |

* SALs from LANL (2015, 600929).

**Table H-4.2-76**
**Residential Carcinogenic Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 10.5 | 96.6 | 1.09E-06 |
| Aroclor-1242 | 0.0272 | 2.43 | 1.12E-07 |
| Aroclor-1260 | 0.0131 | 2.43 | 5.39E-08 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-77**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.44 (UJ) | 31.3 | 4.60E-02 |
| Barium | 80.8 | 15,600 | 5.18E-03 |
| Cadmium | 0.257 | 70.5 | 3.65E-03 |
| Copper | 8.97 | 3130 | 2.87E-03 |
| Cyanide (Total) | 1.22 | 11.2 | 1.09E-01 |
| Lead | 15.8 | 400 | 3.95E-02 |
| Nitrate | 2.76 | 125,000 | 2.21E-05 |
| Perchlorate | 0.00247 | 54.8 | 4.51E-05 |
| Selenium | 1.59 (U) | 391 | 4.07E-03 |
| Uranium | 305 | 234 | 1.30E+00 |
| Zinc | 60.7 | 23,500 | 2.58E-03 |
| Acetone | 0.131 | 66,300 | 1.98E-06 |
| Aroclor-1254 | 0.0312 | 1.14 | 2.74E-02 |
| Butanone[2-] | 0.0024 | 37,400 | 6.42E-08 |
| Isopropyltoluene[4-] | 0.0065 | 2360[b] | 2.75E-06 |
| Methylene chloride | 0.0024 | 409 | 5.87E-06 |
| Toluene | 0.0102 | 5230 | 1.95E-06 |
| Trimethylbenzene[1,2,4-] | 0.000651 | 58[c] | 1.12E-05 |
| Xylene[1,2-] | 0.000574 | 805 | 7.13E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000702 | 871[d] | 8.06E-07 |
| | | **HI** | **2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Isopropylbenzene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-78**
**Residential Radionuclide Screening Evaluation for SWMU 15-009(b)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.831 | 12 | 1.73E+00 |
| Plutonium-239/240 | 0.134 | 79 | 4.24E-02 |
| Tritium | 0.151 | 1700 | 2.22E-03 |
| Uranium-234 | 158 | 290 | 1.36E+01 |
| Uranium-235/236 | 6.06 | 42 | 3.61E+00 |
| Uranium-238 | 163 | 150 | 2.72E+01 |
| | | **Total Dose** | **46** |

* SALs from LANL (2015, 600929).

**Table H-4.2-79**
**Industrial Carcinogenic Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 10.9 | 505 | 2.16E-07 |
| Bis(2-ethylhexyl)phthalate | 0.105 | 1830 | 5.74E-10 |
| | | **Total Excess Cancer Risk** | **2E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-80**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 11 (U) | 519 | 2.12E-02 |
| Perchlorate | 0.000642 | 908 | 7.07E-07 |
| Selenium | 1.3 (U) | 6490 | 2.00E-04 |
| Silver | 0.272 | 6490 | 4.19E-05 |
| Uranium | 4.18 | 3880 | 1.08E-03 |
| Acetone | 0.0527 | 960,000 | 5.49E-08 |
| Isopropyltoluene[4-] | 0.00428 | 14200[b] | 3.01E-07 |
| Toluene | 0.0122 | 61,300 | 1.99E-07 |
| Trimethylbenzene[1,2,4-] | 0.00049 | 240[c] | 2.04E-06 |
| Xylene[1,3-]+1,4-Xylene | 0.000572 | 4280[d] | 1.34E-07 |
| **HI** | | | **0.02** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Isopropylbenzene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-81**
**Industrial Radionuclide Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 0.0504 | 2,400,000 | 5.25E-07 |
| Uranium-234 | 1.53 | 3100 | 1.23E-02 |
| Uranium-238 | 2.39 | 710 | 8.42E-02 |
| | | **Total Dose** | **0.1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-82**
**Residential Carcinogenic Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 9.73 | 96.6 | 1.01E-06 |
| Benzo(a)anthracene | 0.0626 | 1.53 | 4.09E-07 |
| Benzo(a)pyrene | 0.0384 | 0.153 | 2.51E-06 |
| Benzo(b)fluoranthene | 0.072 | 1.53 | 4.71E-07 |
| Bis(2-ethylhexyl)phthalate | 0.105 | 380 | 2.76E-09 |
| Chrysene | 0.0527 | 153 | 3.44E-09 |
| Indeno(1,2,3-cd)pyrene | 0.0208 | 1.53 | 1.36E-07 |
| | | **Total Excess Cancer Risk** | **5E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-83**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 0.602 | 31.3 | 1.92E-02 |
| Cyanide (Total) | 1.69 | 11.2 | 1.51E-01 |
| Nitrate | 1.26 | 125,000 | 1.01E-05 |
| Perchlorate | 0.00105 | 54.8 | 1.92E-05 |
| Selenium | 1.3 (U) | 391 | 3.32E-03 |
| Silver | 0.202 | 391 | 5.17E-04 |
| Uranium | 3.43 | 234 | 1.47E-02 |
| Acetone | 0.00765 | 66,300 | 1.15E-07 |
| Anthracene | 0.0128 | 17,400 | 7.36E-07 |
| Benzo(g,h,i)perylene | 0.0226 | 1740[b] | 1.30E-05 |
| Fluoranthene | 0.127 | 2320 | 5.47E-05 |
| Isopropyltoluene[4-] | 0.00101 | 2360[c] | 4.28E-07 |
| Phenanthrene | 0.0812 | 1740 | 4.67E-05 |
| Pyrene | 0.0783 | 1740 | 4.50E-05 |
| Toluene | 0.00143 | 5230 | 2.73E-07 |
| Trimethylbenzene[1,2,4-] | 0.00049 | 58[d] | 8.45E-06 |
| Xylene[1,3-]+1,4-Xylene | 0.000572 | 871[e] | 6.57E-07 |
| | | **HI** | **0.2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-84**
**Residential Radionuclide Screening Evaluation for SWMU 15-009(c)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Tritium | 0.0399 | 1700 | 5.87E-04 |
| Uranium-234 | 2.93 | 290 | 2.53E-01 |
| Uranium-235/236 | 0.121 | 42 | 7.20E-02 |
| Uranium-238 | 3.93 | 150 | 6.55E-01 |
| | | **Total Dose** | **1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-85**
**Residential Carcinogenic Screening Evaluation for SWMU 15-009(h)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Ethylbenzene | 0.00117 | 75.1 | 1.56E-10 |
| | | **Total Excess Cancer Risk** | **2E-10** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-86**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-009(h)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.11 (UJ) | 31.3 | 3.55E-02 |
| Barium | 124 | 15,600 | 7.95E-03 |
| Nickel | 7.91 | 1560 | 5.07E-03 |
| Nitrate | 5.22 | 125,000 | 4.18E-05 |
| Perchlorate | 0.0012 | 54.8 | 2.19E-05 |
| Selenium | 1.23 (UJ) | 391 | 3.15E-03 |
| Uranium | 4.03 | 234 | 1.72E-02 |
| Acetone | 0.00919 | 66,300 | 1.39E-07 |
| Hexanone[2-] | 0.00201 | 200[b] | 1.01E-05 |
| | | **HI** | **0.07** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-87**
**Residential Radionuclide Screening Evaluation for SWMU 15-009(h)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Plutonium-239/240 | 0.0286 | 79 | 9.05E-03 |
| Tritium | 9.09 | 1700 | 1.34E-01 |
| Uranium-234 | 1.58 | 290 | 1.36E-01 |
| Uranium-235/236 | 0.13 | 42 | 7.74E-02 |
| Uranium-238 | 2.14 | 150 | 3.57E-01 |
| | | **Total Dose** | **0.7** |

* SALs from LANL (2015, 600929).

**Table H-4.2-88**
**Industrial Carcinogenic Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 9.19 | 505 | 1.82E-07 |
| Aroclor-1254 | 0.0046 | 11.5 | 4.00E-09 |
| Aroclor-1260 | 0.0025 | 11.5 | 2.17E-09 |
| Bis(2-ethylhexyl)phthalate | 0.17 | 1830 | 9.29E-10 |
| | | **Total Excess Cancer Risk** | **2E-07** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-89**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.35 (U) | 519 | 2.60E-03 |
| Cadmium | 0.673 (U) | 1110 | 6.06E-04 |
| Iron | 11,900 | 908,000 | 1.31E-02 |
| Mercury | 0.422 | 389 | 1.08E-03 |
| Nitrate | 1.65 | 2,080,000 | 7.93E-07 |
| Perchlorate | 0.000598 | 908 | 6.59E-07 |
| Selenium | 0.72 | 6490 | 1.11E-04 |
| Uranium | 5.94 | 3880 | 1.53E-03 |
| Acetone | 0.0133 | 960,000 | 1.39E-08 |
| Di-n-butylphthalate | 3.64 | 91,600 | 3.97E-05 |
| Dichloroethene[1,1-] | 0.00037 | 2260 | 1.64E-07 |
| Methylene chloride | 0.00371 | 5130 | 7.23E-07 |
| Tetrachloroethene | 0.000584 | 629 | 9.28E-07 |
| Toluene | 0.00723 | 61,300 | 1.18E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.0004 | 4280[b] | 9.35E-08 |
| | | **HI** | **0.02** |

[a] SSLs from NMED (2015, 600915).

[b] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-90**
**Industrial Radionuclide Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 1.03 | 41 | 6.28E-01 |
| Plutonium-239/240 | 0.121 | 1200 | 2.52E-03 |
| Uranium-238 | 3.78 | 710 | 1.33E-01 |
| | | **Total Dose** | **0.8** |

* SALs from LANL (2015, 600929).

**Table H-4.2-91**
**Residential Carcinogenic Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 10 | 96.6 | 1.04E-06 |
| Aroclor-1260 | 0.0025 | 2.43 | 1.03E-08 |
| Bis(2-ethylhexyl)phthalate | 0.17 | 380 | 4.47E-09 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-92**
**Residential Noncarcinogenic Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.35 (U) | 31.3 | 4.31E-02 |
| Cadmium | 0.673 (U) | 70.5 | 9.55E-03 |
| Iron | 13,100 | 54,800 | 2.39E-01 |
| Mercury | 0.292 | 23.5 | 1.24E-02 |
| Nitrate | 1.65 | 125,000 | 1.32E-05 |
| Perchlorate | 0.000762 | 54.8 | 1.39E-05 |
| Selenium | 0.72 | 391 | 1.84E-03 |
| Uranium | 4.21 | 234 | 1.80E-02 |
| Vanadium | 15.7 | 394 | 3.98E-02 |
| Acetone | 0.121 | 66,300 | 1.83E-06 |
| Aroclor-1254 | 0.0065 | 1.14 | 5.70E-03 |
| Di-n-butylphthalate | 0.86 | 6160 | 1.40E-04 |
| Dichloroethene[1,1-] | 0.00037 | 440 | 8.41E-07 |
| Methylene chloride | 0.00414 | 409 | 1.01E-05 |
| Styrene | 0.000555 | 7260 | 7.64E-08 |
| Tetrachloroethene | 0.000584 | 111 | 5.26E-06 |
| Toluene | 0.00421 | 5230 | 8.05E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000732 | 871[b] | 8.40E-07 |
| | | **HI** | **0.4** |

[a] SSLs from NMED (2015, 600915).
[b] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-93**
**Residential Radionuclide Screening Evaluation for SWMU 15-010(b)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.626 | 12 | 1.30E+00 |
| Plutonium-239/240 | 0.0281 | 79 | 8.89E-03 |
| Uranium-238 | 2.68 | 150 | 4.47E-01 |
| | | **Total Dose** | **2** |

* SALs from LANL (2015, 600929).

**Table H-4.2-94**
**Industrial Carcinogenic Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 15.1 | 505 | 2.99E-07 |
| Aroclor-1254 | 0.704 | 11.5 | 6.12E-07 |
| Aroclor-1260 | 0.258 | 11.5 | 2.24E-07 |
| Bis(2-ethylhexyl)phthalate | 0.343 | 1830 | 1.87E-09 |
| Ethylbenzene | 0.00076 | 368 | 2.07E-11 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-95**
**Industrial Noncarcinogenic Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.57 (U) | 519 | 3.03E-03 |
| Barium | 152 | 255,000 | 5.96E-04 |
| Cadmium | 0.39 | 1110 | 3.51E-04 |
| Cobalt | 4.93 | 350[b] | 1.41E-02 |
| Copper | 17.6 | 51,900 | 3.39E-04 |
| Iron | 12,200 | 908,000 | 1.34E-02 |
| Lead | 22.9 | 800 | 2.86E-02 |
| Mercury | 0.521 | 389 | 1.34E-03 |
| Nickel | 8.43 | 25,700 | 3.28E-04 |
| Perchlorate | 0.00118 | 908 | 1.30E-06 |
| Selenium | 1.5 (U) | 6490 | 2.31E-04 |
| Silver | 6.07 | 6490 | 9.35E-04 |
| Uranium | 5.72 | 3880 | 1.47E-03 |

**Table H-4.2-95 (continued)**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Vanadium | 23.8 | 6530 | 3.64E-03 |
| Acetone | 0.0295 | 960,000 | 3.07E-08 |
| Benzoic acid | 1.01 | 3,300,000[b] | 3.06E-07 |
| Di-n-butylphthalate | 0.129 | 91,600 | 1.41E-06 |
| Di-n-octylphthalate | 1.43 | 8200[b] | 1.74E-04 |
| Dichloroethene[1,1-] | 0.000772 | 2260 | 3.42E-07 |
| Isopropyltoluene[4-] | 0.00604 | 14,200[c] | 4.25E-07 |
| Methylene chloride | 0.00508 | 5130 | 9.90E-07 |
| Tetrachloroethene | 0.000948 | 629 | 1.51E-06 |
| Toluene | 0.000802 | 61,300 | 1.31E-08 |
| Xylene[1,3-]+1,4-Xylene | 0.00108 | 4280[d] | 2.52E-07 |
| | | **HI** | **0.07** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-96**
**Industrial Radionuclide Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.549 | 41 | 3.35E-01 |
| Plutonium-238 | 0.0599 | 1300 | 1.15E-03 |
| Plutonium-239/240 | 0.0243 | 1200 | 5.06E-04 |
| Tritium | 0.0901 | 2,400,000 | 9.39E-07 |
| Uranium-234 | 2.24 | 3100 | 1.81E-02 |
| Uranium-238 | 2.86 | 710 | 1.01E-01 |
| | | **Total Dose** | **0.5** |

* SALs from LANL (2015, 600929).

**Table H-4.2-97**
**Residential Carcinogenic Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 18.2 | 96.6 | 1.88E-06 |
| Aroclor-1260 | 0.258 | 2.43 | 1.06E-06 |
| Bis(2-ethylhexyl)phthalate | 0.343 | 380 | 9.03E-09 |
| Chloroform | 0.000687 | 5.9 | 1.16E-09 |
| Ethylbenzene | 0.00076 | 75.1 | 1.01E-10 |
| | | **Total Excess Cancer Risk** | **3E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-98**
**Residential Noncarcinogenic Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 9740 | 78,000 | 1.25E-01 |
| Antimony | 1.57 (U) | 31.3 | 5.02E-02 |
| Barium | 140 | 15,600 | 8.97E-03 |
| Cadmium | 0.344 | 70.5 | 4.88E-03 |
| Cobalt | 4.99 | 23[b] | 2.17E-01 |
| Copper | 14.7 | 3130 | 4.70E-03 |
| Iron | 13100 | 54,800 | 2.39E-01 |
| Lead | 19.3 | 400 | 4.83E-02 |
| Mercury | 0.322 | 23.5 | 1.37E-02 |
| Nickel | 8.25 | 1560 | 5.29E-03 |
| Perchlorate | 0.00113 | 54.8 | 2.06E-05 |
| Selenium | 1.5 (U) | 391 | 3.84E-03 |
| Silver | 3.57 | 391 | 9.13E-03 |
| Uranium | 4.41 | 234 | 1.88E-02 |
| Vanadium | 23.9 | 394 | 6.07E-02 |
| Acetone | 0.0059 | 66,300 | 8.90E-08 |
| Aroclor-1254 | 0.704 | 1.14 | 6.18E-01 |
| Benzoic acid | 1.01 | 250,000[b] | 4.04E-06 |
| Di-n-butylphthalate | 0.129 | 6160 | 2.09E-05 |
| Di-n-octylphthalate | 1.43 | 630[b] | 2.27E-03 |
| Dichloroethene[1,1-] | 0.000772 | 440 | 1.75E-06 |
| Isopropyltoluene[4-] | 0.00538 | 2360[c] | 2.28E-06 |
| Methylene chloride | 0.00477 | 409 | 1.17E-05 |

**Table H-4.2-98 (continued)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Tetrachloroethene | 0.000721 | 111 | 6.50E-06 |
| Toluene | 0.000771 | 5230 | 1.47E-07 |
| Trimethylbenzene[1,2,4-] | 0.000383 | 58[b] | 6.60E-06 |
| Xylene[1,2-] | 0.000371 | 805 | 4.61E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000748 | 871[d] | 8.59E-07 |
| | | **HI** | **1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-99**
**Residential Radionuclide Screening Evaluation for AOC 15-014(h)**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.291 | 12 | 6.06E-01 |
| Plutonium-238 | 0.0599 | 84 | 1.78E-02 |
| Plutonium-239/240 | 0.00605 | 79 | 1.91E-03 |
| Tritium | 0.0882 | 1700 | 1.30E-03 |
| Uranium-234 | 1.68 | 290 | 1.45E-01 |
| Uranium-238 | 2.1 | 150 | 3.50E-01 |
| | | **Total Dose** | **1** |

* SALs from LANL (2015, 600929).

**Table H-4.2-100**
**Residential Carcinogenic Screening Evaluation for SWMU 36-002**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Ethylbenzene | 0.000482 | 75.1 | 6.42E-11 |
| | | **Total Excess Cancer Risk** | **6E-11** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-101**
**Residential Noncarcinogenic Screening Evaluation for SWMU 36-002**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 13800 | 78,000 | 1.77E-01 |
| Antimony | 1.07 (UJ) | 31.3 | 3.42E-02 |
| Barium | 84.6 | 15,600 | 5.42E-03 |
| Beryllium | 2.69 | 156 | 1.72E-02 |
| Cobalt | 4.2 | 23[b] | 1.83E-01 |
| Copper | 9.92 | 3130 | 3.17E-03 |
| Nickel | 10.6 | 1560 | 6.79E-03 |
| Perchlorate | 0.00377 | 54.8 | 6.88E-05 |
| Selenium | 1.02 (UJ) | 391 | 2.61E-03 |
| | | **HI** | **0.4** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

**Table H-4.2-102**
**Residential Radionuclide Screening Evaluation for SWMU 36-002**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Plutonium-238 | 0.033 | 84 | 9.82E-03 |
| Tritium | 0.0101 | 1700 | 1.49E-04 |
| | | **Total Dose** | **0.01** |

* SALs from LANL (2015, 600929).

**Table H-4.2-103**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 36-003(a)**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.11 (U) | 519 | 2.14E-03 |
| Nitrate | 1.92 | 2,080,000 | 9.23E-07 |
| | | **HI** | **0.002** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-104**
**Residential Carcinogenic Screening Evaluation for SWMU 36-003(a)**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| RDX | 0.184 | 60.4 | 3.05E-08 |
| | | **Total Excess Cancer Risk** | **3E-08** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-105**
**Residential Noncarcinogenic Screening Evaluation for SWMU 36-003(a)**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.29 (UJ) | 31.3 | 4.12E-02 |
| Beryllium | 2.23 | 156 | 1.43E-02 |
| Cobalt | 2.89 | 23[b] | 1.26E-01 |
| Nickel | 15.9 | 1560 | 1.02E-02 |
| Nitrate | 1.71 | 125,000 | 1.37E-05 |
| Perchlorate | 0.00101 | 54.8 | 1.84E-05 |
| Selenium | 1.28 (U) | 391 | 3.27E-03 |
| Isopropyltoluene[4-] | 0.00811 | 2360[c] | 3.44E-06 |
| Trimethylbenzene[1,2,4-] | 0.000343 | 58[b] | 5.91E-06 |
| | | **HI** | **0.2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.2-106**
**Industrial Carcinogenic Screening Evaluation for SWMU 36-008**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 38.6 | 505 | 7.64E-07 |
| Aroclor-1254 | 0.378 | 11.5 | 3.29E-07 |
| Aroclor-1260 | 0.138 | 11.5 | 1.20E-07 |
| Bis(2-ethylhexyl)phthalate | 0.436 | 1830 | 2.38E-09 |
| Bromodichloromethane | 0.00117 | 30.2 | 3.87E-10 |
| Chlorodibromomethane | 0.000635 | 67.4 | 9.42E-11 |
| Chloroform | 0.00982 | 28.7 | 3.42E-09 |
| Chloromethane | 0.000633 | 201 | 3.15E-11 |
| RDX | 0.106 | 311 | 3.41E-09 |
| | | **Total Excess Cancer Risk** | **1E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-107**
**Industrial Noncarcinogenic Screening Evaluation for SWMU 36-008**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 5.62 (U) | 519 | 1.08E-02 |
| Cadmium | 0.41 | 1110 | 3.69E-04 |
| Copper | 567 | 51,900 | 1.09E-02 |
| Cyanide (Total) | 0.678 | 63.3 | 1.07E-02 |
| Lead | 41 | 800 | 5.13E-02 |
| Mercury | 3.09 | 389 | 7.94E-03 |
| Nickel | 10.1 | 25,700 | 3.93E-04 |
| Nitrate | 55.7 | 2,080,000 | 2.68E-05 |
| Perchlorate | 0.0715 | 908 | 7.87E-05 |
| Selenium | 2.03 (U) | 6490 | 3.13E-04 |
| Silver | 44.7 | 6490 | 6.89E-03 |
| Uranium | 2.44 | 3880 | 6.29E-04 |
| Zinc | 208 | 389,000 | 5.35E-04 |
| Acetone | 0.00596 | 960,000 | 6.21E-09 |
| Benzoic acid | 0.671 | 3,300,000[b] | 2.03E-07 |
| Di-n-butylphthalate | 0.705 | 91,600 | 7.70E-06 |
| Dibenzofuran | 0.493 | 1000[b] | 4.93E-04 |
| Dichloroethene[1,1-] | 0.00246 | 2260 | 1.09E-06 |
| Isopropyltoluene[4-] | 0.016 | 14,200[c] | 1.13E-06 |
| Methylene chloride | 0.00419 | 5130 | 8.17E-07 |
| Styrene | 0.00197 | 51,300 | 3.84E-08 |
| TATB | 0.331 | 32,000[b,d] | 1.03E-05 |
| Toluene | 0.00133 | 61,300 | 2.17E-08 |
| Trichloroethene | 0.00079 | 36.5 | 2.16E-05 |
| Trimethylbenzene[1,2,4-] | 0.00499 | 240[b] | 2.08E-05 |
| Trimethylbenzene[1,3,5-] | 0.00279 | 12,000[b] | 2.33E-07 |
| Xylene[1,2-] | 0.000616 | 3940 | 1.56E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000764 | 4280[e] | 1.79E-07 |
| | | **HI** | **0.1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[e] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-108**
**Industrial Radionuclide Screening Evaluation for SWMU 36-008**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Americium-241 | 0.00385 | 1000 | 9.63E-05 |
| Cesium-137 | 0.833 | 41 | 5.08E-01 |
| Plutonium-239/240 | 0.0355 | 1200 | 7.40E-04 |
| Tritium | 0.0639 | 2,400,000 | 6.66E-07 |
| Uranium-234 | 1.73 | 3100 | 1.40E-02 |
| Uranium-235/236 | 0.08 | 160 | 1.25E-02 |
| Uranium-238 | 1.93 | 710 | 6.80E-02 |
| | | **Total Dose** | **0.6** |

* SALs from LANL (2015, 600929).

**Table H-4.2-109**
**Residential Carcinogenic Screening Evaluation for SWMU 36-008**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 30.3 | 96.6 | 3.14E-06 |
| Aroclor-1260 | 0.0725 | 2.43 | 2.98E-07 |
| Bis(2-ethylhexyl)phthalate | 0.236 | 380 | 6.21E-09 |
| Bromodichloromethane | 0.00117 | 6.19 | 1.89E-09 |
| Butylbenzylphthalate | 0.214 | 2900 | 7.38E-10 |
| Chlorodibromomethane | 0.000635 | 13.9 | 4.57E-10 |
| Chloroform | 0.00982 | 5.9 | 1.66E-08 |
| Chloromethane | 0.000633 | 41.1 | 1.54E-10 |
| RDX | 0.106 | 60.4 | 1.75E-08 |
| | | **Total Excess Cancer Risk** | **3E-06** |

* SSLs from NMED (2015, 600915).

**Table H-4.2-110**
**Residential Noncarcinogenic Screening Evaluation for SWMU 36-008**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Aluminum | 6080 | 78,000 | 7.79E-02 |
| Antimony | 5.62 (U) | 31.3 | 1.80E-01 |
| Barium | 77.6 | 15,600 | 4.97E-03 |
| Beryllium | 0.654 | 156 | 4.19E-03 |
| Cadmium | 0.397 | 70.5 | 5.63E-03 |
| Copper | 315 | 3130 | 1.01E-01 |
| Cyanide (Total) | 0.538 | 11.2 | 4.80E-02 |
| Lead | 29.7 | 400 | 7.43E-02 |
| Mercury | 2.34 | 23.5 | 9.96E-02 |
| Nickel | 6.79 | 1560 | 4.35E-03 |
| Nitrate | 32.7 | 125,000 | 2.62E-04 |
| Perchlorate | 0.0438 | 54.8 | 7.99E-04 |
| Selenium | 0.635 | 391 | 1.62E-03 |
| Silver | 41.7 | 391 | 1.07E-01 |
| Uranium | 1.89 | 234 | 8.08E-03 |
| Vanadium | 13.9 | 394 | 3.53E-02 |
| Zinc | 135 | 23,500 | 5.74E-03 |
| Acetone | 0.00444 | 66,300 | 6.70E-08 |
| Aroclor-1254 | 0.124 | 1.14 | 1.09E-01 |
| Benzoic acid | 0.63 | 250,000b | 2.52E-06 |
| Chloronaphthalene[2-] | 0.0215 | 6260 | 3.43E-06 |
| Chlorotoluene[4-] | 0.000496 | 1600b | 3.10E-07 |
| Di-n-butylphthalate | 0.448 | 6160 | 7.27E-05 |
| Dibenzofuran | 0.421 | 73b | 5.77E-03 |
| Dichloroethene[1,1-] | 0.00246 | 440 | 5.59E-06 |
| Isopropyltoluene[4-] | 0.00711 | 2360[c] | 3.01E-06 |
| Methylene chloride | 0.00384 | 409 | 9.39E-06 |
| Styrene | 0.00197 | 7260 | 2.71E-07 |
| TATB | 0.331 | 2200[b,d] | 1.50E-04 |
| Toluene | 0.00127 | 5230 | 2.43E-07 |
| Trichloroethene | 0.000729 | 6.77 | 1.08E-04 |
| Trimethylbenzene[1,2,4-] | 0.000826 | 58[b] | 1.42E-05 |
| Trimethylbenzene[1,3,5-] | 0.00569 | 780[b] | 7.29E-06 |
| Xylene[1,2-] | 0.000616 | 805 | 7.65E-07 |
| Xylene[1,3-]+1,4-Xylene | 0.000658 | 871[e] | 7.55E-07 |
| | | **HI** | **0.9** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[e] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-111**
**Residential Radionuclide Screening Evaluation for SWMU 36-008**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Americium-241 | 0.000591 | 83 | 1.78E-04 |
| Cesium-137 | 0.559 | 12 | 1.16E+00 |
| Plutonium-239/240 | 0.0186 | 79 | 5.89E-03 |
| Tritium | 0.0125 | 1700 | 1.84E-04 |
| Uranium-234 | 1.55 | 290 | 1.34E-01 |
| Uranium-235/236 | 0.0699 | 42 | 4.16E-02 |
| Uranium-238 | 1.69 | 150 | 2.82E-01 |
| | | **Total Dose** | **2** |

* SALs from LANL (2015, 600929).

**Table H-4.2-112**
**Industrial Carcinogenic Screening Evaluation for SWMU C-36-003**

| COPC | EPC (mg/kg) | Industrial SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 176 | 505 | 3.49E-06 |
| Aroclor-1254 | 0.392 | 11.5 | 3.41E-07 |
| Aroclor-1260 | 0.617 | 11.5 | 5.37E-07 |
| Bromodichloromethane | 0.00117 | 30.2 | 3.87E-10 |
| Chlorodibromomethane | 0.000635 | 67.4 | 9.42E-11 |
| Chloroform | 0.00982 | 28.7 | 3.42E-09 |
| RDX | 0.106 | 311 | 3.41E-09 |
| | | **Total Excess Cancer Risk** | **4E-06** |

*SSLs from NMED (2015, 600915) unless otherwise noted.

