ERID-249068

LA-UR-13-26024
August 2013
EP2013-0128

Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area

Los Alamos
NATIONAL LABORATORY

Prepared by the Environmental Programs Directorate

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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 42 solid waste management units (SWMUs) and areas of concern (AOCs) in the Upper Sandia Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The SWMUs and AOCs are located in Technical Area 03 (TA-03), TA-60, and TA-61. Forty-one of these sites were investigated in 2009, and the investigation results were documented in the Upper Sandia Canyon Aggregate Area investigation report, submitted to the New Mexico Environment Department (NMED) in October 2010. The approved investigation report concluded that additional sampling to define the extent of contamination was needed for 41 SWMUs and AOCs. Additional sampling requirements for 41 sites were documented in the approved Phase II investigation work plan for Upper Sandia Canyon Aggregate Area, submitted to NMED in August 2011. One additional site was remediated before the 2009 investigation and was addressed in a separate document. Forty-seven additional sites were included in the investigation report but are not addressed by this supplemental investigation report. Of those 47 sites, corrective action complete status has been approved for 24 sites, further investigation will be delayed until decommissioning and demolition of associated buildings and structures at 21 sites, and 2 sites are being addressed under other regulatory programs.

Subsequent to approval of the investigation report and Phase II investigation work plan, NMED and the U.S. Department of Energy (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 Consent Order to identify those sites where the nature and extent of contamination has 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 2009 and previous decision-level investigation data for 41 sites identified in the Phase II investigation work plan requiring additional sampling to define extent were evaluated using this revised process. This process was also applied to the site remediated before the 2009 investigation. The revised process does not affect the status of the 47 sites approved for corrective action completion or delayed investigation or being addressed under other regulatory programs. Based on the evaluation of investigation results using the revised process, the extent of contamination has been defined (or no further sampling for extent is warranted) at 32 sites, and additional sampling for extent is required at 10 sites. Human health and ecological risk assessments were performed for all sites, except SWMU 60-006(a), which had no complete exposure pathways to receptors, and AOC 03-038(d), which was sampled incorrectly.

Based on the results of data evaluations presented in this supplemental investigation report, the following recommendations are made:

- 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.
- One site has been found to have no complete exposure pathways to human and ecological receptors under all three scenarios and is appropriate for corrective actions complete without controls.

- One site has been found to pose no potential unacceptable risks to human health under all three scenarios and to ecological receptors; the site evaluation will be completed in the Upper Mortandad Canyon Aggregate Area supplemental investigation report.
- Corrective action complete with controls is recommended for 10 sites for which extent is defined and which pose no potential unacceptable human health risk under the industrial and construction worker scenarios and no unacceptable ecological risk.
- Additional sampling is recommended for 10 sites for which extent is not defined and which pose no potential unacceptable human health risk under one or more scenarios and no 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. 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 36 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas that are separated by deep canyons containing 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 is participating in a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of the Laboratory's efforts 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 is currently investigating sites potentially contaminated by past Laboratory operations. These sites are designated as either solid waste management units (SWMUs) or areas of concern (AOCs).

This supplemental investigation report addresses SWMUs and AOCs within the Upper Sandia 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 Upper Sandia Canyon Aggregate Area is located in Technical Area 03 (TA-03), TA-60, and TA-61 at the Laboratory (Figure 1.1-1) and consists of 180 SWMUs and AOCs, 91 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 89 SWMUs or AOCs were addressed in the approved investigation work plan for Upper Sandia Canyon Aggregate Area (LANL 2008, 103404.43; NMED 2008, 102721). These sites were investigated in 2009 and the results documented in the approved investigation report for Upper Sandia Canyon Aggregate Area (LANL 2010, 110862.24; NMED 2010, 111398). The approved investigation report concluded that additional sampling to define the nature and extent of contamination was needed for 41 SWMUs and AOCs. Additional sampling requirements for these 41 sites were documented in the approved Phase II investigation work plan for Upper Sandia Canyon Aggregate Area (LANL 2011, 206234; NMED 2011, 206390). One additional site (SWMU 61-002) was remediated before the 2009 investigation and results presented in a separate document (LANL 2007, 100722). Of the other 47 sites included in the investigation report, corrective action complete status has been approved for 24 sites, further investigation will be delayed until decommissioning and demolition (D&D) of associated buildings and structures at 21 sites, and 2 sites are being addressed under other regulatory programs. Table 1.1-1 lists the 89 sites included in the investigation report with a brief description and a summary of the site status following the 2009 investigation.

1.2 Purpose of the Supplemental Investigation Report

Eighty-nine SWMUs and AOCs within the Upper Sandia Canyon Aggregate Area were addressed by the 2009 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 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 41 SWMUs and AOCs, and recommendations for additional sampling at these sites to define extent were incorporated into the Phase II investigation work plan (LANL 2011, 206234). 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 Oder 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 investigation data for the 41 sites proposed for Phase II investigation and data from an additional site (SWMU 61-002) remediated in 2005–2006 were reevaluated using this revised process, and the results are presented in this supplemental investigation report. The revised data evaluation process does not affect the conclusions or recommendations for the sites that received certificates of completion or were recommended for delayed investigation in the approved investigation report; those sites are not included in this report. Similarly, this report does not include the two sites that are being addressed by other regulatory programs.

All analytical data collected from the 2009 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 11 sections, including this introduction, with multiple supporting appendices. 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 the implementation of the work plan. Section 4 describes the regulatory criteria used to evaluate potential risk/dose to ecological and human receptors. Section 5 describes the data review methods. Sections 6 through 8 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 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 TA-03, TA-60, and TA-61, respectively. Section 9 presents the conclusions of the nature and extent of contamination investigation and risk-screening assessments. Section 10 discusses recommendations based on applicable data and the risk-screening assessments. Section 11 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 the data qualifiers used in this report (Appendix A); field methods (Appendix B); borehole logs (Appendix C); investigation-derived waste (IDW) management (Appendix D); geophysical survey results (Appendix E); analytical program descriptions and summaries of data quality (Appendix F); analytical suites and results and analytical reports (Appendix G); box plots and statistical comparisons (Appendix H); and risk-screening assessments (Appendix I).

2.0 AGGREGATE AREA 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 on the mesa top in the Upper Sandia Canyon Aggregate Area belongs generally to the Hackroy series and the Carjo series (Nyhan et al. 1978, 005702). 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. The Carjo series consists of moderately deep, well-drained, and moderately developed soil with an A-B-C horizon sequence. The soil textures of the Carjo series can be very fine sandy 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.

Most of the natural mesa-top surface soil has been altered by anthropogenic activities. Excavation and fill, paved roads, parking lots, landscaped areas, and buildings have changed the natural soil landscape considerably.

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 mesa-top portion of the Upper Sandia Canyon Aggregate Area is currently an industrially developed area. Perennial stream flow and saturated alluvial aquifer conditions occur in the upper and middle portions of the canyon system. A wetland of approximately 7 acres has developed as a result of effluent discharge. The only known perennial spring in the watershed, Sandia Spring, is located in lower Sandia Canyon near the Rio Grande (LANL 2007, 096665).

2.1.3 Land Use

Currently, land use of the Upper Sandia Canyon Aggregate Area is industrial. The TAs make up the core operational and administrative complex of the Laboratory. The area is highly developed with numerous office and Laboratory buildings, utilities, parking facilities, roads, and other paved areas. Most of TA-03 is located on the mesa top west of the head of Sandia Canyon, and most of TA-60 and TA-61 are located on the mesa top south and north of Sandia Canyon, respectively (Figure 2.1-1).

2.2 Subsurface Conditions

2.2.1 Stratigraphic Units of the Bandelier Tuff

This section summarizes the stratigraphy of the Upper Sandia Canyon Aggregate Area. Additional information on the geologic setting of the area and on the Pajarito Plateau can be found in the Laboratory's hydrogeological synthesis report (Collins et al. 2005, 092028).

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 descriptions begin with the oldest (deepest) and proceed to the youngest (topmost). The stratigraphic units encountered during investigation of the Upper Sandia Canyon Aggregate Area 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 yr 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. It 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 that is 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, and crystal fragments, and fragments of perlite.

2.2.1.2 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 plateau, with local areas of thickening and thinning. Its distinctive white color and texture make it easily identifiable in borehole 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; Broxton and Reneau 1995, 049726; Goff 1995, 049682). 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 Sandia 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 that 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 of the Bandelier Tuff (Qbt) and is upper member 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 yr 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 produce 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 clifflike 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 Sandia 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.

Unit 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.

Unit Qbt 3 is a nonwelded to partially welded, vapor-phase altered tuff that forms the upper cliffs in Mortandad 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 unit 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 generally 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 streamflow and may lack alluvial groundwater. Intermediate perched groundwater has been found at certain locations on the plateau at depths ranging between 100 and 400 ft. The regional aquifer is found at depths of about 600 to 1200 ft (Collins et al. 2005, 092028).

The hydrogeologic conceptual site model for the Laboratory (LANL 2012, 225493) shows 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 (Collins et al. 2005, 092028). 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 Laboratory formulated a comprehensive groundwater protection plan for an enhanced set of characterization and monitoring activities. The Laboratory's Interim Facility-Wide Groundwater Monitoring Plan (the Interim Plan) (LANL 2012, 225493) details the implementation of extensive groundwater characterization across the Pajarito Plateau within an area potentially affected by past and present Laboratory operations.

Alluvial Groundwater

Intermittent and ephemeral streamflow in the canyons of the Pajarito Plateau have deposited alluvium that can be as thick as 100 ft. The alluvium in canyons of the Jemez Mountains is generally composed of sand, gravel, pebbles, cobbles, and boulders derived from the Tschicoma Formation and Bandelier Tuff. The alluvium in canyons of the Pajarito Plateau is finer grained, consisting of clay, silt, sand, and gravel derived from the Bandelier Tuff (Purtymun 1995, 045344).

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).

Regional Aquifer

The regional aquifer of the Los Alamos area is the only aquifer capable of large-scale municipal water supply (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 tops 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 the generalized water-level contours on top of the regional aquifer are described in the Interim Plan (LANL 2012, 225493). The regional aquifer is typically separated from the alluvial groundwater and intermediate-perched zone groundwater by 350 to 620 ft of tuff, basalt, and sediments (LANL 1993, 023249).

Groundwater in the regional aquifer flows east-southeast, toward the Rio Grande. The velocity of groundwater flow ranges from about 20 to 250 ft/yr (LANL 1998, 058841, pp. 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).

2.2.2.4 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 Upper Sandia Canyon Aggregate Area approved investigation work plan; the field investigation results and observations are presented in detail in sections 6 through 8 and in the appendixes. The scope of activities for the 2009 Upper Sandia Canyon Aggregate Area investigation included site access and premobilization activities; geodetic, geophysical, and radiological surveys; surface and shallow subsurface sampling; borehole drilling, sampling, and abandonment; health and safety monitoring; and waste management activities.

All activities were conducted in accordance with the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721). The applicable field methods are summarized below and are detailed in Appendix B. Any deviations from the approved investigation work plan are noted in sections 6, 7, and 8 and are described in detail in Appendix B.

3.1 Site Access and Premobilization Activities

The area encompassing the Upper Sandia Canyon Aggregate Area is currently used for Laboratory operations, and some areas are used by Laboratory personnel for road and foot traffic. Before field mobilization, the issue of Laboratory worker access (e.g. traffic control plan, notifications) was reviewed as part of the management self-assessment process. All efforts were made to provide a secure and safe work area and to reduce impacts to Laboratory personnel, cultural resources, and the environment.

3.2 Field Activities

The following subsections describe the field activities conducted during the 2009 investigation, including surface surveys, field screening, surface and shallow subsurface sampling, and borehole drilling, sampling, and abandonment. Details regarding the field methods and procedures used to perform these field activities are presented in Appendix B.

3.2.1 Geodetic Survey

Geodetic surveys were conducted during the Upper Sandia Canyon Aggregate Area investigation to locate surface and subsurface sampling locations. Initial geodetic surveys were performed to establish and mark the planned sampling locations in the field. Geodetic surveys were conducted at the completion of the sampling campaign to establish the spatial coordinates for all sampling locations. Geodetic surveys were conducted in accordance with Standard Operating Procedure (SOP) 5028, Coordinating and Evaluating Geodetic Surveys, using a Trimble 5700 differential global positioning system. The surveyed coordinates for all sampling locations at sites included in this report are presented in Table 3.2-1. All geodetic coordinates are expressed as State Plane Coordinate System 1983, New Mexico Central, U.S.

3.2.2 Geophysical Surveys

A geophysical survey was performed at SWMU 03-029, a former landfill, to locate anomalies that could potentially represent areas of buried asphalt. Multiple geophysical methods were used to optimize the survey, including multianalysis of shear waves (MASW) method, and ground-penetrating radar (GPR). The survey consisted of six MASW profiles, and 16 GPR traverses within the survey area. Appendix E presents the geophysics report with individual profile results.

3.2.3 Field Screening

Environmental samples were analyzed for volatile organic compounds (VOCs) with a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7 electronvolt (eV), or 10.6 eV lamp. Calibration was performed in accordance with the manufacturer's specifications and SOP-06.33, Headspace Vapor Screening with a Photoionization Detector and recorded in the field logbook. After collection, the sample was placed in a sealed plastic bag and warmed for approximately five minutes. Screening measurements were recorded in the field sample collection logs (SCLs), chain of custody (COC) forms, and the field logbook. The SCLs and COC forms are provided on DVD in Appendix G. The VOC screening results for sites included in this report are presented in Table 3.2-2.

All samples collected were field-screened for radioactivity before they were submitted to the Sample Management office (SMO). A Laboratory radiological control technician (RCT) conducted radiological screening using an Eberline E-600 radiation meter with an SHP-380AB alpha/beta scintillation detector held within 1 in. of the sample. All field results for radioactivity were recorded in disintegrations per minute (dpm) on the field SCL/COCs. The SCLs and COC forms are provided on DVD in Appendix G. The radiological screening results for sites included in this report are presented in Table 3.2-2.

3.2.4 Surface and Shallow Subsurface Soil Investigation

Samples were collected according to the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721). Table 3.2-3 lists the proposed sampling locations for the sites included in this report, crosswalked to actual location identifiers. Surface samples were collected using the spade-and-scoop method in accordance with SOP-06.09, Spade and Scoop Method for Collection of Soil

Samples, or with a hand auger in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. The samples were collected in stainless-steel bowls and transferred to sample collection bottles with a stainless-steel spoon.

All surface and shallow subsurface samples were placed in appropriate sample containers and submitted to the laboratory for the analyses specified by the approved work plan. Standard quality assurance (QA)/quality control (QC) samples (field duplicates, field trip blanks, and rinsate blanks) were also collected in accordance with SOP-5059, Field Quality Control Samples.

All sample collection activities were coordinated with the SMO. After the samples were collected, they remained in the controlled custody of the field team at all times until they were delivered to the SMO. Sample custody was then relinquished to the SMO for delivery of samples to a preapproved off-site analytical laboratory (SCLs and COC forms on DVD in Appendix G).

3.2.5 Borehole Drilling and Subsurface Sampling

At locations where the required sampling depths could not be reached by hand augers, a hollow-stem auger drilling rig was used to collect subsurface samples. Samples were collected using stainless-steel core-barrel samplers. The samples were extracted from the core barrels and immediately put in a sample collection bottles.

Samples were collected from depth intervals based on criteria established in the approved work plan (LANL 2008, 103404.43; NMED 2008, 102721). All sampled core material was placed in the appropriate sampling containers, labeled, documented, and preserved (as appropriate) for transport to the SMO. Samples were submitted for laboratory analyses as specified by the approved work plan.

3.2.6 Borehole Abandonment

Boreholes were abandoned in accordance with SOP-5034, Monitoring Well and Borehole Abandonment. All boreholes were abandoned with 3/8-in. bentonite chips hydrated in 2-ft lifts from total depth to 2.0 ft below ground surface (bgs). The top 2.0 ft of each borehole was then capped with Portland type I/II cement to surface grade.

3.2.7 Test Pit Excavation

Four test pits were excavated at SWMU 03-009(i), an inactive surface disposal site consisting of construction debris, crushed tuff, pieces of concrete, rock, and fill. Two samples from each test pit were collected from 5.0 ft and 10.0 ft bgs to characterize the material. Test pits were excavated using a backhoe. During excavation activities, a PID was used to monitor the workers breathing zone to ensure worker safety. Excavated material was placed back in each test pit and contact waste was managed according to the approved waste characterization strategy form (WCSF).

3.2.8 Septic Tank Removal

During the 2009 investigation, the SWMU 60-006(a) septic tank was excavated and removed in accordance with the approved work plan (LANL 2008, 100693; NMED 2008, 102721). An excavator was used to remove the 1000-gal. concrete septic tank that was buried next to the canyon rim approximately 7.0 to 10.0 ft bgs. Plastic sheeting was placed at the bottom of the excavated pit as a marker before the overburden was replaced, and the excavation backfilled with clean fill to original grade. The 6-in. inlet drainline to the septic tank was plugged with concrete and the outlet drainline to the seepage pit was removed. Following the backfilling of the septic tank excavation, confirmation samples were collected in accordance with the approved work plan from three locations below the bottom of the septic tank excavation: at the former septic tank inlet, from the center of the tank footprint, and at the former septic tank outlet (LANL 2008, 100693; NMED 2008, 102721). Management of waste generated from the excavation and removal of the SWMU 60-006(a) septic tank, outlet drainline, and associated IDW is described in Appendix D.

The associated seepage pit was not removed as proposed in the investigation work plan because of site conditions (Appendix B, section B-10, Deviations).

3.2.9 Equipment Decontamination

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

3.2.10 Chemical and Radiological Sample Analyses

All investigation samples were shipped by the SMO to off-site contract analytical laboratories for the requested analyses. The analyses requested were as specified by the approved work plan (LANL 2008, 103404.43; NMED 2008, 102721). The samples were analyzed for all or a subset of the following: target analyte list (TAL) metals, total cyanide, nitrate, perchlorate, chromium hexavalent ion, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), VOCs, total petroleum hydrocarbons (TPH) diesel range organics (DRO), TPH–gasoline range organics (GRO), pesticides, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

Five inorganic chemicals were incorrectly added to the TAL metals analytical suite in Table 4.0-2 of the approved work plan (LANL 2008, 103404.43, p. 210; NMED 2008, 102721): boron, lithium, silicon dioxide, titanium, and uranium. These five inorganic chemicals are not related to any site or associated with processes in the Upper Sandia Canyon Aggregate Area. They were never previously investigated for, nor do they appear as COPCs in any report. The sampling results for boron, lithium, silicon dioxide, titanium, and uranium are presented with the all analyses data on DVD in Appendix G but are not evaluated in this report.

3.2.11 Health and Safety Measures

All 2009 investigation activities were conducted in accordance with a site-specific health and safety plan and an integrated work document that detailed work steps, potential hazards, hazard controls, and required training to conduct work. These health and safety measures included using modified Level-D personal protective equipment (PPE) in areas where elevated radiation was expected and field monitoring for VOCs, gross-alpha and gross-beta radiation, and dust-particulate matter using both portable and personnel air-monitoring systems.

3.2.12 IDW Storage and Disposal

All IDW generated during the Upper Sandia Canyon Aggregate Area field investigation was managed in accordance with EP-ERSS-SOP-5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of all applicable EPA and NMED regulations, DOE orders, and Laboratory implementation requirements, policies, and/or procedures. IDW was also managed in accordance with the approved WCSF. Details of IDW management for the Upper Sandia Canyon Aggregate Area investigation are presented in Appendix D.

The waste streams associated with the investigation included drill cuttings, contact waste, returned samples, concrete and asphalt debris, and solid waste. Each waste stream was containerized and placed in an accumulation area appropriate for the regulatory classification of the waste, in accordance with the approved WSCF.

3.3 Deviations

Deviations occurred while conducting field activities as defined in the approved work plan (LANL 2008, 103404.43; NMED 2008, 102721). The deviations did not adversely affect the completion or results of the investigation. Specific deviations are described in Appendix B, section B-10.

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 Upper Sandia Canyon Aggregate Area using NMED guidance (NMED 2012, 219971). Ecological risk-screening assessments were performed using Laboratory guidance (LANL 2012, 226715).

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 Upper Sandia Canyon Aggregate Area is currently industrial and is expected to remain industrial for the reasonably foreseeable future. A construction worker scenario is evaluated because underground utilities are present near or within the boundaries of various SWMUs and AOCs, and maintenance or repair of these underground utilities is a reasonable possibility in the foreseeable future. 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.

4.2 Screening Levels

Human health and ecological risk-screening evaluations were conducted for the COPCs detected in solid media at sites within the Upper Sandia Canyon Aggregate Area. The human health risk-screening assessments (Appendix I) were performed on inorganic and organic COPCs using NMED SSLs for the industrial, construction worker, and residential scenarios (NMED 2012, 219971). When an NMED SSL was not available for a COPC, SSLs were obtained from EPA regional tables (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) (adjusted to a risk level of 10^{-5} for carcinogens). Radionuclides were assessed using the Laboratory SALs for the same scenarios (LANL 2012, 228852). Surrogate SSLs were used for some COPCs for which no SSLs were available based on structural similarity or breakdown products.

NMED has developed screening guidelines for TPH (NMED 2012, 219971). The values used to screen TPH-DRO results are for diesel No. 2/crankcase oil. Unlike SSLs, the TPH-DRO screening guidelines are not strictly risk-based and were developed using assumed product compositions that may or may not represent the product that was actually released at a site or the constituents present after weathering. Because of the difference basis for toxicity, the TPH-DRO results are screened and presented separately from the other chemical results. Results of the TPH-DRO sampling, in conjunction with the chemical analyses, are used when making cleanup decisions. Potential human health and ecological risk are evaluated primarily based on the petroleum-related contaminants detected at a site, as determined by analysis of samples for SVOCs and VOCs. If samples were analyzed only for TPH-DRO and screening guidelines are exceeded, additional sampling and analysis for SVOCs and VOCs is recommended. There are no screening guidelines for TPH-GRO, and these data are only used as an indication of the potential source of petroleum contamination. Risk from the presence of gasoline-related constituents is evaluated based on screening to NMED and/or EPA SSLs.

Total chromium does not have an NMED or EPA SSL. Because the toxicity of chromium strongly depends on its oxidation state, NMED and EPA have SSLs for trivalent chromium and hexavalent chromium, rather than total chromium. For screening purposes, the SSLs for trivalent chromium are used for comparison to total chromium results unless there is a known or suspected source of hexavalent chromium at the SWMU or AOC and hexavalent chromium was not analyzed for in the samples. This approach is consistent with guidance from the Texas Commission on Environmental Quality (Stone 2002, 243627), which indicates that comparison of total chromium results to trivalent chromium screening levels is appropriate for low-level releases to soil from sources not typically associated with hexavalent chromium. Similarly, EPA recommends collecting valence-specific data for chromium when chromium is likely to be an important contaminant at a site and when hexavalent chromium may exist (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). Otherwise, total chromium data are used.

The only known source of hexavalent chromium use at SWMUs and AOCs in Upper Sandia Canyon Aggregate Area is historical use in the cooling towers. SWMUs 03-012(b) and 03-045(h) were potentially impacted by hexavalent chromium releases from cooling towers and samples from these sites were analyzed for total chromium and hexavalent chromium. Hexavalent chromium results for these sites are screened using the SSLs for hexavalent chromium. SWMUs 03-045(b) and 03-045(c) discharged, or may have discharged, cooling tower blowdown containing hexavalent chromium. Chromium was not detected above background at either of these sites. None of the other SWMUs and AOCs included in this supplemental investigation report are known or suspected sources of hexavalent chromium. Total chromium results for these sites are screened using the SSLs for trivalent chromium.

4.3 Ecological Screening Levels

The ecological risk-screening assessments (Appendix I) were conducted using ecological screening levels (ESLs) obtained from the ECORISK Database, Version 3.1 (LANL 2012, 226667). 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 3.1 (LANL 2012, 226667).

4.4 Cleanup Standards

As specified in the Consent Order, SSLs for inorganic and organic chemicals (NMED 2012, 219971) 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 2012, 228852). Screening assessments compare COPC concentrations for each site with industrial, residential, and construction worker SSLs and SALs.

The cleanup goals specified in Section VIII of the Consent Order are a target risk of 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 I 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 Upper Sandia 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 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).

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., if an organic chemical is detected, it is identified as a COPC). When assessing the nature of contamination, 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 (e.g., polycyclic aromatic hydrocarbon [PAHs]) may be eliminated as COPCs or may be retained as COPCs and addressed in the risk assessment uncertainty analysis.

5.1.1 Inorganic Chemical and Radionuclide Background Comparisons

The COPCs are identified for inorganic chemicals and radionuclides following SOP-5245, Background Value Comparisons—Inorganic Chemicals, and SOP-5246, Background Value Comparisons—Radionuclides. Inorganic COPCs are identified by comparing site data with BVs and maximum concentrations in a background dataset and using statistical comparisons, as applicable (LANL 1998, 059730). Radionuclides are identified as COPCs based on background comparisons and statistical methods if BVs or FVs are available or based on detection status if BVs or FVs have not been established.

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 dataset (upper tolerance limit [UTL] or the 95% upper confidence bound on the 95th quantile) or a detection limit (DL). When a BV is based on a DL, there is no corresponding background dataset 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 (10 or more sampling results), statistical tests are used to compare the site sample data with the background dataset 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 maximum background concentration for the appropriate media. If at least one sampling result is above the BV and the maximum background concentration, 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 to BVs for naturally occurring radionuclides or to 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. These radionuclides background have no datasets. 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 0.0–1.0 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 0.0–1.0 ft sample data are made with the fallout dataset and the radionuclide is eliminated as a COPC if activities are similar to fallout activities is based on statistical comparisons or comparisons to the maximum fallout concentration. 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 Upper Sandia 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 Qbt1g, Qbt2, Qbt3, and Qbt4). Because no separate BVs are available for fill material, fill samples are evaluated by comparison to soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples with soil samples in sample counts and comparisons to background. Fill samples are not discussed separately from soil. The units of the Upper Bandelier Tuff (Qbt2, Qbt3, and Qbt4) are likewise evaluated together with respect to background (LANL 1998, 059730).

5.1.2 Statistical Methods Overview

A variety of statistical methods may be applied to each of the datasets. The use of any of these methods depends on how appropriate the method is for the available data.

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 an 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 datasets are nondetections. It handles datasets 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 datasets 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 datasets, 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 dataset come from the site dataset than would be expected by chance, given the relative sizes of the site and background datasets. If the relative proportion of the two populations being tested is different in the top chosen quantile of the data than in 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 dataset, 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.

Occasionally, 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 dataset 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 dataset 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 dataset (number of samples from the site and number of samples from background) and determines the probability of "n" (or more) exceedances if the two datasets 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.

For all statistical tests, a p-value less than 0.05 was the criterion for accepting the null hypothesis that site sampling results are not different from background.

5.1.2.2 Graphical Presentation

Box plots are provided 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 H 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 dataset 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 to 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 is conducted using 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, comparison with the relevant SSL/SAL may also be conducted if the residential SSL/SAL is exceeded or otherwise similar to COPC concentrations. For all SWMUs and AOCs in Upper Sandia 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 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 using 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.

Several inorganic chemicals (calcium, magnesium, potassium, and sodium) may be COPCs but do not have SSLs. These constituents are essential nutrients and their maximum concentrations are compared with recommended daily allowances. If the maximum concentration is less than the recommended daily allowance, no additional sampling for extent is warranted.

6.0 TA-03 BACKGROUND AND FIELD-INVESTIGATION RESULTS

Thirty-five sites (26 SWMUs and 9 AOCs) located in TA-03 are addressed in this supplemental investigation report (Table 1.1-1). Each site is described separately in sections 6.2 through 6.23, including the site's description and operational history; relationship to other SWMUs and AOCs; previous investigations; site contamination results based on decision-level data from the current and previous investigations; and summaries of human health and ecological risk screening assessments.

Plates 1 through 20 present the sampling locations and inorganic chemical, organic chemical, and radionuclide concentrations at TA-03 sites.

6.1 Background of TA-03

6.1.1 Operational History

TA-03 occupies a large area located near the western end of South Mesa between Los Alamos Canyon to the north and Mortandad Canyon to the south (Figure 2.1-1). Sandia and Mortandad Canyons originate within TA-03 and divide the eastern two-thirds of the area into fingerlike projections. The middle mesa where most of TA-03 is located is called Sigma Mesa (LANL 1999, 064617, p. 2-11). The core operational facilities for the Laboratory are located at TA-03, including the principal administration buildings, library, the Chemistry and Metallurgy Research (CMR) Building, Beryllium Technology Facility, a gas-fired electrical generating plant, and a former sanitary wastewater treatment plant (WWTP) and supporting structures.

TA-03 was originally built as a firing site before 1945. It contained several wooden structures that served as an administration building, a shop, hutments (10- × 10-ft fiberboard buildings used for storage, minor assembly, and checkout of scientific hardware), and magazines. The area also contained a burn pit for destroying explosives (LASL 1947, 005581). The site was decommissioned and cleared in 1949.

In the early 1950s, operational facilities from TA-01 (located in the Los Alamos townsite) were relocated to TA-03. Early TA-03 facilities included the Van de Graaff accelerator building, a laboratory and support structures, the communications building, the CMR Building, the general and chemical warehouses, the cryogenics laboratory, the administration building, the Sigma Building, a fire house, and the physics building. Additional new construction continued through the 1960s and 1970s, when storage areas, shops, office buildings, a WWTP, a cement batch plant, and other transportable structures were added.

The Administration Building was completed in 1956 and used until 2008; demolition of the building was completed in 2011. In addition to offices, it housed laboratory and shop facilities and extensive photographic operations. In 1959, the Sigma Building (building 03-66) was completed at the eastern end of the site. The building now houses a complex array of equipment and activities concerned with metallurgical and ceramics research and fabrication.

A solar pond was built in the 1970s on the eastern end of Sigma Mesa to test the feasibility of reducing the volume of low-level radioactive wastewater from TA-50. The experiment was unsuccessful, and the pond was abandoned. A mobile equipment repair shop and warehouse were built at TA-03 in 1972. Support structures for these facilities included automotive repair, a gas station, and a steam-cleaning facility surrounding the repair shop and warehouse. Office buildings, shops, storage areas, an addition to the WWTP, a cement batch plant, and numerous transportable buildings were located in the areas between the former buildings.

The Oppenheimer Study Center was constructed in 1977, and an annex was added to the administration building in 1981. In 1979, a geothermal test well was drilled at the eastern end of Sigma Mesa. The site was not suitable for geothermal development, and the experiment was terminated. A small pesticide storage shed was assembled in 1984 just east of the test rack assembly enclosure, and other areas on the mesa were historically designated as storage sites (LANL 1999, 064617, p. 2-25). A test rack facility was built in 1985 to assemble racks for use in underground testing of nuclear devices at Nevada Test Site (NTS). A computer laboratory and several centers for various scientific activities were built during the 1990s (LANL 1999, 064617, p. 2-11).

The Syllac Building (building 03-287) underwent D&D from 2003 to 2004, and the Sherwood Complex (building 03-105) underwent D&D in 2001 to make way for the construction of the National Security Sciences Building (NSSB) (03-1400), which replaced the Administration Building. D&D activities included the removal of buildings 03-105, 03-287, all existing storm drains, all existing asphalt paving, and fill directly beneath the asphalt. The entire area was graded and leveled, and approximately 10 ft of clean fill was placed over the entire site to accommodate the NSSB and associated infrastructure. The TA-03 service garage (former building 03-36) was removed in 1999 to prepare for the construction of building 03-2327, the Nicholas C. Metropolis Computing Center. During the demolition of the garage, the structure and all associated infrastructure including drainlines, hydraulic lift wells, and underground storage tanks were removed. Soil below the footprint of the garage was excavated and removed to a depth of approximately 15 ft below grade to accommodate the foundation of building 03-2327.

The Upper Sandia Canyon Aggregate Area includes only part of TA-03. The SWMUs and AOCs that drain to Los Alamos Canyon are discussed in the approved investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2010, 108528; NMED 2010, 109195). The SWMUs and AOCs that drain to Mortandad Canyon are discussed in the approved investigation report for Upper Mortandad Canyon Aggregate Area (LANL 2010, 109180.28; NMED 2010, 109653). The SWMUs and AOCs that drain to Twomile Canyon are discussed in the approved work plan for Twomile Canyon Aggregate Area (LANL 2010, 109520; NMED 2010, 109652).

6.1.2 Summary of Releases

Potential contaminants at TA-03 may have been released into the environment through drainages, outfalls, firing sites, liquid spills, leaks, or operational releases.

6.1.3 Current Site Usage and Status

TA-03 is almost completely developed. Roads and large paved parking areas surround the buildings. Unpaved areas are usually landscaped. Several building complexes are fenced for controlled access.

6.2 SWMU 03-002(c), Former Storage Area

6.2.1 Site Description and Operational History

SWMU 03-002(c) is the site of a former 19-ft × 15-ft wooden storage shed (former structure 03-1494) that was located 100 ft west of the former Johnson Controls, Inc., administrative office (former building 03-70) (Figure 6.2-1). From the early 1960s to 1984, the shed was used to store containers of liquid and powdered pesticides and herbicides. The shed was removed in 1989 and the floor was disposed of as hazardous waste (LANL 1993, 020947). Between 1994 and 1996, the original concrete pad beneath the shed was surrounded by a new concrete pad that covered the site (LANL 1996, 052930, p. 41). The eastern portion of the concrete pad was paved over with asphalt in 2003 as part of the construction of an access road and parking lot (LANL 2008, 099214).

6.2.2 Relationship to Other SWMUs and AOCs

SWMU 03-002(c) is located approximately 100 ft west of former building 03-70 and 50 ft north of the former asphalt batch plant, Consolidated Unit 03-009(a)-00.

6.2.3 Summary of Previous Investigations

During the 1994 Phase I Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) conducted at SWMU 03-002(c), four soil samples were collected from four locations beneath the concrete pad from a depth of 0.0–0.5 ft bgs (LANL 1996, 052930, p. 41). At the fifth location, downgradient of the concrete pad, a surface soil sample was collected from a depth of 0.0–0.25 ft bgs. All samples were submitted for laboratory analyses of TAL metals; SVOCs; PCBs; pesticides; herbicides; gross-alpha, -beta, and -gamma radiation; and tritium. One sample collected from the depth interval of 0.0–0.5 ft was also submitted for laboratory analysis of VOCs (LANL 1996, 052930, p. 44). Data from the 1994 RFI are screening-level data and are summarized below. Section 2.1 of the Upper Sandia Canyon Area historical investigation report (HIR) presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Cadmium, manganese, mercury, and silver were each detected above BVs in one sample; zinc and calcium were each detected above BVs in two and three samples, respectively. Organic chemicals and radionuclides were not detected.

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 03-002(c). As a result, the following activities were completed as part of the 2009 investigation.

- Eight samples were collected from four locations to confirm the results of the previous investigation. At each location, samples were collected from 0.0–1.0 ft bgs and at the soil-tuff interface. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, pesticides, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-002(c) are shown in Figure 6.2-1. Table 6.2-1 presents the samples collected and analyses requested for SWMU 03-002(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.2.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-002(c), a maximum concentration of 2.3 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-002(c) consist of eight soil samples collected from four locations.

Inorganic Chemicals

Eight soil samples were analyzed for TAL metals and cyanide. Table 6.2-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 1 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.1 mg/kg to 1.3 mg/kg) above the BV in seven soil samples. The DLs were also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Beryllium was detected above the soil BV (1.83 mg/kg) in 1 sample at a concentration of 1.96 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (3.95 mg/kg). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.533 mg/kg to 0.652 mg/kg) above the soil BV in eight samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in 3 samples. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentrations were below the maximum soil background concentration (36.5 mg/kg). Chromium is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in 1 sample with a maximum concentration of 37.7 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The maximum concentration was above the maximum soil background concentration (28 mg/kg). Lead is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in 4 samples with a maximum concentration of 2730 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The maximum concentration was above the maximum soil background concentration (1800 mg/kg). Sodium is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in 1 sample at a concentration of 0.931 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (1 mg/kg). Thallium is not a COPC.

Organic Chemicals

Eight soil samples were analyzed for SVOCs, VOCs, pesticides, and PCBs. Table 6.2-3 summarizes the analytical results for detected organic chemicals. Plate 2 shows the spatial distribution of detected organic chemicals.

The organic chemicals detected at SWMU 03-002(c) included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, gamma-chlordane, chrysene, 4,4'-dichlorophenyltrichloroethylene (DDT), fluoranthene, phenanthrene, and pyrene. All detected organic chemicals are retained as COPCs.

6.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-002(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-002(c) include antimony, lead, and sodium.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.1 mg/kg to 1.3 mg/kg) above the BV in seven samples. Because antimony was not detected above the BV and the residential SSL was approximately 24 times to 28 times the DLs, further sampling for extent of antimony is not warranted.

Lead was detected above the soil BV (22.3 mg/kg) in 1 sample at a concentration of 37.7 mg/kg. The concentration was less than 10 mg/kg above the maximum soil background concentration (28 mg/kg), and the residential SSL was approximately 10 times the concentration. In addition, the residential lead hazard quotient (HQ) was 0.09 and the residential HI was 0.1. Further sampling for extent of lead is not warranted.

Sodium was detected above the soil BV (915 mg/kg) in four samples with a maximum concentration of 2730 mg/kg. The concentrations were below the adequate intake (the recommended daily allowance cannot be calculated) for younger and older adults (Appendix I). Further sampling for extent of sodium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-002(c) include benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; gamma-chlordane; chrysene; 4,4'-DDT; fluoranthene; phenanthrene; and pyrene.

Benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; gamma-chlordane; chrysene; 4,4'-DDT; fluoranthene; phenanthrene; and pyrene were detected in one sample. Concentrations decreased with depth and were below the EQLs, and residential SSLs ranged from 10 times the detected concentration [benzo(a)pyrene] to 85,000 times the detected concentration (fluoranthene). The vertical extent of the COPCs is defined, and further sampling for lateral extent is not warranted.

6.2.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 9×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 1×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.07, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-002(c).

6.2.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-002(c).

6.3 AOC 03-003(d), Transformer Pad—PCB Only Site

6.3.1 Site Description and Operational History

AOC 03-003(d) is a concrete pad located east of building 03-141 where two former PCB-containing transformers, structures 03-146 and 03-176, were located (Figure 6.3-1). These transformers (PCB identification numbers 5008 and 5009) contained dielectric fluid with PCB concentrations greater than 500 ppm and were removed in 1991 and 1992, respectively, in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (LANL 1995, 057590). Because no stains were visible on the concrete pad after the transformers were removed, the area was considered free of contamination, and new non-PCB transformers were relocated on the same concrete pad. Additional concrete was added to extend the existing pad in 1993 (LANL 1995, 057590, p. 6-63).

6.3.2 Relationship to Other SWMUs and AOCs

AOC 03-003(d) is located approximately 60 ft south of SWMU 03-056(l), a former storage area, and AOC 03-051(c), a former area of stained asphalt attributed to operational leaks of vacuum pump oil. Neither of these sites is associated with AOC 03-003(d).

6.3.3 Summary of Previous Investigations

No previous investigations have been conducted at AOC 03-003(d).

6.3.4 Site Contamination

6.3.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at AOC 03-003(d):

- One concrete chip sample (made up of five concrete chips) was collected from the pad and analyzed at an off-site fixed laboratory to determine if PCBs are present.
- Ten soil samples were collected from five locations to determine if PCBs have migrated from the concrete pad. Samples were collected from beneath the concrete pad and from around the concrete pad at 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for PCBs. All soil samples were field-screened for VOCs and for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-003(d) are shown in Figure 6.3-1. Table 6.3-1 presents the samples collected and analyses requested at AOC 03-003(d). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.3.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 03-003(d), a maximum concentration of 8.4 ppm was detected at a depth of 1.0–2.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-003(d) consist of 10 soil samples collected from 5 locations and 1 concrete chip sample.

Organic Chemicals

Eleven samples were analyzed for PCBs. Table 6.3-2 summarizes the analytical results. Plate 15 shows the spatial distribution of PCBs detected. Organic COPCs at AOC 03-003(d) include Aroclor-1254 and Aroclor-1260.

6.3.4.4 Nature and Extent of Contamination

Organic COPCs at AOC 03-003(d) include Aroclor-1254 and Aroclor-1260.

Organic Chemicals

Aroclor-1254 was detected in one sample at a concentration of 0.19 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent for Aroclor-1254 are defined.

Aroclor-1260 was detected in 1 concrete chip sample and 10 soil samples with a maximum concentration of 0.965 mg/kg. Concentrations decreased with depth at all locations, except at location 03-608161, and decreased laterally from the pad. The residential SSL was 450 times the detected concrete concentration and 2.3 times the maximum soil concentration (location 03-608161) and the residential cancer risk was approximately 3×10^{-6}. The industrial SSL was approximately 9 times the maximum soil concentration and the industrial cancer risk was approximately 8×10^{-7}. The lateral extent of Aroclor-1260 is defined, and the vertical extent of Aroclor-1260 is not defined at location 03-608161.

6.3.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). Noncarcinogenic COPCs were not identified for the industrial scenario.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 7×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 0.04, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 3×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at AOC 03-003(d).

6.3.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for threatened and endangered [T&E] species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-003(d).

6.4 Consolidated Unit 03-009(a)-00

Consolidated Unit 03-009(a)-00 includes SWMUs 03-009(a), 03-028, 03-029, 03-036(a), 03-036(c), 03-036(d), and 03-045(g) and AOCs 03-043(b), 03-043(d), and 03-043(h). All these sites are associated with the former asphalt batch plant operations. Three of these sites [SWMUs 03-009(a), 03-029, and 03-045(g)] were included in the Phase II investigation work plan for Upper Sandia Canyon Aggregate Area (LANL 2011, 206234) and are discussed below. The remaining seven sites received certificates of completion and are not included in this supplemental investigation report.

The disposal sites within this consolidated unit contained items such as concrete, cured asphalt, and soil. Components of these materials include asphalt, petroleum hydrocarbons, water, and light distillates (LANL 1995, 057590, p. 6-15).

6.4.1 SWMU 03-009(a), Surface Disposal

6.4.1.1 Site Description and Operational History

SWMU 03-009(a) is a 30-ft × 300-ft fill area located on the rim of a small tributary of Sandia Canyon south of the former TA-03 asphalt batch plant (LANL 1993, 020947, p. 6-16) (Figure 6.2-1). The fill was generated by asphalt plant operations and contained small amounts of concrete, crushed tuff, and asphalt road construction debris. A 20-ft section of asbestos pipe was observed at SWMU 03-009(a) in 1990; however, the pipe was not found during a 1992 site visit (LANL 1993, 020947, p. 6-17).

6.4.1.2 Relationship to Other SWMUs and AOCs

This surface disposal site contains concrete and asphalt debris from the batch plant and is therefore related to all the SWMUs and AOCs in Consolidated Unit 03-009(a)-00. SWMU 03-009(a) is located about 100 ft east of AOC 03-036(b), the former site of two 25- to 50-gal. aboveground storage tanks containing No. 2 diesel fuel. It is about 200 ft southeast of the former asphalt batch plant structure 03-73 and other SWMUs/AOCs in Consolidated Unit 03-009(a)-00, including SWMU 03-028, and the former sites of aboveground storage tanks at SWMUs 03-036(a,c,d).

6.4.1.3 Summary of Previous Investigations

During the 2003 RFI conducted at SWMU 03-009(a), three boreholes were advanced to a depth of 20 ft bgs and every 5-ft length of core was field-screened for TPH-DRO to guide sample collection (LANL 2003, 079747). Borehole logs confirm fill material to be present to a depth of approximately 16 ft bgs at the south end of the site and to a depth of approximately 4 ft bgs at the north end of the site. Samples were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, TPH-DRO, and TPH-GRO.

Selenium was detected above BV in two tuff samples, methylene chloride was detected in the fill sample and two tuff samples, and tetrachloroethene was detected in the fill sample. SVOCs, TPH-DRO, and TPH-GRO were not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.4.1.4. Table 6.4-1 presents the samples collected and analyses requested at SWMU 03-009(a).

6.4.1.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-009(a). As a result, the following activities were completed as part of the 2009 investigation.

- Eleven samples were collected from three boreholes to define the vertical extent of contamination. At each location, samples were collected from the soil-tuff interface, 9.0–10.0 ft, 11.5–12.0 ft, 14.0–15.0 ft, and 19.0–20.0 ft bgs. At location 03-608180, only three of the four proposed samples were collected because the soil-tuff interface corresponded to the 9.0–10.0 ft bgs interval (see deviations in Appendix B). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- Four samples were collected from two locations downgradient of the site to define the lateral extent of contamination. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-009(a) are shown in Figure 6.2-1. Table 6.4-1 presents the samples collected and analyses requested at SWMU 03-009(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-009(a), a maximum concentration of 35.6 ppm was detected at a depth of 9.0–10.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-009(a) consist of 21 samples (8 soil and 13 tuff) collected from eight locations.

Inorganic Chemicals

Twenty-one samples were analyzed for TAL metals, and 15 samples were analyzed for cyanide (7 soil and 8 tuff). Table 6.4-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 1 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 (0.742 mg/kg to 1.78 mg/kg) above the BVs in 15 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.503 mg/kg to 0.584 mg/kg) above the BV in 6 samples. Because less than 10 soil samples were collected, statistical tests could not be performed. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in 1 sample at a concentration of 13,400 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (14,000 mg/kg). Calcium is not a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in six samples with a maximum concentration of 65.8 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Table H-1 and Figure H-1). Chromium 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 58.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Table H-1 and Figure H-1). Lead is not a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in one sample at a concentration of 530 mg/kg. The Gehan test indicated site concentrations of manganese in tuff are statistically different from background (Table H-1). However, the maximum concentration was below the maximum tuff background concentration (752 mg/kg), and the quantile and slippage tests indicated concentrations of manganese in tuff are not statistically different from background (Table H-1 and Figure H-2). Manganese is not a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in two samples with a maximum concentration of 0.48 mg/kg and had DLs (1.06 to 1.19 mg/kg) above the BV in eight samples. Selenium is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in 1 sample at a concentration of 1160 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (1800 mg/kg). Sodium is not a COPC.