**Table H-4.2-113**
**Industrial Noncarcinogenic Screening Evaluation for SWMU C-36-003**

| COPC | EPC (mg/kg) | Industrial SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.49 (U) | 519 | 2.87E-03 |
| Cadmium | 1.36 | 1110 | 1.23E-03 |
| Copper | 1830 | 51,900 | 3.53E-02 |
| Cyanide (Total) | 1.47 | 63.3 | 2.32E-02 |
| Lead | 101 | 800 | 1.26E-01 |
| Manganese | 597 | 160,000 | 3.74E-03 |
| Mercury | 0.403 | 389 | 1.04E-03 |
| Nickel | 37.2 | 25,700 | 1.45E-03 |
| Nitrate | 370 | 2,080,000 | 1.78E-04 |
| Perchlorate | 0.474 | 908 | 5.22E-04 |
| Selenium | 1.56 (U) | 6490 | 2.40E-04 |
| Silver | 177 | 6490 | 2.73E-02 |
| Uranium | 6.06 | 3880 | 1.56E-03 |
| Zinc | 904 | 389,000 | 2.32E-03 |
| Benzoic Acid | 0.355 | 3,300,000[b] | 1.08E-07 |
| Di-n-butylphthalate | 8.07 | 91,600 | 8.81E-05 |
| Isopropyltoluene[4-] | 0.00777 | 14,200[c] | 5.47E-07 |
| Methylene Chloride | 0.00378 | 5130 | 7.37E-07 |
| Toluene | 0.0012 | 61,300 | 1.96E-08 |
| Trimethylbenzene[1,2,4-] | 0.001 | 240[b] | 4.17E-06 |
| Xylene[1,3-]+Xylene[1,4-] | 0.000822 | 4280[d] | 1.92E-07 |
| | | **HI** | **0.2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Isoproplybenzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-114**
**Industrial Radionuclide Screening Evaluation for SWMU C-36-003**

| COPC | EPC (pCi/g) | Industrial SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 1.21 | 41 | 7.38E-01 |
| Tritium | 0.0914 | 2,400,000 | 9.52E-07 |
| Uranium-234 | 5.05 | 3100 | 4.07E-02 |
| Uranium-235/236 | 0.178 | 160 | 2.78E-02 |
| Uranium-238 | 3.29 | 710 | 1.16E-01 |
| | | **Total Dose** | **0.9** |

*SALs from LANL (2015, 600929) unless otherwise noted.

**Table H-4.2-115**
**Residential Carcinogenic Screening Evaluation for SWMU C-36-003**

| COPC | EPC (mg/kg) | Residential SSL* (mg/kg) | Cancer Risk |
|---|---|---|---|
| Chromium (Total) | 90.4 | 96.6 | 9.36E-06 |
| Aroclor-1260 | 0.132 | 2.43 | 5.43E-07 |
| Bromodichloromethane | 0.00117 | 6.19 | 1.89E-09 |
| Chlorodibromomethane | 0.000635 | 13.9 | 4.57E-10 |
| Chloroform | 0.00982 | 5.9 | 1.66E-08 |
| RDX | 0.106 | 60.4 | 1.75E-08 |
| | | **Total Excess Cancer Risk** | **1E-05** |

*SSLs from NMED (2015, 600915) unless otherwise noted.

**Table H-4.2-116**
**Residential Noncarcinogenic Screening Evaluation for SWMU C-36-003**

| COPC | EPC (mg/kg) | Residential SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.49 (U) | 31.3 | 4.76E-02 |
| Cadmium | 1.09 | 70.5 | 1.55E-02 |
| Copper | 936 | 3130 | 2.99E-01 |
| Cyanide (Total) | 1.06 | 11.2 | 9.46E-02 |
| Lead | 58.5 | 400 | 1.46E-01 |
| Manganese | 452 | 10,500 | 4.30E-02 |
| Mercury | 0.342 | 23.5 | 1.46E-02 |
| Nickel | 20.7 | 1560 | 1.33E-02 |
| Nitrate | 197 | 125,000 | 1.58E-03 |
| Perchlorate | 0.256 | 54.8 | 4.67E-03 |
| Selenium | 0.635 | 391 | 1.62E-03 |
| Silver | 161 | 391 | 4.12E-01 |
| Uranium | 4.43 | 234 | 1.89E-02 |
| Zinc | 490 | 23,500 | 2.09E-02 |
| Aroclor-1254 | 0.209 | 1.14 | 1.83E-01 |
| Benzoic Acid | 0.355 | 250,000[b] | 1.42E-06 |
| Di-n-butylphthalate | 1.84 | 6160 | 2.99E-04 |
| Isopropyltoluene[4-] | 0.00516 | 2360[c] | 2.19E-06 |
| Methylene Chloride | 0.00378 | 409 | 9.24E-06 |
| Toluene | 0.000815 | 5230 | 1.56E-07 |
| Trimethylbenzene[1,2,4-] | 0.001 | 58[b] | 1.72E-05 |
| Xylene[1,3-]+Xylene[1,4-] | 0.000822 | 871[d] | 9.44E-07 |
| | | **HI** | **1** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Isoproplybenzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.2-117**
**Residential Radionuclide Screening Evaluation for SWMU C-36-003**

| COPC | EPC (pCi/g) | Residential SAL* (pCi/g) | Dose (mrem/yr) |
|---|---|---|---|
| Cesium-137 | 0.711 | 12 | 1.48E+00 |
| Tritium | 0.0219 | 1700 | 3.22E-04 |
| Uranium-234 | 3.23 | 290 | 2.78E-01 |
| Uranium-235/236 | 0.144 | 42 | 8.57E-02 |
| Uranium-238 | 2.63 | 150 | 4.38E-01 |
| | | **Total Dose** | **2** |

*SALs from LANL (2015, 600929) unless otherwise noted.

**Table H-4.2-118**
**Construction Worker Noncarcinogenic Screening Evaluation for SWMU C-36-003**

| COPC | EPC (mg/kg) | Construction Worker SSL[a] (mg/kg) | HQ |
|---|---|---|---|
| Antimony | 1.49 (U) | 142 | 1.05E-02 |
| Cadmium | 1.09 | 72.1 | 1.51E-02 |
| Chromium (Total) | 90.4 | 134 | 6.75E-01 |
| Copper | 936 | 14,200 | 6.59E-02 |
| Cyanide (Total) | 1.06 | 12.1 | 8.76E-02 |
| Lead | 58.5 | 800 | 7.31E-02 |
| Manganese | 452 | 464 | 9.74E-01 |
| Mercury | 0.342 | 77.1 | 4.44E-03 |
| Nickel | 20.7 | 753 | 2.75E-02 |
| Nitrate | 197 | 566,000 | 3.48E-04 |
| Perchlorate | 0.256 | 248 | 1.03E-03 |
| Selenium | 0.635 | 1750 | 3.63E-04 |
| Silver | 161 | 1770 | 9.10E-02 |
| Uranium | 4.43 | 277 | 1.60E-02 |
| Zinc | 490 | 106,000 | 4.62E-03 |
| Aroclor-1254 | 0.209 | 4.91 | 4.26E-02 |
| Benzoic Acid | 0.355 | 1,080,000[b] | 3.29E-07 |
| Di-n-butylphthalate | 1.84 | 26,900 | 6.84E-05 |
| Isopropyltoluene[4-] | 0.00516 | 2740[c] | 1.88E-06 |
| Methylene Chloride | 0.00378 | 1210 | 3.12E-06 |
| RDX | 0.106 | 1010 | 1.04E-04 |
| Toluene | 0.000815 | 14,000 | 5.82E-08 |
| Trimethylbenzene[1,2,4-] | 0.001 | 245[b] | 4.08E-06 |
| Xylene[1,3-]+Xylene[1,4-] | 0.000822 | 798[d] | 1.03E-06 |
| **HI** | | | **2** |

[a] SSLs from NMED (2015, 600915) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening level (http://www.epa.gov/risk/risk-based-screening-table-generic-tables) and equation and parameters from NMED (2015, 600915).

[c] Isoproplybenzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

**Table H-4.3-1**
**Residential Noncarcinogenic Screening of Vapor Intrusion for AOC 15-005(c)**

| COPC | EPC[a] (mg/kg) | Vapor Intrusion Risk-Based Concentration[b] (mg/kg) | HQ |
|---|---|---|---|
| Acetone | 0.0188 | 2240 | 8.39E-06 |
| Isopropyltoluene[4-] | 0.00151 | 34.1[c] | 3.27E-03 |
| | | **HI** | **0.003** |

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.3-2**
**Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 15-009(b)**

| COPC | EPC[a] (mg/kg) | Vapor Intrusion Risk-Based Concentration[b] (mg/kg) | HQ |
|---|---|---|---|
| Acetone | 0.131 | 1060 | 1.24E-04 |
| Isopropyltoluene[4-] | 0.0167 | 8.46c | 1.97E-03 |
| Toluene | 0.0102 | 94 | 1.09E-04 |
| | | **HI** | **0.002** |

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.3-3**
**Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 15-009(c)**

| COPC | EPC[a] (mg/kg) | Vapor Intrusion Risk-Based Concentration[b] (mg/kg) | HQ |
|---|---|---|---|
| Acetone | 0.0527 | 4240 | 1.24E-05 |
| Isopropyltoluene[4-] | 0.00128 | 15.1[c] | 8.48E-05 |
| Toluene | 0.0122 | 685 | 1.78E-05 |
| | | **HI** | **0.0001** |

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.3-4**
**Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 15-010(b)**

| COPC | EPC[a] (mg/kg) | Vapor Intrusion Risk-Based Concentration[b] (mg/kg) | HQ |
|---|---|---|---|
| Acetone | 0.689 | 5320 | 1.30E-04 |
| Toluene | 0.0185 | 859 | 2.15E-05 |
| | | **HI** | **0.0002** |

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

**Table H-4.3-5**
**Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 36-003(a)**

| COPC | EPC[a] (mg/kg) | Vapor Intrusion Risk-Based Concentration[b] (mg/kg) | HQ |
|---|---|---|---|
| Isopropyltoluene[4-] | 0.00811 | 25[c] | 3.24E-04 |
| Trimethylbenzene[1,2,4-] | 0.000343 | 4.46 | 7.69E-05 |
| | | **HI** | **0.0004** |

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

**Table H-4.4-1**
**Essential Nutrient Screening Assessment**

| SWMU | Scenario | COPC | Maximum (mg/kg) | SSL (mg/kg)* | Ratio |
|---|---|---|---|---|---|
| 12-001(a) and 12-001(b) | Residential | Calcium | 4640 | 13,000,000 | 3.6E-04 |
| 12-001(a) and 12-001(b) | Residential | Magnesium | 2800 | 339,000 | 8.3E-03 |
| 12-002 | Residential | Calcium | 2440 | 13,000,000 | 1.9E-04 |
| 12-004(a) | Industrial | Calcium | 5100 | 3,2400,000 | 1.6E-04 |
| 12-004(a) | Residential | Calcium | 5100 | 13,000,000 | 3.9E-04 |
| 12-004(a) | Residential | Magnesium | 2570 | 339,000 | 7.6E-03 |
| 12-004(b) | Residential | Calcium | 5490 | 13,000,000 | 4.2E-04 |
| 12-004(b) | Residential | Magnesium | 3230 | 339,000 | 9.5E-03 |
| 15-008(b) | Industrial | Calcium | 27,600 | 32,400,000 | 8.5E-04 |
| 15-008(b) | Residential | Calcium | 27,600 | 13,000,000 | 2.1E-03 |
| 15-008(g) | Residential | Calcium | 6080 | 13,000,000 | 4.7E-04 |
| 36-002 | Residential | Calcium | 4700 | 13,000,000 | 3.6E-04 |
| 36-002 | Residential | Magnesium | 3080 | 339,000 | 9.1E-03 |
| 36-008 | Industrial | Calcium | 11,700 | 32,400,000 | 3.6E-04 |
| 36-008 | Residential | Calcium | 11,700 | 13,000,000 | 9.0E-04 |
| C-12-001 | Residential | Calcium | 4530 | 13,000,000 | 3.5E-04 |
| C-12-002 | Residential | Calcium | 3360 | 13,000,000 | 2.6E-04 |
| C-12-004 | Residential | Calcium | 3810 | 13,000,000 | 2.9E-04 |
| C-36-003 | Industrial | Calcium | 11,700 | 32,400,000 | 3.6E-04 |
| C-36-003 | Residential | Calcium | 11,700 | 13,000,000 | 9.0E-04 |

* SSLs from NMED (2015, 600915).

**Table H-5.3-1**
**Ecological Screening Levels for Terrestrial Receptors**

| COPEC | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Generic Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | | | | | | | | |
| Antimony | 46 | na* | na | na | na | na | 2.6 | 2.6 | 2.4 | 78 | 11 |
| Arsenic | 820 | 850 | 120 | 42 | 26 | 18 | 140 | 15 | 32 | 6.8 | 18 |
| Barium | 41000 | 28000 | 8600 | 820 | 930 | 1000 | 2900 | 1300 | 1800 | 330 | 110 |
| Cadmium | 530 | 470 | 1.5 | 4.4 | 0.54 | 0.29 | 8.8 | 0.27 | 0.51 | 140 | 32 |
| Chromium (Total) | 1800 | 1000 | 200 | 68 | 40 | 28 | 750 | 45 | 110 | na | na |
| Cobalt | 5500 | 2700 | 720 | 170 | 120 | 96 | 1600 | 160 | 400 | na | 13 |
| Copper | 4000 | 1300 | 92 | 38 | 22 | 15 | 240 | 38 | 64 | 80 | 70 |
| Cyanide (Total) | 2800 | 0.59 | 0.4 | 0.1 | 0.1 | 0.1 | 660 | 310 | 340 | na | na |
| Lead | 3700 | 630 | 95 | 21 | 16 | 14 | 330 | 72 | 120 | 1700 | 120 |
| Manganese | 41000 | 69000 | 27000 | 1400 | 1900 | 3100 | 1800 | 1500 | 1400 | 450 | 220 |
| Mercury | 61 | 0.29 | 0.066 | 0.07 | 0.022 | 0.013 | 20 | 1.7 | 3 | 0.05 | 34 |
| Nickel | 1200 | 2300 | 120 | 160 | 38 | 21 | 440 | 9.7 | 20 | 280 | 38 |
| Selenium | 90 | 81 | 4.3 | 1 | 0.87 | 0.75 | 1.9 | 0.66 | 0.83 | 4.1 | 0.52 |
| Silver | 4300 | 670 | 14 | 11 | 4.3 | 2.6 | 140 | 14 | 24 | na | 560 |
| Thallium | 5.3 | 120 | 56 | 9.2 | 7.5 | 6.3 | 2.5 | 0.22 | 0.73 | na | 0.05 |
| Uranium | 4800 | 30000 | 16000 | 1900 | 1700 | 1600 | 1800 | 220 | 750 | na | 25 |
| Vanadium | 3300 | 130 | 64 | 8.9 | 7.6 | 6.7 | 1300 | 140 | 480 | na | 60 |
| Zinc | 7800 | 2400 | 250 | 350 | 85 | 48 | 1600 | 98 | 170 | 120 | 160 |

**Table H-5.3-1 (continued)**

| COPEC | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Generic Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Organic Chemicals (mg/kg)** | | | | | | | | | | | |
| Acetone | 7800 | 76000 | 970 | 7.5 | 14 | 170 | 1.3 | 15 | 1.2 | na | na |
| Amino-2,6-dinitrotoluene[4-] | 6400 | na | na | na | na | na | 290 | 12 | 23 | 18 | 33 |
| Anthracene | 34000 | na | na | na | na | na | 1000 | 210 | 310 | na | 6.8 |
| Aroclor-1242 | 83 | 5.7 | 0.22 | 1 | 0.079 | 0.041 | 27 | 0.38 | 0.76 | na | na |
| Aroclor-1254 | 5.9 | 7.1 | 0.22 | 1.3 | 0.08 | 0.041 | 46 | 0.44 | 0.88 | na | 160 |
| Aroclor-1260 | 14 | 400 | 4.8 | 46 | 1.7 | 0.88 | 2600 | 10 | 20 | na | na |
| Benzo(a)anthracene | 110 | 34 | 7.4 | 0.8 | 0.91 | 1 | 5.5 | 3 | 3.4 | na | 18 |
| Benzo(a)pyrene | 3400 | na | na | na | na | na | 240 | 53 | 85 | na | na |
| Benzo(b)fluoranthene | 2400 | na | na | na | na | na | 110 | 38 | 52 | na | 18 |
| Benzo(g,h,i)perylene | 3300 | na | na | na | na | na | 480 | 24 | 47 | na | na |
| Benzoic acid | 1800 | na | na | na | na | na | 3.7 | 1 | 1.3 | na | na |
| Bis(2-ethylhexyl)phthalate | 380 | 8.1 | 0.1 | 20 | 0.04 | 0.02 | 2400 | 0.59 | 1.1 | na | na |
| Butylbenzylphthalate | 18000 | na | na | na | na | na | 2000 | 90 | 160 | na | na |
| Chloroform | 8200 | na | na | na | na | na | 15 | 8.2 | 8 | na | na |
| Chrysene | 110 | na | na | na | na | na | 5.8 | 2.4 | 3.1 | na | na |
| Di-n-butylphthalate | 48000 | 1.7 | 0.059 | 0.39 | 0.021 | 0.011 | 14000 | 180 | 370 | na | 160 |
| Di-n-octylphthalate | 1000 | na | na | na | na | na | 11000 | 0.91 | 1.8 | na | na |
| Dibenzofuran | na | na | na | na | na | na | na | na | na | na | 6.1 |
| Dichloroethene[1,1-] | 13000 | na | na | na | na | na | 35 | 11 | 14 | na | na |
| Fluoranthene | 3300 | na | na | na | na | na | 230 | 22 | 38 | 10 | na |
| Hexanone[2-] | 5700 | 320 | 2 | 0.47 | 0.41 | 0.36 | 13 | 5.4 | 6.1 | na | na |

**Table H-5.3-1 (continued)**

| COPEC | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Generic Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HMX | 59,000 | na | na | na | na | na | 340 | 900 | 300 | 16 | 2700 |
| Indeno(1,2,3-cd)pyrene | 4600 | na | na | na | na | na | 530 | 62 | 110 | na | na |
| Methylene chloride | 4200 | na | na | na | na | na | 3 | 9 | 2.6 | na | 1600 |
| PETN | 45,000 | na | na | na | na | na | 100 | 870 | 100 | na | na |
| Phenanthrene | 1700 | na | na | na | na | na | 52 | 10 | 15 | 5.5 | na |
| Pyrene | 2800 | 3100 | 190 | 71 | 46 | 34 | 99 | 22 | 32 | 10 | na |
| RDX | 7000 | 890 | 13 | 2.3 | 2.4 | 2.4 | 31 | 16 | 16 | 8.4 | na |
| Styrene | na | na | na | na | na | na | na | na | na | 1.2 | 3.2 |
| Tetrachloroethene | 97 | na | na | na | na | na | 7.8 | 0.18 | 0.36 | na | 10 |
| Tetryl | 940 | na | na | na | na | na | 1.5 | 35 | 1.5 | na | na |
| Toluene | 11,000 | na | na | na | na | na | 54 | 23 | 25 | na | 200 |
| Trichloroethene | 37,000 | na | na | na | na | na | 150 | 42 | 55 | na | na |
| Trinitrotoluene[2,4,6-] | 26,000 | 3500 | 1500 | 7.6 | 14 | 170 | 96 | 1000 | 96 | 32 | 62 |
| **Radionuclides (pCi/g)** | | | | | | | | | | | |
| Americium-241 | 26,000 | 59,000 | 47,000 | 5000 | 6900 | 11,000 | 20,000 | 33,000 | 33,000 | 190 | 500 |
| Cesium-137 | 1500 | 3900 | 4300 | 1400 | 2600 | 4600 | 1200 | 2400 | 2300 | 2300 | 1500 |
| Plutonium-238 | 45,000 | 130,000 | 120,000 | 5200 | 7700 | 14,000 | 53,000 | 160,000 | 170,000 | 820 | 1800 |
| Plutonium-239/240 | 51,000 | 160,000 | 140,000 | 5400 | 7900 | 14,000 | 620,00 | 270,000 | 280,000 | 870 | 1900 |
| Tritium | 220,000 | 550,000 | 610,000 | 300,000 | 440,000 | 600,000 | 210,000 | 340,000 | 330,000 | 48,000 | 36,000 |
| Uranium-234 | 110,000 | 260,000 | 260,000 | 15,000 | 31,000 | 92,000 | 18,000 | 140,000 | 120,000 | 2200 | 440 |
| Uranium-235/236 | 5200 | 10,000 | 10,000 | 6500 | 8200 | 9800 | 4200 | 5200 | 5200 | 1600 | 440 |
| Uranium-238 | 2100 | 4200 | 4200 | 3400 | 3800 | 4100 | 1900 | 2100 | 2100 | 1100 | 400 |

*na = Not available.

**Table H-5.3-2**
**Minimum ESL Comparison for SWMUs 12-001(a) and 12-001(b)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.15 | 2.4 | Deer mouse | **0.48** |
| Barium | 213 | 110 | Plant | **1.94** |
| Chromium (Total) | 24.6 | 28 | Robin (insectivore) | **0.88** |
| Cobalt | 7.1 | 13 | Plant | **0.55** |
| Copper | 8.09 | 15 | Robin (insectivore) | **0.54** |
| Manganese | 456 | 220 | Plant | **2.07** |
| Nickel | 7.67 | 9.7 | Shrew | **0.79** |
| Selenium | 1.34 (U) | 0.52 | Plant | **2.58** |
| Uranium | 3.52 | 25 | Plant | 0.14 |
| Vanadium | 27.6 | 6.7 | Robin (insectivore) | **4.12** |
| **Organic Chemicals (mg/kg)** | | | | |
| Amino-2,6-dinitrotoluene[4-] | 0.127 | 12 | Shrew | 0.011 |
| HMX | 0.749 | 16 | Earthworm | 0.047 |
| PETN | 5.82 | 100 | Deer mouse | 0.058 |
| RDX | 3.73 | 2.3 | Robin (herbivore) | **1.62** |
| Tetryl | 0.333 | 1.5 | Deer mouse | 0.22 |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 0.234 | 1200 | Cottontail | 0.0002 |
| Plutonium-239/240 | 0.00149 | 870 | Earthworm | 0.0000017 |
| Uranium-234 | 1.45 | 440 | Plant | 0.0033 |
| Uranium-238 | 1.65 | 400 | Plant | 0.0041 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-3**
**HI Analysis for SWMUs 12-001(a) and 12-001(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.15 | 0.025 | na* | na | na | na | na | **0.44** | **0.44** | **0.48** | 0.015 | 0.1 |
| Barium | 213 | 5.2E-03 | 7.6E-03 | 0.025 | 0.26 | 0.23 | 0.21 | 0.073 | 0.16 | 0.12 | **0.65** | **1.94** |
| Chromium (Total) | 24.6 | 0.014 | 0.025 | 0.12 | **0.36** | **0.62** | **0.88** | 0.033 | **0.55** | 0.22 | na | na |
| Cobalt | 7.1 | 1.3E-03 | 2.6E-03 | 9.9E-03 | 0.042 | 0.059 | 0.074 | 4.4E-03 | 0.044 | 0.018 | na | **0.55** |
| Copper | 8.09 | 2.0E-03 | 6.2E-03 | 0.088 | 0.21 | **0.37** | **0.54** | 0.034 | 0.21 | 0.13 | 0.1 | 0.12 |
| Manganese | 456 | 0.011 | 6.6E-03 | 0.017 | **0.33** | 0.24 | 0.15 | 0.25 | 0.3 | **0.33** | **1.01** | **2.07** |
| Nickel | 7.67 | 6.4E-03 | 3.3E-03 | 0.064 | 0.048 | 0.2 | **0.37** | 0.017 | **0.79** | **0.38** | 0.027 | 0.2 |
| Selenium | 1.34 (U) | 0.015 | 0.017 | **0.31** | **1.34** | **1.54** | **1.79** | **0.71** | **2.03** | **1.61** | **0.33** | **2.58** |
| Vanadium | 27.6 | 8.4E-03 | 0.21 | **0.43** | **3.1** | **3.63** | **4.12** | 0.021 | 0.2 | 0.058 | na | **0.46** |
| RDX | 3.73 | 5.3E-04 | 4.2E-03 | 0.29 | **1.62** | **1.55** | **1.55** | 0.12 | 0.23 | 0.23 | **0.44** | na |
| **HI** | | 0.09 | 0.3 | 1 | **7** | **8** | **10** | **2** | **5** | **4** | **3** | **8** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-4**
**Minimum ESL Comparison for SWMU 12-002**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| Inorganic Chemicals (mg/kg) | | | | |
| Antimony | 1.03 (U) | 2.4 | Deer mouse | **0.43** |
| Barium | 191 | 110 | Plant | **1.74** |
| Chromium (Total) | 13.5 | 28 | Robin (insectivore) | **0.48** |
| Cobalt | 14.2 | 13 | Plant | **1.09** |
| Copper | 11.1 | 15 | Robin (insectivore) | **0.74** |
| Nickel | 9.28 | 9.7 | Shrew | **0.96** |
| Selenium | 1.1 (U) | 0.52 | Plant | **2.12** |
| Vanadium | 27.1 | 6.7 | Robin (insectivore) | **4.04** |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-5**
**HI Analysis for SWMU 12-002**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.03 (U) | 0.022 | na* | na | na | na | na | **0.4** | **0.4** | **0.43** | 0.013 | 0.094 |
| Barium | 191 | 4.7E-03 | 6.8E-03 | 0.022 | 0.23 | 0.21 | 0.19 | 0.066 | 0.15 | 0.11 | **0.58** | **1.74** |
| Chromium (Total) | 13.5 | 7.5E-03 | 0.014 | 0.068 | 0.2 | **0.34** | **0.48** | 0.018 | 0.3 | 0.12 | na | na |
| Cobalt | 14.2 | 2.6E-03 | 5.3E-03 | 0.02 | 0.084 | 0.12 | 0.15 | 8.9E-03 | 0.089 | 0.036 | na | **1.09** |
| Copper | 11.1 | 2.8E-03 | 8.5E-03 | 0.12 | 0.29 | **0.5** | **0.74** | 0.046 | 0.29 | 0.17 | 0.14 | 0.16 |
| Nickel | 9.28 | 7.7E-03 | 4.0E-03 | 0.077 | 0.058 | 0.24 | **0.44** | 0.021 | **0.96** | **0.46** | 0.033 | 0.24 |
| Selenium | 1.1 (U) | 0.012 | 0.014 | 0.26 | **1.1** | **1.26** | **1.47** | **0.58** | **1.67** | **1.33** | 0.27 | **2.12** |
| Vanadium | 27.1 | 8.2E-03 | 0.21 | **0.42** | **3.04** | **3.57** | **4.04** | 0.021 | 0.19 | 0.056 | na | **0.45** |
| | **HI** | 0.07 | 0.3 | 1 | **5** | **6** | **8** | 1 | **4** | **3** | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-6**
**Minimum ESL Comparison for AOC 12-004(a)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.677 | 2.4 | Deer mouse | 0.28 |
| Arsenic | 1.83 | 6.8 | Earthworm | 0.27 |
| Barium | 88.5 | 110 | Plant | **0.8** |
| Chromium (Total) | 22.1 | 28 | Robin (insectivore) | **0.79** |
| Cobalt | 3.98 | 13 | Plant | **0.31** |
| Copper | 5.31 | 15 | Robin (insectivore) | **0.35** |
| Nickel | 5.98 | 9.7 | Shrew | **0.62** |
| Selenium | 1.26 (U) | 0.52 | Plant | **2.42** |
| Uranium | 2.64 | 25 | Plant | 0.11 |
| Vanadium | 13.8 | 6.7 | Robin (insectivore) | **2.06** |
| **Organic Chemicals (mg/kg)** | | | | |
| Benzoic acid | 0.608 | 1 | Shrew | **0.61** |
| Di-n-butylphthalate | 0.121 | 0.011 | Robin (insectivore) | **11** |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 0.263 | 1200 | Cottontail | 0.00022 |
| Uranium-234 | 1.44 | 440 | Plant | 0.0033 |
| Uranium-235/236 | 0.0956 | 440 | Plant | 0.00022 |
| Uranium-238 | 2.79 | 400 | Plant | 0.007 |

Note: Bolded values indicate HQs greater than 0.3.