Organic Chemicals

Twenty-one samples were analyzed for SVOCs, VOCs and TPH-DRO. Fifteen samples were analyzed for PCBs (seven soil and eight tuff). Six samples were analyzed for TPH-GRO (one soil and five tuff). Table 6.4-3 summarizes the analytical results for detected organic chemicals. Plate 2 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-009(a) include acenaphthene; anthracene; 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; sec-butylbenzene; chrysene; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; 1-propylbenzene; pyrene; TPH-DRO; tetrachloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-009(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-009(a) include antimony, chromium, and selenium.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.742 mg/kg to 1.78 mg/kg) above the BVs in 15 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 17 times the maximum DL, further sampling for extent of antimony is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in six samples with a maximum concentration of 65.8 mg/kg. Chromium was not detected above the BV at downgradient locations 03-22538, 03-608181, and 03-608182. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 1800 times to 8300 times the concentrations above the BV. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Selenium was detected above Qbt 2,3,4 BV in two samples with a maximum concentration of 0.48 mg/kg and had DLs (1.06 mg/kg to 1.19 mg/kg) above the BV in eight samples. Concentrations decreased with depth at location 03-22539 and selenium was not detected above the BV at downgradient locations 03-608181 and 03-608182. The residential SSL was approximately 810 times the detected concentrations above the BV and approximately 330 times the maximum DL. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-009(a) include acenaphthene; anthracene; 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; sec-butylbenzene; chrysene; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; 1-propylbenzene; pyrene; TPH-DRO; tetrachloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Butylbenzene(sec-); ethylbenzene; isopropylbenzene; 1-propylbenzene; tetrachloroethene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene were detected in one or two samples. Concentrations decreased with depth at location 03-608178 and were below the EQLs at location 03-608181. Concentrations decreased downgradient. The residential SSLs were approximately 12,500 times (tetrachloroethene) to 19,000,000 times (sec-butylbenzene) the maximum concentrations. The lateral and vertical extent of these COPCs are defined.

Isopropyltoluene(4-) and 1,2,4-trimethylbenzene were detected in two samples with maximum concentrations of 0.00183 mg/kg and 0.00206 mg/kg. Concentrations decreased with depth at location 03-608178 and were below the EQLs at location 03-608181. Concentrations decreased downgradient. The residential SSLs were approximately 30,000 times and 1,800,000 times the maximum concentrations. The lateral and vertical extent of 4-isopropyltoluene and 1,2,4-trimethylbenzene are defined.

Methylene chloride was detected in four samples with a maximum concentration of 0.031 mg/kg. Concentrations of methylene chloride decreased with depth at locations 03-22538 and 03-608180 and did not change substantially with depth at location 03-22539 (0.01 mg/kg). Concentrations decreased downgradient. The residential SSL was approximately 13,000 times the maximum concentration. The lateral extent of methylene chloride is defined, and further sampling for vertical extent is not warranted.

Aroclor-1254 and Aroclor-1260 were detected in one and three samples with maximum concentrations of 0.0396 mg/kg and 0.0382 mg/kg, respectively. Aroclor-1254 and Aroclor-1260 concentrations decreased with depth at location 03-608178, and Aroclor-1260 concentrations decreased with depth at location 03-608181. The Aroclor-1260 concentration detected at location 03-608182 was below the EQL. Aroclor-1254 and Aroclor-1260 decreased downgradient. The residential SSLs were approximately 29 times and 58 times the maximum concentrations. The residential HQ for Aroclor-1254 was approximately 0.04 and the residential cancer risk for Aroclor-1260 was approximately 2×10^{-7}. The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.148 mg/kg. The concentration was below the EQL and decreased with depth at location 03-608178. Bis(2-ethylhexyl)phthalate was not detected at downgradient locations 03-22538, 03-608181, and 03-608182. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Acenaphthene anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were detected in 1 to 10 samples. Concentrations decreased with depth at locations 03-608178, 03-608179, and 03-608180. Concentrations decreased downgradient and were below the EQLs for fluorene. The lateral and vertical extent of these COPCs are defined.

TPH-DRO was detected in nine samples with a maximum concentration of 226 mg/kg. Concentrations decreased with depth at locations 03-608178 and 03-608180 and decreased downgradient. The residential screening guideline for diesel No. 2/crankcase oil was approximately 4 times to 300 times the concentrations. The industrial screening guideline for diesel No. 2/crankcase oil was approximately 8 times the maximum concentration. The HQ for the residential screening guideline was approximately 0.09. Further sampling for extent of TPH-DRO is not warranted.

6.4.1.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.01.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.01, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.05.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-5}, which is above the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The HI is 0.05, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the residential screening guideline for diesel No. 2/crankcase oil is 0.09.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial and construction worker scenarios at SWMU 03-009(a). A potential unacceptable cancer risk exists for the residential scenario, but the residential HI is less than 1 at SWMU 03-009(a).

6.4.1.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-009(a).

6.4.2 SWMU 03-029, Landfill

6.4.2.1 Site Description and Operational History

SWMU 03-029 was reportedly a 30-ft × 70-ft asphalt landfill located approximately 300 ft south of building 03-271 near the rim of Sandia Canyon (Figure 6.4-1). The landfill reportedly received excess asphalt from the batch plant and was subsequently covered with sand. The fill raised and leveled the surface areas at the mesa rim (LANL 1999, 064617, p. 2-17). NMED issued a notice of violation to the Laboratory in November 1990 concerning pieces of asphalt and an oily sheen found in the Sandia Canyon watercourse below building 03-73 (LANL 1995, 057590, p. 6-23). In early 1993, the Laboratory completed a corrective action next to SWMU 03-029 to remove the asphalt within the drainage to the south and on the associated slope, regrade the watercourse and slope to support vegetation, extend the drainage, and construct a concrete berm to prevent additional exposure of asphalt buried in the fill. Dense grass cover was seeded and maintained on all fill slopes and disturbed areas (LANL 1995, 057590, p. 6-24). Water samples collected from the storm drain indicated that oil, grease, or other chemicals typically associated with asphalt-plant operations were not present (LANL 1995, 057590 p. 6-24).

In 2004, an accelerated corrective action (ACA) was proposed to complete the investigation and remediation of SWMU 03-029 to accommodate the Laboratory's security perimeter road project. SWMU 03-029 was situated near the proposed location for the security perimeter road (LANL 2004, 087474, p. 1). In May 2005, GPR and electromagnetic surveys were conducted at SWMU 03-029. The results identified two possible locations for buried asphalt, which were further investigated by trenching. In July 2005, a total of 12 trenches were excavated to the top of bedrock, approximately 2.0–4.0 ft bgs, and varied in length from 20 ft to greater than 100 ft. Buried asphalt was not encountered in any of the trenches (LANL 2005, 091150, p. 10). Because buried asphalt was not encountered, the remaining proposed ACA activities for SWMU 03-029 were not implemented (LANL 2005, 091150, p. 29).

6.4.2.2 Relationship to Other SWMUs and AOCs

SWMU 03-029 reportedly received excess asphalt from the batch plant, and is therefore related to the other SWMUs and AOCs in Consolidated Unit 03-009(a)-00. SWMU 03-029 is located approximately 200 ft east of SWMU 03-009(a). SWMU 03-029 is approximately 100 ft south of SWMU 03-059 and receives drainage from the former salvage yard. Both SWMUs 03-029 and 03-059 are located south of building 03-271.

6.4.2.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-029.

6.4.2.4 Site Contamination

Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-029 to assess potential contamination.

- A geophysical survey was conducted to locate potential buried waste (Appendix E).
- Six samples were collected from two locations to define the nature and extent of contamination potentially associated with the landfill. At each location, samples were collected from the soil-tuff interface, 4.0–5.0 ft and 9.0–10.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- Four samples were collected from two locations between the canyon edge and canyon bottom on the slope below SWMU 03-029. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All investigation samples were field-screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-029 are shown in Figure 6.4-1. Table 6.4-4 presents the samples collected and analyses requested at SWMU 03-029. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-029, no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-029 consist of 10 samples (eight soil and two tuff) collected from four locations.

Inorganic Chemicals

Ten samples were analyzed for TAL metals (eight soil and two tuff), and seven samples were analyzed for cyanide (five soil and two tuff). Table 6.4-5 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 4 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 (1.06 mg/kg to 1.11 mg/kg) above the BVs in 10 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Arsenic was detected above the soil BV (8.17 mg/kg) in 1 sample at a concentration of 8.7 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (9.3 mg/kg). Arsenic is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.53 mg/kg to 0.556 mg/kg) above the BV in eight samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in 1 sample at a concentration of 12,200 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (14,000 mg/kg). 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 1 soil sample and 2 tuff samples. Because less than 10 samples were collected, statistical tests could not be performed. The concentration in soil (19.6 mg/kg) was below the maximum soil background concentration (36.5 mg/kg), and 1 concentration in tuff (11.2 mg/kg) was below the maximum Qbt 2,3,4 background concentration (13 mg/kg). The other tuff concentration (22 mg/kg) was above the maximum Qbt 2,3,4 background concentration. Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in 2 samples with a maximum concentration of 40.5 mg/kg. Because there were less than 10 samples, statistical tests could not be performed. Concentrations were above the maximum soil background concentration (16 mg/kg). Copper is retained as a COPC.

Iron was detected above the soil BV (21,500 mg/kg) in 1 sample at a concentration of 34,900 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (36,000 mg/kg). Iron is not a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.09 mg/kg to 1.12 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Organic Chemicals

Ten samples were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.4-6 summarizes the analytical results for detected organic chemicals. Plate 5 shows the spatial distribution of detected organic chemicals.

The organic chemicals detected at SWMU 03-029 include Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-029 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-029 include antimony, chromium, copper, and selenium.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.06 mg/kg to 1.11 mg/kg) above the BVs in eight soil samples and two tuff samples. Because antimony was not detected above the BVs and the residential SSL was 28 times the maximum DL, further sampling for extent of antimony is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in one and two samples, respectively, with a maximum concentration of 22 mg/kg. The concentration at location 03-608183 was below the maximum soil background concentration (36.5 mg/kg). Concentrations were similar across the site (ranging from 6.86 mg/kg to 22 mg/kg). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 5300 times to 13,700 times the concentrations above the BVs. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil BV in two samples with a maximum concentration of 40.5 mg/kg. The residential SSL was approximately 77 times to 165 times the concentrations above the BV. Further sampling for extent of copper is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.09 mg/kg to 1.12 mg/kg) above the BV in two samples. Because selenium was not detected above the BV and the residential SSL was approximately 350 times the maximum DL, further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-029 include Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO.

Aroclor-1254 and Aroclor-1260 were detected in five and four samples with maximum concentrations of 0.0296 mg/kg and 0.0261 mg/kg, respectively. Concentrations decreased with depth or did not change substantially with depth and decreased downgradient. The residential SSLs were 38 times and 85 times the maximum concentrations, respectively. The lateral extent of Aroclor-1254 and Aroclor-1260 is defiend, and further sampling for vertical extent is not warranted.

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in one sample. Concentrations decreased with depth, were below the EQLs, and decreased downgradient. The lateral and vertical extent of these organic COPCs are defined.

TPH-DRO was detected in five samples with a maximum concentration of 5 mg/kg. The concentrations decreased with depth, were below the EQLs, and decreased downgradient. The lateral and vertical extent of TPH-DRO is defined.

6.4.2.5 Summary of Human Health Risk Screening Assessments

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.003.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.06, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.005.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-029.

6.4.2.6 Summary of 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 the relationship of detected concentrations and DLs to background concentrations, 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 03-029.

6.4.3 SWMU 03-045(g), Storm Drain

6.4.3.1 Site Description and Operational History

SWMU 03-045(g) consists of a closed and locked storm drain at the former TA-03 asphalt batch plant that is connected to an outfall, formerly permitted under the EPA National Pollutant Discharge Elimination System (NPDES) as outfall EPA 04A109 (LANL 1993, 020947, p. 6-12) (Figure 6.2-1). The outfall discharged to a tributary of Sandia Canyon directly south of the former asphalt batch plant. The storm drain has been closed and locked since late 1990. Outfall 04A109 had been permitted for the discharge of noncontact cooling water and was removed from the NPDES permit in 1994 (LANL 1999, 064617, p. 2-7). Since 1987, the only discharges from the asphalt plant to the outfall were scrubber water used to collect dust from batching operations (SWMU 03-028) diverted to wash vehicles and equipment and from storm water from the western portion of the batch plant area. Storm water from parking lots, roads, storm drain, and roof drains located in the northwest portion of TA-03 also discharged and continue to discharge to the outfall area in the in the tributary of Sandia Canyon.

6.4.3.2 Relationship to Other SWMUs and AOCs

This former outfall discharged scrubber water from the surface impoundment, SWMU 03-028, and storm water from the SWMUs, AOCs, and surrounding paved and unpaved areas associated with the former asphalt batch plant; these are all part of Consolidated Unit 03-009(a)-00. The SWMU is located about 200 ft south of the former asphalt plant structure 03-73.

6.4.3.3 Summary of Previous Investigations

In 2003, four sediment samples were collected within the catch basin of the closed storm drain (located approximately 150 ft north of the outfall). The four samples were collected from two locations at depths of 0.0–0.5 ft bgs and 1.5–2.0 ft bgs and submitted for laboratory analyses of TAL metals, VOCs, SVOCs, TPH-DRO, and TPH-GRO (Shaw Environmental Inc. 2003, 085517, pp. 10, 26).

Arsenic and lead were detected above BVs in one sample. Cadmium, cobalt, iron, manganese, potassium, and sodium were detected above BVs in two samples. Barium, copper, vanadium, and zinc were detected above BVs in three samples. Calcium, chromium, magnesium, and nickel were detected above BVs in all four samples. Butylbenzene(n-), 4-isopropyltoluene, trichloroethene (TCE), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and TPH-GRO were detected in one sample. Benzo(g,h,i)perylene was detected in two samples. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, and phenanthrene were detected in three samples. Methylene chloride, bis(2-ethylhexyl)phthalate, fluoranthene, and pyrene were detected in all four samples. TPH-DRO was not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.4.3.4. Table 6.4-7 presents the samples collected and analyses requested at SWMU 03-045(g).

6.4.3.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-045(g). As a result, the following activities were completed as part of the 2009 investigation.

- Four samples were collected from location 03-22536 and one location above the inlet. At each location, samples were collected from 1.0–2.0 ft and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, TPH-GRO, and cyanide.
- Four samples were collected from two locations downgradient of the outfall within the drainage to determine the lateral extent of contamination. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, TPH-GRO, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-045(g) are shown in Figure 6.2-1. Table 6.4-7 presents the samples collected and analyses requested at SWMU 03-045(g). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.4.3.5 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-045(g), a maximum concentration of 109 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.4.3.6 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(g) consist of 12 samples (6 soil, 2 tuff, and 4 sediment) collected from 5 locations.

Inorganic Chemicals

Twelve samples were analyzed for TAL metals (six in soil, two in tuff, four in sediment). Eight samples were analyzed for cyanide (six in soil and two in tuff). Table 6.4-8 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 1 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 (1.01 mg/kg to 1.09 mg/kg) above the BVs in eight samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Arsenic was detected above the sediment BV (3.98 mg/kg) in 1 sample at a concentration of 4.2 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentration was above the maximum sediment background concentrations (3.6 mg/kg). Arsenic is retained as a COPC.

Barium was detected above the sediment BV (127 mg/kg) in 3 samples with a maximum concentration of 262 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (127 mg/kg). Barium is retained as a COPC.

Cadmium was detected above the sediment BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.93 mg/kg. Cadmium also had DLs (0.503 mg/kg to 0.547 mg/kg) above the soil BV (0.4 mg/kg) in 5 samples. Because less than 10 soil and sediment samples were collected, statistical tests could not be performed. Concentrations were above the maximum sediment background concentration (0.18 mg/kg) and the DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is retained as a COPC.

Calcium was detected above the soil and sediment BVs (6120 mg/kg and 4420 mg/kg) in 3 soil samples and 4 sediment samples with a maximum concentration of 66,000 mg/kg. Because less than 10 soil and sediment samples were collected, statistical tests could not be performed. Concentrations were above the maximum soil and sediment background concentration (14,000 mg/kg and 4240 mg/kg, respectively). Calcium is retained as a COPC.

Chromium was detected above the soil and sediment BV (19.3 mg/kg and 10.5 mg/kg) in 4 soil samples and 4 sediment samples with a maximum concentration of 58.7 mg/kg. Because less than 10 soil and sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (9.2 mg/kg). Three concentrations were above the maximum soil background concentration (36.5 mg/kg). Chromium is retained as a COPC.

Cobalt was detected above the sediment BV (4.73 mg/kg) in 2 samples with a maximum concentration of 7.9 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (4.2 mg/kg). Cobalt is retained as a COPC.

Copper was detected above the soil and sediment BVs (11.2 mg/kg and 14.7 mg/kg) in 1 soil sample and 3 sediment samples with a maximum concentration of 39.2 mg/kg. Because less than 10 soil and sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum soil and sediment background concentrations (16 mg/kg and 12 mg/kg, respectively). Copper is retained as a COPC.

Iron was detected above the sediment BV (13,800 mg/kg) in 2 samples with a maximum concentration of 19,900 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (13,000 mg/kg). Iron is retained as a COPC.

Lead was detected above the sediment BV (19.7 mg/kg) in 1 sample at a concentration of 27.3 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (25.6 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the sediment BV (2370 mg/kg) in 4 samples with a maximum concentration of 6310 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (2370 mg/kg). Magnesium is retained as a COPC.

Manganese was detected above the sediment BV (543 mg/kg) in 2 samples with a maximum concentration of 654 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (517 mg/kg). Manganese is retained as a COPC.

Nickel was detected above the sediment BV (9.38 mg/kg) in 4 samples with a maximum concentration of 19.3 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (8.9 mg/kg). Nickel is retained as a COPC.

Potassium was detected above the sediment BV (2690 mg/kg) in 2 samples with a maximum concentration of 2870 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (2600 mg/kg). Potassium is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.983 mg/kg to 0.997 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Sodium was detected above the sediment BV (1470 mg/kg) in 2 samples with a maximum concentration of 2190 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. One concentration was above the maximum sediment background concentration (1970 mg/kg). Sodium is retained as a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had a DL (1.04 mg/kg) above the BV in 1 sample. Because less than 10 soil samples were collected, statistical tests could not be performed. The DL was comparable to the maximum soil background concentration (1 mg/kg). Thallium is not a COPC.

Vanadium was detected above the sediment BV (19.7 mg/kg) in 3 samples with a maximum concentration of 32 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The concentrations were above the maximum sediment background concentration (20 mg/kg). 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 1 soil sample and 3 sediment samples with a maximum concentration of 141 mg/kg. Because less than 10 soil and sediment samples were collected, statistical tests could not be performed. The sediment concentrations were above the maximum sediment background concentration (56.2 mg/kg), and the soil concentration was below the maximum soil background concentration (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Twelve samples were analyzed for SVOCs, VOCs, TPH-DRO, and TPH-GRO (six in soil, two in tuff, four in sediment). Eight samples were analyzed for PCBs (six in soil and two in tuff). Table 6.4-9 summarizes the analytical results for detected organic chemicals. Plate 2 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(g) include 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; n-butylbenzene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; TPH-GRO; TPH-DRO; TCE; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene. All detected organic chemicals are retained as COPCs.

6.4.3.7 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-045(g) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(g) include antimony, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.01 mg/kg to 1.09 mg/kg) above the BVs in eight samples. Because antimony was not detected above the 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 sediment BV in one sample at a concentration of 4.2 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of arsenic are defined.

Barium was detected above the sediment BV in three samples with a maximum concentration of 262 mg/kg. Barium concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of barium are defined.

Cadmium was detected above the sediment BV in two samples with a maximum concentration of 0.93 mg/kg. Concentrations decreased with depth at location 03-22536 and decreased downgradient. The concentration at location 03-22355 increased with depth and the residential SSL was approximately 110 times the concentration. 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 three soil samples and four sediment samples with a maximum concentration of 66,000 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 and sediment BV in four soil samples and four sediment samples with a maximum concentration of 58.7 mg/kg. Concentrations decreased with depth at locations 03-22535 and 03-22536, but concentrations increased slightly (5 mg/kg) with depth at location 03-608187. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 1990 times the maximum concentration. Concentrations decreased at downgradient locations. The lateral extent of chromium is defined, and further sampling for vertical extent is not warranted.

Cobalt was detected above the sediment BV in two samples with a maximum concentration of 7.9 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of cobalt are defined.

Copper was detected above the soil and sediment BVs in one soil sample and three sediment samples with a maximum concentration of 39.2 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of copper are defined.

Iron was detected above the sediment BV in two samples with a maximum concentration of 19,900 mg/kg. Iron concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of iron are defined.

Lead was detected above the sediment BV in one sample with a maximum concentration of 27.3 mg/kg . Lead concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of lead are defined.

Magnesium was detected above the sediment BV in four samples with a maximum concentration of 6310 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of magnesium are defined.

Manganese was detected above the sediment BV in two samples with a maximum concentration of 654 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of manganese are defined.

Nickel was detected above the sediment BV in four samples with a maximum concentration of 19.3 mg/kg was. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of nickel are defined.

Potassium was detected above the sediment BV in two samples with a maximum concentration of 2870 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of potassium are defined.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.983 mg/kg to 0.997 mg/kg) above the BV in two samples. Because selenium was not detected above the BV and the residential SSL was approximately 400 times the maximum DL, further sampling for extent of selenium is not warranted.

Sodium was detected above the sediment BV in two samples with a maximum concentration of 2190 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of sodium are defined.

Vanadium was detected above the sediment BV in three samples with a maximum concentration of 32 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of vanadium are defined.

Zinc was detected above the soil and sediment BVs in one soil sample and three sediment samples with a maximum concentration of 141 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-045(g) include 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; n-butylbenzene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; TPH-GRO; TPH-DRO; TCE; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene.

Aroclor-1254 and Aroclor-1260 were each detected in two samples with maximum concentrations of 0.0052 mg/kg and 0.0153 mg/kg, respectively. Concentrations decreased with depth at both locations and decreased downgradient (concentrations were below the EQLs at location 03-608189). The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

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 were detected in one to seven samples. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of these COPCs are defined.

Benzoic acid was detected in one sample at a concentration of 0.174 mg/kg. The concentration was below the EQL, and the residential SSL was approximately 1,400,000 times the concentration. Further sampling for extent of benzoic acid is not warranted.

Bis(2-ethylhexyl)phthalate was detected in four samples with a maximum concentration of 0.77 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Butylbenzene(n-) was detected in one sample at a concentration of 0.0018 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of n-butylbenzene are defined.

Isopropyltoluene(4-), TCE, and 1,3,5-trimethylbenzene were detected in one sample each at concentrations of 0.014 mg/kg, 0.0019 mg/kg, and 0.0011 mg/kg, respectively. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 4-isopropyltoluene, TCE, and 1,3,5-trimethylbenzene are defined.

Methylene chloride was detected in four samples with a maximum concentration of 0.018 mg/kg. Concentrations decreased or did not change substantially with depth (decreased by 0.02 mg/kg) and decreased downgradient. The lateral and vertical extent of methylene chloride are defined.

Trimethylbenzene(1,2,4-) was detected in two samples with a maximum concentration of 0.0029 mg/kg. Concentrations decreased with depth at location 03-608188, and the concentration was below the EQL at location 03-608189. The residential SSL was approximately 21,000 times the maximum concentration. Concentrations decreased at downgradient locations. The lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

TPH-DRO was detected in five samples with a maximum concentration of 48.5 mg/kg. TPH-DRO concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of TPH-DRO are defined.

TPH-GRO was detected in eight samples with a maximum concentration of 0.95 mg/kg. Concentrations decreased with depth at locations 03-22536 and 03-608188 and did not change substantially with depth at locations 03-608187 and 03-608189 (0.018 mg/kg and 0.18 mg/kg, respectively). Concentrations decreased at downgradient locations. The lateral and vertical extent of TPH-GRO are defined.

6.4.3.8 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.03.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 8×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.02.

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). Based on the uncertainties discussed in section I-4.3.2 of Appendix I, the potential exposure to and risk from arsenic were substantially overestimated by the screening-level comparison. Arsenic does not contribute to the potential incremental cancer risk at the site, and the total excess cancer risk for the residential scenario is approximately 1×10^{-5}, which is equivalent to the NMED target risk level. The residential HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.03.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-045(g).

6.4.3.9 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(g).

6.5 SWMU 03-009(i), Surface Disposal Site

6.5.1 Site Description and Operational History

SWMU 03-009(i) is an inactive surface disposal site located east of the liquid and compressed gas facility (building 03-170) (Figure 6.5-1). This site consists primarily of clean fill from TA-03 construction sites with construction debris, including crushed tuff, pieces of concrete, and asphalt mixed in with some of the fill material. The Operable Unit (OU) 1114 RFI work plan (LANL 1995, 057590) incorrectly states that the use of the disposal area ceased in 1980; the 1990 SWMU Report did not specify dates of operation. Aerial photographs from 1979 and 1986 (LASL 1979, 018923; LANL 1986, 018935) show the site was not used before 1980 and was still being used for fill placement in 1986. Site visits in the early 1990s confirmed that fill was periodically still being placed at the site.

6.5.2 Relationship to Other SWMUs and AOCs

There is no documented relationship between this inactive surface disposal site and any other SWMUs or AOCs.

6.5.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-009(i).

6.5.4 Site Contamination

6.5.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-009(i) to assess potential contamination:

- Four samples were collected from two locations downgradient of the disposal site. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- Eight samples were collected from four test pits at depths of 4.0–5.0 ft and 9.0–10.0 ft bgs to characterize the material. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-009(i) are shown in Figure 6.5-1. Table 6.5-1 presents the samples collected and analyses requested at SWMU 03-009(i). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.5.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-009(i), a maximum concentration of 450 ppm was detected at a depth of 4.0–5.0 ft bgs. This sample (RE03-09-13467) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-009(i) consist of 12 samples (3 soil and 9 tuff) collected from 6 locations.

Inorganic Chemicals

Twelve samples (three soil and nine tuff) were analyzed for TAL metals and cyanide. Table 6.5-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 6 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in 1 sample at a concentration of 8110 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (8370 mg/kg). Aluminum is not a COPC.

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 four tuff samples and had DLs (1.01 to 2.07 mg/kg) above the BVs in seven samples. All detected concentrations and DLs were above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 1 sample at a concentration of 4.34 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (5 mg/kg). Arsenic is not a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 2 samples with a maximum concentration of 136 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations in tuff are above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium 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 1 soil and 2 tuff samples with a maximum concentration of 9350 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (14,000 mg/kg), and the concentrations were above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium is retained as a COPC.

Chromium was detected above Qbt 2,3,4 BV (7.14 mg/kg) in 2 samples with a maximum concentration of 14 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One tuff concentration was above the maximum Qbt 2,3,4 background concentration (13 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 6.06 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 2 samples with a maximum concentration of 10.2 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration was above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). 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 0.631 mg/kg. Cyanide is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 3 samples with a maximum concentration of 19,300 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg). Iron is not a COPC.

Lead was detected above Qbt 2,3,4 BV (11.2 mg/kg) in 2 samples with a maximum concentration of 17 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration was above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Manganese was detected above Qbt 2,3,4 BV (482 mg/kg) in 1 sample at a concentration of 565 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (752 mg/kg). Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 2 samples with a maximum concentration of 9.55 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (7 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 mg/kg to 1.09 mg/kg) above the BV in nine samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in 2 samples with a maximum concentration of 24.6 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium is retained as a COPC.

Organic Chemicals

Twelve samples (three soil and nine tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.5-3 summarizes the analytical results for detected organic chemicals. Plate 7 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected include anthracene, Aroclor-1254, Aroclor-1260, fluoranthene, 2-hexanone, methylene chloride, pyrene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

6.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-009(i) are discussed below.

Inorganic Chemicals

The inorganic COPCs at SWMU 03-009(i) include antimony, barium, calcium, chromium, cobalt, copper, cyanide, lead, nickel, selenium, and vanadium.

Antimony was detected above the soil and Qbt 2,3,4 BVs in five samples with a maximum concentration of 2.44 mg/kg. The DLs (1.01 mg/kg to 2.07 mg/kg) were also above the BVs in seven samples. The residential SSL was 13 times to 19 times the detected concentrations above background and 15 times or more than the DLs. 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 136 mg/kg. Concentrations were similar but decreased slightly with depth at location 03-608191 (78.2 mg/kg at 0.0–1.0 ft bgs and 74.4 mg/kg at 1.0–2.0 ft bgs [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) and decreased with depth at location 03-608194. Concentrations also decreased laterally. The lateral and vertical extent of barium are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs in three samples with a maximum concentration of 9350 mg/kg. Concentrations decreased with depth at all locations. The concentrations were below the recommended daily allowances for an adult and child (Appendix I). The vertical extent of calcium is defined, and further sampling for lateral extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration 14 mg/kg. Concentrations decreased with depth at location 03-608194, and the maximum detected concentration was similar to the maximum Qbt 2,3,4 background concentration (13 mg/kg). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 8300 times to 15,000 times the chromium concentrations above the BV. Further sampling for extent of chromium is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration 6.06 mg/kg. Concentrations were similar across the site (ranging from 0.356 mg/kg to 6.06 mg/kg) and decreased with depth at location 03-608194. The residential SSL was 3.8 times the maximum concentration, and the residential HQ for cobalt is approximately 0.2. The industrial SSL was 50 times the maximum concentration (no industrial HQ was available because cobalt was not detected above the BV from 0.0–1.0 ft bgs). Further sampling for extent of cobalt is not warranted.

Copper was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration 10.2 mg/kg. Concentrations were similar across the site (ranging from 0.696 mg/kg to 10.2 mg/kg) and decreased with depth at location 03-608194. The residential SSL was approximately 310 times the maximum copper concentration and the residential HQ was approximately 0.003. Further sampling for extent of copper is not warranted.

Cyanide was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.631 mg/kg. The concentration was less than 0.2 mg/kg above the BV and the residential SSL was approximately 74 times the detected concentration above the BV. Further sampling for extent of cyanide is not warranted.

Lead was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration 17 mg/kg. Concentrations were similar across the site (ranging from 4.91 mg/kg to 17 mg/kg) and decreased with depth at location 03-608194. Lead concentrations above the BV were below or less than 2 mg/kg above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). The residential SSL was approximately 23 times the maximum concentration, and the residential HQ was approximately 0.03. Further sampling for extent of lead is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration 9.55 mg/kg. Concentrations were similar across the site (ranging from 1.57 mg/kg to 9.55 mg/kg) and decreased with depth at location 03-608194. Nickel concentrations above the BV were below or less than 3 mg/kg above the maximum Qbt 2,3,4 background concentration (7 mg/kg) and the residential SSL was 160 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1 mg/kg to 1.09 mg/kg) above the BV. Because selenium was not detected above the BV and the residential SSL was 360 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 24.6 mg/kg. Concentrations decreased with depth at location 03-608194. Vanadium concentrations above the BV were 1.4 mg/kg to 3.6 mg/kg above the maximum Qbt 2,3,4 background concentration (21 mg/kg), the residential SSL was approximately 16 times the maximum concentration, and the residential HQ was approximately 0.04. Further sampling for extent of vanadium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-009(i) include anthracene, Aroclor-1254, Aroclor-1260, fluoranthene, 2-hexanone, methylene chloride, pyrene, and TPH-DRO.

Anthracene, Aroclor-1254, Aroclor-1260, fluoranthene, 2-hexanone, methylene chloride, and pyrene were detected in one to four samples. Their concentrations did not substantially change or they decreased with depth. Concentrations of anthracene, 2-hexanone, and methylene chloride were below the EQLs. The residential SSLs for Aroclor-1254 and Aroclor-1260 were approximately 38 times the maximum concentrations, and the residential SSLs for fluoranthene and pyrene were approximately 43,000 times and 32,000 times the maximum concentrations. Further sampling for extent of these organic COPCs is not warranted.

TPH-DRO was detected in eight samples with a maximum concentration of 36.4 mg/kg. Concentrations decreased with depth at three locations and were below the EQLs at the other two locations. The residential TPH screening guideline for diesel No. 2/crankcase oil was approximately 27 times the maximum TPH-DRO concentration, and the HQ was approximately 0.04. The vertical extent of TPH-DRO is defined and further sampling for lateral extent is not warranted.

6.5.4.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.02.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 8×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.009.

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.02.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-009(i).

6.5.4.6 Summary of 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 the relationship of detected concentrations and DLs to background concentrations, 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 03-009(i).

6.6 Consolidated Unit 03-012(b)-00, Power Plant

Consolidated Unit 03-012(b)-00 consists of SWMUs 03-012(b), 03-014(q), 03-045(b), and 03-045(c). SWMU 03-014(q) received a certificate of completion and is not included in this supplemental investigation report. The remaining three SWMUs were included in the Phase II investigation work plan for Upper Sandia Canyon Aggregate Area (LANL 2011, 206234) and are discussed below.

The distinction between SWMUs 03-012(b) and 03-045(b) is often not clear in historical documents. The 1990 SWMU Report, which originally identified these sites as SWMUs, describes SWMU 03-012(b) as former chilled water operational releases, including cooling tower drift loss and cooling water discharges to Sandia Canyon. SWMU 03-045(b) is described as the NPDES outfall for cooling towers 03-25 and 03-58 (LANL 1990, 007511). The 1993 RFI work plan for OU 1114 identifies SWMU 03-012(b) as the power plant outfall (LANL 1993, 020947, p. 5-46), and the RFI work plan addendum for OU 1114 identifies SWMU 03-045(b) as the outfall for the power plant cooling towers and notes this discharge point is identical to SWMU 03-012(b) (LANL 1995, 057590, p. 5-27-1). Similar descriptions are provided in the 1996 Phase I RFI report for TA-03 (LANL 1996, 052930, p. 56). Based on the original descriptions in the 1990 SWMU report, SWMU 03-012(b) was intended to address only chromium releases associated with the power plant cooling water. Although chromium was released from the cooling tower outfall as well as by drift, discharge of chromium from the outfall ceased before the outfall an NPDES permit was issued. Thus, SWMUs 03-012(b) and 03-045(b) are physically the same outfall but address releases of different materials at different time periods. That is, SWMU 03-012(b) is associated with releases of chromated cooling water, which occurred until the mid-1970s, and SWMU 03-045(b) is associated with permitted discharges from the outfall, which occurred later. For the purposes of the Upper Sandia Canyon Aggregate Area investigation and report, it is not practical to distinguish the releases associated with the same outfall. Thus, releases from the outfall as represented by both SWMUs 03-012(b) and 03-045(b) are addressed by the investigation of SWMU 03-045(b). The investigation of SWMU 03-012(b) is limited to chromium releases from cooling tower drift.

6.6.1 SWMU 03-012(b), Operational Release

6.6.1.1 Site Description and Operational History

SWMU 03-012(b) is soil contamination associated with operational releases from the TA-03 power plant cooling towers. The cooling towers [structure 03-58 and former structure 03-25 (currently structure 03-592)] are located to the east of the power plant (Figure 6.6-1). A gas turbine generator (structure 03-2422), along with supporting utilities, was installed east of the power plant within the eastern portion of SWMU 03-012(b) in 2007 (LANL 2008, 099214). As discussed above, operational releases occurred as a result of both drift from the cooling towers and discharges from the outfall. Outfall releases are investigated and presented as part of SWMU 03-045(b), and the SWMU 03-012(b) investigation presented here addresses only releases due to cooling tower drift.

6.6.1.2 Relationship to Other SWMUs and AOCs

Before 1985, effluent from the former TA-03 WWTP, Consolidated Unit 03-014(a)-99, was used as cooling tower water for the TA-03 power plant (building 03-22). The effluent was stored in a holding tank SWMU 03-014(q) before it was used in the cooling towers and eventually discharged to an outfall [SWMU 03-045(b)], located within the same drainage that receives surface water runoff from SWMU 03-012(b). SWMU 03-045(c) is an NPDES-permitted outfall located about 55 ft east of SWMU 03-012(b). The holding tank and both outfalls, along with SWMU 03-012(b), make up Consolidated Unit 03-012(b)-00. Surface water runoff from SWMU 03-012(b), along with discharges from the SWMU 03-045(b) and SWMU 03-045(c) outfalls, ends up in the tributary to Upper Sandia Canyon that runs along the eastern and southern edges of the TA-03 power plant facility.

6.6.1.3 Summary of Previous Investigations

RFI sampling was performed in 1994. As noted above, the 1996 RFI report describes SWMU 03-012(b) and 03-045(b) as the same outfall, and samples were collected only at and below the outfall and not around the cooling towers. Because all releases from the outfall are addressed under SWMU 03-045(b), the RFI samples are associated with SWMU 03-045(b) rather than SWMU 03-012(b), and the RFI results are summarized in section 6.6.2.3.

The 1996 RFI report presented a Phase II sampling plan for SWMU 03-012(b) that included sampling in the vicinity of the cooling towers and analyzing these samples for metals (LANL 1996, 052930). This sampling was proposed because the RFI report noted that chromium had been identified as a COPC and drift from the cooling towers was a potential source of chromium contamination in soil around the cooling towers. A modified version of this sampling plan was implemented in 2002 in anticipation of construction activities near the cooling towers that might limit future access for sampling. Twenty-eight fill samples were collected from 14 locations at depths of 0.0–0.5 ft and 0.5–1.0 ft bgs; 4 fill samples were collected from 4 locations from a depth of 0.5–1.0 ft bgs. The samples were analyzed for metals and hexavalent chromium (Caporuscio 2003, 088444). During preparation of the supplemental investigation report, a focused validation was performed for the metals and hexavalent chromium data collected during 2002, and the hexavalent chromium data were qualified as rejected (R) (see Appendix F). The hexavalent chromium data are not evaluated further.

Mercury was detected above BV in 1 fill sample; copper was detected above BV in 2 fill samples; cadmium was detected above BV in 3 samples; chromium, silver, and zinc were detected above BVs in 6, 5, and 10 fill samples, respectively.

In 2003, 18 soil samples were collected from 9 locations at the planned location of a new utility trench for the gas turbine generator. The sampling activities included collecting surface and subsurface soil samples from the mesa top directly north and east of former cooling tower 03-25. Sixteen samples were collected from 8 locations at 0.0–0.5 ft and 3.5–4.0 ft bgs; 2 samples were collected from a ninth location at 0.8–1.3 ft and 1.8–2.8 ft bgs. As specified in the sampling notification submitted to NMED, all samples were analyzed for metals and hexavalent chromium ((LANL 2003, 100705, pp. 2-20; LANL 2003, 080102). At NMED’s request, 5 randomly selected samples (4 surface and 1 shallow subsurface) were also analyzed for PCBs even though PCBs are not related to the cooling towers operation (LANL 2003, 100705, pp. 2-20; LANL 2003, 080102).

Zinc was detected above BV in three samples. Chromium and silver were detected above BVs in four and five samples, respectively. Hexavalent chromium was detected in five samples. Aroclor-1254 and Aroclor-1260 were detected in three and four samples, respectively.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.6.1.4. Table 6.6-1 presents the samples collected and analyses requested at SWMU 03-012(b).

6.6.1.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was not required to assess potential contamination from operational releases at SWMU 03-012(b). The only samples collected during the 2009 investigation were at the outfall, which is associated with SWMU 03-045(b).

Soil, Rock, and Sediment Field-Screening Results

No field screening was conducted at SWMU 03-012(b) because no samples were collected in 2009.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-012(b) consist of 50 soil samples collected from 27 locations.

Inorganic Chemicals

A total of 50 samples were analyzed for TAL metals and hexavalent chromium. Table 6.6-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had a DL (5.6 mg/kg) above the BV in one sample. The DL was also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.689 mg/kg. In addition, cadmium had 10 DLs (0.491 mg/kg to 2.79 mg/kg) above the BV. Because the combined site and background dataset had more than 80% nondetections, statistical analyses could not be performed. The detected concentrations were below the maximum soil background concentration (2.6 mg/kg), and the maximum DL was slightly above the maximum soil background concentration. Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in 10 samples with a maximum concentration of 156.6 mg/kg. The quantile test indicated site concentrations of chromium in soil are statistically different from background (Table H-2 and Figure H-3). Chromium is retained as a COPC.

Hexavalent chromium was detected in five soil samples with a maximum concentration of 0.241 mg/kg. Hexavalent chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in two samples with a maximum concentration of 26.1 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Table H-2 and Figure H-3). Copper is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.102 mg/kg. The concentration is similar to the soil BV. Mercury is not a COPC.

Silver was detected above the soil BV (1 mg/kg) in nine samples with a maximum concentration of 6.4 mg/kg. In addition, silver had one DL (2.79 mg/kg) above the BV. Silver is retained as a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had a DL (2.79 mg/kg) above the BV in one sample. The quantile and slippage tests indicated site concentrations of thallium in soil are not statistically different from background (Table H-2 and Figure H-4). Thallium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 13 samples with a maximum concentration of 145.2 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-2 and Figure H-4). Zinc is retained as a COPC.

Organic Chemicals

Five soil samples were analyzed for PCBs. Table 6.6-3 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-012(b) include Aroclor-1254 and Aroclor-1260. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-012(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-012(b) include antimony, chromium, hexavalent chromium, silver, and zinc.

Antimony was not detected above the soil BV but had a DL (5.6 mg/kg) above the BV. Because antimony was not detected above the BV and the residential SSL was approximately 5 times the maximum DL, further sampling for extent of antimony is not warranted.

Chromium was detected above the soil BV in 10 samples with a maximum concentration of 156.6 mg/kg. Concentrations decreased with depth at 8 locations and were below the maximum soil background concentration (36.5 mg/kg) at locations 03-02-21045 and 03-02-21048. Concentrations decreased laterally including at location 03-608199, which is downgradient from SWMU 03-014(q). The trivalent chromium residential SSL was also 750 times the maximum chromium concentration. The lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected in 5 soil samples with a maximum concentration of 0.241 mg/kg. The 2 highest hexavalent chromium concentrations were detected to the east of the cooling towers at locations 03-22577 and 03-22585. This distribution is consistent with the historical windfield patterns showing the predominant wind direction is from the northwest (LASL 1974, 005467, pp. 46-47). Hexavalent chromium concentrations decreased laterally to the north, east, and south of these locations, but samples were not collected to the west because of the historical wind direction. Concentrations decreased with depth at three locations, and hexavalent chromium was detected only at depth at two locations. The residential SSL was approximately 12 times the maximum detected concentration, and the industrial SSL was approximately 262 times the maximum detected concentration. In addition, the residential cancer risk and the industrial HI are 5×10^{-6} and 0.005, respectively. Further sampling to define extent of hexavalent chromium is not warranted.

Silver was detected above the soil BV in 9 samples with a maximum concentration of 6.4 mg/kg. In addition, silver had a DL (2.8 mg/kg) above the BV. Concentrations decreased with depth at all locations. Concentrations decreased laterally including at location 03-608199, which is downgradient from

SWMU 03-014(q), and at locations 03-608196 and 03-608197 [SWMUs 03-045(b) and 03-045(c)]. In addition, the residential SSL was approximately 61 times the maximum concentration, and the residential HQ was approximately 0.003. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV in 13 samples with a maximum concentration of 145.2 mg/kg. Concentrations decreased with depth at 9 locations and were below the maximum soil background concentration (75.5 mg/kg) at the other 2 locations. Concentrations decreased laterally including at locations 03-608199 and 03-608200, downgradient of SWMU 03-014(q), and at locations 03-608196 and 03-608197 [SWMUs 03-045(b) and 03-045(c)]. In addition, the residential SSL was approximately 160 times the maximum concentration. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-012(b) include Aroclor-1254 and Aroclor-1260.

Aroclor-1254 and Aroclor-1260 were detected in three and four samples with maximum concentrations of 0.336 mg/kg and 0.925 mg/kg, respectively. Aroclor-1254 and Aroclor-1260 were only analyzed at one depth at five randomly selected locations within the SWMU at the request of NMED. As described previously, PCBs are not related to this SWMU, which is only associated with the drift loss from the cooling towers. Because PCBs were not known to be associated with cooling tower drift, these samples were collected to determine whether PCBs were present at the site and not to define the nature and extent. PCB-containing electrical equipment was historically used at the power plant, and the site receives runoff from areas where this equipment was used. Aroclor-1254 and Aroclor-1260 were detected at two locations to the east of the cooling towers below the EQLs as well as at location 03-608198, which was sampled as part of the investigation of SWMU 03-014(q). Concentrations decreased laterally to the north/northeast of the holding tank [SWMU 03-014(q)] at locations 03-608199 and 03-608200. Aroclor-1254 and Aroclor-1260 were also detected at two locations to the south of the cooling towers. The residential SSLs were approximately 3.3 times and 2.4 times the maximum concentrations. The industrial SSLs were approximately 24 times and 9 times the maximum concentrations. Sections 6.10.3.4 and 6.10.4.4 discuss the extent of Aroclor-1254 and Aroclor-1260 at the two outfalls associated with SWMUs 03-045(b) and 03-045(c). Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted at SWMU 03-012(b).

6.6.1.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.005, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is 5×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-012(b).

6.6.1.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-012(b).

6.6.2 SWMU 03-045(b), Outfall

SWMU 03-045(b) is the NPDES-permitted outfall (Outfall 001) that currently receives treated sanitary effluent from the TA-46 Sanitary Wastewater Systems Consolidation (SWSC) Plant and the Sanitary Effluent Reclamation Facility (SERF) as well as occasional discharges of power plant cooling tower blowdown (Figure 6.6-1). All wastewater previously discharged from the TA-03 power plant to SWMU 03-045(b) was treated in a neutralization tank (structure 03-1381); the function of the tank was to adjust the pH of wastewater before it was discharged to meet NPDES requirements. Sulfuric acid and soda ash were used to adjust the pH of wastewater before discharge to the SWMU 03-045(b) outfall. The NPDES permit number for the outfall was previously identified as EPA 01A001, but it is currently permitted as 001 on the 2007 NPDES authorization permit (EPA 2007, 099009). The outfall is currently authorized to discharge power plant wastewater from cooling towers, boiler blowdown drains, demineralizer backwash, floor and sink drains, and treated sanitary reuse to Sandia Canyon (EPA 2007, 099009, p. 1). The outfall discharges onto sand and gravel southeast of building 03-22 and into a small tributary of Sandia Canyon. Discharge from another permitted outfall (13S) at the TA-46 SWSC plant is pumped to the holding tank 03-336 [SWMU 03-014(q)]. Most of this wastewater is routed to SERF for additional treatment, and the remainder is discharged to SWMU 03-045(b) after it is mixed with SERF effluent. The outfall formerly received effluent from two power plant cooling towers (structures 03-25 and 03-58) and the chlorine building (structure 03-24). From 1951 until the mid-1970s, this cooling water contained chromate (see section 6.6 for historical perspective). Cooling tower (structure 03-25) was demolished in 1990, and a new cooling tower (structure 03-592) was constructed at the same location in 1998 (LANL 2008, 099214); the concrete foundation of structure 03-25 collected storm water that discharged to the outfall (LANL 1996, 052930, p. 56). The two cooling tower structures (03-58 and 03-592) currently operate during periodic testing of power plant equipment and blowdown is discharged from the outfall.