### Table H-5.3-7
### HI Analysis for AOC 12-004(a)

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 88.5 | 2.2E-03 | 3.2E-03 | 0.01 | 0.11 | 0.095 | 0.089 | 0.031 | 0.068 | 0.049 | 0.27 | **0.8** |
| Chromium (Total) | 22.1 | 0.012 | 0.022 | 0.11 | **0.33** | **0.55** | **0.79** | 0.029 | **0.49** | 0.2 | na* | na |
| Cobalt | 3.98 | 7.2E-04 | 1.5E-03 | 5.5E-03 | 0.023 | 0.033 | 0.041 | 2.5E-03 | 0.025 | 0.01 | na | **0.31** |
| Copper | 5.31 | 1.3E-03 | 4.1E-03 | 0.058 | 0.14 | 0.24 | **0.35** | 0.022 | 0.14 | 0.083 | 0.066 | 0.076 |
| Nickel | 5.98 | 5.0E-03 | 2.6E-03 | 0.05 | 0.037 | 0.16 | 0.28 | 0.014 | **0.62** | 0.3 | 0.021 | 0.16 |
| Selenium | 1.26 (U) | 0.014 | 0.016 | 0.29 | **1.26** | **1.45** | **1.68** | **0.66** | **1.91** | **1.52** | **0.31** | **2.42** |
| Vanadium | 13.8 | 4.2E-03 | 0.11 | 0.22 | **1.55** | **1.82** | **2.06** | 0.011 | 0.099 | 0.029 | na | 0.23 |
| Benzoic acid | 0.608 | 3.4E-04 | na | na | na | na | na | 0.16 | **0.61** | **0.47** | na | na |
| Di-n-butylphthalate | 0.121 | 2.5E-06 | 0.071 | **2.05** | **0.31** | **5.76** | **11** | 8.6E-06 | 6.7E-04 | 3.3E-04 | na | 7.6E-04 |
| | **HI** | 0.04 | 0.2 | **3** | **4** | **10** | **16** | 0.9 | **4** | **3** | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
* na = Not available.

**Table H-5.3-8**
**Minimum ESL Comparison for AOC 12-004(b)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.373 | 2.4 | Deer mouse | 0.16 |
| Arsenic | 2.92 | 6.8 | Earthworm | **0.43** |
| Barium | 246 | 110 | Plant | **2.24** |
| Chromium (Total) | 13.3 | 28 | Robin (insectivore) | **0.48** |
| Cobalt | 7.49 | 13 | Plant | **0.58** |
| Copper | 9.38 | 15 | Robin (insectivore) | **0.63** |
| Lead | 18.5 | 14 | Robin (insectivore) | **1.32** |
| Nickel | 7.82 | 9.7 | Shrew | **0.81** |
| Selenium | 1.1 | 0.52 | Plant | **2.12** |
| Uranium | 2.97 | 25 | Plant | 0.12 |
| Vanadium | 30.3 | 6.7 | Robin (insectivore) | **4.52** |
| Organic Chemicals (mg/kg) | | | | |
| Aroclor-1254 | 0.015 | 0.041 | Robin (insectivore) | **0.37** |

Note: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

**Table H-5.3-9**
**HI Analysis for AOC 12-004(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate ) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.92 | 3.6E-03 | 3.4E-03 | 0.024 | 0.07 | 0.11 | 0.16 | 0.021 | 0.19 | 0.091 | **0.43** | 0.16 |
| Barium | 246 | 6.0E-03 | 8.8E-03 | 0.029 | 0.3 | 0.26 | 0.25 | 0.085 | 0.19 | 0.14 | **0.75** | **2.24** |
| Chromium (Total) | 13.3 | 7.4E-03 | 0.013 | 0.067 | 0.2 | **0.33** | **0.48** | 0.018 | 0.3 | 0.12 | na | na |
| Cobalt | 7.49 | 1.4E-03 | 2.8E-03 | 0.01 | 0.044 | 0.062 | 0.078 | 4.7E-03 | 0.047 | 0.019 | na | **0.58** |
| Copper | 9.38 | 2.3E-03 | 7.2E-03 | 0.1 | 0.25 | **0.43** | **0.63** | 0.039 | 0.25 | 0.15 | 0.12 | 0.13 |
| Lead | 18.5 | 5.0E-03 | 0.029 | 0.19 | **0.88** | **1.16** | **1.32** | 0.056 | 0.26 | 0.15 | 0.011 | 0.15 |
| Nickel | 7.82 | 6.5E-03 | 3.4E-03 | 0.065 | 0.049 | 0.21 | **0.37** | 0.018 | **0.81** | **0.39** | 0.028 | 0.21 |
| Selenium | 1.1 | 0.012 | 0.014 | 0.26 | **1.1** | **1.26** | **1.47** | **0.58** | **1.67** | **1.33** | 0.27 | **2.12** |
| Vanadium | 30.3 | 9.2E-03 | 0.23 | **0.47** | **3.4** | **3.99** | **4.52** | 0.023 | 0.22 | 0.063 | na | **0.51** |
| Aroclor-1254 | 0.015 | 2.5E-03 | 2.1E-03 | 0.068 | 0.012 | 0.19 | **0.37** | 3.3E-04 | 0.034 | 0.017 | na | 9.4E-05 |
| | **HI** | 0.06 | 0.3 | 1 | **6** | **8** | **10** | 0.8 | **4** | **2** | **2** | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
* na = Not available.

**Table H-5.3-10**
**Minimum ESL Comparison for AOC C-12-001**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.426 | 2.4 | Deer mouse | 0.18 |
| Barium | 132 | 110 | Plant | **1.2** |
| Chromium (Total) | 16.3 | 28 | Robin (insectivore) | **0.58** |
| Cobalt | 4.97 | 13 | Plant | **0.38** |
| Nickel | 7.75 | 9.7 | Shrew | **0.8** |
| Selenium | 1.26 (U) | 0.52 | Plant | **2.42** |
| Uranium | 1.96 | 25 | Plant | 0.078 |
| Organic Chemicals (mg/kg) | | | | |
| Aroclor-1242 | 0.114 | 0.041 | Robin (insectivore) | **2.78** |
| Aroclor-1254 | 0.109 | 0.041 | Robin (insectivore) | **2.66** |
| Aroclor-1260 | 0.0477 | 0.88 | Robin (insectivore) | 0.054 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-11**
**HI Analysis for AOC C-12-001**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 132 | 3.2E-03 | 4.7E-03 | 0.015 | 0.16 | 0.14 | 0.13 | 0.046 | 0.1 | 0.073 | **0.4** | **1.2** |
| Chromium (Total) | 16.3 | 9.1E-03 | 0.016 | 0.082 | 0.24 | **0.41** | **0.58** | 0.022 | **0.36** | 0.15 | na* | na |
| Cobalt | 4.97 | 9.0E-04 | 1.8E-03 | 6.9E-03 | 0.029 | 0.041 | 0.052 | 3.1E-03 | 0.031 | 0.012 | na | **0.38** |
| Nickel | 7.75 | 6.5E-03 | 3.4E-03 | 0.065 | 0.048 | 0.2 | **0.37** | 0.018 | **0.8** | **0.39** | 0.028 | 0.2 |
| Selenium | 1.26 (U) | 0.014 | 0.016 | 0.29 | **1.26** | **1.45** | **1.68** | **0.66** | **1.91** | **1.52** | **0.31** | **2.42** |
| Aroclor-1242 | 0.114 | 1.4E-03 | 0.02 | **0.52** | 0.11 | **1.44** | **2.78** | 4.2E-03 | 0.3 | 0.15 | na | na |
| Aroclor-1254 | 0.109 | 0.018 | 0.015 | **0.5** | 0.084 | **1.36** | **2.66** | 2.4E-03 | 0.25 | 0.12 | na | 6.8E-04 |
| **HI** | | 0.05 | 0.08 | 1 | **2** | **5** | **8** | 0.8 | **4** | **2** | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-12**
**Minimum ESL Comparison for AOC C-12-002**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| Inorganic Chemicals (mg/kg) | | | | |
| Antimony | 1.11 (U) | 2.4 | Deer mouse | **0.46** |
| Barium | 223 | 110 | Plant | **2.03** |
| Chromium (Total) | 15 | 28 | Robin (insectivore) | **0.54** |
| Cobalt | 7.49 | 13 | Plant | **0.58** |
| Copper | 7.65 | 15 | Robin (insectivore) | **0.51** |
| Nickel | 7.8 | 9.7 | Shrew | **0.8** |
| Selenium | 1.15 (U) | 0.52 | Plant | **2.21** |
| Vanadium | 28.2 | 6.7 | Robin (insectivore) | **4.21** |

Note: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

**Table H-5.3-13**
**HI Analysis for AOC C-12-002**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate i) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.11 (U) | 0.024 | na* | na | na | na | na | **0.43** | **0.43** | **0.46** | 0.014 | 0.1 |
| Barium | 223 | 5.4E-03 | 8.0E-03 | 0.026 | 0.27 | 0.24 | 0.22 | 0.077 | 0.17 | 0.12 | **0.68** | **2.03** |
| Chromium (Total) | 15 | 8.3E-03 | 0.015 | 0.075 | 0.22 | **0.38** | **0.54** | 0.02 | **0.33** | 0.14 | na | na |
| Cobalt | 7.49 | 1.4E-03 | 2.8E-03 | 0.01 | 0.044 | 0.062 | 0.078 | 4.7E-03 | 0.047 | 0.019 | na | **0.58** |
| Copper | 7.65 | 1.9E-03 | 5.9E-03 | 0.083 | 0.2 | **0.35** | **0.51** | 0.032 | 0.2 | 0.12 | 0.096 | 0.11 |
| Nickel | 7.8 | 6.5E-03 | 3.4E-03 | 0.065 | 0.049 | 0.21 | **0.37** | 0.018 | **0.8** | **0.39** | 0.028 | 0.21 |
| Selenium | 1.15 (U) | 0.013 | 0.014 | 0.27 | **1.15** | **1.32** | **1.53** | **0.61** | **1.74** | **1.39** | 0.28 | **2.21** |
| Vanadium | 28.2 | 8.5E-03 | 0.22 | **0.44** | **3.17** | **3.71** | **4.21** | 0.022 | 0.2 | 0.059 | na | **0.47** |
| | **HI** | 0.07 | 0.3 | 1 | **5** | **6** | **7** | 1 | **4** | **3** | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-14**
**Minimum ESL Comparison for AOC C-12-003**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| Inorganic Chemicals (mg/kg) | | | | |
| Antimony | 2.74 | 2.4 | Deer mouse | **1.14** |
| Barium | 117 | 110 | Plant | **1.06** |
| Chromium (Total) | 45 | 28 | Robin (insectivore) | **1.61** |
| Cobalt | 4.99 | 13 | Plant | **0.38** |
| Selenium | 1.12 (UJ) | 0.52 | Plant | **2.15** |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-15**
**HI Analysis for AOC C-12-003**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 2.74 | 0.06 | na* | na | na | na | na | **1.05** | **1.05** | **1.14** | 0.035 | 0.25 |
| Barium | 117 | 2.9E-03 | 4.2E-03 | 0.014 | 0.14 | 0.13 | 0.12 | 0.04 | 0.09 | 0.065 | **0.35** | **1.06** |
| Chromium (Total) | 45 | 0.025 | 0.045 | 0.23 | **0.66** | **1.13** | **1.61** | 0.06 | **1** | **0.41** | na | na |
| Cobalt | 4.99 | 9.1E-04 | 1.8E-03 | 6.9E-03 | 0.029 | 0.042 | 0.052 | 3.1E-03 | 0.031 | 0.012 | na | **0.38** |
| Selenium | 1.12 (UJ) | 0.012 | 0.014 | 0.26 | **1.12** | **1.29** | **1.49** | **0.59** | **1.7** | **1.35** | 0.27 | **2.15** |
| **HI** | | 0.1 | 0.07 | 0.5 | **2** | **3** | **3** | **2** | **4** | **3** | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-16**
**Minimum ESL Comparison for AOC C-12-004**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.21 (UJ) | 2.4 | Deer mouse | **0.5** |
| Barium | 214 | 110 | Plant | **1.95** |
| Chromium (Total) | 18.4 | 28 | Robin (insectivore) | **0.66** |
| Cobalt | 5.85 | 13 | Plant | **0.45** |
| Copper | 13.7 | 15 | Robin (insectivore) | **0.91** |
| Lead | 39.2 | 14 | Robin (insectivore) | **2.8** |
| Nickel | 8.38 | 9.7 | Shrew | **0.86** |
| Selenium | 1.14 (U) | 0.52 | Plant | **2.19** |
| Silver | 1.63 | 2.6 | Robin (insectivore) | **0.63** |
| Uranium | 3.86 | 25 | Plant | 0.15 |
| Vanadium | 28.1 | 6.7 | Robin (insectivore) | **4.19** |

Note: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

**Table H-5.3-17**
**HI Analysis for AOC C-12-004**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.21 (UJ) | 0.026 | na* | na | na | na | na | **0.47** | **0.47** | **0.5** | 0.016 | 0.11 |
| Barium | 214 | 5.2E-03 | 7.6E-03 | 0.025 | 0.26 | 0.23 | 0.21 | 0.074 | 0.16 | 0.12 | **0.65** | **1.95** |
| Chromium (Total) | 18.4 | 0.01 | 0.018 | 0.092 | 0.27 | **0.46** | **0.66** | 0.025 | **0.41** | 0.17 | na | na |
| Cobalt | 5.85 | 1.1E-03 | 2.2E-03 | 8.1E-03 | 0.034 | 0.049 | 0.061 | 3.7E-03 | 0.037 | 0.015 | na | **0.45** |
| Copper | 13.7 | 3.4E-03 | 0.011 | 0.15 | **0.36** | **0.62** | **0.91** | 0.057 | **0.36** | 0.21 | 0.17 | 0.2 |
| Lead | 39.2 | 0.011 | 0.062 | **0.41** | **1.87** | **2.45** | **2.8** | 0.12 | **0.54** | **0.33** | 0.023 | **0.33** |
| Nickel | 8.38 | 7.0E-03 | 3.6E-03 | 0.07 | 0.052 | 0.22 | **0.4** | 0.019 | **0.86** | **0.42** | 0.03 | 0.22 |
| Selenium | 1.14 (U) | 0.013 | 0.014 | 0.27 | **1.14** | **1.31** | **1.52** | **0.6** | **1.73** | **1.37** | 0.28 | **2.19** |
| Silver | 1.63 | 3.8E-04 | 2.4E-03 | 0.12 | 0.15 | **0.38** | **0.63** | 0.012 | 0.12 | 0.068 | na | 2.9E-03 |
| Vanadium | 28.1 | 8.5E-03 | 0.22 | **0.44** | **3.16** | **3.7** | **4.19** | 0.022 | 0.2 | 0.059 | na | **0.47** |
| | **HI** | 0.09 | 0.3 | **2** | **7** | **9** | **11** | 1 | **5** | **3** | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
* na = Not available.

**Table H-5.3-18**
**Minimum ESL Comparison for AOC C-12-005**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 3.89 | 2.4 | Deer mouse | **1.62** |
| Chromium (Total) | 114 | 28 | Robin (insectivore) | **4.07** |
| Uranium | 1.81 | 25 | Plant | 0.072 |

Note: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

**Table H-5.3-19**
**HI Analysis for AOC C-12-005**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.89 | 0.085 | na* | na | na | na | na | **1.5** | **1.5** | **1.62** | 0.05 | **0.35** |
| Chromium (Total) | 114 | 0.063 | 0.11 | **0.57** | **1.68** | **2.85** | **4.07** | 0.15 | **2.53** | **1.04** | na | na |
| **HI** | | 0.1 | 0.1 | 0.6 | **2** | **3** | **4** | **2** | **4** | **3** | 0.05 | 0.4 |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-20**
**Minimum ESL Comparison for AOC C-14-006**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.933 | 2.4 | Deer mouse | **0.39** |
| Chromium (Total) | 13.9 | 28 | Robin (insectivore) | **0.5** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.00973 | 1.2 | Deer mouse | 0.0081 |
| Toluene | 0.000887 | 23 | Shrew | 0.000039 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-21**
**HI Analysis for AOC C-14-006**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate ) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.933 | 0.02 | na* | na | na | na | na | **0.36** | **0.36** | **0.39** | 0.012 | 0.085 |
| Chromium (Total) | 13.9 | 7.7E-03 | 0.014 | 0.07 | 0.2 | **0.35** | **0.5** | 0.019 | **0.31** | 0.13 | na | na |
| | **HI** | 0.03 | 0.01 | 0.07 | 0.2 | 0.4 | 0.5 | 0.4 | 0.7 | 0.5 | 0.01 | 0.09 |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-22**
**Minimum ESL Comparison for AOC 15-005(c)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.855 | 2.4 | Deer mouse | **0.36** |
| Barium | 199 | 110 | Plant | **1.81** |
| Chromium (Total) | 11.3 | 28 | Robin (insectivore) | **0.4** |
| Cobalt | 6.13 | 13 | Plant | **0.47** |
| Copper | 12 | 15 | Robin (insectivore) | **0.8** |
| Lead | 35.3 | 14 | Robin (insectivore) | **2.52** |
| Selenium | 1.48 (U) | 0.52 | Plant | **2.85** |
| Uranium | 6.35 | 25 | Plant | 0.25 |
| Vanadium | 27.4 | 6.7 | Robin (insectivore) | **4.09** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.0188 | 1.2 | Deer mouse | 0.016 |
| Bis(2-ethylhexyl)phthalate | 0.0995 | 0.02 | Robin (insectivore) | **4.98** |
| Toluene | 0.000754 | 23 | Shrew | 0.000033 |
| **Radionuclides (pCi/g)** | | | | |
| Uranium-234 | 3.15 | 440 | Plant | 0.0072 |
| Uranium-235/236 | 0.169 | 440 | Plant | 0.00038 |
| Uranium-238 | 4.96 | 400 | Plant | 0.012 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-23**
**HI Analysis for AOC 15-005(c)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate i) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.855 | 0.019 | na* | na | na | na | na | **0.33** | **0.33** | **0.36** | 0.011 | 0.078 |
| Barium | 199 | 4.9E-03 | 7.1E-03 | 0.023 | 0.24 | 0.21 | 0.2 | 0.069 | 0.15 | 0.11 | **0.6** | **1.81** |
| Chromium (Total) | 11.3 | 6.3E-03 | 0.011 | 0.057 | 0.17 | 0.28 | **0.4** | 0.015 | 0.25 | 0.1 | na | na |
| Cobalt | 6.13 | 1.1E-03 | 2.3E-03 | 8.5E-03 | 0.036 | 0.051 | 0.064 | 3.8E-03 | 0.038 | 0.015 | na | **0.47** |
| Copper | 12 | 3.0E-03 | 9.2E-03 | 0.13 | **0.32** | **0.55** | **0.8** | 0.05 | **0.32** | 0.19 | 0.15 | 0.17 |
| Lead | 35.3 | 9.5E-03 | 0.056 | **0.37** | **1.68** | **2.21** | **2.52** | 0.11 | **0.49** | 0.29 | 0.021 | 0.29 |
| Selenium | 1.48 (U) | 0.016 | 0.018 | **0.34** | **1.48** | **1.7** | **1.97** | **0.78** | **2.24** | **1.78** | **0.36** | **2.85** |
| Vanadium | 27.4 | 8.3E-03 | 0.21 | **0.43** | **3.08** | **3.61** | **4.09** | 0.021 | 0.2 | 0.057 | na | **0.46** |
| Bis(2-ethylhexyl)phthalate | 0.0995 | 2.6E-04 | 0.012 | **1** | 5.0E-03 | **2.49** | **4.98** | 4.1E-05 | 0.17 | 0.09 | na | na |
| | **HI** | 0.07 | 0.3 | **2** | **7** | **11** | **15** | 1 | **4** | **3** | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-24**
**Minimum ESL Comparison for SWMU 15-007(c)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 243 | 2.4 | Deer mouse | **101** |
| Chromium (Total) | 31.8 | 28 | Robin (insectivore) | **1.14** |
| Copper | 8.17 | 15 | Robin (insectivore) | **0.54** |
| Lead | 7290 | 14 | Robin (insectivore) | **521** |
| Nickel | 8.79 | 9.7 | Shrew | **0.91** |
| Selenium | 2.11 (U) | 0.52 | Plant | **4.06** |
| Silver | 1.15 | 2.6 | Robin (insectivore) | **0.44** |
| Zinc | 46.7 | 48 | Robin (insectivore) | **0.97** |
| **Organic Chemicals (mg/kg)** | | | | |
| Aroclor-1242 | 0.0034 | 0.041 | Robin (insectivore) | 0.083 |
| Aroclor-1254 | 0.0055 | 0.041 | Robin (insectivore) | 0.13 |
| **Radionuclides (pCi/g)** | | | | |
| Tritium | 7.45 | 36000 | Plant | 0.00021 |

Note: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

**Table H-5.3-25**
**HI Analysis for SWMU 15-007(c)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 243 | **5.28** | na* | na | na | na | na | **93.5** | **93.5** | **101** | **3.12** | **22.1** |
| Chromium (Total) | 31.8 | 0.018 | 0.032 | 0.16 | **0.47** | **0.8** | **1.14** | 0.042 | **0.71** | 0.29 | na | na |
| Copper | 8.17 | 2.0E-03 | 6.3E-03 | 0.089 | 0.22 | **0.37** | **0.54** | 0.034 | 0.22 | 0.13 | 0.1 | 0.12 |
| Lead | 7290 | **1.97** | **11.6** | **76.7** | **347** | **456** | **521** | **22.1** | **101** | **60.8** | **4.29** | **60.8** |
| Nickel | 8.79 | 7.3E-03 | 3.8E-03 | 0.073 | 0.055 | 0.23 | **0.42** | 0.02 | **0.91** | **0.44** | 0.031 | 0.23 |
| Selenium | 2.11 (U) | 2.3E-02 | 2.6E-02 | **0.49** | **2.11** | **2.43** | **2.81** | **1.11** | **3.20** | **2.54** | **0.52** | **4.06** |
| Silver | 1.15 | 2.7E-04 | 1.7E-03 | 0.082 | 0.1 | 0.27 | **0.44** | 8.2E-03 | 0.082 | 0.048 | na | 2.1E-03 |
| Zinc | 46.7 | 6.0E-03 | 0.019 | 0.19 | 0.13 | **0.55** | **0.97** | 0.029 | **0.48** | 0.27 | **0.39** | 0.29 |
| | **HI** | **7** | **12** | **77** | **350** | **460** | **528** | **117** | **200** | **166** | **8** | **88** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-26**
**Minimum ESL Comparison for SWMU 15-007(d)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| Inorganic Chemicals (mg/kg) | | | | |
| Antimony | 0.998 (U) | 2.4 | Deer mouse | **0.42** |
| Selenium | 1 (U) | 0.52 | Plant | **1.92** |
| Radionuclides (pCi/g) | | | | |
| Tritium | 6.11 | 36000 | Plant | 0.00017 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-27**
**HI Analysis for SWMU 15-007(d)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.998 (U) | 0.022 | na* | na | na | na | na | **0.38** | **0.38** | **0.42** | 0.013 | 0.091 |
| Selenium | 1 (U) | 0.011 | 0.012 | 0.23 | **1** | **1.15** | **1.33** | **0.53** | **1.52** | **1.2** | 0.24 | **1.92** |
| | **HI** | 0.03 | 0.01 | 0.2 | 1 | 1 | 1 | 0.9 | **2** | **2** | 0.3 | **2** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
* na = Not available.

**Table H-5.3-28**
**Minimum ESL Comparison for SWMU 15-008(b)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 5.63 | 2.4 | Deer mouse | **2.35** |
| Arsenic | 2.01 | 6.8 | Earthworm | 0.3 |
| Barium | 73.2 | 110 | Plant | **0.67** |
| Beryllium | 4.46 | 2.5 | Plant | **1.78** |
| Cadmium | 0.394 | 0.27 | Shrew | **1.46** |
| Chromium (Total) | 13.6 | 28 | Robin (insectivore) | **0.49** |
| Copper | 1410 | 15 | Robin (insectivore) | **94** |
| Lead | 4400 | 14 | Robin (insectivore) | **314** |
| Manganese | 266 | 220 | Plant | **1.21** |
| Nickel | 6.58 | 9.7 | Shrew | **0.68** |
| Selenium | 0.696 | 0.52 | Plant | **1.34** |
| Silver | 0.51 | 2.6 | Robin (insectivore) | 0.2 |
| Uranium | 90.4 | 25 | Plant | **3.62** |
| Vanadium | 13.3 | 6.7 | Robin (insectivore) | **1.99** |
| Zinc | 457 | 48 | Robin (insectivore) | **9.52** |
| **Organic Chemicals (mg/kg)** | | | | |
| Aroclor-1242 | 0.282 | 0.041 | Robin (insectivore) | **6.88** |
| Aroclor-1254 | 0.0168 | 0.041 | Robin (insectivore) | **0.41** |
| Aroclor-1260 | 0.0105 | 0.88 | Robin (insectivore) | 0.012 |
| HMX | 1.98 | 16 | Earthworm | 0.12 |
| RDX | 0.475 | 2.3 | Robin (herbivore) | 0.21 |
| Trinitrotoluene[2,4,6-] | 0.205 | 7.6 | Robin (herbivore) | 0.027 |
| **Radionuclides (pCi/g)** | | | | |
| Americium-241 | 0.00575 | 190 | Earthworm | 0.00003 |
| Cesium-137 | 0.161 | 1200 | Cottontail | 0.00013 |
| Plutonium-239/240 | 0.0254 | 870 | Earthworm | 0.000029 |
| Tritium | 10.6 | 36,000 | Plant | 0.00029 |
| Uranium-234 | 6.53 | 440 | Plant | 0.015 |
| Uranium-235/236 | 0.795 | 440 | Plant | 0.0018 |
| Uranium-238 | 38.4 | 400 | Plant | 0.096 |

Note: Bolded values indicate HQs greater than 0.3.