A sulfuric acid release to the SWMU 03-045(b) outfall from the power plant neutralization tank, structure 03-1381, occurred in May 1990 (LANL 1995, 057590, p. 5-27-1). Low pH values were reported in a 2.5-mi section of the watercourse below the outfall. Soda ash was added along the watercourse to raise the pH. A subsequent survey detected no measurements below pH 6.9 (LANL 1996, 052930, p. 56).

6.6.2.2 Relationship to Other SWMUs and AOCs

Before 1985, treated effluent from the former TA-03 WWTP, Consolidated Unit 03-014(a)-99, was used as cooling tower makeup water for the TA-03 power plant (building 03-22). The effluent was stored in a holding tank, SWMU 03-014(q), before it was used in the cooling towers and eventually discharged to this outfall, SWMU 03-045(b). SWMU 03-045(c) is an NPDES-permitted outfall located about 55 ft east of SWMU 03-045(b). The holding tank and both outfalls are components of Consolidated Unit 03-012(b)-00. A wastewater neutralization tank (structure 03-1381) at the TA-03 power plant is used to adjust the pH of wastewater before discharge to SWMU 03-045(b).

6.6.2.3 Summary of Previous Investigations

During the 1994 RFI, 11 soil and sediment samples were collected from 5 locations at a depth of 0.0 to 0.5 ft bgs at the outfall [now designated SWMU 03-045(b)]. Four of the samples were collected from 2 locations near the outfall. Seven samples were collected from 3 downstream locations to characterize the sediment in the outfall channel. All samples were submitted for laboratory analyses of PCBs, gross-alpha, -beta, and -gamma radioactivity, and tritium; 8 samples were submitted for laboratory analysis of herbicides; 5 samples were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, and pesticides and by gamma spectroscopy; 1 sample was submitted for laboratory analyses of isotopic plutonium, uranium, and strontium-90 (LANL 1996, 052930, pp. 57–60). Data from the 1994 RFI are screening-level data and are summarized below. Section 2.9 of the Upper Sandia Canyon Aggregate Area HIR presents a detailed discussion of the screening-level results (LANL 2008, 100693).

Arsenic, cadmium, lead, and nickel were detected in one sample above BVs. Chromium and silver were detected in two samples above BVs. Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and total PCBs were detected in one sample. Fluoranthene was detected in two samples. Aroclor-1260 was detected in three samples. Plutonium-238, plutonium-239/240, uranium-234, uranium-235, and uranium-236 were detected above BVs/FVs in one sample. Tritium was detected in three samples.

6.6.2.4 Site Contamination

Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-045(b) to assess potential contamination.

- Two soil samples were collected from depths of 0.0–1.0 ft and 1.0–2.0 ft bgs at one location (03-608197). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling location at SWMU 03-045(b) is shown in Figure 6.6-1. Table 6.6-4 presents the samples collected and analyses requested at SWMU 03-045(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-045(b), no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(b) consist of two soil samples collected from one location.

Inorganic Chemicals

Two soil samples were analyzed for TAL metals and cyanide. Table 6.6-5 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.06 mg/kg and 1.07 mg/kg) above the BV in 2 samples. The DLs were also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.528 mg/kg and 0.536 mg/kg) above the BV in two samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.159 mg/kg. Mercury is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.17 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 1 sample at a concentration of 53.4 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

Two soil samples were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.6-6 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(b) include anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-045(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(b) include antimony, mercury, and silver.

Antimony was not detected above the soil BV but had DLs (1.06 mg/kg to1.07 mg/kg) above the BV in two samples. Because antimony was not detected above the BV and the residential SSL was approximately 29 times the maximum DL, further sampling for extent of antimony is not warranted.

Mercury was detected above the soil BV in one sample at a concentration of 0.159 mg/kg. The mercury concentration decreased with depth at location 03-608197, and the vertical extent is defined. The lateral extent of mercury is not defined because only one location at the outfall was sampled.

Silver was detected above the soil BV in one sample at a concentration of 1.17 mg/kg. The silver concentration decreased with depth at location 03-608197 and the vertical extent is defined. The lateral extent of silver is not defined because only one location at the outfall was sampled.

Historically, cooling water discharged from this outfall contained chromate (section 6.6); hexavalent chromium, therefore, is a potential contaminant at this site. Although total chromium was not detected above BV and was not identified as a COPC, samples collected during the 1994 and 2009 investigations were not analyzed for hexavalent chromium. Samples will be collected and analyzed for hexavalent chromium to complete the characterization of the nature and extent of contamination at this site.

Organic Chemicals

Organic COPCs at SWMU 03-045(b) include anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; and TPH-DRO.

Anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and TPH-DRO were detected at one or two samples. Concentrations decreased with depth at location 03-608197 and the vertical extent is defined. The lateral extent of these organic COPCs is not defined because only one location at the outfall was sampled.

Methylene chloride was detected in one sample below the EQL. The residential SSL was approximately 180,000 times the concentration. Further sampling for extent of methylene chloride is not warranted.

6.6.2.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 5×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.005.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.005.

Residential Scenario

The total excess cancer risk for the residential scenario is 5×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.009.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-045(b).

6.6.2.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(b).

6.6.3 SWMU 03-045(c), Outfall

6.6.3.1 Site Description and Operational History

SWMU 03-045(c) is an NPDES-permitted outfall (EPA 03A027), located approximately 55 ft east of SWMU 03-045(b) (LANL 1996, 052930, p. 56) (Figure 6.6-1). SWMU 03-045(c) previously received effluent from a cooling tower (structure 03-285) that served the generators powering a Laboratory computer system. Cooling tower 03-285 was taken out of service several years ago and demolished in 2012, and SWMU 03-045(c) now receives blowdown from the cooling towers at the Strategic Computing Complex (building 03-2327), which became operational in 2002. Cooling tower 03-285 was constructed in 1968, and SWMU 03-045(c) may have historically received chromate-treated water (LANL 1996, 052930, pp. 56–57). Outfall 03A027 is currently permitted for the discharge of cooling tower blowdown water and other wastewater from structures 03-285 and 03-2327 (EPA 2007, 099009).

6.6.3.2 Relationship to Other SWMUs and AOCs

SWMU 03-045(c) is located about 55 ft east of the power plant outfall, SWMU 03-045(b), in a small tributary to Sandia Canyon. The SWMU 03-014(q) holding tank, the SWMU 03-045(b) and SWMU 03-045(c) outfalls, and SWMU 03-012(b) are all components of Consolidated Unit 03-012(b)-00.

6.6.3.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-045(c).

6.6.3.4 Site Contamination

Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-045(c) to assess potential contamination.

- Two soil samples were collected from depths of 0.0–1.0 ft and 1.0–2.0 ft bgs at one location (03-608196). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling location at SWMU 03-045(c) is shown in Figure 6.6-1. Table 6.6-7 presents the samples collected and analyses requested at SWMU 03-045(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-045(c), no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(c) consist of two soil samples collected from one location.

Inorganic Chemicals

Two soil samples were analyzed for TAL metals and cyanide. Table 6.6-8 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.12 mg/kg to 1.14 mg/kg) above the BV in 2 samples. The DLs were also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in 2 samples with a maximum concentration of 22,800 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. One concentration exceeded the maximum soil background concentration (14,000 mg/kg). Calcium is retained as a COPC.

Magnesium was detected above the soil BV (4610 mg/kg) in 1 sample at a concentration of 5240 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (10,000 mg/kg). Magnesium is not a COPC.

Sodium was detected above the soil BV (915 mg/kg) in 1 sample at a concentration of 1450 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (1800 mg/kg). Sodium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 1 sample at a concentration of 50.3 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

Two soil samples were analyzed for SVOCs, VOCs, TPH-DRO, and PCBs. Table 6.6-9 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(c) include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-045(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(c) include antimony and calcium.

Antimony was not detected above the soil BV but had DLs (1.12 mg/kg and 1.14 mg/kg) above the BV in 2 samples. Antimony was not detected above the BV, and the residential SSL was approximately 28 times the maximum DL. Further sampling for extent of antimony is not warranted.

Calcium was detected above the soil BV in two samples with a maximum concentration of 22,800 mg/kg. Concentrations decreased with depth at location 03-608196. The concentrations above the BV were below the recommended daily allowances for an adult and child (Appendix I). Further sampling for vertical extent is not warranted. The lateral extent is not defined because only one location at the outfall was sampled.

Historically, cooling water discharged from this outfall may have contained chromate; hexavalent chromium, therefore, is a potential contaminant at this site. Although total chromium was not detected above BV and was not identified as a COPC, samples collected during the 2009 investigation were not analyzed for hexavalent chromium. Samples will be collected and analyzed for hexavalent chromium to complete the characterization of the nature and extent of contamination at this site.

Organic Chemicals

Organic COPCs at SWMU 03-045(c) include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO.

The residential SSLs of acenaphthene; anthracene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO were 13 times to 125,000 times the maximum concentrations. The concentrations of methylene chloride, 2-methylnaphthalene, and naphthalene were also below the EQLs. Further sampling for vertical extent is not warranted. The lateral extent is not defined because only one location at the outfall was sampled.

The residential SSLs of Aroclor-1254, benzo(a)anthracene, and benzo(b)fluoranthene were 1.4 times to 4 times the maximum concentrations. The Aroclor-1260 and benzo(a)pyrene concentrations exceeded the residential SSLs by factors of 1.4 to 1.6. The Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene industrial SSLs ranged from approximately 2.6 times the maximum Aroclor-1260 concentration to approximately 83 times the maximum benzo(a)anthracene concentration. Further sampling for vertical extent is not warranted. The lateral extent is not defined because only one location at the outfall was sampled.

6.6.3.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.002, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 6×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.05.

Based on the risk-screening assessment results, no potential unacceptable risk exists for the industrial and construction worker scenarios at SWMU 03-045(c). A potential unacceptable cancer risk exists for the residential scenario, but the residential HI is less than the NMED target level.

6.6.3.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(c).

6.7 SWMU 03-052(f), Outfall

6.7.1 Site Description and Operational History

SWMU 03-052(f) is a former NPDES-permitted outfall (EPA 03A023) (Figure 6.7-1) which received wastewater from floor drains [AOC 03-013(b)], sinks, water fountains, and a storm drain [SWMU 03-013(a)], which served building 03-38 until 1987 when the drains in building 03-38 were rerouted to the TA-03 sanitary sewer system. Stoddard solvents, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains to this outfall. Spent paint solvents and cutting oils contaminated with machined beryllium particles also may have been released to the floor drains during the 1960s and 1970s. In addition, cooling water for welding torches was discharged directly to the drains. The first spill was approximately 200 gal. of waterwaste oil mixture that was discharged when an automatic compressor blowdown mechanism failed. A second spill from a ruptured air-compressor oil line resulted in the release of approximately 1 qt of compressor oil to the drain. This spill produced an oily sheen on the surface of the water at the SWMU 03-052(f) outfall (LANL 1995, 057590, p. 5-25-1). A third spill occurred when approximately 15 gal. of diesel fuel was released from a ruptured truck fuel line into the utilities construction trench between buildings 03-1793 and 03-1794. On the same day, a clay sewer pipe in the utility trench broke, releasing approximately 2000 gal. of wastewater into the excavation. A sump was used to remove the wastewater from the excavation, and the wastewater was discharged to SWMU 03-052(f). The diesel-contaminated asphalt and soil were removed and disposed of. Runoff from parking lots and the surrounding areas also discharges to the outfall (LANL 1995, 057590, p. 5-25-2). Outfall 03A023 was removed from the NPDES permit on July 11, 1997.

6.7.2 Relationship to Other SWMUs and AOCs

The former outfall at SWMU 03-052(f) discharge storm water collected from the SWMU 03-013(a) storm drain and other storm drains from TA-03 buildings. The storm drain and the outfall make up Consolidated Unit 03-013(a)-00.

6.7.3 Summary of Previous Investigations

RFI activities were conducted at SWMU 03-052(f) in the summer of 1994 as part of the RFI for Consolidated Unit 03-013(a)-00. Seven sediment samples (five samples plus one field duplicate and one collocated sample) were collected from five locations (at depths ranging from 0.0–0.5 ft) along the sides and within the SWMU 03-052(f) outfall channel 10.0–50.0 ft downstream from the outfall pipe (LANL 1995, 057590, p. 5-25-3). Sampling locations were biased to areas where sediment accumulated (LANL 1996, 052930, p. 75). Samples were field-screened and analyzed for gross-alpha, -beta, and -gamma radiation, tritium, TAL metals, PCBs, VOCs, and SVOCs. Data from the 1994 RFI are screening-level data and are summarized below. Section 2.10.1 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Chromium, copper, and mercury were detected above BVs in one sample. Lead was detected above BVs in three samples and zinc in six samples. Aroclor-1254 and total PCBs were detected in one sample. VOCs and radionuclides were not detected. Data also showed low concentrations of PAHs, which were attributed to runoff from the adjacent parking lot (LANL 1996, 052930, p. 82).

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 SWMU 03-052(f). As a result, the following activities were completed as part of the 2009 investigation.

- Fourteen samples were collected from seven locations along the storm drainage to confirm previous sampling results and to define the nature and extent of contamination. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, cyanide, perchlorate, americium-241, isotopic plutonium, and isotopic uranium.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-052(f) are shown in Figure 6.7-1. Table 6.7-1 presents the samples collected and analyses requested at SWMU 03-052(f). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.7.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-052(f), a maximum concentration of 61.4 ppm was detected at a depth of 1.0–2.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.7.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-052(f) consist of 14 samples (10 soil and 4 tuff) collected from 7 locations.

Inorganic Chemicals

Fourteen samples (10 soil and 4 tuff) were analyzed for TAL metals, cyanide, and perchlorate. Table 6.7-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 6.7-2 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 (1.04 mg/kg to 1.44 mg/kg) above the BVs in 13 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 2 samples with a maximum concentration of 92.6 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration was above the maximum Qbt 2,3,4 background concentration (51.6 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 0.409 mg/kg. Cadmium also had DLs (0.554 mg/kg to 0.72 mg/kg) above the BV in three samples. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-3 and Figure H-5). 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 1 soil sample and 4 tuff samples with a maximum concentration of 67.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Table H-3 and Figure H-5). Because less than 10 tuff samples were collected, statistical tests could not be performed. Three concentrations were above the maximum Qbt 2,3,4 background concentration (13 mg/kg). 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 6 soil samples and 3 tuff samples with a maximum concentration of 27.2 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Table H-3 and Figure H-6). Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in three samples with a maximum concentration of 12.8 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 8 soil samples and 3 tuff samples with a maximum concentration of 56.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Table H-3 and Figure H-6). Because less than 10 tuff samples were collected, statistical tests could not be performed. Two concentrations were above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Perchlorate was detected in one soil sample and three tuff samples with a maximum concentration of 0.00085 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 (1.05 mg/kg to 1.24 mg/kg) above the BV in four samples. Selenium 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 7 soil samples and 3 tuff samples with a maximum concentration of 200 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-3 and Figure H-7). Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (65.6 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Fourteen samples (10 soil and 4 tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.7-3 summarizes the analytical results for detected organic chemicals. Figure 6.7-3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-052(f) included 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; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 4-nitroaniline; phenanthrene; pyrene; toluene; TPH-DRO; and 1,2,4-trimethylbenzene. All detected organic chemicals are retained as COPCs.

Radionuclides

Fourteen samples (10 soil and 4 tuff) were analyzed for americium-241, isotopic plutonium, and isotopic uranium. Radionuclides were not detected or detected above BVs/FVs at SWMU 03-052(f).

6.7.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-052(f) are discussed below. Radionuclides were not detected or detected above BVs/FVs.

Inorganic Chemical

Inorganic COPCs at SWMU 03-052(f) included antimony, barium, chromium, copper, cyanide, lead, perchlorate, selenium, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.04 mg/kg to 1.44 mg/kg) above the BVs in 13 samples. Because antimony was not detected above the 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 Qbt 2,3,4 BV in two samples with a maximum concentration of 92.6 mg/kg. Concentrations decreased with depth at both locations (the concentrations in the samples at locations 03-608215 and 03-608216 were 97.8 mg/kg and 102 mg/kg, respectively, and were below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) and decreased downgradient. The lateral and vertical extent of barium are defined.

Chromium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 67.3 mg/kg. Chromium 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 SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 1700 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 six soil samples and three tuff samples with a maximum concentration of 27.2 mg/kg. Copper concentrations were fairly consistent in surface soil down the drainage; concentrations ranged from 0.3 mg/kg below the maximum soil background concentration (16 mg/kg) to 4.9 mg/kg above the maximum soil background concentration; concentrations decreased slightly at the farthest downgradient location (03-608219). Concentrations decreased with depth at four locations. The residential SSL was approximately 115 times the maximum concentration. Further sampling for extent of copper is not warranted.

Cyanide was detected above the soil BV in three samples with a maximum concentration of 12.8 mg/kg. Cyanide concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of cyanide are defined.

Lead was detected above the soil and Qbt 2,3,4 BVs in eight soil samples and three tuff samples with a maximum concentration of 56.7 mg/kg. Concentrations decreased with depth at five locations and decreased downgradient. The residential SSL was approximately 7 times and the industrial SSL was approximately 14 times the maximum concentration. The lead HIs were approximately 0.09 and 0.07, respectively. The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in four samples with a maximum concentration of 0.00085 mg/kg. Perchlorate concentrations were below the EQLs and decreased downgradient. The residential SSL was approximately 64,000 times the maximum concentration. The lateral 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 (1.05 mg/kg to 1.24 mg/kg) above the BV in four samples. Because selenium was not detected above the BV and the residential SSL was approximately 315 times the maximum DL, further sampling for extent of selenium is not warranted.

Zinc was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and three tuff samples with a maximum concentration of 200 mg/kg. Zinc concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-052(f) included 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; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 4-nitroaniline; phenanthrene; pyrene; toluene; TPH-DRO; and 1,2,4-trimethylbenzene.

Acetone was detected in three samples with a maximum concentration of 0.0226 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. The residential SSL was approximately 2,900,000 times the maximum concentration. The lateral and vertical extent of acetone are defined.

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; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene were detected in 1 to 13 samples. Concentrations decreased with depth at all locations, except at location 03-608219, and decreased downgradient. Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene concentrations at location 03-608219 were above the residential SSLs at both sample depths. The benzo(a)pyrene concentration was slightly above the industrial SSL at depth, and the other COPC concentrations were approximately an order of magnitude below the industrial SSL. The residential SSLs of the other COPCs at this location (03-608219) ranged from approximately 1.2 times the concentration [indeno(1,2,3-cd)pyrene] to approximately 13,000 times the concentration (anthracene). The industrial SSLs of the other COPCs at this location ranged from approximately 20 times to 135,000 times the concentrations. The lateral extent of these COPCs is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 10 samples with a maximum concentration of 0.128 mg/kg. Concentrations decreased with depth at all locations. The maximum concentration was detected in the farthest downgradient sample but was not substantially different from upgradient concentrations (next highest concentration was 0.118 mg/kg at location 03-608215). The residential SSL was approximately 9 times and the industrial SSL was approximately 65 times the maximum concentration. The residential HQ for Aroclor-1254 was approximately 0.04. The vertical extent of Aroclor-1254 is defined, and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in 11 samples with a maximum concentration of 0.14 mg/kg. Concentrations decreased with depth at 5 locations and decreased downgradient. Aroclor-1260 concentrations at location 03-608217 did not change substantially with depth (0.0078 mg/kg), and the residential SSL was approximately 25 times and the industrial SSL was approximately 92 times the concentration at depth. The residential cancer risk for Aroclor-1260 was approximately 2×10^{-7}. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in seven samples with a maximum concentration of 0.298 mg/kg. Concentrations were below the EQLs and decreased downgradient. The residential SSL was approximately 1160 times the maximum concentration. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Nitroaniline(4-) was detected in one sample at a concentration of 0.46 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of 4-nitroaniline are defined.

Toluene was detected in one soil sample at a concentration of 0.000507 mg/kg. The concentration was below the EQL and decreased downgradient. The lateral and vertical extent of toluene are defined.

TPH-DRO was detected in 14 samples with a maximum concentration of 693 mg/kg. Concentrations decreased with depth or did not change substantially with depth (increased by 2 mg/kg) and decreased downgradient. The residential HQ was 0.3. The lateral and vertical extent of TPH-DRO are defined.

Trimethylbenzene(1,2,4-) was detected in one sample at a concentration of 0.000435 mg/kg. The concentration was below the EQL and the residential SSL was approximately 140,000 times the concentration. The lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

Radionuclides

No radionuclide COPCs were identified at SWMU 03-052(f).

6.7.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.4.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.2.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.3.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the construction worker scenario at SWMU 03-052(f). A potential unacceptable cancer risk exists for the industrial and residential scenarios, but the HIs are less than 1 at SWMU 03-052(f). However, the potential risk is primarily from PAHs that are not site-related and the exposure and risk are not issues for a Laboratory worker at this site (Appendix I).

6.7.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-052(f).

6.8 SWMU 03-013(i), Operational Release

6.8.1 Site Description and Operational History

SWMU 03-013(i) is an area of soil and gravel contamination from historical releases of hydraulic oil at former buildings 03-246 and 03-247 (Figure 6.8-1). These buildings housed operations that involved testing the tensile strength of various steel cables used in conjunction with underground nuclear test assemblies. The cable control building (former building 03-246) and the cable stress building (former building 03-247) were collectively referred to as the Pull Test Facility. The facility was constructed before 1967 and operated until the mid-1980s, when a replacement facility was constructed on Sigma Mesa. Building 03-246 was constructed on a concrete slab that contained a hydraulic oil compressor and storage tank. Building 03-247 was constructed on a concrete curb surrounding a gravel floor that contained two hydraulic rams used to perform the tensile strength testing. Hydraulic oil was provided to the rams through underground pipes between the buildings (LANL 2005, 091540, pp. 1-2).