## Table H-5.3-29
## HI Analysis for SWMU 15-008(b)

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 5.63 | 0.12 | na* | na | na | na | na | **2.17** | **2.17** | **2.35** | 0.072 | **0.51** |
| Barium | 73.2 | 1.8E-03 | 2.6E-03 | 8.5E-03 | 0.089 | 0.079 | 0.073 | 0.025 | 0.056 | 0.041 | 0.22 | **0.67** |
| Beryllium | 4.46 | 0.011 | na | na | na | na | na | 0.03 | 0.25 | 0.08 | 0.11 | **1.78** |
| Cadmium | 0.394 | 7.4E-04 | 8.4E-04 | 0.26 | 0.09 | **0.73** | **1.36** | 0.045 | **1.46** | **0.77** | 2.8E-03 | 0.012 |
| Chromium (Total) | 13.6 | 7.6E-03 | 0.014 | 0.068 | 0.2 | **0.34** | **0.49** | 0.018 | 0.3 | 0.12 | na | na |
| Copper | 1410 | **0.35** | **1.08** | **15.3** | **37.1** | **64.1** | **94** | **5.88** | **37.1** | **22** | **17.6** | **20.1** |
| Lead | 4400 | **1.19** | **6.98** | **46.3** | **210** | **275** | **314** | **13.3** | **61.1** | **36.7** | **2.59** | **36.7** |
| Manganese | 266 | 6.5E-03 | 3.9E-03 | 9.9E-03 | 0.19 | 0.14 | 0.086 | 0.15 | 0.18 | 0.19 | **0.59** | **1.21** |
| Nickel | 6.58 | 5.5E-03 | 2.9E-03 | 0.055 | 0.041 | 0.17 | **0.31** | 0.015 | **0.68** | **0.33** | 0.024 | 0.17 |
| Selenium | 0.696 | 7.7E-03 | 8.6E-03 | 0.16 | **0.7** | **0.8** | **0.93** | **0.37** | **1.05** | **0.84** | 0.17 | **1.34** |
| Uranium | 90.4 | 0.019 | 3.0E-03 | 5.7E-03 | 0.048 | 0.053 | 0.057 | 0.05 | **0.41** | 0.12 | na | **3.62** |
| Vanadium | 13.3 | 4.0E-03 | 0.1 | 0.21 | **1.49** | **1.75** | **1.99** | 0.01 | 0.095 | 0.028 | na | 0.22 |
| Zinc | 457 | 0.059 | 0.19 | **1.83** | **1.31** | **5.38** | **9.52** | 0.29 | **4.66** | **2.69** | **3.81** | **2.86** |
| Aroclor-1242 | 0.282 | 3.4E-03 | 0.049 | **1.28** | 0.28 | **3.57** | **6.88** | 0.01 | **0.74** | **0.37** | na | na |
| Aroclor-1254 | 0.0168 | 2.8E-03 | 2.4E-03 | 0.076 | 0.013 | 0.21 | **0.41** | 3.7E-04 | 0.038 | 0.019 | na | 1.1E-04 |
| **HI** | | **2** | **8** | **66** | **252** | **352** | **430** | **22** | **110** | **67** | **25** | **69** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-30**
**Minimum ESL Comparison for AOC 15-008(g)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 3.77 | 2.4 | Deer mouse | **1.57** |
| Cobalt | 9.43 | 13 | Plant | **0.73** |
| Copper | 25.7 | 15 | Robin (insectivore) | **1.71** |
| Lead | 309 | 14 | Robin (insectivore) | **22.1** |
| Selenium | 1.28 (U) | 0.52 | Plant | **2.46** |
| Uranium | 4.95 | 25 | Plant | 0.2 |
| **Radionuclides (pCi/g)** | | | | |
| Tritium | 0.0374 | 36,000 | Plant | 0.000001 |
| Uranium-238 | 2.8 | 400 | Plant | 0.007 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-31**
**HI Analysis for AOC 15-008(g)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.77 | 0.082 | na* | na | na | na | na | **1.45** | **1.45** | **1.57** | 0.048 | **0.34** |
| Cobalt | 9.43 | 1.7E-03 | 3.5E-03 | 0.013 | 0.055 | 0.079 | 0.098 | 5.9E-03 | 0.059 | 0.024 | na | **0.73** |
| Copper | 25.7 | 6.4E-03 | 0.02 | 0.28 | **0.68** | **1.17** | **1.71** | 0.11 | **0.68** | **0.4** | **0.32** | **0.37** |
| Lead | 309 | 0.084 | **0.49** | **3.25** | **14.7** | **19.3** | **22.1** | **0.94** | **4.29** | **2.58** | 0.18 | **2.58** |
| Selenium | 1.28 (U) | 0.014 | 0.016 | 0.3 | **1.28** | **1.47** | **1.71** | **0.67** | **1.94** | **1.54** | **0.31** | **2.46** |
| | **HI** | 0.2 | 0.5 | **4** | **17** | **22** | **26** | **3** | **8** | **6** | 0.9 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-32**
**Minimum ESL Comparison for SWMU 15-009(b)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.44 (UJ) | 2.4 | Deer mouse | **0.6** |
| Barium | 94 | 110 | Plant | **0.85** |
| Cadmium | 0.757 (U) | 0.27 | Shrew | **2.8** |
| Chromium (Total) | 14.4 | 28 | Robin (insectivore) | **0.51** |
| Copper | 10 | 15 | Robin (insectivore) | **0.67** |
| Cyanide (Total) | 1.22 | 0.1 | Robin (all diets) | **12.2** |
| Lead | 16.2 | 14 | Robin (insectivore) | **1.16** |
| Selenium | 1.59 (U) | 0.52 | Plant | **3.06** |
| Uranium | 417 | 25 | Plant | **16.7** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.0141 | 1.2 | Deer mouse | 0.012 |
| Toluene | 0.00112 | 23 | Shrew | 0.000049 |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 1.04 | 1200 | Cottontail | 0.00087 |
| Plutonium-239/240 | 0.134 | 870 | Earthworm | 0.00015 |
| Tritium | 0.123 | 36,000 | Plant | 0.0000034 |
| Uranium-234 | 215 | 440 | Plant | **0.49** |
| Uranium-235/236 | 14.4 | 440 | Plant | 0.033 |
| Uranium-238 | 221 | 400 | Plant | **0.55** |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-33**
**HI Analysis for SWMU 15-009(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.44 (UJ) | 0.031 | na* | na | na | na | na | **0.55** | **0.55** | **0.6** | 0.018 | 0.13 |
| Barium | 94 | 2.3E-03 | 3.4E-03 | 0.011 | 0.11 | 0.1 | 0.094 | 0.032 | 0.072 | 0.052 | 0.28 | **0.85** |
| Cadmium | 0.757 (U) | 1.4E-03 | 1.6E-03 | **0.5** | 0.17 | **1.4** | **2.61** | 0.086 | **2.8** | **1.48** | 5.4E-03 | 0.024 |
| Chromium (Total) | 14.4 | 8.0E-03 | 0.014 | 0.072 | 0.21 | **0.36** | **0.51** | 0.019 | **0.32** | 0.13 | na | na |
| Copper | 10 | 2.5E-03 | 7.7E-03 | 0.11 | 0.26 | **0.45** | **0.67** | 0.042 | 0.26 | 0.16 | 0.13 | 0.14 |
| Cyanide (Total) | 1.22 | 4.4E-04 | **2.07** | **3.05** | **12.2** | **12.2** | **12.2** | 1.8E-03 | 3.9E-03 | 3.6E-03 | na | na |
| Lead | 16.2 | 4.4E-03 | 0.026 | 0.17 | **0.77** | **1.01** | **1.16** | 0.049 | 0.23 | 0.14 | 9.5E-03 | 0.14 |
| Selenium | 1.59 (U) | 0.018 | 0.02 | **0.37** | **1.59** | **1.83** | **2.12** | **0.84** | **2.41** | **1.92** | **0.39** | **3.06** |
| Uranium | 417 | 0.087 | 0.014 | 0.026 | 0.22 | 0.25 | 0.26 | 0.23 | **1.9** | **0.56** | na | **16.7** |
| Uranium-234 | 215 | 2.0E-03 | 8.3E-04 | 8.3E-04 | 0.014 | 6.9E-03 | 2.3E-03 | 0.012 | 1.5E-03 | 1.8E-03 | 0.098 | **0.49** |
| Uranium-238 | 221 | 0.11 | 0.053 | 0.053 | 0.065 | 0.058 | 0.054 | 0.12 | 0.11 | 0.11 | 0.2 | **0.55** |
| | **HI** | 0.3 | **2** | **4** | **16** | **18** | **20** | **2** | **9** | **5** | 1 | **22** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*na = Not available.

**Table H-5.3-34**
**Minimum ESL Comparison for SWMU 15-009(c)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.386 | 2.4 | Deer mouse | 0.16 |
| Chromium (Total) | 10.3 | 28 | Robin (insectivore) | **0.37** |
| Cyanide (Total) | 1.69 | 0.1 | Robin (all diets) | **16.9** |
| Selenium | 1.3 (U) | 0.52 | Plant | **2.5** |
| Silver | 0.209 | 2.6 | Robin (insectivore) | 0.08 |
| Uranium | 3.73 | 25 | Plant | 0.15 |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.00811 | 1.2 | Deer mouse | 0.0068 |
| Anthracene | 0.0128 | 6.8 | Plant | 0.0019 |
| Benzo(a)anthracene | 0.0626 | 0.8 | Robin (herbivore) | 0.078 |
| Benzo(a)pyrene | 0.0384 | 53 | Shrew | 0.00072 |
| Benzo(b)fluoranthene | 0.072 | 18 | Plant | 0.004 |
| Benzo(g,h,i)perylene | 0.0226 | 24 | Shrew | 0.00094 |
| Bis(2-ethylhexyl)phthalate | 0.105 | 0.02 | Robin (insectivore) | **5.25** |
| Chrysene | 0.0527 | 2.4 | Shrew | 0.022 |
| Fluoranthene | 0.127 | 10 | Earthworm | 0.013 |
| Indeno(1,2,3-cd)pyrene | 0.0208 | 62 | Shrew | 0.00034 |
| Phenanthrene | 0.0812 | 5.5 | Earthworm | 0.015 |
| Pyrene | 0.0783 | 10 | Earthworm | 0.0078 |
| Toluene | 0.00152 | 23 | Shrew | 0.000066 |
| **Radionuclides (pCi/g)** | | | | |
| Tritium | 0.0413 | 36,000 | Plant | 0.0000011 |
| Uranium-234 | 3.09 | 440 | Plant | 0.007 |
| Uranium-235/236 | 0.13 | 440 | Plant | 0.0003 |
| Uranium-238 | 4.14 | 400 | Plant | 0.01 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-35**
**HI Analysis for SWMU 15-009(c)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium (Total) | 10.3 | 5.7E-03 | 0.01 | 0.052 | 0.15 | 0.26 | **0.37** | 0.014 | 0.23 | 0.094 | na* | na |
| Cyanide (Total) | 1.69 | 6.0E-04 | **2.86** | **4.23** | **16.9** | **16.9** | **16.9** | 2.6E-03 | 5.5E-03 | 5.0E-03 | na | na |
| Selenium | 1.3 (U) | 0.014 | 0.016 | 0.3 | **1.3** | **1.49** | **1.73** | **0.68** | **1.97** | **1.57** | **0.32** | **2.5** |
| Bis(2-ethylhexyl)phthalate | 0.105 | 2.8E-04 | 0.013 | **1.05** | 5.3E-03 | **2.63** | **5.25** | 4.4E-05 | 0.18 | 0.095 | na | na |
| **HI** | | 0.02 | **3** | **6** | **18** | **21** | **24** | 0.7 | **2** | **2** | 0.3 | **3** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-36**
**Minimum ESL Comparison for SWMU 15-009(h)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.09 (UJ) | 2.4 | Deer mouse | **0.45** |
| Uranium | 4.06 | 25 | Plant | 0.16 |
| **Organic Chemicals (mg/kg)** | | | | |
| Hexanone[2-] | 0.00201 | 0.36 | Robin (insectivore) | 0.0056 |
| **Radionuclides (pCi/g)** | | | | |
| Tritium | 0.0424 | 36000 | Plant | 0.0000012 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-37**
**HI Analysis for SWMU 15-009(h)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.09 (UJ) | 0.024 | na* | na | na | na | na | **0.42** | **0.42** | **0.45** | 0.014 | 0.099 |
| | **HI** | 0.02 | na | na | na | na | na | 0.4 | 0.4 | 0.5 | 0.01 | 0.1 |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-38**
**Minimum ESL Comparison for SWMU 15-010(b)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.35 (U) | 2.4 | Deer mouse | **0.56** |
| Cadmium | 0.673 (U) | 0.27 | Shrew | **2.49** |
| Chromium (Total) | 10 | 28 | Robin (insectivore) | **0.36** |
| Mercury | 0.292 | 0.013 | Robin (insectivore) | **22.5** |
| Selenium | 0.72 | 0.52 | Plant | **1.38** |
| Uranium | 4.21 | 25 | Plant | 0.17 |
| Vanadium | 15.7 | 6.7 | Robin (insectivore) | **2.34** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.121 | 1.2 | Deer mouse | 0.1 |
| Aroclor-1254 | 0.0065 | 0.041 | Robin (insectivore) | 0.16 |
| Aroclor-1260 | 0.0025 | 0.88 | Robin (insectivore) | 0.0028 |
| Bis(2-ethylhexyl)phthalate | 0.17 | 0.02 | Robin (insectivore) | **8.5** |
| Di-n-butylphthalate | 0.86 | 0.011 | Robin (insectivore) | **78.2** |
| Dichloroethene[1,1-] | 0.00037 | 11 | Shrew | 0.000034 |
| Methylene chloride | 0.00414 | 2.6 | Deer mouse | 0.0016 |
| Styrene | 0.000555 | 1.2 | Earthworm | 0.00046 |
| Tetrachloroethene | 0.000584 | 0.18 | Shrew | 0.0032 |
| Toluene | 0.00421 | 23 | Shrew | 0.00018 |
| **Radionuclides (pCi/g)** | | | | |
| Uranium-238 | 2.68 | 400 | Plant | 0.0067 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-39**
**HI Analysis for SWMU 15-010(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.35 (U) | 0.029 | na* | na | na | na | na | **0.52** | **0.52** | **0.56** | 0.017 | 0.12 |
| Cadmium | 0.673 (U) | 1.3E-03 | 1.4E-03 | **0.45** | 0.15 | **1.25** | **2.32** | 0.076 | **2.49** | **1.32** | 4.8E-03 | 0.021 |
| Chromium (Total) | 10 | 5.6E-03 | 0.01 | 0.05 | 0.15 | 0.25 | **0.36** | 0.013 | 0.22 | 0.091 | na | na |
| Mercury | 0.292 | 4.8E-03 | **1.01** | **4.42** | **4.17** | **13.3** | **22.5** | 0.015 | 0.17 | 0.097 | **5.84** | 8.6E-03 |
| Selenium | 0.72 | 8.0E-03 | 8.9E-03 | 0.17 | **0.72** | **0.83** | **0.96** | **0.38** | **1.09** | **0.87** | 0.18 | **1.38** |
| Vanadium | 15.7 | 4.8E-03 | 0.12 | 0.25 | **1.76** | **2.07** | **2.34** | 0.012 | 0.11 | 0.033 | na | 0.26 |
| Bis(2-ethylhexyl)phthalate | 0.17 | 4.5E-04 | 0.021 | **1.7** | 8.5E-03 | **4.25** | **8.5** | 7.1E-05 | 0.29 | 0.15 | na | na |
| Di-n-butylphthalate | 0.86 | 1.8E-05 | **0.51** | **14.6** | **2.21** | **41** | **78.2** | 6.1E-05 | 4.8E-03 | 2.3E-03 | na | 5.4E-03 |
| | **HI** | 0.05 | **2** | **22** | **9** | **63** | **115** | 1 | **5** | **3** | **6** | **2** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*na = Not available.

**Table H-5.3-40**
**Minimum ESL Comparison for AOC 15-014(h)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.57 (U) | 2.4 | Deer mouse | **0.65** |
| Barium | 142 | 110 | Plant | **1.29** |
| Cadmium | 0.348 | 0.27 | Shrew | **1.29** |
| Chromium (Total) | 18.4 | 28 | Robin (insectivore) | **0.66** |
| Cobalt | 5.08 | 13 | Plant | **0.39** |
| Copper | 15.2 | 15 | Robin (insectivore) | **1.01** |
| Lead | 19.8 | 14 | Robin (insectivore) | **1.41** |
| Mercury | 0.34 | 0.013 | Robin (insectivore) | **26.2** |
| Nickel | 8.35 | 9.7 | Shrew | **0.86** |
| Selenium | 1.5 (U) | 0.52 | Plant | **2.88** |
| Silver | 3.72 | 2.6 | Robin (insectivore) | **1.43** |
| Uranium | 4.62 | 25 | Plant | 0.18 |
| Vanadium | 24.2 | 6.7 | Robin (insectivore) | **3.61** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.00598 | 1.2 | Deer mouse | 0.005 |
| Aroclor-1254 | 0.704 | 0.041 | Robin (insectivore) | **17.2** |
| Aroclor-1260 | 0.258 | 0.88 | Robin (insectivore) | 0.29 |
| Benzoic acid | 1.01 | 1 | Shrew | **1.01** |
| Bis(2-ethylhexyl)phthalate | 0.343 | 0.02 | Robin (insectivore) | **17.2** |
| Chloroform | 0.000687 | 8 | Deer mouse | 0.000086 |
| Di-n-butylphthalate | 0.129 | 0.011 | Robin (insectivore) | **11.7** |
| Di-n-octylphthalate | 1.43 | 0.91 | Shrew | **1.57** |
| Dichloroethene[1,1-] | 0.000772 | 11 | Shrew | 0.00007 |
| Methylene chloride | 0.00478 | 2.6 | Deer mouse | 0.0018 |
| Tetrachloroethene | 0.000723 | 0.18 | Shrew | 0.004 |
| Toluene | 0.000778 | 23 | Shrew | 0.000034 |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 0.31 | 1200 | Cottontail | 0.00026 |
| Plutonium-238 | 0.0599 | 820 | Earthworm | 0.000073 |
| Plutonium-239/240 | 0.00693 | 870 | Earthworm | 0.000008 |
| Tritium | 0.00467 | 36,000 | Plant | 0.00000013 |
| Uranium-234 | 1.74 | 440 | Plant | 0.004 |
| Uranium-238 | 2.54 | 400 | Plant | 0.0064 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-41**
**HI Analysis for AOC 15-014(h)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.57 (U) | 0.034 | na* | na | na | na | na | **0.6** | **0.6** | **0.65** | 0.02 | 0.14 |
| Barium | 142 | 3.5E-03 | 5.1E-03 | 0.017 | 0.17 | 0.15 | 0.14 | 0.049 | 0.11 | 0.079 | **0.43** | **1.29** |
| Cadmium | 0.348 | 6.6E-04 | 7.4E-04 | 0.23 | 0.079 | **0.64** | **1.2** | 0.04 | **1.29** | **0.68** | 2.5E-03 | 0.011 |
| Chromium (Total) | 18.4 | 0.01 | 0.018 | 0.092 | 0.27 | **0.46** | **0.66** | 0.025 | **0.41** | 0.17 | na | na |
| Cobalt | 5.08 | 9.2E-04 | 1.9E-03 | 7.1E-03 | 0.03 | 0.042 | 0.053 | 3.2E-03 | 0.032 | 0.013 | na | **0.39** |
| Copper | 15.2 | 3.8E-03 | 0.012 | 0.17 | **0.4** | **0.69** | **1.01** | 0.063 | **0.4** | 0.24 | 0.19 | 0.22 |
| Lead | 19.8 | 5.4E-03 | 0.031 | 0.21 | **0.94** | **1.24** | **1.41** | 0.06 | 0.28 | 0.17 | 0.012 | 0.17 |
| Mercury | 0.34 | 5.6E-03 | **1.17** | **5.15** | **4.86** | **15.5** | **26.2** | 0.017 | 0.2 | 0.11 | **6.8** | 0.01 |
| Nickel | 8.35 | 7.0E-03 | 3.6E-03 | 0.07 | 0.052 | 0.22 | **0.4** | 0.019 | **0.86** | **0.42** | 0.03 | 0.22 |
| Selenium | 1.5 (U) | 0.017 | 0.019 | **0.35** | **1.5** | **1.72** | **2** | **0.79** | **2.27** | **1.81** | **0.37** | **2.88** |
| Silver | 3.72 | 8.7E-04 | 5.6E-03 | 0.27 | **0.34** | **0.87** | **1.43** | 0.027 | 0.27 | 0.16 | na | 6.6E-03 |
| Vanadium | 24.2 | 7.3E-03 | 0.19 | **0.38** | **2.72** | **3.18** | **3.61** | 0.019 | 0.17 | 0.05 | na | **0.4** |
| Aroclor-1254 | 0.704 | 0.12 | 0.099 | **3.2** | **0.54** | **8.8** | **17.2** | 0.015 | **1.6** | **0.8** | na | 4.4E-03 |
| Benzoic acid | 1.01 | 5.6E-04 | na | na | na | na | na | 0.27 | **1.01** | **0.78** | na | na |
| Bis(2-ethylhexyl)phthalate | 0.343 | 9.0E-04 | 0.042 | **3.43** | 0.017 | **8.58** | **17.2** | 1.4E-04 | **0.58** | **0.31** | na | na |
| Di-n-butylphthalate | 0.129 | 2.7E-06 | 0.076 | **2.19** | **0.33** | **6.14** | **11.7** | 9.2E-06 | 7.2E-04 | 3.5E-04 | na | 8.1E-04 |
| Di-n-octylphthalate | 1.43 | 1.4E-03 | na | na | na | na | na | 1.3E-04 | **1.57** | **0.79** | na | na |
| | **HI** | 0.2 | **2** | **16** | **12** | **48** | **84** | **2** | **12** | **7** | **8** | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-42**
**Minimum ESL Comparison for SWMU 36-002**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 0.913 (UJ) | 2.4 | Deer mouse | **0.38** |
| Barium | 84.6 | 110 | Plant | **0.77** |
| Cobalt | 4.2 | 13 | Plant | **0.32** |
| Copper | 5.98 | 15 | Robin (insectivore) | **0.4** |
| Nickel | 6.82 | 9.7 | Shrew | **0.7** |
| Selenium | 0.922 (UJ) | 0.52 | Plant | **1.77** |
| **Radionuclides (pCi/g)** | | | | |
| Plutonium-238 | 0.033 | 820 | Earthworm | 0.00004 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-43**
**HI Analysis for SWMU 36-002**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.913 (UJ) | 0.02 | na* | na | na | na | na | **0.35** | **0.35** | **0.38** | 0.012 | 0.083 |
| Barium | 84.6 | 2.1E-03 | 3.0E-03 | 9.8E-03 | 0.1 | 0.091 | 0.085 | 0.029 | 0.065 | 0.047 | 0.26 | **0.77** |
| Cobalt | 4.2 | 7.6E-04 | 1.6E-03 | 5.8E-03 | 0.025 | 0.035 | 0.044 | 2.6E-03 | 0.026 | 0.011 | na | **0.32** |
| Copper | 5.98 | 1.5E-03 | 4.6E-03 | 0.065 | 0.16 | 0.27 | **0.4** | 0.025 | 0.16 | 0.093 | 0.075 | 0.085 |
| Nickel | 6.82 | 5.7E-03 | 3.0E-03 | 0.057 | 0.043 | 0.18 | **0.32** | 0.016 | **0.7** | **0.34** | 0.024 | 0.18 |
| Selenium | 0.922 (UJ) | 0.01 | 0.011 | 0.21 | **0.92** | **1.06** | **1.23** | **0.49** | **1.4** | **1.11** | 0.22 | **1.77** |
| | **HI** | 0.04 | 0.02 | 0.3 | 1 | **2** | **2** | 0.9 | **3** | **2** | 0.6 | **3** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-44**
**Minimum ESL Comparison for SWMU 36-003(a)**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.29 (UJ) | 2.4 | Deer mouse | **0.54** |
| Beryllium | 2.63 | 2.5 | Plant | **1.05** |
| Cobalt | 2.81 | 13 | Plant | 0.22 |
| Nickel | 18.6 | 9.7 | Shrew | **1.92** |
| Selenium | 1.28 (U) | 0.52 | Plant | **2.46** |
| **Organic Chemicals (mg/kg)** | | | | |
| RDX | 0.184 | 2.3 | Robin (herbivore) | 0.08 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-45**
**HI Analysis for SWMU 36-003(a)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.29 (UJ) | 0.028 | na* | na | na | na | na | **0.5** | **0.5** | **0.54** | 0.017 | 0.12 |
| Beryllium | 2.63 | 6.3E-03 | na | na | na | na | na | 0.018 | 0.15 | 0.047 | 0.066 | **1.05** |
| Nickel | 18.6 | 0.016 | 8.1E-03 | 0.16 | 0.12 | **0.49** | **0.89** | 0.042 | **1.92** | **0.93** | 0.066 | **0.49** |
| Selenium | 1.28 (U) | 0.014 | 0.016 | 0.3 | **1.28** | **1.47** | **1.71** | **0.67** | **1.94** | **1.54** | **0.31** | **2.46** |
| | **HI** | 0.06 | 0.02 | 0.5 | 1 | **2** | **3** | 1 | **5** | **3** | 0.5 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-46**
**Minimum ESL Comparison for SWMU 36-008**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 5.62 (U) | 2.4 | Deer mouse | **2.34** |
| Barium | 77.6 | 110 | Plant | **0.71** |
| Beryllium | 0.654 | 2.5 | Plant | 0.26 |
| Cadmium | 0.397 | 0.27 | Shrew | **1.47** |
| Chromium (Total) | 30.3 | 28 | Robin (insectivore) | **1.08** |
| Copper | 315 | 15 | Robin (insectivore) | **21** |
| Cyanide (Total) | 0.538 | 0.1 | Robin (all diets) | **5.38** |
| Lead | 29.7 | 14 | Robin (insectivore) | **2.12** |
| Mercury | 2.34 | 0.013 | Robin (insectivore) | **180** |
| Nickel | 6.79 | 9.7 | Shrew | **0.7** |
| Selenium | 0.635 | 0.52 | Plant | **1.22** |
| Silver | 41.7 | 2.6 | Robin (insectivore) | **16** |
| Uranium | 1.89 | 25 | Plant | 0.076 |
| Vanadium | 13.9 | 6.7 | Robin (insectivore) | **2.07** |
| Zinc | 135 | 48 | Robin (insectivore) | **2.81** |
| **Organic Chemicals (mg/kg)** | | | | |
| Acetone | 0.00444 | 1.2 | Deer mouse | 0.0037 |
| Aroclor-1254 | 0.124 | 0.041 | Robin (insectivore) | **3.02** |
| Aroclor-1260 | 0.0725 | 0.88 | Robin (insectivore) | 0.082 |
| Benzoic acid | 0.63 | 1 | Shrew | **0.63** |
| Bis(2-ethylhexyl)phthalate | 0.236 | 0.02 | Robin (insectivore) | **11.8** |
| Butylbenzylphthalate | 0.214 | 90 | Shrew | 0.0024 |
| Chloroform | 0.00982 | 8 | Deer mouse | 0.0012 |
| Di-n-butylphthalate | 0.448 | 0.011 | Robin (insectivore) | **40.7** |
| Dibenzofuran | 0.421 | 6.1 | Plant | 0.069 |
| Dichloroethene[1,1-] | 0.00246 | 11 | Shrew | 0.00022 |
| Methylene chloride | 0.00384 | 2.6 | Deer mouse | 0.0015 |
| RDX | 0.106 | 2.3 | Robin (herbivore) | 0.046 |
| Styrene | 0.00197 | 1.2 | Earthworm | 0.0016 |
| Toluene | 0.00127 | 23 | Shrew | 0.000055 |
| Trichloroethene | 0.000729 | 42 | Shrew | 0.000017 |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 0.559 | 1200 | Cottontail | 0.00047 |
| Plutonium-239/240 | 0.0186 | 870 | Earthworm | 0.000021 |
| Tritium | 0.0125 | 36,000 | Plant | 0.00000035 |
| Uranium-234 | 1.55 | 440 | Plant | 0.0035 |
| Uranium-235/236 | 0.0699 | 440 | Plant | 0.00016 |
| Uranium-238 | 1.69 | 400 | Plant | 0.0042 |

Note: Bolded values indicate HQs greater than 0.3.