Hydraulic oil is likely to have been released to the concrete slab floor inside former building 03-246 and subsequently flowed beneath the building walls and onto the soil surrounding the building. Soil staining was evident along the north side of the building and along the northeast and northwest corners. The gravel floor inside former building 03-247 was visibly stained with oil in several locations beneath the hydraulic ram assembly (LANL 2004, 087406, p. 1). Building 03-247 and its contents were demolished and removed in 2005. The contents and the concrete slab of building 03-246 were also demolished and removed in 2005. Following the demolition and removal of the concrete slab, approximately 144 ft^2 of contaminated soil was excavated from the footprint of former building 03-246. Following the demolition and removal of building 03-247 and its gravel floor, an 8-in. concrete slab that was connected to the building foundation on the north and west sides was exposed. The slab was removed, and stained soil and debris were also removed from SWMU 03-013(i). Confirmation samples were collected from both locations after demolition and removal, and the excavation was backfilled and graded (LANL 2005, 091540, pp. 1–4).

6.8.2 Relationship to Other SWMUs and AOCs

SWMU 03-013(i) is not related to any other SWMUs or AOCs.

6.8.3 Summary of Previous Investigations

During the 2005 site investigation, 8 fill samples were collected from 4 locations within the footprint of former building 03-246 from depths of 0.0–0.5 ft and at 1.5 ft bgs. Four confirmation samples were also collected from 2 locations downgradient of former building 03-246 at depths of 0.0–0.5 ft and at 1.5 ft bgs. Four additional samples were collected from 2 locations within the footprint of former building 03-247 at depths of 0.0–0.5 ft and at 1.5 ft bgs (LANL 2005, 091540, pp. 4–5). A total of 16 samples were submitted for laboratory analyses of TAL metals, SVOCs, PCBs, TPH-DRO, and TPH-GRO. Each of the samples collected from 1.5 ft bgs were also submitted for analysis of VOCs.

Barium, copper, and nickel were detected above BVs; antimony, lead, and zinc were detected above BVs in 3, 7, and 8 samples, respectively; cadmium was detected above BV in 8 samples. The DLs for cadmium were above BV in 3 samples, and the DL for selenium was greater that BV in most samples. Acenaphthene and 2-butanone were detected in 1 sample. Acenaphthylene, anthracene, 4-isopropyltoluene, and 2-methylnaphthalene were detected in 2 samples. Benzoic acid, bis(2-ethylhexly)phthalate, fluorene, and pyrene were detected in 3 samples. Acetone, fluoranthene, and phenanthrene were detected in 4 samples. Aroclor-1260 and Aroclor-1254 were detected in 10 and 12 samples, respectively. TPH-GRO and TPH-DRO were detected in 10 and 16 samples, respectively.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.8.4. Table 6.8-1 presents the samples collected and analyses requested at SWMU 03-013(i).

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 SWMU 03-013(i). As a result, the following activities were completed as part of the 2009 investigation.

- Thirty-two samples were collected from 16 locations to define the extent of contamination. At each location, samples were collected from 0.0–1.0 ft and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, TPH-DRO, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-013(i) are shown in Figure 6.8-1. Table 6.8-1 presents the samples collected and analyses requested at SWMU 03-013(i). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.8.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-013(i), a maximum concentration of 43.4 ppm was detected at a depth of 0.0–1.0 ft bgs. This sample (RE03-09-13569) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-013(i) consist of 48 soil samples collected from 24 locations.

Inorganic Chemicals

A total of 48 soil samples were analyzed for TAL metals, and 32 soil samples were analyzed for cyanide. Table 6.8-2 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 detected above the soil BV (0.83 mg/kg) in 13 samples with a maximum concentration of 5.71 mg/kg. Antimony also had DLs (1.08 to 1.25 mg/kg) above the BV in 19 samples. The quantile and slippage tests indicated site concentrations of antimony in soil are statistically different from background (Table H-4 and Figure H-8). Antimony is retained as a COPC.

Barium was detected above the soil BV (295 mg/kg) in two samples with a maximum concentration of 373 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not different from background (Table H-4 and Figure H-8). Barium is not a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 15 samples with a maximum concentration of 5.58 mg/kg. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-4 and Figure H-9). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in seven samples with a maximum concentration of 14,200 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Table H-4 and Figure H-9). Calcium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in two samples with a maximum concentration of 21.6 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Table H-4 and Figure H-10). Chromium is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in three samples with a maximum concentration of 21.8 mg/kg. The quantile test indicated site concentrations of copper in soil are statistically different from background (Table H-4 and Figure H-10). Copper is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in 19 samples with a maximum concentration of 238 mg/kg. The quantile test indicated site concentrations of lead in soil are statistically different from background (Table H-4 and Figure H-11). Lead is retained as a COPC.

Magnesium was detected above the soil BV (4610 mg/kg) in one sample at a concentration of 4700 mg/kg. The Gehan and quantile tests indicate site concentrations of magnesium in soil are not statistically different from background (Table H-4 and Figure H-11). Magnesium is not a COPC.

Nickel was detected above the soil BV (15.4 mg/kg) in one sample at a concentration of 16.3 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Table H-4 and Figure H-12). Nickel is not a COPC.

Selenium was not detected above the soil BV (1.52 mg/kg) but had DLs (1.66 mg/kg to 1.97 mg/kg) above the BV in 15 samples. Selenium is retained as a COPC.

Zinc was detected above soil BV (48.8 mg/kg) in 20 samples with a maximum concentration of 482 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-4 and Figure H-12). Zinc is retained as a COPC.

Organic Chemicals

A total of 48 soil samples were analyzed for SVOCs, PCBs, and TPH-DRO; 40 soil samples were analyzed for VOCs; and 16 soil samples were analyzed for TPH-GRO. Table 6.8-3 summarizes the analytical results for detected organic chemicals. Plate 11 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-013(i) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; 2-butanone; chrysene; dibenz(a,h)anthracene; dibenzofuran; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; TPH-GRO; 1,2,4-trimethylbenzene;1,2-xylene; and 1,3-xylene+1,4-xylene. All detected organic chemicals are retained as COPCs.

6.8.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-013(i) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-013(i) include antimony, copper, lead, selenium, and zinc.

Antimony was detected above the soil BV in 13 samples with a maximum concentration of 5.71 mg/kg. Antimony also had DLs (1.08 mg/kg to 1.25 mg/kg) above the BV in 19 samples. Concentrations decreased with depth at all locations and decreased laterally to the east. The residential SSL was approximately 6 times and the industrial SSL was approximately 80 times the maximum detected concentration. The vertical extent of antimony 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 21.8 mg/kg. Copper concentrations decreased with depth at all locations. Concentrations were 3 mg/kg to 5 mg/kg above the maximum soil background concentration (16 mg/kg), and the residential SSL was approximately 145 times the maximum concentration above the BV. Concentrations also decreased to the east. Further sampling for extent of copper is not warranted.

Lead was detected above the soil BV in 19 samples with a maximum concentration of 238 mg/kg. Lead concentrations decreased with depth at all locations and decreased to the east. The lateral and vertical extent of lead are defined.

Selenium was not detected above the soil BV but had DLs (1.66 mg/kg to 1.97 mg/kg) above the BV in 15 samples. Because selenium was not detected above the BV and the residential SSL was approximately 200 times the maximum DL, further sampling for extent of selenium is not warranted.

Zinc was detected above the soil BV in 20 samples with a maximum concentration of 482 mg/kg. Zinc concentrations decreased with depth at 17 locations, and the concentration was less than the maximum soil background concentration (75.5 mg/kg) at the other location. Concentrations decreased to the east. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-013(i) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; 2-butanone; chrysene; dibenz(a,h)anthracene; dibenzofuran; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; TPH-GRO; 1,2,4-trimethylbenzene;1,2-xylene; and 1,3-xylene+1,4-xylene.

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 were detected in 2 to 17 samples. Concentrations decreased with depth at all locations. Concentrations generally decreased to the east. The residential SSLs for acenaphthene; acenaphthylene; anthracene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene were approximately 40 times to 100,000 times the maximum concentrations. The residential SSLs for benzo(a)anthracene; benzo(b)fluoranthene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene were approximately 3 times to 28 times the maximum concentrations. The residential SSL for benzo(a)pyrene was exceeded in 3 samples with concentrations ranging from approximately equivalent (0.153 mg/kg) to 2.7 times the SSL. The residential cancer risk for these 4 COPCs (and for the site) was approximately 1×10^{-5}. The industrial SSLs for benzo(a)anthracene; benzo(b)fluoranthene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene were approximately 45 times to 95 times the maximum concentrations and the industrial SSL for benzo(a)pyrene was approximately 6 times the maximum concentration. The industrial cancer risk for these four COPCs was approximately 8×10^{-7}. Further sampling for extent of these COPCs is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0297 mg/kg. The concentration decreased with depth and laterally. The residential SSL was approximately 75 times the detected concentration. The lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 and Aroclor-1260 were detected in 24 and 22 samples with maximum concentrations of 2.81 mg/kg and 2.26 mg/kg, respectively. Concentrations decreased with depth or did not change substantially with depth at all locations (0.005 mg/kg or less). Aroclor-1254 and Aroclor-1260 concentrations decreased laterally. The maximum concentrations were above the residential SSL for Aroclor-1254 and equivalent to the residential SSL for Aroclor-1260, but the industrial SSLs were approximately 3 times to 4 times the maximum concentrations (the industrial cancer risk for these COPCs was approximately 1×10^{-6}). The industrial SSLs were approximately 3 times or more and 125 times or more than the other detected concentrations of Aroclor-1254 and Aroclor-1260, respectively. Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted.

Acetone; 2-butanone; ethylbenzene; 4-isopropyltoluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene were detected in one to four samples. Concentrations of ethylbenzene; 4-isopropyltoluene; 1,2,4-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene and one concentration of 4-isopropyltoluene were below the EQLs. The residential SSLs were approximately 175,000 times (acetone) to 2,100,000 times (2-butanone) the maximum concentrations. Further sampling for extent of these COPCs is not warranted.

Methylene chloride was detected in 11 samples with a maximum concentration of 0.00291 mg/kg. Concentrations were similar at all locations, were below the EQLs, and the residential SSL was approximately 140,000 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

Toluene was detected in 11 samples with a maximum concentration of 0.0104 mg/kg. Concentrations of toluene decreased with depth at all locations and the residential SSL was approximately 500,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Benzoic acid, bis(2-ethylhexyl)phthalate, and dibenzofuran were detected in four, six, and one samples, respectively. Concentrations of benzoic acid and dibenzofuran as well as three concentrations of bis(2-ethylhexyl)phthalate were below the EQLs. The residential SSLs were approximately 360,000 times (benzoic acid), 250 times [bis(2-ethylhexyl)phthalate], and 1000 times (dibenzofuran) the maximum concentrations. Further sampling for extent of benzoic acid, bis(2-ethylhexyl)phthalate, and dibenzofuran is not warranted.

TPH-DRO was detected in 39 samples with a maximum concentration of 5370 mg/kg. Concentrations decreased with depth at 16 locations and decreased to the east. Concentrations at location 03-608230 were below the EQLs. The residential screening guideline for diesel No. 2/crankcase oil at 4 of the other locations was approximately 4 times to 10 times the concentrations. Concentrations at location 03-24445 were approximately 3 times the residential screening guideline and increased with depth. The industrial screening guideline for diesel No. 2/crankcase oil at four of the other locations was approximately 7 times to 20 times the concentrations. Concentrations at location 03-24445 were less than 2 times the industrial screening guideline and increased with depth. The extent of TPH-DRO is not defined.

TPH-GRO was detected in 10 samples with a maximum concentration of 0.35 mg/kg. The detected concentrations are 0.35 mg/kg or less, which indicates TPH-GRO is not a major part of the contamination at this site compared with TPH-DRO. Concentrations decreased with depth at 4 locations and decreased laterally to the east. Concentrations at locations 03-24450 and 03-24451 were below the EQLs. There are no TPH screening guidelines for TPH-GRO, and the individual components were evaluated separately. Further sampling for extent of TPH-GRO is not warranted.

6.8.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.8. Potential risk from TPH-GRO is based on constituents. The potential risks for the industrial scenario are below the NMED target levels.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 9×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.5. Potential risk from TPH-GRO is based on constituents. The potential risks for the construction worker scenario are below the NMED target levels.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.9. Potential risk from TPH-GRO is based on constituents. The potential risks for the residential scenario are equivalent to or below the NMED target levels.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-013(i).

6.8.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-013(i).

6.9 Consolidated Unit 03-014(a)-99

Consolidated Unit 03-014(a)-99 consists of 20 of the 30 SWMUs and AOCs associated with the former WWTP that operated at TA-03 from 1951 to 1992, until the Laboratory's SWSC plant at TA-46 came online in 1992 (LANL 1993, 020947, p. 5-46). Nine of these SWMUs [03-014(b2), 03-014(c2), 03-014(k-o), 03-014(u), and 03-056(d)] were included in the Phase II investigation work plan for Upper Sandia Canyon Aggregate Area (LANL 2011, 206234) and are discussed below. Investigation of the remaining 11 SWMUs is delayed until D&D of their associated structures, and they are not included in this supplemental investigation report.

The former WWTP is next to and east of the utilities control center (building 03-223) on the southern rim near the head of Sandia Canyon. The WWTP served TA-03, TA-43, TA-59, and TA-60, the trailer park on East Jemez Road, and holding tank and septic system wastes throughout the Laboratory. The WWTP had two parallel systems, the north plant (Plant 1) built in 1951, and the south plant (Plant 2) built in 1964. Each system consisted of entrance works, Imhoff tanks, dosing siphons, trickling filters, and final clarifying tanks. The plants were different in some physical dimensions but functionally similar. The WWTP was designed with a 750,000 gal./d combined capacity (LANL 1993, 020947, p. 5-45). Although no longer operational, many of the structures associated with the SWMUs and AOCs of Consolidated Unit 03-014(a)-99 are still present, the locations of which are shown in Figure 6.9-1.

When it entered the former WWTP, raw sewage was metered at a splitter box (structure 03-677) where the flow was diverted to either Plant 1 or Plant 2. The water passed through a comminutor that shredded large solid material. Manually cleaned bar racks were available for both plants when the comminutors were down for repair. Effluent flow was approximately 150,000 gal./d (LANL 1993, 020947, pp. 5-45–5-47). The splitter box, comminutor, and bar racks are collectively identified as SWMU 03-014(i) (LANL 1993, 020947, p. 5-46).

Wastewater passed from the entrance works directly to the Imhoff tanks, structures 03-49 and 03-192 [SWMUs 03-014(a) and 03-014(e)], which functioned as settling/digestion tanks. Effluent water flowed from the Imhoff tanks to dosing siphons, structures 03-48 and 03-193 [SWMUs 03-014(b) and 03-014(f)], then to the trickling filters, structures 03-47 and 03-194 [SWMUs 03-014(c) and 03-014(g)], where organic waste was biologically digested through bacterial growth on rock media (LANL 1993, 020947, p. 5-47). Material sloughed from the trickling filter media settled in final clarifying tanks, structures 03-46 and 03-195 [SWMUs 03-014(d) and 03-014(h)]; the resulting sludge was then recirculated back to the head of the plant to allow solids to settle out in the Imhoff tanks (LANL 1993, 020947, p. p. 5-47).

Sludge collected in the Imhoff tanks was ultimately siphoned to four sludge drying beds, structures 03-196, 03-197, 03-198, and 03-199 [SWMUs 03-014(k,l,m,n)], located immediately north of the Imhoff tanks. Three of the four beds were used for sludge drying, while the fourth was used as a skimmer bed. Overflow sludge was directed to three additional sludge drying beds, structure 03-1871 [SWMU 03-014(o)], located north and downslope of the four sludge drying beds and west of the chlorine contact chamber [SWMU 03-014(j)] (LANL 1993, 020947, p. 5-47). SWMUs 03-014(k,l,m,n) were constructed in 1965 and are referred to as the “upper beds,” while the other three sludge drying beds [SWMU 03-014(o)] were constructed in 1987 and are referred to as the “lower beds” (LANL 1993, 020947, p. 5-46; LANL 1997, 056660.4, p. 57).

Effluent from the sludge beds flowed from a subsurface drain system to a holding tank, structure 03-1901 [SWMU 03-014(u)]. The contents of the tank were recirculated by truck to the head of the plant for additional treatment. From the late 1950s to the late 1970s, dried sludge was added to the soil around the entrance works as a soil amendment (LANL 1993, 020947, p. 5-47).

Additional AOCs and SWMUs addressed as part of Consolidated Unit 03-014(a)-99 include AOCs 03-014(b2) and 03-014(c2), historical outfalls associated with the former WWTP; SWMU 03-014(p), a lift station associated with the former WWTP; and SWMU 03-056(d), a drum storage area located on the northeast side and next to SWMU 03-014(c), the trickling filter (structure 03-47).

RFI activities were performed at the former WWTP in 1994 and 1997. In 1994, the area around the Imhoff tanks and the two historical outfalls were sampled. The Imhoff tanks were sampled because treated sludge was directly applied to the soil in the grassy areas around the tanks. The historical outfalls

[AOC 03-014(b2) and AOC 03-014(c2)] were sampled because AOC 03-014(b2) was an active outfall for the WWTP, and AOC 03-014(c2) was believed to be an out-of-service outfall trench but was subsequently identified as a storm drain trench and overflow outlet pipe outfall (LANL 1996, 052930, p. 83). In 1997, the sludge drying beds [SWMUs 03-014(k,l,m,n,o)] were sampled. SWMU 03-014(n) was scheduled for sampling; however, oil was discovered in the bed, which was subsequently remediated in early September 1997 (LANL 1997, 056660.4, p. 60).

6.9.1 AOC 03-014(b2), Outfall

6.9.1.1 Site Description and Operational History

AOC 03-014(b2) is a former NPDES-permitted outfall (EPA SSSO1S) for the former TA-03 WWTP (Figure 6.9-1). The outfall received treated effluent from a flow-measurement weir north of the WWTP chlorination system [SWMU 03-014(j)] dosing and contact chamber via a 1.5-ft-diameter × 300-ft-long corrugated metal pipe. The outfall discharged to a rocky outcrop at the edge of Sandia Canyon (LANL 1993, 020947, p. 5-49). Outfall SSS01S was permitted for the discharge of wastewater and was removed from the NPDES permit in 1994 (LANL 1999, 064617, p. 2-7).

AOC 03-014(b2) received effluent from the former TA-03 WWTP from 1989 to 1992 when the WWTP was decommissioned. AOC 03-014(b2) received treated effluent from the SWSC plant at TA-46 from 1992 to 1998 when the effluent was switched to the outfall at the power plant, building 03-22. AOC 03-014(b2) was monitored three times per month for biochemical oxygen demand, total suspended solids, pH, fecal coliform, total chlorine, and radioactive constituents. From 1989 to 1993, radioactive constituents were reported above the DLs (LANL 1993, 020947, p. 5-49).

6.9.1.2 Relationship to Other SWMUs and AOCs

Effluent from the former TA-03 WWTP was discharged to the AOC 03-014(b2) outfall. This former outfall is located northeast of the former TA-03 WWTP and is a component of Consolidated Unit 03-014(a)-99.

6.9.1.3 Summary of Previous Investigations

During the 1994 Phase I RFI conducted at AOC 03-014(b2), 12 sediment samples were collected from 4 locations within the outfall drainage channel in areas where sediment had accumulated. Samples were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, PCBs, pesticides, herbicides, gross-alpha, -beta, and -gamma radiation, and tritium and by gamma spectroscopy (LANL 1996, 052930, pp. 95–98). Data from the 1994 RFI are screening-level data and are summarized below. Section 2.13.3 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Chromium was detected above BV in one sample. Lead and silver were detected above BVs in two samples. Isopropyltoluene[4-], toluene, and bis(2-ethylhexyl)phthalate were detected in one sample. Cesium-137 was detected above BV/FV in one sample. Cobalt-60 was detected in one sample. Gross-alpha and -beta radiation were detected in four samples.

6.9.1.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 03-014(b2). As a result, the following activities were completed as part of the 2009 investigation.

- Ten samples were collected from five locations to confirm the results of previous sampling events and to define the extent of contamination between the AOC and the Sandia Canyon reach S-1. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, and isotopic uranium.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-014(b2) are shown in Figure 6.9-1. Table 6.9-1 presents the samples collected and analyses requested at AOC 03-014(b2). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 03-014(b2), a maximum concentration of 4.0 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-014(b2) consist of 10 samples (6 soil and 4 tuff) collected from 5 locations.

Inorganic Chemicals

Ten samples (six soil and four tuff) were analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 6.9-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 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 (1.02 mg/kg to 1.29 mg/kg) above the BVs in 10 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 1 sample at a concentration of 3.61 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (5 mg/kg). Arsenic is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs above the BV (0.528 mg/kg to 0.644 mg/kg) in 6 samples. Because less than 10 soil samples were collected, statistical tests could not be performed. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 1 sample at a concentration of 14.9 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (13 mg/kg). Chromium is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in three samples with a maximum concentration of 1.61 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 1 sample each with a maximum concentration of 37.3 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum soil background concentration (28 mg/kg) and the maximum Qbt 2,3,4 background concentration (15.5 mg/kg), respectively. Lead is retained as a COPC.

Perchlorate was detected in one soil sample and one tuff sample with a maximum concentration of 0.00173 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 (0.999 mg/kg to 1.19 mg/kg) above the BV in four samples. Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 2 samples with a maximum concentration of 82.4 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. One concentration was above the maximum soil background concentration (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Ten samples (six soil and four tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.9-3 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 03-014(b2) include acetone, Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

Radionuclides

Ten samples (six soil and four tuff) were analyzed for americium-241, isotopic plutonium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs at AOC 03-014(b2). Radionuclide COPCs were not identified for the site.

Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC 03-014(b2) are discussed below. No radionuclide COPCs were identified at AOC 03-014(b2).

Inorganic Chemicals

Inorganic COPCs at AOC 03-014(b2) include antimony, chromium, cyanide, lead, perchlorate, selenium, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.02 mg/kg to 1.29 mg/kg) above the BVs in 10 samples. Because antimony was not detected above BVs and the residential SSL was 24 times the maximum DL, further sampling for extent of antimony is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 14.9 mg/kg. The maximum detected concentration was similar to the maximum Qbt 2,3,4 background concentration (13 mg/kg). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared to SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 7800 times the concentration above the BV. Further sampling for extent of chromium is not warranted.

Cyanide was detected above the soil BV in three samples with a maximum concentration of 1.61 mg/kg. Concentrations decreased with depth at location 03-608245 and did not change substantially downgradient (0.07 mg/kg). The residential SSL was approximately 29 times to 40 times the concentrations above the BV and the residential HQ was approximately 0.03. Further sampling for extent of cyanide is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in one sample each with a maximum concentration of 37.3 mg/kg. Concentrations decreased with depth at location 03-608243 and decreased downgradient. The lateral and vertical extent of lead are defined.

Perchlorate was detected in two samples with a maximum concentration of 0.00173 mg/kg. Concentrations were below the EQLs (only a 0.00083 mg/kg difference between concentrations) and decreased downgradient. The residential SSL was approximately 31,000 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 (0.999 mg/kg to 1.19 mg/kg) above the BV in four samples. Because selenium was not detected above BVs and the residential SSL was approximately 330 times the maximum DL, further sampling for extent of selenium is not warranted.

Zinc was detected above the soil BV in two samples with a maximum concentration of 82.4 mg/kg. Concentrations decreased with depth at locations 03-608245 and 03-608246 and decreased downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at AOC 03-014(b2) include acetone, Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO.