**Table H-5.3-47**
**HI Analysis for SWMU 36-008**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 5.62 (U) | 0.12 | na* | na | na | na | na | **2.16** | **2.16** | **2.34** | 0.072 | **0.51** |
| Barium | 77.6 | 1.9E-03 | 2.8E-03 | 9.0E-03 | 0.095 | 0.083 | 0.078 | 0.027 | 0.06 | 0.043 | 0.24 | **0.71** |
| Cadmium | 0.397 | 7.5E-04 | 8.4E-04 | 0.26 | 0.09 | **0.74** | **1.37** | 0.045 | **1.47** | **0.78** | 2.8E-03 | 0.012 |
| Chromium (Total) | 30.3 | 0.017 | 0.03 | 0.15 | **0.45** | **0.76** | **1.08** | 0.04 | **0.67** | 0.28 | na | na |
| Copper | 315 | 0.079 | 0.24 | **3.42** | **8.29** | **14.3** | **21** | **1.31** | **8.29** | **4.92** | **3.94** | **4.5** |
| Cyanide (Total) | 0.538 | 1.9E-04 | **0.91** | **1.35** | **5.38** | **5.38** | **5.38** | 8.2E-04 | 1.7E-03 | 1.6E-03 | na | na |
| Lead | 29.7 | 8.0E-03 | 0.047 | **0.31** | **1.41** | **1.86** | **2.12** | 0.09 | **0.41** | 0.25 | 0.017 | 0.25 |
| Mercury | 2.34 | 0.038 | **8.07** | **35.5** | **33.4** | **106** | **180** | 0.12 | **1.38** | **0.78** | **46.8** | 0.069 |
| Nickel | 6.79 | 5.7E-03 | 3.0E-03 | 0.057 | 0.042 | 0.18 | **0.32** | 0.015 | **0.7** | **0.34** | 0.024 | 0.18 |
| Selenium | 0.635 | 7.1E-03 | 7.8E-03 | 0.15 | **0.64** | **0.73** | **0.85** | **0.33** | **0.96** | **0.77** | 0.15 | **1.22** |
| Silver | 41.7 | 9.7E-03 | 0.062 | **2.98** | **3.79** | **9.7** | **16** | 0.3 | **2.98** | **1.74** | na | 0.074 |
| Vanadium | 13.9 | 4.2E-03 | 0.11 | 0.22 | **1.56** | **1.83** | **2.07** | 0.011 | 0.099 | 0.029 | na | 0.23 |
| Zinc | 135 | 0.017 | 0.056 | **0.54** | **0.39** | **1.59** | **2.81** | 0.084 | **1.38** | **0.79** | **1.13** | **0.84** |
| Aroclor-1254 | 0.124 | 0.021 | 0.017 | **0.56** | 0.095 | **1.55** | **3.02** | 2.7E-03 | 0.28 | 0.14 | na | 7.8E-04 |
| Benzoic acid | 0.63 | 3.5E-04 | na | na | na | na | na | 0.17 | **0.63** | **0.48** | na | na |
| Bis(2-ethylhexyl)phthalate | 0.236 | 6.2E-04 | 0.029 | **2.36** | 0.012 | **5.9** | **11.8** | 9.8E-05 | **0.4** | 0.21 | na | na |
| Di-n-butylphthalate | 0.448 | 9.3E-06 | 0.26 | **7.59** | **1.15** | **21.3** | **40.7** | 3.2E-05 | 2.5E-03 | 1.2E-03 | na | 2.8E-03 |
| **HI** | | 0.3 | **10** | **55** | **57** | **172** | **289** | **5** | **22** | **14** | **52** | **9** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.3-48**
**Minimum ESL Comparison for SWMU C-36-003**

| COPC | EPC (mg/kg) | ESL (mg/kg) | Receptor | HQ |
|---|---|---|---|---|
| **Inorganic Chemicals (mg/kg)** | | | | |
| Antimony | 1.49 (U) | 2.4 | Deer mouse | **0.62** |
| Cadmium | 1.09 | 0.27 | Shrew | **4.04** |
| Chromium (Total) | 90.4 | 28 | Robin (insectivore) | **3.23** |
| Copper | 936 | 15 | Robin (insectivore) | **62.4** |
| Cyanide (Total) | 1.06 | 0.1 | Robin (all diets) | **10.6** |
| Lead | 58.5 | 14 | Robin (insectivore) | **4.18** |
| Manganese | 452 | 220 | Plant | **2.05** |
| Mercury | 0.342 | 0.013 | Robin (insectivore) | **26.3** |
| Nickel | 20.7 | 9.7 | Shrew | **2.13** |
| Selenium | 0.635 | 0.52 | Plant | **1.22** |
| Silver | 161 | 2.6 | Robin (insectivore) | **61.9** |
| Uranium | 4.43 | 25 | Plant | 0.18 |
| Zinc | 490 | 48 | Robin (insectivore) | **10.2** |
| **Organic Chemicals (mg/kg)** | | | | |
| Aroclor-1254 | 0.209 | 0.041 | Robin (insectivore) | **5.1** |
| Aroclor-1260 | 0.132 | 0.88 | Robin (insectivore) | 0.15 |
| Benzoic Acid | 0.355 | 1 | Shrew | **0.36** |
| Chloroform | 0.00982 | 8 | Deer mouse | 0.0012 |
| Di-n-butylphthalate | 1.84 | 0.011 | Robin (insectivore) | **167** |
| Methylene Chloride | 0.00378 | 2.6 | Deer mouse | 0.0015 |
| RDX | 0.106 | 2.3 | Robin (herbivore) | 0.046 |
| Toluene | 0.000815 | 23 | Shrew | 0.000035 |
| **Radionuclides (pCi/g)** | | | | |
| Cesium-137 | 0.711 | 1200 | Cottontail | 0.00059 |
| Tritium | 0.0219 | 36,000 | Plant | 0.00000061 |
| Uranium-234 | 3.23 | 440 | Plant | 0.0073 |
| Uranium-235/236 | 0.144 | 440 | Plant | 0.00033 |
| Uranium-238 | 2.63 | 400 | Plant | 0.0066 |

**Table H-5.3-49**
**HI Analysis for SWMU C-36-003**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.49 (U) | 0.032 | na* | na | na | na | na | **0.57** | **0.57** | **0.62** | 0.019 | 0.14 |
| Cadmium | 1.09 | 2.1E-03 | 2.3E-03 | **0.73** | 0.25 | **2.02** | **3.76** | 0.12 | **4.04** | **2.14** | 7.8E-03 | 0.034 |
| Chromium | 90.4 | 0.05 | 0.09 | **0.45** | **1.33** | **2.26** | **3.23** | 0.12 | **2.01** | **0.82** | na | na |
| Copper | 936 | 0.23 | **0.72** | **10.2** | **24.6** | **42.5** | **62.4** | **3.9** | **24.6** | **14.6** | **11.7** | **13.4** |
| Cyanide (Total) | 1.06 | 3.8E-04 | **1.8** | **2.65** | **10.6** | **10.6** | **10.6** | 1.6E-03 | 3.4E-03 | 3.1E-03 | na | na |
| Lead | 58.5 | 0.016 | 0.093 | **0.62** | **2.79** | **3.66** | **4.18** | 0.18 | **0.81** | **0.49** | 0.034 | **0.49** |
| Manganese | 452 | 0.011 | 6.6E-03 | 0.017 | **0.32** | 0.24 | 0.15 | 0.25 | 0.3 | **0.32** | **1** | **2.05** |
| Mercury | 0.342 | 5.6E-03 | **1.18** | **5.18** | **4.89** | **15.5** | **26.3** | 0.017 | 0.2 | 0.11 | **6.84** | 0.01 |
| Nickel | 20.7 | 0.017 | 9.0E-03 | 0.17 | 0.13 | **0.54** | **0.99** | 0.047 | **2.13** | **1.04** | 0.074 | **0.54** |
| Selenium | 0.635 | 7.1E-03 | 7.8E-03 | 0.15 | **0.64** | **0.73** | **0.85** | **0.33** | **0.96** | **0.77** | 0.15 | **1.22** |
| Silver | 161 | 0.037 | 0.24 | **11.5** | **14.6** | **37.4** | **61.9** | **1.15** | **11.5** | **6.71** | na | 0.29 |
| Zinc | 490 | 0.063 | 0.2 | **1.96** | **1.4** | **5.76** | **10.2** | **0.31** | **5** | **2.88** | **4.08** | **3.06** |
| Aroclor-1254 | 0.209 | 0.035 | 0.029 | **0.95** | 0.16 | **2.61** | **5.1** | 4.5E-03 | **0.48** | 0.24 | na | 1.3E-03 |
| Benzoic Acid | 0.355 | 2.0E-04 | na | na | na | na | na | 0.096 | **0.36** | 0.27 | na | na |
| Di-n-butylphthalate | 1.84 | 3.8E-05 | **1.08** | **31.2** | **4.72** | **87.6** | **167** | 1.3E-04 | 0.01 | 5.0E-03 | na | 0.012 |
| **HI** | | 0.5 | **5** | **66** | **66** | **211** | **357** | **7** | **53** | **31** | **24** | **21** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*na = Not available.

**Table H-5.4-1**
**Mexican Spotted Owl AUFs for Sites within the Threemile Canyon Aggregate Area**

| Site | Site Area (ha) | AUF* |
|---|---|---|
| 12-001(a) and 12-001(b) | 1.82 | 0.00497 |
| 12-002 | 0.000232 | 0.000000635 |
| 12-004(a) | 0.271 | 0.000741 |
| 12-004(b) | 0.000513 | 0.0000014 |
| C-12-001 | 0.00353 | 0.00000964 |
| C-12-002 | 0.00422 | 0.0000115 |
| C-12-003 | 0.0101 | 0.0000277 |
| C-12-004 | 0.00391 | 0.0000107 |
| C-12-005 | 0.00261 | 0.00000712 |
| C-14-006 | 0.00295 | 0.00000806 |
| 15-005(c) | 0.111 | 0.000305 |
| 15-007(c) | 0.0508 | 0.000139 |
| 15-007(d) | 0.0267 | 0.0000729 |
| 15-008(b) | 3.12 | 0.00853 |
| 15-008(g) | 0.00254 | 0.00000694 |
| 15-009(b) | 0.0165 | 0.000045 |
| 15-009(c) | 0.273 | 0.000746 |
| 15-009(h) | 0.00485 | 0.0000132 |
| 15-010(b) | 0.267 | 0.00073 |
| 15-014(h) | 1.36 | 0.00371 |
| 36-002 | 0.00356 | 0.00000972 |
| 36-003(a) | 0.0591 | 0.000161 |
| 36-008 | 0.452 | 0.00124 |
| C-36-003 | 0.0165 | 0.000045 |

*AUF is calculated as the area of the site divided by the owl home range of 366 ha.

**Table H-5.4-2**
**PAUFs for Ecological Receptors for SWMUs 12-001(a) and 12-001(b)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 4.29E-04 |
| American Robin | 0.42 | 16.8 | 1.08E-01 |
| Deer Mouse | 0.077 | 3 | 6.06E-01 |
| Desert Cottontail | 3.1 | 124 | 1.47E-02 |
| Montane Shrew | 0.39 | 15.6 | 1.17E-01 |
| Red Fox | 1038 | 41520 | 4.38E-05 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (1.82 ha) divided by the population area.

**Table H-5.4-3**
**Adjusted HIs for SWMUs 12-001(a) and 12-001(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.15 | 1.1E-06 | na* | na | na | na | na | 0.0065 | 0.052 | 0.29 | 0.015 | 0.1 |
| Barium | 213 | 2.3E-07 | 3.3E-06 | 1.1E-05 | 0.028 | 0.025 | 0.023 | 0.0011 | 0.019 | 0.072 | **0.65** | **1.94** |
| Chromium (Total) | 24.6 | 6.0E-07 | 1.1E-05 | 5.3E-05 | 0.039 | 0.067 | 0.095 | 4.8E-04 | 0.064 | 0.14 | na | na |
| Cobalt | 7.1 | 5.7E-08 | 1.1E-06 | 4.2E-06 | 4.5E-03 | 6.4E-03 | 0.008 | 6.5E-05 | 0.0052 | 0.011 | na | **0.55** |
| Copper | 8.09 | 8.9E-08 | 2.7E-06 | 3.8E-05 | 0.023 | 0.04 | 0.058 | 4.9E-04 | 0.025 | 0.077 | 0.1 | 0.12 |
| Manganese | 456 | 4.9E-07 | 2.8E-06 | 7.2E-06 | 0.035 | 0.026 | 0.016 | 0.0037 | 0.035 | 0.2 | **1.01** | **2.07** |
| Nickel | 7.67 | 2.8E-07 | 1.4E-06 | 2.7E-05 | 5.2E-03 | 0.022 | 0.04 | 2.6E-04 | 0.092 | 0.23 | 0.027 | 0.2 |
| Selenium | 1.34 (U) | 6.5E-07 | 7.1E-06 | 1.3E-04 | 0.15 | 0.17 | 0.19 | 0.01 | 0.24 | **0.98** | **0.33** | **2.58** |
| Vanadium | 27.6 | 3.7E-07 | 9.1E-05 | 1.8E-04 | **0.34** | **0.39** | **0.45** | 3.1E-04 | 0.023 | 0.035 | na | **0.46** |
| RDX | 3.73 | 2.3E-08 | 1.8E-06 | 1.2E-04 | 0.18 | 0.17 | 0.17 | 0.0018 | 0.027 | 0.14 | **0.44** | na |
| **Adjusted HI** | | 4E-06 | 1E-04 | 6E-04 | 0.8 | 0.9 | 1 | 0.02 | 0.6 | **2** | **3** | **8** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

**Table H-5.4-4**
**PAUFs for Ecological Receptors for SWMU 12-002**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 5.48E-08 |
| American Robin | 0.42 | 16.8 | 1.38E-05 |
| Deer Mouse | 0.077 | 3 | 7.74E-05 |
| Desert Cottontail | 3.1 | 124 | 1.87E-06 |
| Montane Shrew | 0.39 | 15.6 | 1.49E-05 |
| Red Fox | 1038 | 41520 | 5.59E-09 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.000232 ha) divided by the population area.

## Table H-5.4-5
## Adjusted HIs for SWMU 12-002

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.03 (U) | 1.3E-10 | na* | na | na | na | na | 7.4E-07 | 5.9E-06 | 3.3E-05 | 0.013 | 0.094 |
| Barium | 191 | 2.6E-11 | 3.7E-08 | 1.2E-09 | 3.2E-06 | 2.8E-06 | 2.6E-06 | 1.2E-07 | 2.2E-06 | 8.2E-06 | **0.58** | **1.74** |
| Chromium (Total) | 13.5 | 4.2E-11 | 7.4E-08 | 3.7E-09 | 2.7E-06 | 4.7E-06 | 6.7E-06 | 3.4E-08 | 4.5E-06 | 9.5E-06 | na | na |
| Cobalt | 14.2 | 1.4E-11 | 2.9E-10 | 1.1E-09 | 1.2E-06 | 1.6E-06 | 2.0E-06 | 1.7E-08 | 1.3E-06 | 2.7E-06 | na | **1.09** |
| Copper | 11.1 | 1.6E-11 | 4.7E-08 | 6.6E-09 | 4.0E-06 | 7.0E-06 | 1.0E-05 | 8.7E-08 | 4.3E-06 | 1.3E-05 | 0.14 | 0.16 |
| Nickel | 9.28 | 4.3E-11 | 2.2E-10 | 4.2E-09 | 8.0E-07 | 3.4E-06 | 6.1E-06 | 4.0E-08 | 1.4E-05 | 3.6E-05 | 0.033 | 0.24 |
| Selenium | 1.1 (U) | 6.8E-11 | 7.4E-08 | 1.4E-08 | 1.5E-05 | 1.7E-05 | 2.0E-05 | 1.1E-06 | 2.5E-05 | 1.0E-04 | 0.27 | **2.12** |
| Vanadium | 27.1 | 4.6E-11 | 1.1E-08 | 2.3E-08 | 4.2E-05 | 4.9E-05 | 5.6E-05 | 3.9E-08 | 2.9E-06 | 4.4E-06 | na | **0.45** |
| **Adjusted HI** | | 4E-10 | 2E-07 | 5E-08 | 7E-05 | 9E-05 | 1E-04 | 2E-06 | 6E-05 | 2E-04 | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

## Table H-5.4-6
## PAUFs for Ecological Receptors for AOC 12-004(a)

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 6.39E-05 |
| American Robin | 0.42 | 16.8 | 1.61E-02 |
| Deer Mouse | 0.077 | 3 | 9.04E-02 |
| Desert Cottontail | 3.1 | 124 | 2.19E-03 |
| Montane Shrew | 0.39 | 15.6 | 1.74E-02 |
| Red Fox | 1038 | 41520 | 6.53E-06 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.271 ha) divided by the population area.

**Table H-5.4-7**
**Adjusted HIs for AOC 12-004(a)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 88.5 | 1.4E-08 | 2.0E-07 | 6.6E-07 | 1.7E-03 | 1.5E-03 | 0.0014 | 6.7E-05 | 0.0012 | 0.0044 | 0.27 | **0.8** |
| Chromium (Total) | 22.1 | 8.0E-08 | 1.4E-06 | 7.1E-06 | 5.2E-03 | 8.9E-03 | 0.013 | 6.4E-05 | 0.0085 | 0.018 | na* | na |
| Cobalt | 3.98 | 4.7E-09 | 9.4E-08 | 3.5E-07 | 3.8E-04 | 5.4E-04 | 6.7E-04 | 5.4E-06 | 4.3E-04 | 9.0E-04 | na | **0.31** |
| Copper | 5.31 | 8.7E-09 | 2.6E-07 | 3.7E-06 | 2.3E-03 | 3.9E-03 | 0.0057 | 4.8E-05 | 0.0024 | 0.0075 | 0.066 | 0.076 |
| Nickel | 5.98 | 3.3E-08 | 1.7E-07 | 3.2E-06 | 6.0E-04 | 2.5E-03 | 0.0046 | 3.0E-05 | 0.011 | 0.027 | 0.021 | 0.16 |
| Selenium | 1.26 (U) | 9.1E-08 | 9.9E-07 | 1.9E-05 | 0.02 | 0.023 | 0.027 | 0.0015 | 0.033 | 0.14 | **0.31** | **2.42** |
| Vanadium | 13.8 | 2.7E-08 | 6.8E-06 | 1.4E-05 | 0.025 | 0.029 | 0.033 | 2.3E-05 | 0.0017 | 0.0026 | na | 0.23 |
| Benzoic acid | 0.608 | 2.2E-09 | na | na | na | na | na | 3.6E-04 | 0.011 | 0.042 | na | na |
| Di-n-butylphthalate | 0.121 | 1.6E-11 | 4.6E-06 | 1.3E-04 | 5.0E-03 | 0.093 | 0.18 | 1.9E-08 | 1.2E-05 | 3.0E-05 | na | 7.6E-04 |
| **Adjusted HI** | | 3E-07 | 1E-05 | 2E-04 | 0.06 | 0.2 | 0.3 | 0.002 | 0.07 | 0.2 | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

## Table H-5.4-8
## PAUFs for Ecological Receptors for AOC 12-004(b)

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 1.21E-07 |
| American Robin | 0.42 | 16.8 | 3.05E-05 |
| Deer Mouse | 0.077 | 3 | 1.71E-04 |
| Desert Cottontail | 3.1 | 124 | 4.13E-06 |
| Montane Shrew | 0.39 | 15.6 | 3.29E-05 |
| Red Fox | 1038 | 41520 | 1.23E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.000513 ha) divided by the population area.

## Table H-5.4-9
## Adjusted HIs for AOC 12-004(b)

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.92 | 4.4E-11 | 4.2E-08 | 2.9E-09 | 2.1E-06 | 3.4E-06 | 5.0E-06 | 8.6E-08 | 6.4E-06 | 1.6E-05 | **0.43** | 0.16 |
| Barium | 246 | 7.4E-11 | 1.1E-09 | 3.5E-09 | 9.2E-06 | 8.1E-06 | 7.5E-06 | 3.5E-07 | 6.2E-06 | 2.3E-05 | **0.75** | **2.24** |
| Chromium (Total) | 13.3 | 9.1E-11 | 1.6E-09 | 8.0E-09 | 6.0E-06 | 1.0E-05 | 1.4E-05 | 7.3E-08 | 9.7E-06 | 2.1E-05 | na* | na |
| Cobalt | 7.49 | 1.7E-11 | 3.4E-08 | 1.3E-09 | 1.3E-06 | 1.9E-06 | 2.4E-06 | 1.9E-08 | 1.5E-06 | 3.2E-06 | na | **0.58** |
| Copper | 9.38 | 2.9E-11 | 8.7E-08 | 1.2E-08 | 7.5E-06 | 1.3E-05 | 1.9E-05 | 1.6E-07 | 8.1E-06 | 2.5E-05 | 0.12 | 0.13 |
| Lead | 18.5 | 6.2E-11 | 3.6E-09 | 2.4E-08 | 2.7E-05 | 3.5E-05 | 4.0E-05 | 2.3E-07 | 8.4E-06 | 2.6E-05 | 0.011 | 0.15 |

**Table H-5.4-9 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nickel | 7.82 | 8.0E-11 | 4.1E-08 | 7.9E-09 | 1.5E-06 | 6.3E-06 | 1.1E-05 | 7.3E-08 | 2.6E-05 | 6.7E-05 | 0.028 | 0.21 |
| Selenium | 1.1 | 1.5E-10 | 1.6E-09 | 3.1E-08 | 3.4E-05 | 3.9E-05 | 4.5E-05 | 2.4E-06 | 5.5E-05 | 2.3E-04 | 0.27 | **2.12** |
| Vanadium | 30.3 | 1.1E-10 | 2.8E-08 | 5.7E-08 | 1.0E-04 | 1.2E-04 | 1.4E-04 | 9.6E-08 | 7.1E-06 | 1.1E-05 | na | **0.51** |
| Aroclor-1254 | 0.015 | 3.1E-11 | 2.6E-10 | 8.2E-09 | 3.5E-07 | 5.7E-06 | 1.1E-05 | 1.3E-09 | 1.1E-06 | 2.9E-06 | na | 9.4E-05 |
| **Adjusted HI** | | 7E-10 | 2E-07 | 2E-07 | 2E-04 | 2E-04 | 3E-04 | 3E-06 | 1E-04 | 4E-04 | **2** | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-10**
**PAUFs for Ecological Receptors for AOC C-12-001**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 8.32E-07 |
| American Robin | 0.42 | 16.8 | 2.10E-04 |
| Deer Mouse | 0.077 | 3 | 1.18E-03 |
| Desert Cottontail | 3.1 | 124 | 2.85E-05 |
| Montane Shrew | 0.39 | 15.6 | 2.26E-04 |
| Red Fox | 1038 | 41520 | 8.50E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00353 ha) divided by the population area.

**Table H-5.4-11**
**Adjusted HIs for AOC C-12-001**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 132 | 2.7E-10 | 3.9E-09 | 1.3E-08 | 3.4E-05 | 3.0E-05 | 2.8E-05 | 1.3E-06 | 2.3E-05 | 8.6E-05 | **0.4** | **1.2** |
| Chromium (Total) | 16.3 | 7.7E-08 | 1.4E-08 | 6.8E-08 | 5.0E-05 | 8.6E-05 | 1.2E-04 | 6.2E-07 | 8.2E-05 | 1.7E-04 | na* | na |
| Cobalt | 4.97 | 7.7E-11 | 1.5E-09 | 5.7E-09 | 6.1E-06 | 8.7E-06 | 1.1E-05 | 8.8E-08 | 7.0E-06 | 1.5E-05 | na | **0.38** |
| Nickel | 7.75 | 5.5E-08 | 2.8E-09 | 5.4E-08 | 1.0E-05 | 4.3E-05 | 7.8E-05 | 5.0E-07 | 1.8E-04 | 4.6E-04 | 0.028 | 0.2 |
| Selenium | 1.26 (U) | 1.2E-09 | 1.3E-08 | 2.4E-07 | 2.6E-04 | 3.0E-04 | 3.5E-04 | 1.9E-05 | 4.3E-04 | 0.0018 | **0.31** | **2.42** |
| Aroclor-1242 | 0.114 | 1.2E-10 | 1.7E-08 | 4.3E-07 | 2.4E-05 | 3.0E-04 | 5.8E-04 | 1.2E-07 | 6.8E-05 | 1.8E-04 | na | na |
| Aroclor-1254 | 0.109 | 1.6E-09 | 1.3E-08 | 4.1E-07 | 1.8E-05 | 2.9E-04 | 5.6E-04 | 6.7E-08 | 5.6E-05 | 1.5E-04 | na | 6.8E-04 |
| **Adjusted HI** | | 1E-07 | 7E-08 | 1E-06 | 4E-04 | 0.001 | 0.002 | 2E-05 | 8E-04 | 0.003 | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

**Table H-5.4-12**
**PAUFs for Ecological Receptors for AOC C-12-002**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 9.95E-07 |
| American Robin | 0.42 | 16.8 | 2.51E-04 |
| Deer Mouse | 0.077 | 3 | 1.41E-03 |
| Desert Cottontail | 3.1 | 124 | 3.40E-05 |
| Montane Shrew | 0.39 | 15.6 | 2.70E-04 |
| Red Fox | 1038 | 41520 | 1.02E-07 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.00422 ha) divided by the population area.

**Table H-5.4-13**
**Adjusted HIs for AOC C-12-002**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.11 (U) | 2.5E-09 | na* | na | na | na | na | 1.5E-05 | 1.2E-04 | 6.5E-04 | 0.014 | 0.1 |
| Barium | 223 | 5.5E-08 | 7.9E-09 | 2.6E-08 | 6.8E-05 | 6.0E-05 | 5.6E-05 | 2.6E-06 | 4.6E-05 | 1.7E-04 | **0.68** | **2.03** |
| Chromium (Total) | 15 | 8.5E-08 | 1.5E-08 | 7.5E-08 | 5.5E-05 | 9.4E-05 | 1.3E-04 | 6.8E-07 | 9.0E-05 | 1.9E-04 | na | na |
| Cobalt | 7.49 | 1.4E-10 | 2.8E-09 | 1.0E-08 | 1.1E-05 | 1.6E-05 | 2.0E-05 | 1.6E-07 | 1.3E-05 | 2.6E-05 | na | **0.58** |
| Copper | 7.65 | 1.9E-10 | 5.9E-09 | 8.3E-08 | 5.1E-05 | 8.7E-05 | 1.3E-04 | 1.1E-06 | 5.4E-05 | 1.7E-04 | 0.096 | 0.11 |
| Nickel | 7.8 | 6.6E-08 | 3.4E-09 | 6.5E-08 | 1.2E-05 | 5.2E-05 | 9.3E-05 | 6.0E-07 | 2.2E-04 | 5.5E-04 | 0.028 | 0.21 |
| Selenium | 1.15 (U) | 1.3E-09 | 1.4E-08 | 2.7E-07 | 2.9E-04 | 3.3E-04 | 3.8E-04 | 2.1E-05 | 4.7E-04 | 0.0019 | 0.28 | **2.21** |
| Vanadium | 28.2 | 8.7E-08 | 2.2E-07 | 4.4E-07 | 8.0E-04 | 9.3E-04 | 0.0011 | 7.4E-07 | 5.4E-05 | 8.3E-05 | na | **0.47** |
| **Adjusted HI** | | 3E-07 | 3E-07 | 1E-06 | 0.001 | 0.002 | 0.002 | 4E-05 | 0.001 | 0.004 | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

## Table H-5.4-14
## PAUFs for Ecological Receptors for AOC C-12-003

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 2.39E-06 |
| American Robin | 0.42 | 16.8 | 6.03E-04 |
| Deer Mouse | 0.077 | 3 | 3.38E-03 |
| Desert Cottontail | 3.1 | 124 | 8.18E-05 |
| Montane Shrew | 0.39 | 15.6 | 6.50E-04 |
| Red Fox | 1038 | 41520 | 2.44E-07 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0101 ha) divided by the population area.

## Table H-5.4-15
## Adjusted HIs for AOC C-12-003

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 2.74 | 1.5E-08 | na* | na | na | na | na | 8.6E-05 | 6.8E-04 | 0.0039 | 0.035 | 0.25 |
| Barium | 117 | 7.0E-08 | 1.0E-08 | 3.3E-08 | 8.6E-05 | 7.6E-05 | 7.1E-05 | 3.3E-06 | 5.8E-05 | 2.2E-04 | **0.35** | **1.06** |
| Chromium (Total) | 45 | 6.1E-09 | 1.1E-07 | 5.4E-07 | 4.0E-04 | 6.8E-04 | 9.7E-04 | 4.9E-06 | 6.5E-04 | 0.0014 | na | na |
| Cobalt | 4.99 | 2.2E-10 | 4.4E-09 | 1.7E-08 | 1.8E-05 | 2.5E-05 | 3.1E-05 | 2.5E-07 | 2.0E-05 | 4.2E-05 | na | **0.38** |
| Selenium | 1.12 (UJ) | 3.0E-09 | 3.3E-08 | 6.2E-07 | 6.8E-04 | 7.8E-04 | 9.0E-04 | 4.8E-05 | 0.0011 | 0.0046 | 0.27 | **2.15** |
| **Adjusted HI** | | 9E-08 | 2E-07 | 1E-06 | 1E-03 | 2E-03 | 2E-03 | 1E-04 | 3E-03 | 0.01 | 0.7 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-16**
**PAUFs for Ecological Receptors for AOC C-12-004**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 9.22E-07 |
| American Robin | 0.42 | 16.8 | 2.33E-04 |
| Deer Mouse | 0.077 | 3 | 1.30E-03 |
| Desert Cottontail | 3.1 | 124 | 3.15E-05 |
| Montane Shrew | 0.39 | 15.6 | 2.51E-04 |
| Red Fox | 1038 | 41520 | 9.41E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00391 ha) divided by the population area.