Acetone was detected in three samples with a maximum concentration of 0.0144 mg/kg. The residential SSL was 4,700,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1254 and Aroclor-1260 were detected in five samples with maximum concentrations of 0.0693 mg/kg and 0.0514 mg/kg, respectively. Concentrations decreased with depth at locations 03-608243 and 03-608245 and decreased downgradient. The residential SSLs were 16 times and 43 times the maximum concentrations of Aroclor-1254 and Aroclor-1260, respectively. Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration below the EQL and decreased downgradient. The residential SSL was approximately 3500 times the detected concentration. Further sampling for extent of bis(2-ethylhexyl)phthalate is not warranted.

Benzo(a)pyrene benzo(b)fluoranthene, benzo(k)fluoranthene chrysene, fluoranthene, phenanthrene, and pyrene were detected in one or two samples. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of these organic COPCs are defined.

TPH-DRO was detected in 10 samples with a maximum concentration of 32.1 mg/kg. The concentrations decreased with depth at locations 03-608243, 03-608244, 03-608245, and 03-608246 and decreased downgradient. The residential TPH screening guideline for diesel No. 2/crankcase oil was approximately 31 times the maximum concentration and the HQ was approximately 0.03. The lateral extent of TPH-DRO is defined and further sampling for vertical extent of TPH-DRO is not warranted.

Radionuclides

No radionuclide COPCs were identified at AOC 03-014(b2).

6.9.1.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.05, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.02.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 0.05, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.01.

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.02.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at AOC 03-014(b2).

6.9.1.6 Summary of 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 the relationship of detected concentrations and DLs to background concentrations, 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 03-014(b2).

6.9.2 AOC 03-014(c2), Outfall

6.9.2.1 Site Description and Operational History

AOC 03-014(c2) is the inactive overflow outfall that previously received treated effluent from the former TA-03 WWTP from 1975 until the WWTP chlorination system [SWMU 03-014(j)] was constructed in 1985 (LANL 1993, 020947, pp. 5-48–5-49). The outfall was located on the north side of the chlorination system pump pit (structure 03-166) (Figure 6.9-1). Effluent for this outfall discharged as sheet flow onto a steep slope containing an erosion channel from storm water runoff. The channel eventually trends northeast into Sandia Canyon. Soil and sediment were occasionally cleaned out of the channel with a backhoe and piled onto the upslope channel bank (LANL 1996, 052930, p. 103). Following the construction of the chlorination system, the outfall was rerouted underground from the pump pit to the chlorination dosing and contact chamber where the final effluent discharged freely into Sandia Canyon from a flow measurement weir north of the contact chamber. This outfall was abandoned in 1988 or 1989, when the WWTP effluent was routed to a new outfall, AOC 03-014(b2) (section 6.9.1) (LANL 1993, 020947, p. 5-49).

An evaluation of the former WWTP blueprints during the 1994 RFI identified the location of the original treated effluent outfall approximately 20 to 30 ft west of the original AOC 03-014(c2) outfall (LANL 1996, 052930, p. 116).

6.9.2.2 Relationship to Other SWMUs and AOCs

Before the chlorine contact chamber [SWMU 03-014(j)] was installed, clarified effluent from the final clarifying tanks. SWMUs 03-014(d) and 03-014(h) discharged through the outfall at AOC 03-014(c2). This former outfall is located in the northeast corner of the former WWTP, west of the more recent outfall at AOC 03-014(b2), and is a component of Consolidated Unit 03-014(a)-99.

6.9.2.3 Summary of Previous Investigations

During the 1994 Phase I RFI conducted at AOC 03-014(c2), 20 sediment samples (including 1 field duplicate) were collected from 9 locations from depths of 0.0–1.0 ft and 1.0–1.5 ft bgs. Samples from the 0.0–1.0-ft interval were submitted for laboratory analyses of TAL metals, SVOCs, PCBs, pesticides, herbicides, gross-alpha, -beta, and -gamma radiation, isotopic plutonium and uranium, strontium-90, and tritium and by gamma spectroscopy. Samples from the 1.0–1.5-ft interval were submitted for laboratory analyses of cyanide, VOCs, gross-alpha, -beta, and -gamma radiation, and tritium (LANL 1996, 052930, p. 106). Data from the 1994 RFI are screening-level data and are summarized below. Section 2.13.5 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Calcium and zinc were detected above BVs in one sample. Lead and nickel were detected above BVs in three samples. Cadmium, chromium, copper, cyanide, mercury, and silver were detected above BVs in six samples. 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 were detected in one sample. Aroclor-1260 was detected in eight samples at less than 1 ppm. Plutonium-239/240 and plutonium-238 were detected above FVs in one and six samples, respectively. Europium-152 and tritium were detected in two samples. VOCs, pesticides, and herbicides were not detected.

6.9.2.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 03-014(c2). As a result, the following activities were completed as part of the 2009 investigation.

- Ten samples were collected from five locations to characterize the drainage, confirm the results of a previous sampling event, and define the extent of contamination. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, and isotopic uranium.
- Six samples were collected from three locations on the north-facing slope and associated drainage to confirm the results of a previous sampling event. At each location, samples were collected from 0.0–1.0 ft and 2.0–3.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, and isotopic uranium.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-014(c2) are shown in Figure 6.9-1. Table 6.9-4 presents the samples collected and analyses requested at AOC 03-014(c2). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors, at AOC 03-014(c2), a maximum concentration of 96.5 ppm was detected at a depth of 2.0–3.0 ft bgs. This sample (RE03-09-13642) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-014(c2) consist of 16 samples (12 soil and 4 tuff) collected from 8 locations.

Inorganic Chemicals

Sixteen samples (12 soil and 4 tuff) were analyzed for TAL metals, nitrate, cyanide, and perchlorate. Table 6.9-5 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 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 (0.999 mg/kg to 1.11 mg/kg) above the BVs in 16 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in four samples with a maximum concentration of 1.09 mg/kg and had DLs (0.52 to 0.541 mg/kg) above the BV in three samples. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-5 and Figure H-13). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in two samples with a maximum concentration of 7270 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Table H-5 and Figure H-13). 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 3 soil samples and 2 tuff samples with a maximum concentration of 34.4 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Table H-5 and Figure H-14). Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration in tuff was above the maximum Qbt 2,3,4 background concentration (13 mg/kg). 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 5 soil samples and 3 tuff samples with a maximum concentration of 32.3 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Table H-5 and Figure H-14). Because less than 10 tuff samples were collected, statistical tests could not be performed. Concentrations in tuff were above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Cyanide was detected above the soil and Qbt 2,3,4 BV (0.5 mg/kg) in six soil samples and three tuff samples with a maximum concentration of 30.2 mg/kg. Cyanide is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in two samples with a maximum concentration of 30.5 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Table H-5 and Figure H-15). Lead is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BV (0.1 mg/kg) in 10 soil samples and 2 tuff samples with a maximum concentration of 0.847 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in 1 sample each with a maximum concentration of 18.6 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Table H-5 and Figure H-15). Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration in tuff (7.04 mg/kg) is equivalent to the maximum Qbt 2,3,4 background concentration (7 mg/kg). Nickel is not a COPC.

Nitrate was detected in four samples with a maximum concentration of 2.75 mg/kg. Nitrate is naturally occurring, and the concentrations reflect naturally occurring levels of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.000989 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 mg/kg to 1.03 mg/kg) above the BV in four samples. Selenium is retained as a COPC.

Silver was detected above the soil and Qbt 2,3,4 BV (1 mg/kg) in nine soil samples and three tuff samples with a maximum concentration of 10.9 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in four samples with a maximum concentration of 89.4 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-5 and Figure H-16). Zinc is retained as a COPC.

Organic Chemicals

Sixteen samples (12 soil and 4 tuff) were analyzed for SVOCs, VOCs, TPH-DRO, and PCBs. Table 6.9-6 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 03-014(c2) include acetone; anthracene; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; tert-butylbenzene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; phenanthrene; pyrene; toluene; and TPH-DRO. All detected organic chemicals are retained as COPC.

Radionuclides

Sixteen samples (12 soil and 4 tuff) were analyzed for americium-241, isotopic plutonium, and isotopic uranium. Table 6.9-7 summarizes radionuclides detected or detected above BVs/FVs. Plate 14 shows the spatial distribution of detected radionuclides.

Americium-241 was detected in one soil sample below 0.0–1.0 ft bgs and one tuff sample with a maximum concentration of 0.0498 pCi/g. Americium-241 is retained as a COPC.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 03-014(c2) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 03-014(c2) are antimony, chromium, copper, cyanide, mercury, perchlorate, selenium, silver, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.999 mg/kg to 1.11 mg/kg) above the BVs in 16 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 28 times the maximum DL, further sampling for extent of antimony is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in three soil samples and two tuff samples with a maximum concentration of 34.4 mg/kg. Concentrations decreased with depth at locations 03-608251 and 03-608254 and decreased downgradient. Concentrations were below the maximum Qbt 2,3,4 background concentration (13 mg/kg) at location 03-608248 and were below the maximum soil background concentration (36.5 mg/kg) at location 03-608252. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 3400 times to 10,000 times the concentrations above the BVs. 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 three tuff samples with a maximum concentration of 32.3 mg/kg. Concentrations decreased with depth at four locations and decreased downgradient. The residential SSL was approximately 100 times to 575 times the concentrations above the BVs. The lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Cyanide was detected above soil and Qbt 2,3,4 BVs in six soil samples and three tuff samples with a maximum concentration of 30.2 mg/kg. Concentrations decreased with depth at four locations and decreased downgradient. The residential SSL was approximately 1.5 times to 90 times the concentrations above the BVs. The industrial SSL was approximately 22 times the maximum concentration. The industrial and residential HQs were 0.03 and 0.2, respectively. The lateral extent of cyanide is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil and Qbt 2,3,4 BVs in 10 soil samples and 2 tuff samples with a maximum concentration of 0.847 mg/kg. Concentrations decreased with depth or did not change substantially with depth (0.2 mg/kg or less) at all locations and decreased downgradient. The residential SSL was approximately 28 times to 200 times the concentrations (the residential HQ was 0.02). The lateral extent of mercury is defined, and further sampling for vertical extent is not warranted.

Perchlorate was detected in three samples with a maximum concentration of 0.000989 mg/kg. Concentrations were below the EQLs, and the residential SSL was approximately 55,000 times the maximum concentration. Perchlorate was not detected downgradient. 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 (1 mg/kg to 1.03 mg/kg) above the BV in four 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.

Silver was detected above the soil and Qbt 2,3,4 BV in nine soil samples and three tuff samples with a maximum concentration of 10.9 mg/kg. Silver concentrations decreased or did not change substantially with depth (0.16 mg/kg) at five locations and decreased downgradient. The residential SSL was approximately 36 times to 235 times the concentrations above the BVs (the residential HQ was 0.02). The lateral extent of silver is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above the soil BV in four samples with a maximum concentration of 89.4 mg/kg. Zinc concentrations decreased with depth or did not change substantially with depth (0.5 mg/kg) at two locations and decreased downgradient. The concentration at location 03-608249 was below the maximum soil background concentration (75.5 mg/kg). The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at AOC 03-014(c2) include acetone; anthracene; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; tert-butylbenzene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; phenanthrene; pyrene; toluene; and TPH-DRO.

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 were detected in two to nine samples. Concentrations decreased with depth or were below EQLs at all locations and decreased downgradient. The lateral and vertical extent of 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 defined.

Acetone was detected in three samples with a maximum concentration of 0.0511 mg/kg. Acetone was not detected at downgradient locations. The residential SSL was approximately 1,300,000 times the maximum concentration. The lateral extent of acetone is defined, and further sampling for vertical extent is not warranted.

Aroclor-1248 was detected in one sample at a concentration of 0.0141 mg/kg. Aroclor-1248 was not detected at downgradient locations. The residential SSL was approximately 160 times the concentration. The lateral extent of Aroclor-1248 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 14 samples with a maximum concentration of 6.78 mg/kg. Concentrations decreased at downgradient locations. Concentrations decreased with depth at four locations. The residential SSL was exceeded in two samples. The maximum concentration (6.78 mg/kg) at location 03-608249 exceeded the residential SSL by a factor of 6, was 82% of the industrial SSL, and increased with depth. The residential SSL for Aroclor-1254 was exceeded at location 03-608248 by approximately 0.5 mg/kg, and the industrial SSL was approximately 5 times the concentration. The concentrations at this location decreased with depth. The industrial SSL was approximately 22 times to 650 times the detected concentrations at the other locations. Further sampling for lateral extent of Aroclor-1254 is not warranted. Additional sampling for vertical extent of Aroclor-1254 at location 03-608249 is warranted.

Aroclor-1260 was detected in 14 samples with a maximum concentration of 6.03 mg/kg. Concentrations decreased at downgradient locations. Concentrations decreased with depth at 4 locations. The residential SSL for Aroclor-1260 was exceeded in 1 sample. The maximum concentration (6.03 mg/kg) at location 03-608249 exceeded the residential SSL by a factor of 6, was 73% of the industrial SSL, and increased with depth. The concentration at location 03-608248 was 1 mg/kg below residential SSL and the industrial SSL was approximately 7 times the concentration. The concentrations at this location decreased with depth. The industrial SSL was approximately 24 times to 1300 times the detected concentrations at the other locations. Further sampling for lateral extent of Aroclor-1254 is not warranted. Additional sampling for vertical extent of Aroclor-1260 at location 03-608249 is warranted.

Butylbenzene(tert-), 4-isopropyltoluene, and toluene were detected in one sample at concentrations of 0.000685 mg/kg, 0.0333 mg/kg, and 0.00156 mg/kg, respectively. The residential SSLs were approximately 73,000 times to 5,600,000 times the concentrations. Further sampling for extent of tert-butylbenzene, 4-isopropyltoluene, and toluene is not warranted.

TPH-DRO was detected in 16 samples with a maximum concentration of 69.1 mg/kg. Concentrations decreased with depth at 6 locations and decreased downgradient. The residential screening guideline for diesel No. 2/crankcase oil was approximately 14 times to 310 times the concentrations. The industrial screening guideline for diesel No. 2/crankcase oil was approximately 26 times to 550 times the concentrations. The residential and industrial HQs were 0.04 and 0.02, respectively. The lateral extent of TPH-DRO is defined, and further sampling for vertical extent is not warranted.

Radionuclides

The radionuclide COPC at AOC 03-014(c2) is americium-241.

Americium-241 was detected in one soil sample and one tuff sample with a maximum activity of 0.0498 pCi/g. Activities decreased downgradient. The residential SAL was approximately 1640 times the maximum activity. The lateral extent of americium-241 is defined and further sampling for vertical extent is not warranted.

6.9.2.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.04, which is below the NMED target HI of 1 (NMED 2012, 219971). No radionuclides were detected in the surface samples. The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.02.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 4×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.7, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.009 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.02.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 3, which is above the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.02 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.04.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial and construction worker scenarios at AOC 03-014(c2). There are potential unacceptable risks for the residential scenario at AOC 03-014(c2).

6.9.2.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-014(c2).

6.9.3 SWMU 03-014(k), Structure Associated with Former WWTP

6.9.3.1 Site Description and Operational History

SWMU 03-014(k), structure 03-196, is one of four unlined sludge-drying beds [SWMUs 03-014(k,l,m,n)] associated with the former TA-03 WWTP (Figure 6.9-1). The drying beds, located north of the Imhoff tanks, received sludge siphoned from the Imhoff tanks. Three of the four beds were used for drying sludge, while the fourth bed, SWMU 03-014(n), was used as a skimmer bed (LANL 1993, 020947, pp. 5-46–5-47).

SWMU 03-014(k) consists of an unlined sludge-drying bed excavated into the tuff. The sludge bed measures 35 ft × 10 ft (LANL 1990, 007511, p. 3-14). A 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in numerous places, exposing the underlying soil-tuff (LANL 1997, 056660.4, p. 58).

6.9.3.2 Relationship to Other SWMUs and AOCs

SWMU 03-014(k) is located next to three other sludge drying beds, SWMUs 03-014(l,m,n), in the west-central portion of the former WWTP. Sludge was siphoned from the Imhoff tanks at SWMUs 03-014(a) and 03-014(e). All four SWMUs are components of Consolidated Unit 03-014(a)-99.

6.9.3.3 Summary of Previous Investigations

During the 1997 Phase I RFI conducted at SWMU 03-014(k), one location was sampled near the inlet pipes on the south side of the drying bed at SWMU 03-014(k). Three samples were collected from three depths: one from filter (fill) material within the bed and two from successive 1-ft intervals (in tuff) beneath the bed. All samples were submitted for laboratory analyses of TAL metals, SVOCs, PCBs, pesticides, herbicides, isotopic plutonium and uranium, strontium-90, and tritium. One tuff sample was also submitted for laboratory analysis of VOCs.

Mercury and silver were detected above BVs in the fill sample; copper was detected above BV in one tuff sample; chromium, nickel, and zinc were detected above BVs in the two tuff samples. The DLs for antimony and cadmium were above BVs in several samples. Organic chemicals and radionuclides were not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.9.13.4. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(k).

6.9.3.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-014(k). Sampling was conducted at locations in, around, and downgradient of SWMUs 03-014(k,l,m,n). The data for these sites were evaluated together because of their close proximity and the collocation of sampling locations around and downgradient of the sludge beds. As a result, the following activities were completed as part of the 2009 investigation.

- Ten samples were collected from historical sampling locations 03-03264, 03-03265, 03-03266, 03-03201, and 03-03202 to confirm the results of the previous sampling event and to define the vertical extent of contamination within and beneath the beds at SWMUs 03-014(k,l,m,n). At each location, samples were collected from 4.0–5.0 ft and 6.0–7.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, cyanide, perchlorate, nitrate, tritium, americium-241, isotopic plutonium, and isotopic uranium.
- Eleven samples were collected from four locations around and downgradient of SWMUs 03-014(k,l,m,n). At each location, samples were collected from 0.0–1.0 ft bgs, 0.0–1.0 ft beneath the sand and gravel layer at the base of the bed (the bed-tuff interface), and 5.0 ft below the bed-tuff interface, except at location 03-608273 where a sample could not be collected from 5.0 ft below the bed-tuff interface because material could not be recovered during drilling (see deviations in Appendix B). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, tritium, americium-241, isotopic plutonium, and isotopic uranium.

- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-014(k,l,m,n) are shown in Figure 6.9-1. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(k,l,m,n). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-014(k,l,m,n), a maximum concentration of 3.8 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMUs 03-014(k,l,m,n) consist of 44 samples (18 soil and 26 tuff) collected from 12 locations.

Inorganic Chemicals

Forty-five samples were analyzed for TAL metals (11 soil and 34 tuff), and 32 samples were analyzed for cyanide, nitrate, and perchlorate (6 soil and 26 tuff). Table 6.9-9 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in 1 sample at a concentration of 8.3 mg/kg. Antimony also had DLs (0.75 to 6.94 mg/kg) above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) in 41 samples. The detected concentration was above the maximum soil background concentration (1 mg/kg). 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 3.83 mg/kg. The Gehan and quantile tests indicated that the site data for arsenic in tuff are statistically different from background (Table H-6). However, the slippage test indicated the concentrations of arsenic in tuff are not statistically different from background (Table H-6), and the box plot shows the site concentrations are within the range of background concentrations (Figure H-17). Arsenic is not a COPC.

Barium was detected above the soil and Qbt 2,3,4 BVs (295 mg/kg and 46 mg/kg) in one sample each with a maximum concentration of 345 mg/kg. The Gehan and quantile tests indicated site data for barium in soil and tuff are not statistically different from background (Tables H-6 and H-7; Figures H-17 and H-22). Barium is not a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in three samples with a maximum concentration of 15.5 mg/kg. Cadmium also had DLs (0.47 mg/kg to 0.562 mg/kg) above the BV in three samples. The Gehan and quantile tests indicated site data for cadmium in soil are not statistically different from background (Table H-7). However, the maximum detected concentration is well above the maximum background concentration (2.6 mg/kg) (Figure H-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 sample each with a maximum concentration of 6430 mg/kg. The Gehan and quantile tests indicated site data for calcium in soil are not statistically different from background (Table H-7 and Figure H-23). The Gehan test indicated site data for calcium in tuff are statistically different from background (Table H-6). However, the quantile and slippage tests indicated the concentrations of calcium in tuff are not statistically different from background (Table H-6 and Figure H-18). 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 2 soil samples and 10 tuff samples with a maximum concentration of 51.9 mg/kg. The Gehan and quantile tests indicated site data for chromium in soil are not statistically different from background (Table H-7 and Figure H-23). The Gehan and quantile tests indicated that the site data for chromium in tuff are statistically different from background (Table H-6 and Figure H-18). 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 4 soil samples and 10 tuff samples with a maximum concentration of 231 mg/kg. The Gehan and quantile tests indicated site data for copper in soil and tuff are statistically different from background (Tables H-6 and H-7; Figures H-19 and H-24). Copper is retained as a COPC.

Cyanide was detected above the soil and Qbt 2,3,4 BV (0.5 mg/kg) in two soil samples and six tuff samples with a maximum concentration of 9.48 mg/kg. Cyanide 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 15,200 mg/kg. The Gehan test indicated site data for iron in tuff are statistically different from background (Table H-6). However, the maximum concentration was below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg), and the quantile and slippage tests indicated concentrations of iron in tuff are not statistically different from background (Table H-6 and Figure H-19). 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 four tuff samples with a maximum concentration of 217 mg/kg. The Gehan and quantile tests indicated site data for lead in soil are not statistically different from background (Table H-7 and Figure H-24). The Gehan and quantile tests indicated site data for lead in tuff are statistically different from background (Table H-6 and Figure H-20). Lead 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 509 mg/kg. The Gehan and quantile tests indicated that the site data for manganese in tuff are not statistically different from background (Table H-6 and Figure H-20). Manganese is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BV (0.1 mg/kg) in seven soil samples and one tuff sample with a maximum concentration of 0.92 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in one soil sample and six tuff samples with a maximum concentration of 30.7 mg/kg. The Gehan and quantile tests indicated site data for nickel in soil are not statistically different from background (Table H-7 and Figure H-25). The quantile and slippage tests indicated site data for nickel in tuff are statistically different from background (Table H-6 and Figure H-21). Nickel is retained as a COPC.

Nitrate was detected in nine samples with a maximum concentration of 2.09 mg/kg. Nitrate is naturally occurring, and the concentrations reflect naturally occurring levels of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.00355 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 (0.6 mg/kg to 1.38 mg/kg) above the BV in 28 samples. Selenium is retained as a COPC.

Silver was detected above the soil and Qbt 2,3,4 BV (1 mg/kg) in seven soil samples and five tuff samples with a maximum concentration of 18.3 mg/kg. Silver 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 five soil samples and four tuff samples with a maximum concentration of 638 mg/kg. The Gehan and quantile tests indicated site data for zinc in soil and tuff are statistically different from background (Tables H-6 and H-7; Figures H-21 and H-25). Zinc is retained as a COPC.

Organic Chemicals

Fifty-two samples were analyzed for SVOCs (18 soil and 34 tuff), 39 samples were analyzed for VOCs (8 soil and 31 tuff), 10 samples were analyzed for pesticides (4 soil and 6 tuff), 45 samples were analyzed for PCBs (15 soil and 30 tuff), 10 samples were analyzed for herbicides (4 soil and 6 tuff), and 39 samples were analyzed for TPH-DRO (11 soil and 28 tuff). Table 6.9-10 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMUs 03-014(k,l,m,n) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; 1,4-dichlorobenzene; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; naphthalene; phenanthrene; pyrene; TPH-DRO; and toluene. These detected organic chemicals are retained as COPCs.