**Table H-5.4-17**
**Adjusted HIs for AOC C-12-004**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.21 (UJ) | 2.5E-09 | na* | na | na | na | na | 1.5E-05 | 1.2E-04 | 6.6E-04 | 0.016 | 0.11 |
| Barium | 214 | 4.9E-08 | 7.0E-09 | 2.3E-08 | 6.1E-05 | 5.4E-05 | 5.0E-05 | 2.3E-06 | 4.1E-05 | 1.5E-04 | **0.65** | **1.95** |
| Chromium (Total) | 18.4 | 9.6E-08 | 1.7E-08 | 8.5E-08 | 6.3E-05 | 1.1E-04 | 1.5E-04 | 7.7E-07 | 1.0E-04 | 2.2E-04 | na | na |
| Cobalt | 5.85 | 1.0E-10 | 2.0E-09 | 7.5E-09 | 8.0E-06 | 1.1E-05 | 1.4E-05 | 1.2E-07 | 9.2E-06 | 1.9E-05 | na | **0.45** |
| Copper | 13.7 | 3.2E-08 | 9.7E-09 | 1.4E-07 | 8.4E-05 | 1.4E-04 | 2.1E-04 | 1.8E-06 | 9.0E-05 | 2.8E-04 | 0.17 | 0.2 |
| Lead | 39.2 | 1.0E-07 | 5.7E-08 | 3.8E-07 | 4.3E-04 | 5.7E-04 | 6.5E-04 | 3.7E-06 | 1.4E-04 | 4.3E-04 | 0.023 | **0.33** |

**Table H-5.4-17 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nickel | 8.38 | 6.6E-08 | 3.4E-09 | 6.4E-08 | 1.2E-05 | 5.1E-05 | 9.3E-05 | 6.0E-07 | 2.2E-04 | 5.5E-04 | 0.03 | 0.22 |
| Selenium | 1.14 (U) | 1.2E-09 | 1.3E-08 | 2.4E-07 | 2.7E-04 | 3.0E-04 | 3.5E-04 | 1.9E-05 | 4.3E-04 | 0.0018 | 0.28 | **2.19** |
| Silver | 1.63 | 3.6E-11 | 2.2E-09 | 1.1E-07 | 3.4E-05 | 8.8E-05 | 1.5E-04 | 3.7E-07 | 2.9E-05 | 8.8E-05 | na | 2.9E-03 |
| Vanadium | 28.1 | 8.0E-08 | 2.0E-07 | 4.0E-07 | 7.3E-04 | 8.6E-04 | 9.8E-04 | 6.8E-07 | 5.0E-05 | 7.6E-05 | na | **0.47** |
| **Adjusted HI** | | 4E-07 | 3E-07 | 1E-06 | 0.002 | 0.002 | 0.003 | 4E-05 | 0.001 | 0.004 | 1 | **6** |

**Table H-5.4-18**
**PAUFs for Ecological Receptors for AOC C-12-005**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 6.15E-07 |
| American Robin | 0.42 | 16.8 | 1.55E-04 |
| Deer Mouse | 0.077 | 3 | 8.69E-04 |
| Desert Cottontail | 3.1 | 124 | 2.10E-05 |
| Montane Shrew | 0.39 | 15.6 | 1.67E-04 |
| Red Fox | 1038 | 41520 | 6.28E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00261 ha) divided by the population area.

**Table H-5.4-19**
**Adjusted HIs for AOC C-12-005**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.89 | 5.3E-09 | na* | na | na | na | na | 3.1E-05 | 2.5E-04 | 0.0014 | 0.05 | **0.35** |
| Chromium (Total) | 114 | 4.0E-09 | 7.0E-08 | 3.5E-07 | 2.6E-04 | 4.4E-04 | 6.3E-04 | 3.2E-06 | 4.2E-04 | 9.0E-04 | na | na |
| **Adjusted HI** | | 9E-09 | 7E-08 | 4E-07 | 3E-04 | 4E-04 | 6E-04 | 3E-05 | 7E-04 | 0.002 | 0.05 | 0.4 |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.



**Table H-5.4-20**
**PAUFs for Ecological Receptors for AOC 15-005(c)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 2.63E-05 |
| American Robin | 0.42 | 16.8 | 6.64E-03 |
| Deer Mouse | 0.077 | 3 | 3.72E-02 |
| Desert Cottontail | 3.1 | 124 | 8.99E-04 |
| Montane Shrew | 0.39 | 15.6 | 7.15E-03 |
| Red Fox | 1038 | 41520 | 2.69E-06 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.111 ha) divided by the population area.

**Table H-5.4-21**
**Adjusted HIs for AOC 15-005(c)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.855 | 5.0E-08 | na* | na | na | na | na | 3.0E-04 | 0.0024 | 0.013 | 0.011 | 0.078 |
| Barium | 199 | 1.3E-08 | 1.9E-07 | 6.1E-07 | 1.6E-03 | 1.4E-03 | 0.0013 | 6.2E-05 | 0.0011 | 0.0041 | **0.6** | **1.81** |
| Chromium (Total) | 11.3 | 1.7E-08 | 3.0E-07 | 1.5E-06 | 1.1E-03 | 1.9E-03 | 0.0027 | 1.4E-05 | 0.0018 | 0.0038 | na | na |
| Cobalt | 6.13 | 3.0E-09 | 6.0E-08 | 2.2E-07 | 2.4E-04 | 3.4E-04 | 4.2E-04 | 3.4E-06 | 2.7E-04 | 5.7E-04 | na | **0.47** |
| Copper | 12 | 8.1E-09 | 2.4E-07 | 3.4E-06 | 2.1E-03 | 3.6E-03 | 0.0053 | 4.5E-05 | 0.0023 | 0.007 | 0.15 | 0.17 |
| Lead | 35.3 | 2.6E-08 | 1.5E-06 | 9.8E-06 | 0.011 | 0.015 | 0.017 | 9.6E-05 | 0.0035 | 0.011 | 0.021 | 0.29 |
| Selenium | 1.48 (U) | 4.4E-08 | 4.8E-07 | 9.0E-06 | 9.8E-03 | 0.011 | 0.013 | 7.0E-04 | 0.016 | 0.066 | **0.36** | **2.85** |
| Vanadium | 27.4 | 2.2E-08 | 5.5E-06 | 1.1E-05 | 0.02 | 0.024 | 0.027 | 1.9E-05 | 0.0014 | 0.0021 | na | **0.46** |
| Bis(2-ethylhexyl)phthalate | 0.0995 | 7.0E-08 | 3.2E-07 | 2.6E-05 | 3.3E-05 | 0.017 | 0.033 | 3.7E-08 | 0.0012 | 0.0034 | na | na |
| **Adjusted HI** | | 3E-07 | 9E-06 | 6E-05 | 0.05 | 0.07 | 0.1 | 0.001 | 0.03 | 0.1 | 1 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

## Table H-5.4-22
## PAUFs for Ecological Receptors for SWMU 15-007(c)

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 1.20E-05 |
| American Robin | 0.42 | 16.8 | 3.03E-03 |
| Deer Mouse | 0.077 | 3 | 1.69E-02 |
| Desert Cottontail | 3.1 | 124 | 4.10E-04 |
| Montane Shrew | 0.39 | 15.6 | 3.26E-03 |
| Red Fox | 1038 | 41520 | 1.22E-06 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0508 ha) divided by the population area.

## Table H-5.4-23
## Adjusted HIs for SWMU 15-007(c)

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 243 | 6.5E-06 | na* | na | na | na | na | 0.038 | 0.3 | **1.72** | **3.12** | **22.1** |
| Chromium (Total) | 31.8 | 2.2E-08 | 3.8E-07 | 1.9E-06 | 1.4E-03 | 2.4E-03 | 0.0034 | 1.7E-05 | 0.0023 | 0.0049 | na | na |
| Copper | 8.17 | 2.5E-09 | 7.5E-08 | 1.1E-06 | 6.5E-04 | 1.1E-03 | 0.0016 | 1.4E-05 | 7.0E-04 | 0.0022 | 0.1 | 0.12 |
| Lead | 7290 | 2.4E-06 | 1.4E-04 | 9.2E-04 | **1.05** | **1.38** | **1.58** | 0.0091 | **0.33** | **1.03** | **4.29** | **60.8** |
| Nickel | 8.79 | 9.0E-09 | 4.6E-08 | 8.8E-07 | 1.7E-04 | 7.0E-04 | 0.0013 | 8.2E-06 | 0.003 | 0.0074 | 0.031 | 0.23 |
| Selenium | 2.11 (U) | 2.9E-09 | 3.1E-07 | 5.9E-06 | 6.4E-03 | 7.4E-03 | 3.03E-03 | 4.6E-04 | 1.0E-02 | 4.3E-02 | **0.52** | **4.06** |
| Silver | 1.15 | 3.3E-08 | 2.1E-08 | 9.9E-07 | 3.2E-04 | 8.1E-04 | 0.0013 | 3.4E-06 | 2.7E-04 | 8.1E-04 | na | 2.1E-03 |
| Zinc | 46.7 | 7.3E-09 | 2.3E-07 | 2.2E-06 | 4.0E-04 | 1.7E-03 | 0.0029 | 1.2E-05 | 0.0016 | 0.0047 | **0.39** | 0.29 |
| **Adjusted HI** | | 9E-06 | 1E-04 | 9E-04 | 1 | 1 | **2** | 0.05 | 0.6 | **3** | **8** | **84** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*na = Not available.

**Table H-5.4-24**
**PAUFs for Ecological Receptors for SWMU 15-007(d)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 6.29E-06 |
| American Robin | 0.42 | 16.8 | 1.59E-03 |
| Deer Mouse | 0.077 | 3 | 8.89E-03 |
| Desert Cottontail | 3.1 | 124 | 2.15E-04 |
| Montane Shrew | 0.39 | 15.6 | 1.71E-03 |
| Red Fox | 1038 | 41520 | 6.42E-07 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0267 ha) divided by the population area.

**Table H-5.4-25**
**Adjusted HIs for SWMU 15-007(d)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.998 (U) | 1.4E-08 | na* | na | na | na | na | 8.3E-05 | 6.6E-04 | 0.0037 | 0.013 | 0.091 |
| Selenium | 1 (U) | 7.1E-09 | 7.8E-08 | 1.5E-06 | 1.6E-03 | 1.8E-03 | 0.0021 | 1.1E-04 | 0.0026 | 0.011 | 0.24 | **1.92** |
| **Adjusted HI** | | 2E-08 | 8E-08 | 2E-06 | 0.002 | 0.002 | 0.002 | 2E-04 | 0.003 | 0.01 | 0.3 | **2** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-26**
**PAUFs for Ecological Receptors for SWMU 15-008(b)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 7.36E-04 |
| American Robin | 0.42 | 16.8 | 1.86E-01 |
| Deer Mouse | 0.077 | 3 | 1.00E+00 |
| Desert Cottontail | 3.1 | 124 | 2.52E-02 |
| Montane Shrew | 0.39 | 15.6 | 2.00E-01 |
| Red Fox | 1038 | 41520 | 7.52E-05 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (3.12 ha) divided by the population area.

**Table H-5.4-27**
**Adjusted HIs for SWMU 15-008(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 5.63 | 9.2E-06 | na* | na | na | na | na | 0.054 | **0.43** | **2.35** | 0.072 | **0.51** |
| Barium | 73.2 | 1.3E-07 | 1.9E-06 | 6.3E-06 | 0.017 | 0.015 | 0.014 | 6.4E-04 | 0.011 | 0.041 | 0.22 | **0.67** |
| Beryllium | 4.46 | 8.0E-07 | na | na | na | na | na | 7.5E-04 | 0.05 | 0.08 | 0.11 | **1.78** |
| Cadmium | 0.394 | 5.6E-08 | 6.2E-07 | 1.9E-04 | 0.017 | 0.14 | 0.25 | 0.0011 | 0.29 | **0.77** | 2.8E-03 | 0.012 |
| Chromium (Total) | 13.6 | 5.7E-07 | 1.0E-05 | 5.0E-05 | 0.037 | 0.063 | 0.09 | 4.6E-04 | 0.06 | 0.12 | na | na |
| Copper | 1410 | 2.6E-05 | 8.0E-04 | 0.011 | **6.89** | **11.9** | **17.5** | 0.15 | **7.42** | **22** | **17.6** | **20.1** |

**Table H-5.4 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 4400 | 8.9E-05 | 5.1E-03 | 0.034 | **38.9** | **51.1** | **58.4** | **0.34** | **12.2** | **36.7** | **2.59** | **36.7** |
| Manganese | 266 | 4.9E-07 | 2.8E-06 | 7.3E-06 | 0.035 | 0.026 | 0.016 | 0.0037 | 0.035 | 0.19 | **0.59** | **1.21** |
| Nickel | 6.58 | 4.1E-07 | 2.1E-06 | 4.0E-05 | 7.6E-03 | 0.032 | 0.058 | 3.8E-04 | 0.14 | **0.33** | 0.024 | 0.17 |
| Selenium | 0.696 | 5.8E-07 | 6.3E-06 | 1.2E-04 | 0.13 | 0.15 | 0.17 | 0.0092 | 0.21 | **0.84** | 0.17 | **1.34** |
| Uranium | 90.4 | 1.4E-06 | 2.2E-06 | 4.2E-06 | 8.8E-03 | 9.9E-03 | 0.01 | 0.0013 | 0.082 | 0.12 | na | **3.62** |
| Vanadium | 13.3 | 3.0E-07 | 7.5E-05 | 1.5E-04 | 0.28 | **0.33** | **0.37** | 2.6E-04 | 0.019 | 0.028 | na | 0.22 |
| Zinc | 457 | 4.4E-06 | 1.4E-04 | 1.3E-03 | 0.24 | **1** | **1.77** | 0.0072 | **0.93** | **2.69** | **3.81** | **2.86** |
| Aroclor-1242 | 0.282 | 2.6E-07 | 3.6E-05 | 9.4E-04 | 0.052 | **0.66** | **1.28** | 2.6E-04 | 0.15 | **0.37** | na | na |
| Aroclor-1254 | 0.0168 | 2.1E-07 | 1.7E-06 | 5.6E-05 | 2.4E-03 | 0.039 | 0.076 | 9.2E-06 | 0.0076 | 0.019 | na | 1.1E-04 |
| | **Adjusted HI** | 1E-04 | 0.006 | 0.05 | **47** | **65** | **80** | 0.6 | **22** | **67** | **25** | **69** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-28**
**PAUFs for Ecological Receptors for AOC 15-008(g)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 5.99E-07 |
| American Robin | 0.42 | 16.8 | 1.51E-04 |
| Deer Mouse | 0.077 | 3 | 8.46E-04 |
| Desert Cottontail | 3.1 | 124 | 2.05E-05 |
| Montane Shrew | 0.39 | 15.6 | 1.63E-04 |
| Red Fox | 1038 | 41520 | 6.11E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00254 ha) divided by the population area.

**Table H-5.4-29**
**Adjusted HIs for AOC 15-008(g)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.77 | 5.0E-09 | na* | na | na | na | na | 3.0E-05 | 2.4E-04 | 0.0013 | 0.048 | **0.34** |
| Cobalt | 9.43 | 1.0E-10 | 2.1E-09 | 7.8E-09 | 8.4E-06 | 1.2E-05 | 1.5E-05 | 1.2E-07 | 9.6E-06 | 2.0E-05 | na | **0.73** |
| Copper | 25.7 | 3.9E-08 | 1.2E-08 | 1.7E-07 | 1.0E-04 | 1.8E-04 | 2.6E-04 | 2.2E-06 | 1.1E-04 | 3.4E-04 | **0.32** | **0.37** |
| Lead | 309 | 5.1E-09 | 2.9E-07 | 1.9E-06 | 2.2E-03 | 2.9E-03 | 0.0033 | 1.9E-05 | 7.0E-04 | 0.0022 | 0.18 | **2.58** |
| Selenium | 1.28 (U) | 8.7E-08 | 9.5E-09 | 1.8E-07 | 1.9E-04 | 2.2E-04 | 2.6E-04 | 1.4E-05 | 3.2E-04 | 0.0013 | **0.31** | **2.46** |
| **Adjusted HI** | | 1E-07 | 3E-07 | 2E-06 | 0.002 | 0.003 | 0.004 | 7E-05 | 0.001 | 0.005 | 0.9 | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-30**
**PAUFs for Ecological Receptors for SWMU 15-009(b)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 3.88E-06 |
| American Robin | 0.42 | 16.8 | 9.79E-04 |
| Deer Mouse | 0.077 | 3 | 5.48E-03 |
| Desert Cottontail | 3.1 | 124 | 1.33E-04 |
| Montane Shrew | 0.39 | 15.6 | 1.05E-03 |
| Red Fox | 1038 | 41520 | 3.96E-07 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0165 ha) divided by the population area.

**Table H-5.4-31**
**Adjusted HIs for SWMU 15-009(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.44 (UJ) | 1.2E-08 | na* | na | na | na | na | 7.3E-05 | 5.8E-04 | 0.0033 | 0.018 | 0.13 |
| Barium | 94 | 9.1E-08 | 1.3E-08 | 4.2E-08 | 1.1E-04 | 9.9E-05 | 9.2E-05 | 4.3E-06 | 7.6E-05 | 2.9E-04 | 0.28 | **0.85** |
| Cadmium | 0.757 (U) | 5.7E-08 | 6.3E-09 | 2.0E-06 | 1.7E-04 | 1.4E-03 | 0.0026 | 1.1E-05 | 0.003 | 0.0081 | 5.4E-03 | 0.024 |
| Chromium (Total) | 14.4 | 3.2E-09 | 5.6E-08 | 2.8E-07 | 2.1E-04 | 3.5E-04 | 5.0E-04 | 2.5E-06 | 3.4E-04 | 7.2E-04 | na | na |
| Copper | 10 | 9.9E-08 | 3.0E-08 | 4.2E-07 | 2.6E-04 | 4.5E-04 | 6.5E-04 | 5.5E-06 | 2.8E-04 | 8.6E-04 | 0.13 | 0.14 |
| Cyanide (Total) | 1.22 | 1.7E-10 | 8.0E-06 | 1.2E-05 | 0.012 | 0.012 | 0.012 | 2.5E-07 | 4.2E-06 | 2.0E-05 | na | na |

**Table H-5.4-31 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 16.2 | 1.7E-09 | 1.0E-07 | 6.6E-07 | 7.6E-04 | 9.9E-04 | 0.0011 | 6.5E-06 | 2.4E-04 | 7.4E-04 | 9.5E-03 | 0.14 |
| Selenium | 1.59 (U) | 7.0E-09 | 7.6E-08 | 1.4E-06 | 1.6E-03 | 1.8E-03 | 0.0021 | 1.1E-04 | 0.0025 | 0.011 | **0.39** | **3.06** |
| Uranium | 417 | 3.4E-08 | 5.4E-08 | 1.0E-07 | 2.1E-04 | 2.4E-04 | 2.6E-04 | 3.1E-05 | 0.002 | 0.003 | na | **16.7** |
| Uranium-234 | 215 | 7.7E-08 | 3.2E-09 | 3.2E-09 | 1.4E-05 | 6.8E-06 | 2.3E-06 | 1.6E-06 | 1.6E-06 | 9.8E-06 | 0.098 | **0.49** |
| Uranium-238 | 221 | 4.2E-08 | 2.0E-07 | 2.0E-07 | 6.4E-05 | 5.7E-05 | 5.3E-05 | 1.5E-05 | 1.1E-04 | 5.8E-04 | 0.2 | **0.55** |
| | **Adjusted HI** | 4E-07 | 9E-06 | 2E-05 | 0.02 | 0.02 | 0.02 | 3E-04 | 0.009 | 0.03 | 1 | **22** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

**Table H-5.4-32**
**PAUFs for Ecological Receptors for SWMU 15-009(c)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 6.44E-05 |
| American Robin | 0.42 | 16.8 | 1.62E-02 |
| Deer Mouse | 0.077 | 3 | 9.10E-02 |
| Desert Cottontail | 3.1 | 124 | 2.20E-03 |
| Montane Shrew | 0.39 | 15.6 | 1.75E-02 |
| Red Fox | 1038 | 41520 | 6.57E-06 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.273 ha) divided by the population area.

**Table H-5.4-33**
**Adjusted HIs for SWMU 15-009(c)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium (Total) | 10.3 | 3.8E-08 | 6.6E-07 | 3.3E-06 | 2.5E-03 | 4.2E-03 | 0.006 | 3.0E-05 | 0.004 | 0.0085 | na* | na |
| Cyanide (Total) | 1.69 | 4.0E-09 | 1.8E-04 | 2.7E-04 | 0.27 | 0.27 | 0.27 | 5.6E-06 | 9.5E-05 | 4.5E-04 | na | na |
| Selenium | 1.3 (U) | 9.5E-08 | 1.0E-06 | 1.9E-05 | 0.021 | 0.024 | 0.028 | 0.0015 | 0.034 | 0.14 | **0.32** | **2.5** |
| Bis(2-ethylhexyl)phthalate | 0.105 | 1.8E-09 | 8.3E-07 | 6.8E-05 | 8.5E-05 | 0.043 | 0.085 | 9.6E-08 | 0.0031 | 0.0087 | na | na |
| **Adjusted HI** | | 1E-07 | 2E-04 | 4E-04 | 0.3 | 0.3 | 0.4 | 0.002 | 0.04 | 0.2 | 0.3 | **3** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

**Table H-5.4-34**
**PAUFs for Ecological Receptors for SWMU 15-010(b)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 6.30E-05 |
| American Robin | 0.42 | 16.8 | 1.59E-02 |
| Deer Mouse | 0.077 | 3 | 8.90E-02 |
| Desert Cottontail | 3.1 | 124 | 2.15E-03 |
| Montane Shrew | 0.39 | 15.6 | 1.71E-02 |
| Red Fox | 1038 | 41520 | 6.43E-06 |

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.267 ha) divided by the population area.

**Table H-5.4-35**
**Adjusted HIs for SWMU 15-010(b)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.35 (U) | 1.9E-07 | na* | na | na | na | na | 0.0011 | 0.0089 | 0.05 | 0.017 | 0.12 |
| Cadmium | 0.673 (U) | 8.2E-09 | 9.0E-08 | 2.8E-05 | 2.4E-03 | 0.02 | 0.037 | 1.6E-04 | 0.043 | 0.12 | 4.8E-03 | 0.021 |
| Chromium (Total) | 10 | 3.6E-08 | 6.3E-07 | 3.2E-06 | 2.3E-03 | 4.0E-03 | 0.0057 | 2.9E-05 | 0.0038 | 0.0081 | na | na |
| Mercury | 0.292 | 3.1E-08 | 6.3E-05 | 2.8E-04 | 0.066 | 0.21 | **0.36** | 3.1E-05 | 0.0029 | 0.0087 | **5.84** | 8.6E-03 |
| Selenium | 0.72 | 5.1E-08 | 5.6E-07 | 1.1E-05 | 0.011 | 0.013 | 0.015 | 8.2E-04 | 0.019 | 0.077 | 0.18 | **1.38** |
| Vanadium | 15.7 | 3.1E-08 | 7.6E-06 | 1.5E-05 | 0.028 | 0.033 | 0.037 | 2.6E-05 | 0.0019 | 0.0029 | na | 0.26 |
| Bis(2-ethylhexyl)phthalate | 0.17 | 2.9E-09 | 1.3E-06 | 1.1E-04 | 1.4E-04 | 0.068 | 0.14 | 1.5E-07 | 0.0049 | 0.014 | na | na |
| Di-n-butylphthalate | 0.86 | 1.2E-10 | 3.2E-05 | 9.2E-04 | 0.035 | **0.65** | **1.24** | 1.3E-07 | 8.2E-05 | 2.1E-04 | na | 5.4E-03 |
| **Adjusted HI** | | 4E-07 | 1E-04 | 0.001 | 0.1 | 1 | **2** | 0.002 | 0.08 | 0.3 | **6** | **2** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

**Table H-5.4-36**
**PAUFs for Ecological Receptors for AOC 15-014(h)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 3.20E-04 |
| American Robin | 0.42 | 16.8 | 8.08E-02 |
| Deer Mouse | 0.077 | 3 | 4.52E-01 |
| Desert Cottontail | 3.1 | 124 | 1.09E-02 |
| Montane Shrew | 0.39 | 15.6 | 8.70E-02 |
| Red Fox | 1038 | 41520 | 3.27E-05 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (1.36 ha) divided by the population area.

**Table H-5.4-37**
**Adjusted HIs for AOC 15-014(h)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.57 (U) | 1.1E-06 | na* | na | na | na | na | 0.0066 | 0.053 | 0.3 | 0.02 | 0.14 |
| Barium | 142 | 1.1E-07 | 1.6E-06 | 5.3E-06 | 0.014 | 0.012 | 0.011 | 5.4E-04 | 0.0095 | 0.036 | **0.43** | **1.29** |
| Cadmium | 0.348 | 2.1E-08 | 2.4E-07 | 7.4E-05 | 6.4E-03 | 0.052 | 0.097 | 4.3E-04 | 0.11 | **0.31** | 2.5E-03 | 0.011 |
| Chromium (Total) | 18.4 | 3.3E-07 | 5.9E-06 | 2.9E-05 | 0.022 | 0.037 | 0.053 | 2.7E-04 | 0.036 | 0.076 | na | na |
| Cobalt | 5.08 | 3.0E-08 | 6.0E-07 | 2.3E-06 | 2.4E-03 | 3.4E-03 | 0.0043 | 3.5E-05 | 0.0028 | 0.0057 | na | **0.39** |
| Copper | 15.2 | 1.2E-07 | 3.7E-06 | 5.3E-05 | 0.032 | 0.056 | 0.082 | 6.9E-04 | 0.035 | 0.11 | 0.19 | 0.22 |

**Table H-5.4-37 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 19.8 | 1.7E-07 | 1.0E-05 | 6.7E-05 | 0.076 | 0.1 | 0.11 | 6.6E-04 | 0.024 | 0.075 | 0.012 | 0.17 |
| Mercury | 0.34 | 1.8E-07 | 3.8E-04 | 1.6E-03 | **0.39** | **1.25** | **2.11** | 1.9E-04 | 0.017 | 0.051 | **6.8** | 0.01 |
| Nickel | 8.35 | 2.3E-07 | 1.2E-06 | 2.2E-05 | 4.2E-03 | 0.018 | 0.032 | 2.1E-04 | 0.075 | 0.19 | 0.03 | 0.22 |
| Selenium | 1.5 (U) | 5.4E-07 | 5.9E-06 | 1.1E-04 | 0.12 | 0.14 | 0.16 | 0.0086 | 0.2 | **0.82** | **0.37** | **2.88** |
| Silver | 3.72 | 2.8E-08 | 1.8E-06 | 8.5E-05 | 0.027 | 0.07 | 0.12 | 2.9E-04 | 0.023 | 0.07 | na* | 6.6E-03 |
| Vanadium | 24.2 | 2.4E-07 | 6.0E-05 | 1.2E-04 | 0.22 | 0.26 | 0.29 | 2.0E-04 | 0.015 | 0.023 | na | **0.4** |
| Aroclor-1254 | 0.704 | 3.9E-06 | 3.2E-05 | 1.0E-03 | 0.044 | **0.71** | **1.39** | 1.7E-04 | 0.14 | **0.36** | na | 4.4E-03 |
| Benzoic acid | 1.01 | 1.8E-08 | na | na | na | na | na | 0.003 | 0.088 | **0.35** | na | na |
| Bis(2-ethylhexyl)phthalate | 0.343 | 2.9E-08 | 1.4E-05 | 1.1E-03 | 1.4E-03 | **0.69** | **1.39** | 1.6E-06 | 0.051 | 0.14 | na | na |
| Di-n-butylphthalate | 0.129 | 8.8E-11 | 2.4E-05 | 7.0E-04 | 0.027 | **0.5** | **0.95** | 1.0E-07 | 6.2E-05 | 1.6E-04 | na | 8.1E-04 |
| Di-n-octylphthalate | 1.43 | 4.7E-08 | na | na | na | na | na | 1.4E-06 | 0.14 | **0.36** | na | na |
| **Adjusted HI** | | 7E-06 | 5E-04 | 0.005 | 1 | **4** | **7** | 0.02 | 1 | **3** | **8** | **6** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

## Table H-5.4-38
## PAUFs for Ecological Receptors for SWMU 36-002

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 8.39E-07 |
| American Robin | 0.42 | 16.8 | 2.12E-04 |
| Deer Mouse | 0.077 | 3 | 1.19E-03 |
| Desert Cottontail | 3.1 | 124 | 2.87E-05 |
| Montane Shrew | 0.39 | 15.6 | 2.28E-04 |
| Red Fox | 1038 | 41520 | 8.57E-08 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00356 ha) divided by the population area.

## Table H-5.4-39
## Adjusted HIs for SWMU 36-002

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.913 (UJ) | 1.7E-09 | na | na | na | na | na | 1.0E-05 | 8.0E-05 | 4.5E-04 | 0.012 | 0.083 |
| Barium | 84.6 | 1.8E-10 | 2.5E-09 | 8.3E-09 | 2.2E-05 | 1.9E-05 | 1.8E-05 | 8.4E-07 | 1.5E-05 | 5.6E-05 | 0.26 | **0.77** |
| Cobalt | 4.2 | 6.5E-11 | 1.3E-09 | 4.9E-09 | 5.2E-06 | 7.4E-06 | na | 1.0E-05 | 8.0E-05 | 4.5E-04 | 0.012 | 0.083 |
| Copper | 5.98 | 1.3E-10 | 3.9E-09 | 5.5E-08 | 3.3E-05 | 5.8E-05 | 8.4E-05 | 7.1E-07 | 3.6E-05 | 1.1E-04 | 0.075 | 0.085 |
| Nickel | 6.82 | 4.9E-08 | 2.5E-09 | 4.8E-08 | 9.0E-06 | 3.8E-05 | 6.9E-05 | 4.4E-07 | 1.6E-04 | 4.0E-04 | 0.024 | 0.18 |
| Selenium | 0.922 (UJ) | 8.8E-08 | 9.6E-09 | 1.8E-07 | 2.0E-04 | 2.2E-04 | 2.6E-04 | 1.4E-05 | 3.2E-04 | 0.0013 | 0.22 | **1.77** |
| | **Adjusted HI** | 1E-07 | 2E-08 | 3E-07 | 3E-04 | 3E-04 | 4E-04 | 3E-05 | 6E-04 | 0.002 | 0.6 | **3** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-40**
**PAUFs for Ecological Receptors for SWMU 36-003(a)**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 1.39E-05 |
| American Robin | 0.42 | 16.8 | 3.52E-03 |
| Deer Mouse | 0.077 | 3 | 1.97E-02 |
| Desert Cottontail | 3.1 | 124 | 4.76E-04 |
| Montane Shrew | 0.39 | 15.6 | 3.79E-03 |
| Red Fox | 1038 | 41520 | 1.42E-06 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0591 ha) divided by the population area.

**Table H-5.4-41**
**Adjusted HIs for SWMU 36-003(a)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.29 (UJ) | 4.0E-08 | na* | na | na | na | na | 2.4E-04 | 0.0019 | 0.011 | 0.017 | 0.12 |
| Beryllium | 2.63 | 8.9E-09 | na | na | na | na | na | 8.4E-06 | 5.5E-04 | 9.2E-04 | 0.066 | **1.05** |
| Nickel | 18.6 | 2.2E-08 | 1.1E-07 | 2.2E-06 | 4.1E-04 | 1.7E-03 | 0.0031 | 2.0E-05 | 0.0073 | 0.018 | 0.066 | **0.49** |
| Selenium | 1.28 (U) | 2.0E-08 | 2.2E-07 | 4.1E-06 | 4.5E-03 | 5.2E-03 | 0.006 | 3.2E-04 | 0.0073 | 0.03 | **0.31** | **2.46** |
| | **Adjusted HI** | 9E-08 | 3E-07 | 6E-06 | 0.005 | 0.007 | 0.009 | 6E-04 | 0.02 | 0.06 | 0.5 | **4** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-42**
**PAUFs for Ecological Receptors for SWMU 36-008**

| Receptor | HR (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 1.07E-04 |
| American Robin | 0.42 | 16.8 | 2.69E-02 |
| Deer Mouse | 0.077 | 3 | 1.51E-01 |
| Desert Cottontail | 3.1 | 124 | 3.65E-03 |
| Montane Shrew | 0.39 | 15.6 | 2.90E-02 |
| Red Fox | 1038 | 41520 | 1.09E-05 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.452 ha) divided by the population area.

**Table H-5.4-43**
**Adjusted HIs for SWMU 36-008**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 5.62 (U) | 1.3E-06 | na* | na | na | na | na | 0.0079 | 0.063 | **0.35** | 0.072 | **0.51** |
| Barium | 77.6 | 2.1E-08 | 3.0E-07 | 9.6E-07 | 2.5E-03 | 2.2E-03 | 0.0021 | 9.8E-05 | 0.0017 | 0.0065 | 0.24 | **0.71** |
| Cadmium | 0.397 | 8.2E-09 | 9.0E-08 | 2.8E-05 | 2.4E-03 | 0.02 | 0.037 | 1.6E-04 | 0.043 | 0.12 | 2.8E-03 | 0.012 |
| Chromium (Total) | 30.3 | 1.8E-07 | 3.2E-06 | 1.6E-05 | 0.012 | 0.02 | 0.029 | 1.5E-04 | 0.02 | 0.042 | na | na |
| Copper | 315 | 8.6E-07 | 2.6E-05 | 3.7E-04 | 0.22 | **0.39** | **0.57** | 0.0048 | 0.24 | **0.74** | **3.94** | **4.5** |
| Cyanide (Total) | 0.538 | 2.1E-09 | 9.7E-05 | 1.4E-04 | 0.14 | 0.14 | 0.14 | 3.0E-06 | 5.0E-05 | 2.4E-04 | na | na |

**Table H-5.4-43 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 29.7 | 8.7E-08 | 5.0E-06 | 3.3E-05 | 0.038 | 0.05 | 0.057 | 3.3E-04 | 0.012 | 0.037 | 0.017 | 0.25 |
| Mercury | 2.34 | 4.2E-07 | 8.6E-04 | 3.8E-03 | **0.9** | **2.86** | **4.84** | 4.3E-04 | 0.04 | 0.12 | **46.8** | 0.069 |
| Nickel | 6.79 | 6.2E-08 | 3.1E-07 | 6.0E-06 | 1.1E-03 | 4.8E-03 | 0.0087 | 5.6E-05 | 0.02 | 0.051 | 0.024 | 0.18 |
| Selenium | 0.635 | 7.7E-08 | 8.4E-07 | 1.6E-05 | 0.017 | 0.02 | 0.023 | 0.0012 | 0.028 | 0.12 | 0.15 | **1.22** |
| Silver | 41.7 | 1.1E-07 | 6.6E-06 | 3.2E-04 | 0.1 | 0.26 | **0.43** | 0.0011 | 0.086 | 0.26 | na | 0.074 |
| Vanadium | 13.9 | 4.6E-08 | 1.1E-05 | 2.3E-05 | 0.042 | 0.049 | 0.056 | 3.9E-05 | 0.0029 | 0.0044 | na | 0.23 |
| Zinc | 135 | 1.9E-07 | 6.0E-06 | 5.8E-05 | 0.01 | 0.043 | 0.076 | 3.1E-04 | 0.04 | 0.12 | **1.13** | **0.84** |
| Aroclor-1254 | 0.124 | 2.3E-07 | 1.9E-06 | 6.0E-05 | 2.6E-03 | 0.042 | 0.081 | 9.8E-06 | 0.0082 | 0.021 | na | 7.8E-04 |
| Benzoic acid | 0.63 | 3.8E-09 | na | na | na | na | na | 6.2E-04 | 0.018 | 0.073 | na | na |
| Bis(2-ethylhexyl)phthalate | 0.236 | 6.8E-09 | 3.1E-06 | 2.5E-04 | 3.2E-04 | 0.16 | **0.32** | 3.6E-07 | 0.012 | 0.032 | na | na |
| Di-n-butylphthalate | 0.448 | 1.0E-10 | 2.8E-05 | 8.1E-04 | 0.031 | **0.57** | **1.1** | 1.2E-07 | 7.2E-05 | 1.8E-04 | na | 2.8E-03 |
| **Adjusted HI** | | 4E-06 | 0.001 | 0.006 | **2** | **5** | **8** | 0.02 | 0.6 | **2** | **52** | **9** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-44**
**PAUFs for Ecological Receptors for SWMU C-36-003**

| Receptor | Home Range (ha)[a] | Population Area (ha) | PAUF[b] |
|---|---|---|---|
| American Kestrel | 106 | 4240 | 3.88E-06 |
| American Robin | 0.42 | 16.8 | 9.80E-04 |
| Deer Mouse | 0.077 | 3 | 5.49E-03 |
| Desert Cottontail | 3.1 | 124 | 1.33E-04 |
| Montane Shrew | 0.39 | 15.6 | 1.06E-03 |
| Red Fox | 1038 | 41520 | 3.97E-07 |

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0165 ha) divided by the population area.

**Table H-5.4-45**
**Adjusted HIs for SWMU C-36-003**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 1.49 (U) | 1.3E-08 | na* | na | na | na | na | 7.6E-05 | 6.0E-04 | 0.0034 | 0.019 | 0.14 |
| Cadmium | 1.09 | 8.2E-08 | 9.0E-09 | 2.8E-06 | 2.4E-04 | 2.0E-03 | 0.0037 | 1.6E-05 | 0.0043 | 0.012 | 7.8E-03 | 0.034 |
| Chromium | 90.4 | 2.0E-08 | 3.5E-07 | 1.8E-06 | 1.3E-03 | 2.2E-03 | 0.0032 | 1.6E-05 | 0.0021 | 0.0045 | na | na |
| Copper | 936 | 9.3E-08 | 2.8E-06 | 4.0E-05 | 0.024 | 0.042 | 0.061 | 5.2E-04 | 0.026 | 0.08 | **11.7** | **13.4** |
| Cyanide (Total) | 1.06 | 1.5E-10 | 7.0E-06 | 1.0E-05 | 0.01 | 0.01 | 0.01 | 2.1E-07 | 3.6E-06 | 1.7E-05 | na | na |

**Table H-5.4-45 (continued)**

| COPEC | EPC (mg/kg) | Red Fox (mammalian top carnivore) | American Kestrel (avian Top carnivore) | American Kestrel (avian intermediate carnivore) | American Robin (avian herbivore) | American Robin (avian omnivore) | American Robin (avian insectivore) | Desert Cottontail (mammalian herbivore) | Montane Shrew (mammalian insectivore) | Deer Mouse (mammalian omnivore) | Earthworm (soil dwelling invertebrate) | Plant (terrestrial autotroph-producer) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 58.5 | 6.3E-09 | 3.6E-07 | 2.4E-06 | 2.7E-03 | 3.6E-03 | 0.0041 | 2.4E-05 | 8.6E-04 | 0.0027 | 0.034 | **0.49** |
| Manganese | 452 | 4.4E-09 | 2.5E-08 | 6.5E-08 | 3.2E-04 | 2.3E-04 | 1.4E-04 | 3.3E-05 | 3.2E-04 | 0.0018 | **1** | **2.05** |
| Mercury | 0.342 | 2.2E-09 | 4.6E-06 | 2.0E-05 | 4.8E-03 | 0.015 | 0.026 | 2.3E-06 | 2.1E-04 | 6.3E-04 | **6.84** | 0.01 |
| Nickel | 20.7 | 6.8E-09 | 3.5E-08 | 6.7E-07 | 1.3E-04 | 5.3E-04 | 9.7E-04 | 6.2E-06 | 0.0023 | 0.0057 | 0.074 | **0.54** |
| Selenium | 0.635 | 2.8E-09 | 3.0E-08 | 5.7E-07 | 6.2E-04 | 7.2E-04 | 8.3E-04 | 4.4E-05 | 0.001 | 0.0042 | 0.15 | **1.22** |
| Silver | 161 | 1.5E-08 | 9.3E-07 | 4.5E-05 | 0.014 | 0.037 | 0.061 | 1.5E-04 | 0.012 | 0.037 | na | 0.29 |
| Zinc | 490 | 2.5E-08 | 7.9E-07 | 7.6E-06 | 1.4E-03 | 5.6E-03 | 0.01 | 4.1E-05 | 0.0053 | 0.016 | **4.08** | **3.06** |
| Aroclor-1254 | 0.209 | 1.4E-08 | 1.1E-07 | 3.7E-06 | 1.6E-04 | 2.6E-03 | 0.005 | 6.0E-07 | 5.0E-04 | 0.0013 | na | 1.3E-03 |
| Benzoic Acid | 0.355 | 7.8E-11 | na | na | na | na | na | 1.3E-05 | 3.7E-04 | 0.0015 | na | na |
| Di-n-butylphthalate | 1.84 | 1.5E-11 | 4.2E-06 | 1.2E-04 | 4.6E-03 | 0.086 | 0.16 | 1.7E-08 | 1.1E-05 | 2.7E-05 | na | 0.012 |
| **Adjusted HI** | | 3.E-07 | 2.E-05 | 3.E-04 | 0.06 | 0.2 | 0.3 | 9.E-04 | 0.06 | 0.2 | **24** | **21** |

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

**Table H-5.4-46**
**Summary of LOAEL-Based ESLs for Terrestrial Receptors**

| COPEC | Receptor | LOAEL-Based ESL* (mg/kg) |
|---|---|---|
| Antimony | Deer Mouse | 24 |
| | Earthworm | 780 |
| | Plant | 58 |
| | Montane shrew | 26 |
| Arsenic | Earthworm | 68 |
| Barium | Earthworm | 3200 |
| | Plant | 260 |
| Beryllium | Plant | 25 |
| Cadmium | Deer Mouse | 5.1 |
| Cobalt | Plant | 130 |
| Copper | Robin—herbivore | 110 |
| | Robin—insectivore | 46 |
| | Robin—omnivore | 66 |
| | Deer Mouse | 100 |
| | Earthworm | 530 |
| | Plant | 490 |
| | Montane shrew | 63 |
| Lead | Robin—herbivore | 42 |
| | Robin—insectivore | 28 |
| | Robin—omnivore | 33 |
| | Deer Mouse | 230 |
| | Earthworm | 8400 |
| | Plant | 570 |
| | Montane shrew | 130 |
| Manganese | Earthworm | 4500 |
| | Plant | 1100 |
| Mercury | Robin—herbivore | 0.7 |
| | Robin—insectivore | 0.13 |
| | Robin—omntivore | 0.22 |
| | Earthworm | 0.5 |
| Nickel | Deer Mouse | 41 |
| | Plant | 270 |
| Selenium | Deer Mouse | 1.2 |
| | Earthworm | 41 |
| | Plant | 3 |
| Silver | Robin - insectivore | 26 |
| Uranium | Plant | 250 |

**Table H-5.4-46 (continued)**

| COPEC | Receptor | LOAEL-Based ESL* (mg/kg) |
|---|---|---|
| Vanadium | Robin - insectivore | 13 |
| | Robin - omnivore | 15 |
| | Plant | 80 |
| Zinc | Robin - insectivore | 480 |
| | Robin - omnivore | 850 |
| | Deer Mouse | 1700 |
| | Earthworm | 930 |
| | Plant | 810 |
| | Montane shrew | 980 |
| Aroclor-1242 | Robin - insectivore | 0.41 |
| | Robin - omnivore | 0.79 |
| | Deer Mouse | 3 |
| Aroclor-1254 | Robin - insectivore | 0.41 |
| | Robin - omnivore | 0.8 |
| | Deer Mouse | 4.9 |
| Benzoic acid | Deer Mouse | 13 |
| Bis(2-ethylhexyl)phthalate | Robin - insectivore | 0.2 |
| | Robin - omnivore | 0.4 |
| Di-n-butylphthalate | Robin - insectivore | 0.11 |
| | Robin - omnivore | 0.21 |
| Di-n-octylphthalate | Deer Mouse | 18 |
| RDX | Earthworm | 15 |
| Uranium-234 | Plant | 4400 |
| Uranium-238 | Plant | 4000 |

*LOAEL-based ESLs from ECORISK Database, Version 3.3 (LANL 2015, 600929)

**Table H-5.4-47**
**HI Analysis Using LOAEL-Based ESLs for SWMUs 12-001(a) and 12-001(b)**

| COPEC | EPC (mg/kg) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|
| Barium | 213 | n/a[a] | n/a | 0.067 | **0.82** |
| Cobalt | 7.1 | n/a | n/a | n/a | 0.055 |
| Manganese | 456 | n/a | n/a | 0.1 | **0.41** |
| Selenium | 1.34 (U) | n/a | **1.12** | 0.033 | **0.45** |
| Vanadium | 27.6 | **2.12** | n/a | na[b] | **0.35** |
| RDX | 3.73 | n/a | n/a | 0.25 | na |
| | **HI** | **2** | 1 | 0.5 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] n/a = Not applicable.

[b] na = Not available.

**Table H-5.4-48**
**Adjusted HI Analysis Using LOAEL-Based ESLs for SWMUs 12-001(a) and 12-001(b)**

| COPEC | EPC (mg/kg) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|
| Barium | 213 | n/a[a] | n/a | 0.067 | **0.82** |
| Cobalt | 7.1 | n/a | n/a | n/a | 0.055 |
| Manganese | 456 | n/a | n/a | 0.1 | **0.41** |
| Selenium | 1.34 (U) | n/a | **0.68** | 0.033 | **0.45** |
| Vanadium | 27.6 | 0.23 | n/a | na[b] | **0.35** |
| RDX | 3.73 | n/a | n/a | 0.25 | na |
| **Adjusted HI** | | 0.2 | 0.7 | 0.5 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] n/a = Not applicable.

[b] na = Not available.

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**Table H-5.4-49**
**HI Analysis Using LOAEL-Based ESLs for SWMU 12-002**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Barium | 191 | 0.06 | **0.73** |
| Cobalt | 14.2 | n/a* | 0.11 |
| Selenium | 1.1 (U) | n/a | **0.37** |
| Vanadium | 27.1 | na[b] | **0.34** |
| | **HI** | 0.06 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-50**
**HI Analysis Using LOAEL-Based ESLs for AOC 12-004(a)**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Barium | 88.5 | **0.34** |
| Cobalt | 3.98 | 0.031 |
| Selenium | 1.26 (U) | **0.42** |
| | **HI** | 0.8 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-51**
**HI Analysis Using LOAEL-Based ESLs for AOC 12-004(b)**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Arsenic | 2.92 | 0.043 | n/a[a] |
| Barium | 246 | 0.077 | **0.95** |
| Cobalt | 7.49 | n/a | 0.058 |
| Selenium | 1.1 | n/a | **0.37** |
| Vanadium | 30.3 | na[b] | **0.38** |
| | **HI** | 0.1 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-52**
**HI Analysis Using LOAEL-Based ESLs for AOC C-12-001**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Barium | 132 | **0.51** |
| Cobalt | 4.97 | 0.038 |
| Selenium | 1.26 (U) | **0.42** |
| | **HI** | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-53**
**HI Analysis Using LOAEL-Based ESLs for AOC C-12-002**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Barium | 223 | 0.07 | **0.86** |
| Cobalt | 7.49 | n/a[a] | 0.058 |
| Selenium | 1.15 (U) | n/a | **0.38** |
| Vanadium | 28.2 | na[b] | **0.35** |
| | **HI** | 0.07 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-54**
**HI Analysis Using LOAEL-Based ESLs for AOC C-12-003**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Barium | 117 | **0.45** |
| Cobalt | 4.99 | 0.038 |
| Selenium | 1.12 (UJ) | **0.37** |
| | **HI** | 0.9 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-55**
**HI Analysis Using LOAEL-Based ESLs for AOC C-12-004**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Barium | 214 | 0.067 | **0.82** |
| Cobalt | 5.85 | na[a] | 0.045 |
| Lead | 39.2 | n/a[b] | 0.069 |
| Selenium | 1.14 (U) | n/a | **0.38** |
| Vanadium | 28.1 | na | **0.35** |
| **HI** | | 0.07 | **2** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

[a] n/a = Not applicable.

[b] na = Not available.

**Table H-5.4-56**
**HI Analysis Using LOAEL-Based ESLs for AOC 15-005(c)**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Barium | 199 | 0.062 | 0.77 |
| Cobalt | 6.13 | na* | 0.047 |
| Selenium | 1.48 (U) | 0.036 | 0.49 |
| Vanadium | 27.4 | na | 0.34 |
| **HI** | | 0.1 | 2 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

* na = Not available.

**Table H-5.4-57**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-007(c)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Antimony | 243 | na[a] | na | na | **10.1** | **0.31** | **4.19** |
| Lead | 7290 | **174** | **221** | **260** | **31.7** | **0.87** | **12.8** |
| Selenium | 2.11 (U) | n/a[b] | n/a | n/a | n/a | 0.05 | **0.7** |
| Zinc | 46.7 | n/a | n/a | n/a | n/a | 0.05 | n/a |
| **HI** | | **174** | **221** | **260** | **42** | 1 | **18** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] n/a = Not applicable.

**Table H-5.4-58**
**Adjusted HI Analysis Using LOAEL-Based ESLs for SWMU 15-007(c)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Antimony | 243 | na[a] | na | na | 0.17 | **0.31** | **4.19** |
| Lead | 7290 | **0.53** | **0.67** | **0.79** | **0.54** | **0.87** | **12.8** |
| Selenium | 2.11 (U) | n/a[b] | n/a | n/a | n/a | 0.05 | **0.7** |
| Zinc | 46.7 | n/a | n/a | n/a | n/a | 0.05 | n/a |
| **Adjusted HI** | | 0.5 | 0.7 | 0.8 | 0.7 | 1 | **18** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-59**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-007(d)**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Selenium | 1 (U) | **0.33** |
| **HI** | | 0.3 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-60**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-008(b)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Montane Shrew | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|---|
| Antimony | 5.63 | na[a] | na | na | 0.22 | 0.23 | n/a[b] | 0.097 |
| Barium | 73.2 | n/a | n/a | n/a | n/a | n/a | n/a | 0.28 |
| Beryllium | 4.46 | na | na | na | n/a | n/a | n/a | 0.18 |
| Cadmium | 0.394 | n/a | n/a | n/a | n/a | 0.077 | n/a | n/a |
| Copper | 1410 | **12.8** | **21.4** | **30.7** | **22.4** | **14.1** | **2.66** | **2.88** |
| Lead | 4400 | **105** | **133** | **157** | **33.8** | **19.1** | **0.52** | **7.72** |
| Manganese | 266 | n/a | n/a | n/a | n/a | n/a | 0.059 | 0.24 |
| Nickel | 6.58 | n/a | n/a | n/a | n/a | 0.16 | n/a | n/a |
| Selenium | 0.696 | n/a | n/a | n/a | n/a | **0.58** | n/a | 0.23 |
| Uranium | 90.4 | n/a | n/a | n/a | n/a | n/a | na | **0.36** |
| Vanadium | 13.3 | n/a | **0.89** | **1.02** | n/a | n/a | na | n/a |
| Zinc | 457 | n/a | **0.54** | **0.95** | **0.47** | 0.27 | **0.49** | **0.56** |
| Aroclor-1242 | 0.282 | n/a | **0.36** | **0.69** | n/a | 0.094 | na | na |
| **HI** | | **118** | **156** | **190** | **57** | **35** | **4** | **13** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-61**
**Adjusted HI Analysis Using LOAEL-Based ESLs for SWMU 15-008(b)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Montane Shrew | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|---|
| Antimony | 5.63 | na[a] | na | na | 0.043 | 0.23 | n/a[b] | 0.097 |
| Barium | 73.2 | n/a | n/a | n/a | n/a | n/a | n/a | 0.28 |
| Beryllium | 4.46 | na | na | na | n/a | n/a | n/a | 0.18 |
| Cadmium | 0.394 | n/a | n/a | n/a | n/a | 0.077 | n/a | n/a |
| Copper | 1410 | **2.38** | **3.97** | **5.69** | **4.48** | **14.1** | **2.66** | **2.88** |
| Lead | 4400 | **19.5** | **24.8** | **29.2** | **6.77** | **19.1** | **0.52** | **7.72** |
| Manganese | 266 | n/a | n/a | n/a | n/a | n/a | 0.059 | 0.24 |
| Nickel | 6.58 | n/a | n/a | n/a | n/a | 0.16 | n/a | n/a |
| Selenium | 0.696 | n/a | n/a | n/a | n/a | **0.58** | n/a | 0.23 |
| Uranium | 90.4 | n/a | n/a | n/a | n/a | n/a | na | **0.36** |
| Vanadium | 13.3 | n/a | 0.16 | 0.19 | n/a | n/a | na | n/a |
| Zinc | 457 | n/a | 0.1 | 0.18 | 0.093 | 0.27 | **0.49** | **0.56** |
| Aroclor-1242 | 0.282 | n/a | 0.066 | 0.13 | n/a | 0.094 | na | na |
| | **Adjusted HI** | **22** | **29** | **35** | **11** | **35** | **4** | **13** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] n/a = Not applicable.

[b] na = Not available.

**Table H-5.4-62**
**HI Analysis Using LOAEL-Based ESLs for AOC 15-008(g)**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Antimony | 3.77 | 0.065 |
| Cobalt | 9.43 | 0.073 |
| Copper | 25.7 | 0.052 |
| Lead | 309 | **0.54** |
| Selenium | 1.28 (U) | **0.43** |
| | **HI** | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-63**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-009(b)**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Barium | 94 | n/a[a] | **0.36** |
| Selenium | 1.59 (U) | 0.039 | **0.53** |
| Uranium | 417 | na[b] | **1.67** |
| Uranium-234 | 215 | n/a | 0.049 |
| Uranium-238 | 221 | n/a | 0.055 |
| | **HI** | 0.04 | **3** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-64**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-009(c)**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Selenium | 1.3 (U) | **0.43** |
| | **HI** | 0.4 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-65**
**HI Analysis Using LOAEL-Based ESLs for SWMU 15-010(b)**

| COPEC | EPC (mg/kg) | Robin (omnivore) | Robin (insectivore) | Earthworm | Plant |
|---|---|---|---|---|---|
| Mercury | 0.292 | n/a[a] | **2.25** | **0.58** | n/a |
| Selenium | 0.72 | n/a | n/a | n/a | 0.24 |
| Di-n-butylphthalate | 0.86 | **4.1** | **7.82** | na[b] | n/a |
| | **HI** | **4** | **10** | 0.6 | 0.2 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-66**
**Adjusted HI Analysis Using LOAEL-Based ESLs for SWMU 15-010(b)**

| COPEC | EPC (mg/kg) | Robin (omnivore) | Robin (insectivore) | Earthworm | Plant |
|---|---|---|---|---|---|
| Mercury | 0.292 | n/a[a] | 0.036 | 0.58 | n/a |
| Selenium | 0.72 | n/a | n/a | n/a | 0.24 |
| Di-n-butylphthalate | 0.86 | 0.065 | 0.12 | na[b] | n/a |
| **Adjusted HI** | | 0.07 | 0.2 | 0.6 | 0.2 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-67**
**HI Analysis Using LOAEL-Based ESLs for AOC 15-014(h)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Barium | 142 | n/a[a] | n/a | n/a | n/a | 0.044 | **0.55** |
| Cadmium | 0.348 | n/a | n/a | n/a | 0.068 | n/a | n/a |
| Cobalt | 5.08 | n/a | n/a | n/a | n/a | n/a | 0.039 |
| Mercury | 0.34 | **0.49** | **1.55** | **2.62** | n/a | **0.68** | n/a |
| Selenium | 1.5 (U) | n/a | n/a | n/a | **1.25** | 0.037 | **0.5** |
| Vanadium | 24.2 | n/a | n/a | n/a | n/a | na[b] | 0.3 |
| Aroclor-1254 | 0.704 | n/a | **0.88** | **1.72** | 0.14 | na | n/a |
| Benzoic acid | 1.01 | na | na | na | 0.078 | na | na |
| Bis(2-ethylhexyl)phthalate | 0.343 | n/a | **0.86** | **1.72** | n/a | na | na |
| Di-n-butylphthalate | 0.129 | n/a | **0.61** | **1.17** | n/a | na | n/a |
| Di-n-octylphthalate | 1.43 | na | na | na | 0.079 | na | na |
| **HI** | | 0.5 | **4** | **7** | **2** | 0.8 | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
[a] n/a = Not applicable.
[b] na = Not available.

**Table H-5.4-68**
**Adjusted HI Analysis Using LOAEL-Based ESLs for AOC 15-014(h)**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Barium | 142 | n/a[a] | n/a | n/a | n/a | 0.044 | **0.55** |
| Cadmium | 0.348 | n/a | n/a | n/a | 0.031 | n/a | n/a |
| Cobalt | 5.08 | n/a | n/a | n/a | n/a | n/a | 0.039 |
| Mercury | 0.34 | 0.039 | 0.12 | 0.21 | n/a | **0.68** | n/a |
| Selenium | 1.5 (U) | n/a | n/a | n/a | **0.57** | 0.037 | **0.5** |
| Vanadium | 24.2 | n/a | n/a | n/a | n/a | n/a | 0.3 |
| Aroclor-1254 | 0.704 | n/a | 0.071 | 0.14 | 0.065 | na[b] | n/a |
| Benzoic acid | 1.01 | na | na | na | 0.035 | na | na |
| Bis(2-ethylhexyl)phthalate | 0.343 | n/a | 0.069 | 0.14 | n/a | na | na |
| Di-n-butylphthalate | 0.129 | n/a | 0.05 | 0.095 | n/a | na | n/a |
| Di-n-octylphthalate | 1.43 | na | na | na | 0.036 | na | na |
| **Adjusted HI** | | 0.04 | 0.3 | 0.6 | 0.7 | 0.8 | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] n/a = Not applicable.

**Table H-5.4-69**
**HI Analysis Using LOAEL-Based ESLs for SWMU 36-002**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Barium | 84.6 | **0.33** |
| Selenium | 0.922 (UJ) | **0.31** |
| **HI** | | 0.7 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-70**
**HI Analysis Using LOAEL-Based ESLs for SWMU 36-003(a)**

| COPEC | EPC (mg/kg) | Plant |
|---|---|---|
| Beryllium | 2.63 | 0.11 |
| Nickel | 18.6 | 0.069 |
| Selenium | 1.28 (U) | **0.43** |
| | **HI** | 0.6 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

**Table H-5.4-71**
**HI Analysis Using LOAEL-Based ESLs for SWMU 36-008**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Antimony | 5.62 (U) | na[a] | na | na | 0.23 | n/a[b] | 0.097 |
| Barium | 77.6 | n/a | n/a | n/a | n/a | n/a | 0.3 |
| Copper | 315 | n/a | **4.77** | **6.85** | **3.15** | **0.59** | **0.64** |
| Mercury | 2.34 | **3.34** | **10.6** | **18** | n/a | **4.68** | n/a |
| Selenium | 0.635 | n/a | n/a | n/a | n/a | n/a | 0.21 |
| Silver | 41.7 | n/a | n/a | **1.6** | n/a | n/a | n/a |
| Zinc | 135 | n/a | n/a | n/a | n/a | 0.15 | 0.17 |
| Bis(2-ethylhexyl)phthalate | 0.236 | n/a | n/a | **1.18** | n/a | na | na |
| Di-n-butylphthalate | 0.448 | n/a | **2.13** | **4.07** | n/a | na | n/a |
| | **HI** | **3** | **18** | **32** | **3** | **5** | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] n/a = Not applicable.

**Table H-5.4-72**
**Adjusted HI Analysis Using LOAEL-Based ESLs for SWMU 36-008**

| COPEC | EPC (mg/kg) | Robin (herbivore) | Robin (omnivore) | Robin (insectivore) | Deer Mouse | Earthworm | Plant |
|---|---|---|---|---|---|---|---|
| Antimony | 5.62 (U) | na[a] | na | na | 0.035 | n/a[b] | 0.097 |
| Barium | 77.6 | n/a | n/a | n/a | n/a | n/a | 0.3 |
| Copper | 315 | n/a | 0.13 | 0.18 | **0.47** | **0.59** | **0.64** |
| Mercury | 2.34 | 0.09 | 0.29 | **0.48** | n/a | **4.68** | n/a |
| Selenium | 0.635 | n/a | n/a | n/a | n/a | n/a | 0.21 |
| Silver | 41.7 | n/a | n/a | 0.043 | n/a | n/a | n/a |
| Zinc | 135 | n/a | n/a | n/a | n/a | 0.15 | 0.17 |
| Bis(2-ethylhexyl)phthalate | 0.236 | n/a | n/a | 0.032 | n/a | na | na |
| Di-n-butylphthalate | 0.448 | n/a | 0.057 | 0.11 | n/a | na | n/a |
| **Adjusted HI** | | 0.09 | 0.5 | 0.8 | 0.5 | **5** | 1 |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] n/a = Not applicable.

**Table H-5.4-73**
**HI Analysis Using LOAEL-Based ESLs for SWMU C-36-003**

| COPEC | EPC (mg/kg) | Earthworm | Plant |
|---|---|---|---|
| Copper | 936 | **1.77** | **1.91** |
| Lead | 58.5 | n/a* | 0.1 |
| Manganese | 452 | 0.1 | **0.41** |
| Mercury | 0.342 | **0.68** | n/a |
| Nickel | 20.7 | n/a | 0.077 |
| Selenium | 0.635 | n/a | 0.21 |
| Zinc | 490 | **0.53** | **0.6** |
| **HI** | | **3** | **3** |

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.
Data qualifiers are are defined in Appendix A.

*n/a = Not applicable.

# Attachment H-1

*ProUCL Files*
*(on CD included with this document)*

# Attachment H-2

*Vapor Intrusion Spreadsheets*
*(on CD included with this document)*

# Attachment H-3

*Ecological Scoping Checklist*

## H3-1.0 PART A—SCOPING MEETING DOCUMENTATION

| | |
|---|---|
| **Site IDs** | Areas of Concern (AOCs) C-12-001, C-12-002, C-12-003, C-12-004, C-12-005, C-14-006, 12-004(a), 12-004(b), 15-005(c), 15-008(g), 15-014(h), and Solid Waste Management Units (SWMUs) 12-001(a), 12-001(b), 12-002, 15-007(c), 15-007(d), 15-008(b), 15-009(b), 15-009(c), 15-009(h), 15-010(b), 36-002, 36-003(a), 36-008, C-36-003 |
| **Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.), and describe potential areas of release. Reference locations on a map as appropriate.** | Threemile Canyon Aggregate Area consists of a mixture of current buildings, inactive and active firing sites, and other former or currently inactive structures associated with high explosives testing. There is potential for liquid releases via outfalls and releases of solids from firing sites and transport with storm events. |
| **List of Primary Impacted Media**<br>**(Indicate all that apply.)** | **Surface soil –** X<br>**Surface water/sediment –** NA<br>**Subsurface –** X<br>**Groundwater –** NA<br>**Other, explain –** NA |
| **Vegetation Class Based on GIS Vegetation Coverage**<br>**(Indicate all that apply.)** | **Water** – NA<br>**Bare ground/unvegetated** – X<br>**Spruce/fir/aspen/mixed conifer** – NA<br>**Ponderosa pine –** X<br>**Piñon juniper/juniper savannah** – X<br>**Grassland/shrubland** – X<br>**Developed** – X<br>**Burned –** X |
| **Is T&E habitat present?**<br>**If applicable, list species known or suspected of using the site for breeding or foraging.** | The Threemile Canyon Aggregate Area lies within or adjacent to the mapped threatened and endangered (T&E) species core or buffer habitat (Los Alamos National Laboratory's [LANL's] Integrated Natural and Cultural Resources Management Plan). This aggregate area also lies between the known Mexican spotted owl nests in Cañon de Valle and Mortandad Canyon. The area is within the foraging range of the Mexican spotted owl. |
| **Provide list of neighboring/ contiguous/upgradient sites, include a brief summary of COPCs and the form of releases for relevant sites, and reference a map as appropriate.**<br>**(Use this information to evaluate the need to aggregate sites for screening.)** | The Threemile Canyon Aggregate Area is spatially extensive and includes sites in former Technical Area 12 (TA-12), TA-14, TA-15, and TA-36. However, the activities and types of contaminants overlap greatly across this aggregate and therefore the ecological exposure pathways are discussed for the entire collection of sites in the Threemile Canyon Aggregate Area. |
| **Surface Water Erosion Potential Information**<br>Surface water erosion potential is based on site observations | There is run-off from some sites located around the perimeter of the mesa top or extend from the mesa top into the canyons. |

## H3-2.0 PART B—SITE VISIT DOCUMENTATION

| | |
|---|---|
| **Site ID** | AOCs C-12-001, C-12-002, C-12-003, C-12-004, C-12-005, C-14-006, 12-004(a), 12-004(b), 15-005(c), 15-008(g), 15-009(h), SWMUs 12-001(a), 12-001(b), 12-002, 15-007(c), 15-007(d), 15-008(b), 15-009(b), 15-009(c), 15-010(b), 15-014(h), 36-002, 36-003(a), 36-008, C-36-003 |
| **Date of Site Visit** | 8/7/2015 |
| **Site Visit Conducted by** | Randall Ryti, Kent Rich, Richard Mirenda, Tracy McFarland, Joe English, Brian Clayton |

### *Receptor Information:*

| | |
|---|---|
| **Estimate cover.** | **Relative vegetative cover (high, medium, low, none)** = Medium to High<br>**Relative wetland cover (high, medium, low, none)** = None<br>**Relative structures/asphalt, etc., cover (high, medium, low, none)** = Low to None |
| **Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information** | Threemile Canyon Aggregate Area includes TAs that are still active and some that are inactive or decommissioned. There is in general a high relative vegetative cover across the sites. The aggregate area includes ponderosa pine, shrubs, and grassland. |
| **Are ecological receptors present at the site (yes/ no/uncertain)?**<br>**Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.** | Terrestrial receptors, including mammals and birds, could use the sites for both foraging and nesting. |

### *Contaminant Transport Information:*

| | |
|---|---|
| **Surface Water Transport/Field Notes on the Erosion Potential, Including a Discussion of the Terminal Point of Surface Water Transport (if applicable)** | Run-off potential at some sites is high because they are situated on the mesa edge, but there was no evidence for significant surface water erosion at these sites (e.g., lack of head cuts). However, most of the sites are flat with little to no runoff potential. |
| **Are there any off-site transport pathways (surface water, air, or groundwater)?**<br>**(yes/no/uncertain)**<br>**Provide explanation** | Yes. Surface water run-on to the sites and runoff leaving the sites generally enters Threemile Canyon. A portion of former TA-12 drains northward toward Pajarito Canyon. There may be some air dispersion when the area is dry, but it is a minor transport pathway. A pathway to groundwater is unlikely, because regional groundwater is approximately 1000 to 1300 ft below ground surface (bgs) to the aquifer. No intermediate or alluvial groundwater is in the vicinity of the sites. |

### *Ecological Effects Information:*

| | |
|---|---|
| **Physical Disturbance**<br>**(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)** | Most of the sites in the Threemile Canyon Aggregate Area are on developed land and had been disturbed in the past. However, there is little evidence for present day physical disturbance impacting the aggregate area. |
| **Are there obvious ecological effects?**<br>**(yes/ no/uncertain)**<br>**Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).** | No. Areas surrounding the developed sites show no obvious ecological effects. |

### *No Exposure/Transport Pathways:*

**If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, the remainder of the checklist should not be completed. Stop here, and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include the likelihood that future construction activities could make contamination more available for exposure or transport.**

Not applicable

### *Adequacy of Site Characterization:*

| | |
|---|---|
| **Do existing or proposed data provide information on the nature and extent of contamination?**<br>**(yes/ no/uncertain)?**<br>**Provide explanation (consider whether the maximum value was captured by existing sample data).** | Yes. The sampling approach in the approved work plan (LANL 2008, 105673; NMED 2008, 104256) included biased sampling to determine the nature and extent of contamination within the aggregate area. |
| **Do existing or proposed data for the site address potential transport pathways of site contamination?**<br>**(yes/no/uncertain)**<br>**Provide explanation (consider whether other sites should be aggregated to characterize potential ecological risk).** | Yes. Data from samples collected within the SWMUs and AOCs address potential transport pathways and characterize the potential ecological risk. The results indicate that the nature and extent of contamination at the sites has been defined, except for four sites where additional sampling for extent is required: SWMUs 15-007(c), 15-008(b), and 15-009(b), and AOC 15-008(g). |

### *Additional Field Notes:*

**Provide additional field notes on the site setting and potential ecological receptors.**

**TA-14 site:**

AOC C-14-006. Site is adjacent to an active bunker. Area is disturbed but has signs of vegetation regrowth.

**TA-12 sites:**

SWMUs 12-001(a) and 12-001(b). Historical structure that has been inactive for many years. Some post–Cerro Grande fire mitigation work is still evident. The access road to the site is also a LANL fire road. Some cobbles and gravels were noted on the surface. Fossorial activity was evident. Noted elk sign (prints, scats), also rabbit and deer scats.

AOC 12-004(a). Power pole still present but structure removed. Oaks, junipers, and other shrubs. Note elk prints.

**TA-15 sites:**

SWMU 15-010(b). Settling tank still in place. Decayed gravel road is upgradient. Oaks and other shrubs downstream. Run-on controls are currently in place.

AOC 15-014(h). Weathered asphalt parking lot over part of the site. Some ponderosa pine that widely spaced with thick vegetative undergrowth of oaks, chamisa, currents, and other shrubs. Fossorial activity noted. Storage is the current use for this site.

AOC 15-005(c). Facility is planned for removal. Decayed asphalt and gravel is evident.

SWMU 15-009(h). Septic system located inside the fence for Firing Site R-45. Vegetation is managed inside the fence and limits to grass and forbs.

SWMU 15-009(b). Septic tank has been removed and site is currently inactive.

SWMU 15-009(c). Septic tank has been removed.

SWMU 15-008(b). Firing site. Some vegetation was noted growing in the cracks in the asphalt.

**TA-36 sites:**

SWMU 36-002. Sump. Oaks and junipers present.

SWMU 36-003(a). Inactive septic system. Oaks and junipers in the area of the tank. Leach field located to the west with grasses, forbs, and shrubs noted.

SWMU 36-008. Debris area burned during the Cerro Grande fire. Steep slope with ponderosa pine, oaks, and other shrubs. Abundant forbs and grasses.

SWMU C-36-003 is collocated with SWMU 36-008.

## H3-3.0 PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

**Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model**

**Question A:**

**Could soil contaminants reach receptors through vapors?**

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >$10^{-5}$ atm-$m^3$/mol and molecular weight <200 g/mol).**

**Answer (likely/unlikely/uncertain):** Unlikely

**Provide explanation:** VOCs were detected. Most of the detected concentrations were below or similar to the estimated quantitation limits (EQLs).

**Question B:**

**Could the soil contaminants reach receptors through fugitive dust carried in air?**

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

**Answer (likely/unlikely/uncertain):** Likely

**Provide explanation:** Some COPCs were detected in the surface interval.

**Question C:**

**Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?**

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (*Note that the runoff score is not the entire erosion potential score; rather, it is a subtotal of this score with a maximum value of 46 points.)**
- **If erosion is a transport pathway, evaluate the terminal point to see whether aquatic receptors could be affected by contamination from this site.**

**Answer (likely/unlikely/uncertain):** Unlikely

**Provide explanation:** No aquatic communities are present in the aggregate area or in close proximity.

**<u>Question D:</u>**

**Is contaminated groundwater potentially available to biological receptors through seeps, springs, or shallow groundwater?**

- **Known or suspected presence of contaminants in groundwater.**
- **The potential exists for contaminants to migrate through groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

**Answer (likely/unlikely/uncertain):** Unlikely

**Provide explanation:** The depth to regional groundwater is approximately 1000 to 1300 ft. There are no seeps, springs, or shallow groundwater in the aggregate area.

**<u>Question E:</u>**

**Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?**

- **The potential exists for contaminants to migrate to groundwater.**
- **The potential exists for contaminants to migrate through groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

**Answer (likely/unlikely/uncertain):** Unlikely

**Provide explanation:** The depth to regional groundwater is approximately 1000 to 1300 ft. There are no seeps, springs, or shallow groundwater in the aggregate area.

**<u>Question F:</u>**

**Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?**

- **This question is only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

**Answer (likely/unlikely/uncertain):** Unlikely

**Provide explanation:** Most sites are not located near the main canyon edge, so mass wasting is not relevant. There is minimal evidence of erosion at the sites.

**Question G:**

**Could airborne contaminants interact with receptors through the respiration of vapors?**

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of vapors is typically not a significant exposure pathway.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 2

**Terrestrial Animals:** 2

**Provide explanation:** Volatile organic compounds were detected but at low concentrations.

**Question H:**

**Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?**

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 3

**Terrestrial Animals:** 3

**Provide explanation:** Surface soil contamination is present.

**Question I:**

**Could contaminants interact with plants through root uptake or rain splash from surficial soils?**

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants is present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 3

**Provide explanation:** Surface soil contamination is present.

**Question J:**

**Could contaminants interact with receptors through food-web transport from surficial soils?**

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 3

**Provide explanation:** Chemicals of potential concern **(**COPCs) are present in the surface soil.

**Question K:**

**Could contaminants interact with receptors through the incidental ingestion of surficial soils?**

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil, or groom themselves clean of soil.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 3

**Provide explanation:** COPCs are present in the surface soil.

**<u>Question L:</u>**

**Could contaminants interact with receptors through dermal contact with surficial soils?**

- **Significant exposure through dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 2

**Provide explanation:** Low to moderate concentrations of lipophilic COPCs were detected in surface soil.

**<u>Question M:</u>**

**Could contaminants interact with plants or animals through external irradiation?**

- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 2

**Terrestrial Animals:** 2

**Provide explanation:** Some radionuclides were identified as COPCs.

**<u>Question N:</u>**

**Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?**

- **Contaminants may be taken up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 0

**Provide explanation:** No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

**Question O:**

**Could contaminants interact with receptors through food-web transport from water and sediment?**

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 0

**Provide explanation:** No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

**Question P:**

**Could contaminants interact with receptors through the ingestion of water and suspended sediments?**

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 0

**Provide explanation:** No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

**Question Q:**

**Could contaminants interact with receptors through dermal contact with water and sediment?**

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Animals:** 0

**Provide explanation:** No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

__Question R:__

**Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?**

- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Terrestrial Plants:** 0

**Terrestrial Animals:** 0

**Provide explanation:** No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

__Question S:__

**Could contaminants bioconcentrate in free-floating aquatic plants, attached aquatic plants, or emergent vegetation?**

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Aquatic Plants/Emergent Vegetation:** 0

**Provide explanation:** There is no aquatic habitat at the sites.

__Question T:__

**Could contaminants bioconcentrate in sedimentary or water-column organisms?**

- **Aquatic receptors may actively or incidentally ingest sediment while foraging.**
- **Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Aquatic Animals:** 0

**Provide explanation:** There is no aquatic habitat at the sites.

**<u>Question U:</u>**

**Could contaminants bioaccumulate in sedimentary or water-column organisms?**

- **Lipophilic organic contaminants and some metals may concentrate in an organism's tissues.**
- **Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.**

**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Aquatic Animals:** 0

**Provide explanation:** There is no aquatic habitat at the sites.

**<u>Question V:</u>**

**Could contaminants interact with aquatic plants or animals through external irradiation?**

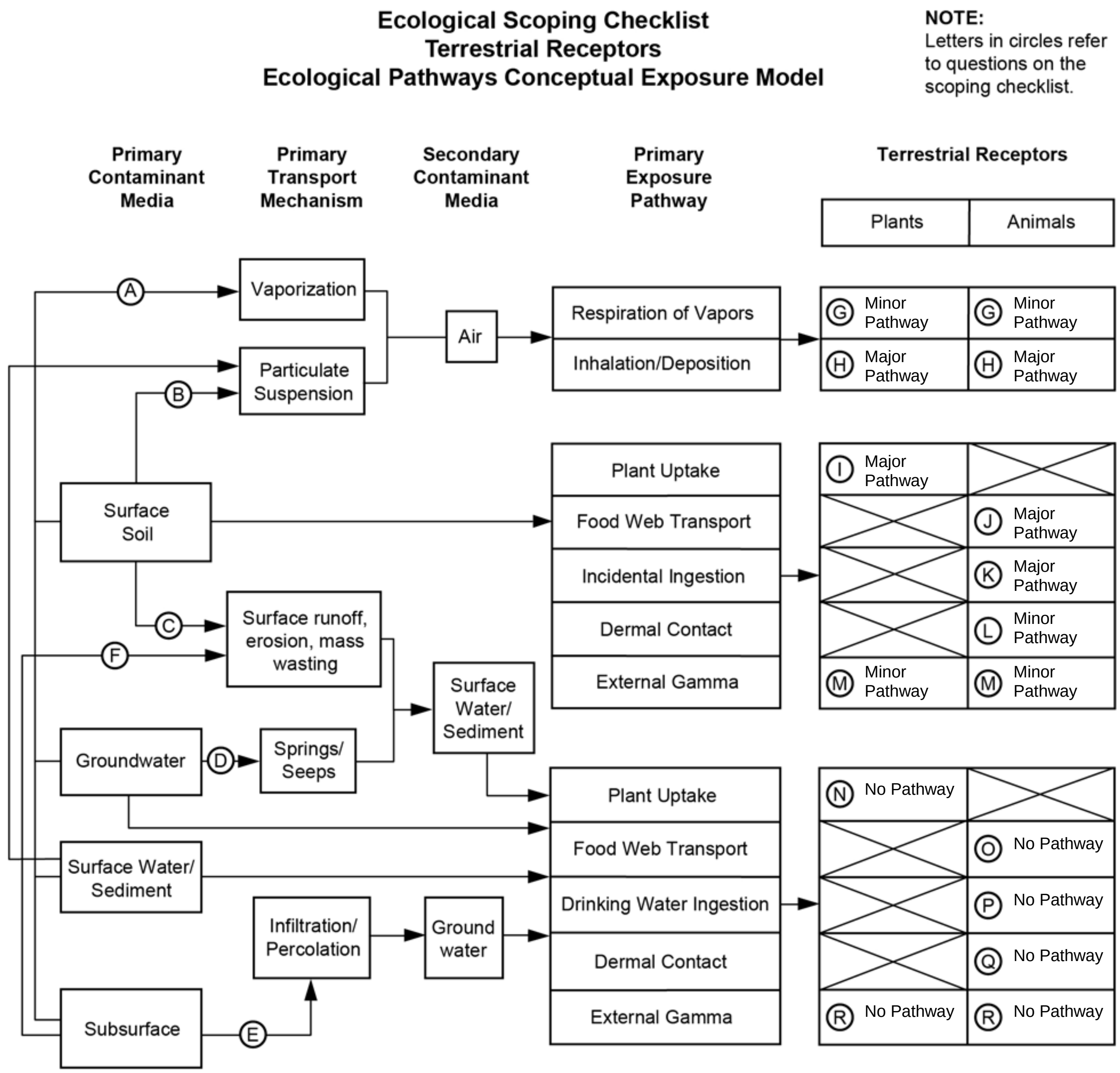
- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

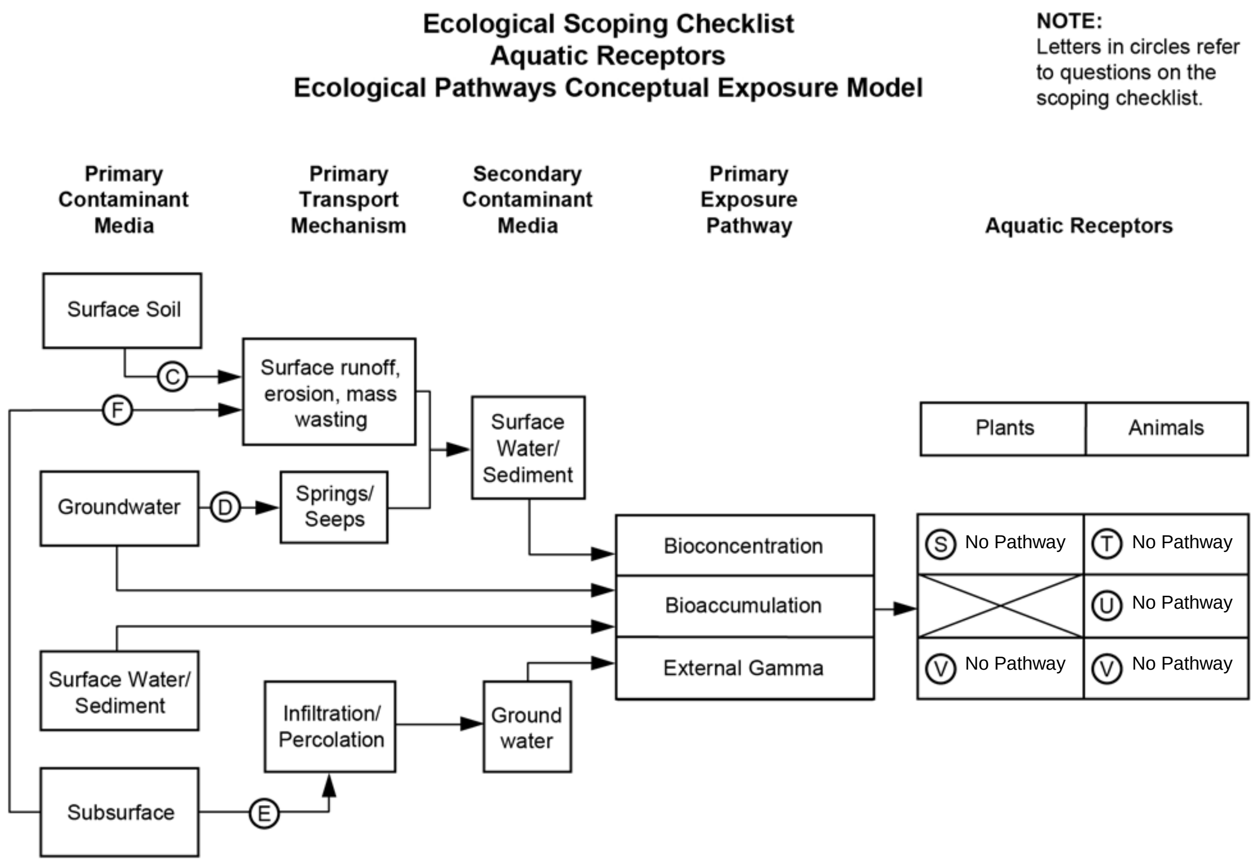
**Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):**

**Aquatic Plants:** 0

**Aquatic Animals:** 0

**Provide explanation:** There is no aquatic habitat at the sites.


Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model
NOTE:
Letters in circles refer to questions on the scoping checklist.
Primary Contaminant Media
Primary Transport Mechanism
Secondary Contaminant Media
Primary Exposure Pathway
Terrestrial Receptors
Plants
Animals
A
B
C
D
E
F
Vaporization
Particulate Suspension
Air
Respiration of Vapors
Inhalation/Deposition
G Minor Pathway
G Minor Pathway
H Major Pathway
H Major Pathway
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I Major Pathway
J Major Pathway
K Major Pathway
L Minor Pathway
M Minor Pathway
M Minor Pathway
Surface runoff, erosion, mass wasting
Surface Water/ Sediment
Groundwater
Springs/ Seeps
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
Plant Uptake
Food Web Transport
Drinking Water Ingestion
Dermal Contact
External Gamma
N No Pathway
O No Pathway
P No Pathway
Q No Pathway
R No Pathway
R No Pathway


Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model
NOTE:
Letters in circles refer to questions on the scoping checklist.
Primary Contaminant Media
Primary Transport Mechanism
Secondary Contaminant Media
Primary Exposure Pathway
Aquatic Receptors
Surface Soil
C
F
Surface runoff, erosion, mass wasting
Surface Water/ Sediment
Plants
Animals
Groundwater
D
Springs/ Seeps
Bioconcentration
Bioaccumulation
External Gamma
S No Pathway
T No Pathway
U No Pathway
V No Pathway
V No Pathway
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E

## SIGNATURES AND CERTIFICATION

| | |
|---|---|
| **Name (printed):** | Randall Ryti |
| **Name (signature):** | Randall Ryti |
| **Organization:** | Neptune and Company, Inc. |
| **Date completed:** | August 7, 2015 |

**Checklist reviewed by:**

| | |
|---|---|
| **Name (printed):** | Richard Mirenda |
| **Name (signature):** | Richard Mirenda |
| **Organization:** | Los Alamos National Laboratory |
| **Date reviewed:** | 11/3/2015 |

## H3-4.0 REFERENCES

*The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

LANL (Los Alamos National Laboratory), October 2008. "Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-6727, Los Alamos, New Mexico. (LANL 2008, 105673)

NMED (New Mexico Environment Department), November 20, 2008. "Approval with Modifications for Investigation Work Plan for Threemile Canyon Aggregate Area, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 104256)

# Appendix I

*Site Photographs*

**Figure I-1 Eroded soil near Areas of Concern (AOCs) 12-004(a) and 12-004(b)**

**Figure I-2 Weathered asphalt on the south side of AOC 15-005(c), looking north**

**Figure I-3 Weathered asphalt on the south side of AOC 15-005(c), looking east**

**Figure I-4 Creosote-treated telephone pole north of AOC 15-005(c) near sampling location 15-610562**

**Figure I-5 Paved road north of Solid Waste Management Unit (SWMU) 15-009(b) looking southeast toward soil pile where septic tank was removed**

**Figure I-6 Asphalt debris adjacent to SWMU 15-009(b)**

**Figure I-7 Tuff ridge between asphalt roadway and SWMU 15-009(c), looking southeast**

**Figure I-8 Best management practices (BMPs) above SWMU 15-010(b), looking northeast**

**Figure I-9 Asphalt roadway above SWMU 15-010(b), looking southwest**

**Figure I-10 Burned trees adjacent to SWMU 15-010(b)**

**Figure I-11 Burned trees below SWMU 15-010(b)**

**Figure I-12** **Trench drain connected to eastern outfall at AOC 15-014(h) with asphalt debris, looking northeast**

**Figure I-13 Trench drain connected to eastern outfall at AOC 15-014(h) with asphalt debris, looking northeast**

**Figure I-14 Weathered asphalt pad above AOC 15-014(h) outfalls, looking northeast**

**Figure I-15 Weathered asphalt pad above AOC 15-014(h) outfalls, looking northeast**

**Figure I-16 Asphalt debris in drainage below AOC 15-014(h)**

**Figure I-17 Weathered asphalt area adjacent to SWMU 36-003(a) drainline and west of drain field, looking east**

**Figure I-18 Weathered asphalt at Potrillo Drive draining to SWMU 36-003(a) drain field, looking north**

**Figure I-19 Eroded asphalt debris between Potrillo Drive and SWMU 36-003(a) drain field, looking north**

**Figure I-20 Weathered asphalt area above SWMUs 36-008 and C-36-003, looking west**

**Figure I-21 BMPs at edge of asphalt area above SWMUs 36-008 and C-36-003, looking north**

**Figure I-22 Burned trees within SWMU 36-008, looking north**

**Figure I-23 Burned trees within SWMU 36-008, looking north**

**Figure I-24 Burned trees within SWMU 36-008, looking north**