TPH-lubrication range organic (LRO) was detected in three 1997 samples with a maximum concentration of 490 mg/kg. However, the TPH-LRO analysis was not requested and the results are probably because of an analytical misinterpretation, and the concentrations represent constituents associated with TPH-DRO. The analytical laboratory analyzing these samples calibrated for only TPH-DRO because that was the only TPH requested: a one-point motor oil standard was analyzed as a response factor for any chromatographic response outside the diesel range, and that calibration factor was used to give a number for lubricating oil quantitation. The TPH-LRO results do not meet current Laboratory quality standards and are screening-level data only. TPH-LRO is not retained as a COPC, and further sampling is not warranted.

Radionuclides

Twenty-seven samples were analyzed for americium-241 (5 soil and 22 tuff), 41 samples were analyzed for isotopic plutonium and uranium (8 soil and 33 tuff), 9 samples were analyzed for strontium-90 (3 soil and 6 tuff), and 41 samples were analyzed for tritium (8 soil and 33 tuff).Table 6.9-11 summarizes the analytical results for radionuclides. Plate 14 shows the spatial distribution of detected radionuclides.

Tritium was detected in three soil samples and eight tuff samples with a maximum concentration of 0.213 pCi/g. Tritium is retained as a COPC.

Uranium-234, uranium-235/236, and uranium-238 were detected above the soil BVs (2.59 pCi/g, 0.2 pCi/g, and 2.29 pCi/g, respectively) in one sample. Uranium-234, uranium-235/236, and uranium-238 are retained as COPCs.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMUs 03-014(k,l,m,n) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMUs 03-014(k,l,m,n) include antimony, cadmium, chromium, copper, cyanide, lead, mercury, nickel, perchlorate, selenium, silver, and zinc.

Antimony was detected above the soil BV in 1 sample at a concentration of 8.3 mg/kg. Antimony also had DLs (0.75 mg/kg to 6.94 mg/kg) above the soil and Qbt 2,3,4 BVs in 41 samples. Concentrations decreased with depth at the location where antimony was detected above the BV (location 03-03202). Concentrations decreased laterally in all directions at locations 03-608270, 03-608271, 03-608272, and 03-608273. The residential SSL was approximately 4.5 times to 40 times the DLs. Further sampling for extent of antimony is not warranted.

Cadmium was detected above the soil and Qbt 2,3,4 BV in three samples with a maximum concentration of 15.5 mg/kg. Calcium concentrations decreased with depth at all locations and laterally in all directions. The lateral and vertical extent of cadmium are defined.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples and 12 tuff samples with a maximum concentration of 51.9 mg/kg. Concentrations decreased with depth at 5 locations, and the concentrations at location 03-03201 were below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Concentrations decreased laterally in all directions. The lateral and vertical extent of chromium are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in 4 soil samples and 12 tuff samples with a maximum concentration of 231 mg/kg. Concentrations decreased with depth at all locations and decreased laterally in all directions. The residential SSL was approximately 13 times the maximum concentration above the BVs. The residential HQ was 0.01. The lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Cyanide was detected above the soil and Qbt 2,3,4 BV in two soil samples and six tuff samples with a maximum concentration of 9.48 mg/kg. Concentrations decreased with depth at four locations and decreased to the north at location 03-608180 associated with SWMU 03-014(o). The residential SSL was approximately 5 times the maximum concentration and approximately 37 times the concentration detected at location 03-03201. The residential HQ was 0.03. The industrial SSL was approximately 71 times the maximum concentration and approximately 540 times the concentration detected at location 03-03201. Further sampling for extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in three soil samples and five tuff samples with a maximum concentration of 217 mg/kg. Concentrations decreased with depth at five locations and decreased laterally. Concentrations at locations 03-03201 and 03-608273 were slightly above (0.3 mg/kg) or below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). The residential SSL was approximately 2 times to 30 times the concentrations above the BVs (the lead HQ was 0.1). The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Mercury was detected above the soil BV in eight samples with a maximum concentration of 0.92 mg/kg. Mercury concentrations decreased with depth at all locations and decreased laterally in all directions [mercury decreased to the north at downgradient location 03-608280 associated with SWMU 03-014(o)]. The lateral and vertical extent of mercury are defined.

Nickel was detected above the soil and Qbt 2,3,4 BVs in one soil sample and six tuff samples with a maximum concentration of 30.7 mg/kg. Concentrations decreased with depth at all locations and decreased laterally in all directions. The lateral and vertical extent of nickel are defined.

Perchlorate was detected in two samples with a maximum concentration of 0.00355 mg/kg. Concentrations were below the EQLs and decreased with depth at two locations. Concentrations decreased laterally in all directions [perchlorate was not detected to the north at downgradient location 03-608280 associated with SWMU 03-014(o)]. The residential SSL was approximately 15,000 times the maximum concentration. Further sampling for extent is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.6 mg/kg to 1.38 mg/kg) above the BV in 28 samples. Because selenium was not detected above the BV and the residential SSL was approximately 280 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and five tuff samples with a maximum concentration of 18.3 mg/kg. Silver concentrations decreased with depth at all locations and decreased laterally in all directions [silver decreased to the north at downgradient location 03-608280 associated with SWMU 03-014(o)]. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and five tuff samples with a maximum concentration of 638 mg/kg. Zinc concentrations decreased with depth at all locations, except at location 03-603357, and decreased laterally in all directions [zinc decreased to the north at downgradient location 03-608280 associated with SWMU 03-014(o)]. The zinc concentration at depth at location 03-603357 (65.7 mg/kg) was equivalent to the maximum Qbt 2,3,4 background concentration (65.6 mg/kg), and the residential SSL was approximately 357 times the concentration. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMUs 03-014(k,l,m,n) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; 1,4-dichlorobenzene; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; naphthalene; phenanthrene; pyrene; TPH-DRO; and toluene.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene were detected in one to eight samples Concentrations decreased with depth at all locations, except at location 03-612229, and decreased laterally in all directions. The concentrations at location 03-612229 increased by 0.17 mg/kg or less with depth or were below the EQL. The residential SSLs were approximately 1.7 times [benzo(a)pyrene] to 51,000 times (fluorene) the maximum concentration at location 03-612229. The industrial SSL was approximately 27 times the maximum benzo(a)pyrene concentration at this location. The lateral extent of these COPCs is defined, and further sampling for vertical extent is not warranted.

Acetone was detected in four samples with a maximum concentration of 2.2 mg/kg. Acetone decreased with depth at three locations and decreased laterally in all directions. The acetone concentration at location 03-03266 was below the EQL. The lateral and vertical extent of acetone are defined.

Aroclor-1242 was detected in one sample at a concentration of 0.0141 mg/kg. The residential SSL was approximately 157 times and the industrial SSL was approximately 585 times the concentration. Further sampling for extent of Aroclor-1242 is not warranted.

Aroclor-1254 and Aroclor-1260 were detected in 23 and 26 samples with maximum concentrations of 6.5 mg/kg and 0.206 mg/kg, respectively. Concentrations decreased or did not change substantially with depth (0.004 mg/kg or less) at all locations. Concentrations also decreased at the perimeter locations, except at location 03-608272 along the western perimeter. Concentrations decreased laterally in the surface samples at location 03-612229 to the west and decreased with depth. The industrial SSLs were approximately 8.3 times and 45 times the concentrations from 3.0–4.0 ft at location 03-612229. The residential SSL for Aroclor-1254 was exceeded at location 03-03266 by approximately a factor of 6 but was below the industrial SSL and decreased with depth. The residential SSL for Aroclor-1260 was approximately 10 times the maximum concentration and decreased with depth. The vertical extent of Aroclor-1254 and Aroclor-1260 is defined, and further sampling for lateral extent is not warranted.

Bis(2-ethylhexyl)phthalate, carbon disulfide, and 4-isopropyltoluene were detected in three to four samples with maximum concentrations of 44 mg/kg, 0.00978 mg/kg, and 0.0061 mg/kg, respectively. Concentrations decreased with depth or were below the EQLs and decreased laterally in all directions. The lateral and vertical extent of bis(2-ethylhexyl)phthalate, carbon disulfide, and 4-isopropyltoluene are defined.

Butylbenzylphthalate; 1,4-dichlorobenzene; 2-hexanone; and toluene were each detected in one sample at concentrations of 30 mg/kg, 1.4 mg/kg, 0.02 mg/kg, and 0.004 mg/kg, respectively. Concentrations decreased with depth and decreased laterally in all directions. The lateral and vertical extent of butylbenzylphthalate, 1,4-dichlorobenzene, 2-hexanone, and toluene are defined.

TPH-DRO was detected in 26 samples with a maximum concentration of 31,000 mg/kg. Concentrations of TPH-DRO decreased with depth at all locations and decreased laterally in all directions. The lateral and vertical extent of TPH-DRO are defined.

Radionuclides

Radionuclide COPCs at SWMUs 03-014(k,l,m,n) include tritium, uranium-234, uranium-235/236, and uranium-238.

Tritium was detected in three soil samples and eight tuff samples with a maximum activity of 0.213 pCi/g. The residential SAL was approximately 3500 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-234, uranium-235/236, and uranium-238 were detected above the soil BVs in one sample at concentrations of 4.72 pCi/g, 0.237 pCi/g, and 2.94 pCi/g, respectively. Concentrations decreased with depth and decreased laterally in all directions [isotopic uranium decreased to the north at downgradient location 03-608280 associated with SWMU 03-014(o)]. The lateral and vertical extent of isotopic uranium are defined.

6.9.3.5 Summary of Human Health Risk Screening

Human health risk screening assessments were conducted for SWMUs 03-014(k,l,m,n), and the results are summarized below.

Industrial Scenario

The total excess cancer risk for the industrial scenario is 5×10^{-5}, which is above the NMED target risk of 1×10^{-5}. Based on the uncertainties discussed in section I-4.3.2 of Appendix I, this risk estimate is conservative and is not representative of the exposure because the cancer risk is based on single elevated detected concentrations of PAHs from a single location (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the deteriorating berms rather than the detection being the result of residual contamination from site operations. Given the unrelated nature and source of the PAHs, the industrial cancer risk is 4×10^{-6} without the one location with elevated PAHs or without PAHs at all. The HI is 0.2, which is less than the NMED target 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 TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 5. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the detected TPH.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The HI is 0.4, 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 TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 3. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the TPH detected.

Residential Scenario

The total excess cancer risk for the residential scenario is 8×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. Based on the uncertainties discussed in section I-4.3.2, this risk estimate is conservative and is not representative of the exposure because the cancer risk is based on single elevated detected concentrations of PAHs from a single location (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the deteriorating berms rather than the detection being the result of residual contamination from site operations. Given the unrelated nature and source of the PAHs, the residential cancer risk is 3×10^{-6} without the one location with elevated PAHs or 2×10^{-6} without PAHs at all.

The residential HI is approximately 1.2 without lead. In addition, the antimony HQ is based on a single detected concentration. This risk estimate is not representative of the exposure across the site. The lead exposure point concentration (EPC) is below the residential SSL (400 mg/kg). Because of the conservative nature of the risk estimate and the adjustment of the HI without lead, the residential HI is equivalent to the NMED target risk level.

The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 5. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the TPH detected.

6.9.3.6 Summary of Ecological Risk Screening

The ecological screening assessment was conducted for SWMUs 03-014(k,l,m,n), and the results are summarized below.

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-014(k).

6.9.4 SWMU 03-014(l), Structure Associated with Former WWTP

6.9.4.1 Site Description and Operational History

SWMU 03-014(l), structure 03-197, is one of four unlined sludge-drying beds [SWMUs 03-014(k,l,m,n)] associated with the former TA-03 WWTP (Figure 6.9-1). The drying beds, located north of the Imhoff tanks, received sludge siphoned from the Imhoff tanks (LANL 1993, 020947, pp. 5-46–5-47). SWMU 03-014(l) consists of an unlined sludge drying bed excavated into the tuff. The sludge bed measures 40 ft × 20 ft (LANL 1990, 007511, p. 3-14). A 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in various places exposing the underlying soil-tuff (LANL 1997, 056660.4, p. 58).

6.9.4.2 Relationship to Other SWMUs and AOCs

SWMU 03-014(l) is located next to three other sludge drying beds, SWMUs 03-014(k,l,m,n) in the west-central portion of the former WWTP. Sludge was siphoned from the Imhoff tanks, SWMUs 03-014(a) and 03-014(e). All four SWMUs are components of Consolidated Unit 03-014(a)-99.

6.9.4.3 Summary of Previous Investigations

During the 1997 Phase I RFI conducted at SWMU 03-014(l), three samples were collected from three depth intervals at one sampling location in the center of the bed: one from filter (fill) material within the bed and two from successive 1-ft intervals (in tuff) beneath the bed. All samples were submitted for laboratory analyses of TAL metals, SVOCs, PCBs, pesticides, herbicides, isotopic plutonium and isotopic uranium, strontium-90, and tritium. One tuff sample was also submitted for laboratory analysis of VOCs.

Copper, mercury, and silver were each detected above BVs in the fill sample; copper and nickel were detected above BVs in one tuff sample; chromium was detected above BV in the two tuff samples. The DLs for antimony and cadmium were above BVs. Toluene was detected in one tuff sample, and

Aroclor-1254 was detected in the fill sample. Tritium was detected in one tuff sample. Pesticides herbicides, isotopic plutonium and uranium, and strontium-90 were not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.9.3.4. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(l).

6.9.4.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-014(l). As a result, the following activities were completed as part of the 2009 investigation.

- Sampling was conducted from historical sampling locations and locations around and downgradient of SWMUs 03-014(k,l,m,n). Sampling activities are described in section 6.9.3.4 as part of SWMU 03-014(k).

The 2009 sampling locations at SWMU 03-014(l) are shown in Figure 6.9-1. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(l). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

Field-screening activities are described in section 6.9.3.4 as part of SWMU 03-014(k).

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMUs 03-014(k,l,m,n) consist of 44 samples (18 soil and 26 tuff) collected from 12 locations. Sample results for SWMU 03-014(l) are described in section 6.9.3.4 as part of SWMU 03-014(k).

Nature and Extent of Contamination

SWMUs 03-014(k,l,m,n) were sampled collectively in 2009 per the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721) in an effort to characterize the former sludge-drying beds. All data within and around the perimeter of the beds have been evaluated to determine the nature and extent of contamination at SWMUs 03-014(k,l,m,n), including all data collected for SWMU 03-014(l); therefore, section 6.9.3.4 presents the nature and extent of contamination determination for SWMUs 03-014(k,l,m,n).

6.9.4.5 Summary of Human Health Risk Screening

Human health risk screening results are summarized in section 6.9.3.5 as part of SWMU 03-014(k).

6.9.4.6 Summary of Ecological Risk Screening

Ecological risk screening results are summarized in section 6.9.3.6 as part of SWMU 03-014(k).

6.9.5 SWMU 03-014(m), Structure Associated with Former WWTP

6.9.5.1 Site Description and Operational History

SWMU 03-014(m), structure 03-198, is one of four unlined sludge-drying beds [SWMUs 03-014(k,l,m,n)] associated with the former TA-03 WWTP (Figure 6.9-1) (LANL 1993, 020947, pp. 5-46–5-47). The drying beds, located north of the Imhoff tanks, received sludge siphoned from the Imhoff tanks. The sludge bed is excavated into the tuff and measures 40 ft × 20 ft (LANL 1990, 007511, p. 3-14). A 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff (LANL 1997, 056660.4, p. 58).

6.9.5.2 Relationship to Other SWMUs and AOCs

SWMU 03-014(m) is located next to three other sludge drying beds, SWMUs 03-014(k,l,n) in the west-central portion of the former TA-03 WWTP. Sludge was siphoned from the Imhoff tanks, SWMUs 03-014(a) and 03-014(e). All four SWMUs are components of Consolidated Unit 03-014(a)-99.

6.9.5.3 Summary of Previous Investigations

During the 1997 Phase I RFI conducted at SWMU 03-014(m), 10 samples were collected from 3 locations. At 1 location, 1 sample was collected from filter (fill) material within the bed, and 2 samples were collected from successive 1-ft intervals (in tuff) beneath the bed. All samples from this location were submitted for laboratory analyses of TAL metals, SVOCs, PCBs, herbicides, pesticides, isotopic plutonium and uranium, strontium-90, and tritium. One tuff sample was also submitted for laboratory analysis of VOCs. Filter-material samples were collected from the second location at 3 successive 0.5–ft intervals and submitted for laboratory analyses of SVOCs and PCBs. Filter-material samples were collected from the third location at 4 successive 0.5-ft intervals and submitted for laboratory analyses of SVOCs and PCBs.

Cadmium, chromium, copper, lead, mercury, silver, and zinc were detected above BVs in one fill sample; copper was detected above BV in one tuff sample; and chromium and nickel were detected above BVs in the two tuff samples. The DLs for antimony were above BV in all samples. Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, carbazole, chrysene, dibenz(a,h)anthracene, dibenzofuran, 1,4-dichlorobenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, and Aroclor-1254 were detected in one fill sample. Aroclor-1260 was detected in three fill samples. Herbicides, pesticides, and radionuclides were not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.9.3.4. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(m).

6.9.5.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-014(m). As a result, the following activities were completed as part of the 2009 investigation.

- Sampling was conducted from historical sampling locations and locations around and downgradient of SWMUs 03-014(k,l,m,n). Sampling activities are described in section 6.9.3.4 as part of SWMU 03-014(k).

The 2009 sampling locations at SWMU 03-014(m) are shown in Figure 6.9-1. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(m). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

Field-screening activities are described in section 6.9.3.4 as part of SWMU 03-014(k).

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMUs 03-014(k,l,m,n) consist of 44 samples (18 soil and 26 tuff) collected from 12 locations. Sample results for SWMU 03-014(m) are described in section 6.9.3.4 as part of SWMU 03-014(k).

Nature and Extent of Contamination

SWMUs 03-014(k,l,m,n) were sampled collectively in 2009 per the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721) in an effort to characterize the former sludge-drying beds. All data within and around the perimeter of the beds have been evaluated to determine the nature and extent of contamination at SWMUs 03-014(k,l,m,n), including all data collected for SWMU 03-014(m). Therefore, section 6.9.3.4 presents the nature and extent of contamination determination for SWMUs 03-014(k,l,m,n).

6.9.5.5 Summary of Human Health Risk Screening

Human health risk screening results are summarized in section 6.9.3.5 as part of SWMU 03-014(k).

6.9.5.6 Summary of Ecological Risk Screening

Ecological risk screening results are summarized in section 6.9.3.6 as part of SWMU 03-014(k).

6.9.6 SWMU 03-014(n), Structure Associated with Former WWTP

6.9.6.1 Site Description and Operational History

SWMU 03-014(n), structure 03-199, is one of four unlined sludge-drying beds [SWMUs 03-014(k,l,m,n)] associated with the TA-03 WWTP (Figure 6.9-1) (LANL 1993, 020947, pp. 5-46, 5-47). The drying beds, located north of the Imhoff tanks, received sludge siphoned from the Imhoff tanks. The sludge drying bed is excavated into the tuff and measures 40 ft × 20 ft (LANL 1990, 007511, p. 3-014). A 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff (LANL 1997, 056660.4, p. 58).

6.9.6.2 Relationship to Other SWMUs and AOCs

SWMU 03-014(n) is located next to three other sludge drying beds, SWMUs 03-014(k,l,m), in the west-central portion of the former WWTP. Sludge was siphoned from the Imhoff tanks, SWMUs 03-014(a) and 03-014(e). All four SWMUs are components of Consolidated Unit 03-014(a)-99.

6.9.6.3 Summary of Previous Investigations

During the 1997 RFI conducted at SWMU 03-014(n), oil was discovered in the sludge bed, which was subsequently remediated in September 1997 (LANL 1997, 056660.4, p. 60). Four samples were collected from two locations. At the first location, one sample collected from the filter (fill) material within the bed and two samples collected from successive 1-ft intervals (in tuff) beneath the bed were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, PCBs, herbicides, pesticides, TPH-DRO, isotopic plutonium and uranium, strontium-90, and tritium. At the second location, one sample collected from the filter material was submitted for laboratory analyses of TAL metals, VOCs, SVOCs, herbicides, pesticides, and TPH-DRO. Four additional soil, fill, and sludge samples collected from a depth of 0.0–0.5 ft bgs following remediation activities were submitted for analysis of TPH-DRO.

Antimony, barium, cadmium, calcium, chromium, lead, and nickel were detected above BVs in one fill sample. Copper, mercury, silver, and zinc were detected above BVs in two fill samples. Chromium, mercury, nickel, and silver were detected above BVs in one tuff sample. Copper was detected above BV in two tuff samples. The DLs for antimony and selenium were above BVs in the tuff samples. Acetone was detected in one fill and one tuff sample; butylbenzylphthalate was detected in one fill sample; and bis(2-ethylhexyl)phthalate was detected in on two fill samples and one tuff sample. TPH-DRO was detected in three fill samples and two tuff samples; and TPH-LRO was detected in one soil, one sludge, and two fill samples. No radionuclides were detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.9.3.4. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(n).

6.9.6.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-014(n). As a result, the following activities were completed as part of the 2009 investigation.

- Sampling was conducted from historical sampling locations and locations around and downgradient of SWMUs 03-014(k,l,m,n). Sampling activities are described in section 6.9.3.4, SWMU 03-014(k).

The 2009 sampling locations at SWMU 03-014(n) are shown in Figure 6.9-1. Table 6.9-8 presents the samples collected and analyses requested at SWMU 03-014(n). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-014(n), a maximum concentration of 3.8 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMUs 03-014(k,l,m,n) consist of 44 samples (18 soil and 26 tuff) collected from 12 locations. Sample results for SWMU 03-014(n) are described in section 6.9.3.4 as part of SWMU 03-014(k).

Nature and Extent of Contamination

SWMUs 03-014(k,l,m,n) were sampled collectively in 2009 per the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721) in an effort to characterize the former sludge-drying beds. All data within and around the perimeter of the beds have been evaluated to determine the nature and extent of contamination at SWMUs 03-014(k,l,m,n), including all data collected for SWMU 03-014(n). Therefore, section 6.9.3.4 presents the nature and extent of contamination determination for SWMUs 03-014(k,l,m,n).

6.9.6.5 Summary of Human Health Risk Screening

Human health risk screening results are summarized in section 6.9.3.5 as part of SWMU 03-014(k).

6.9.6.6 Summary of Ecological Risk Screening

Ecological risk screening results are summarized in section 6.9.3.6 as part of SWMU 03-014(k).

6.9.7 SWMU 03-014(o), Structure Associated with Former WWTP

6.9.7.1 Site Description and Operational History

SWMU 03-014(o) consists of three polypropylene-lined sludge-drying beds (structure 03-1871) excavated into tuff at the former TA-03 WWTP (Figure 6.9-1). SWMU 03-014(o) is located north and downslope of the four upper sludge-drying beds [SWMUs 03-014(k,l,m,n)]. The drying beds were constructed in 1987, and each bed measures 22 ft × 60 ft with an approximately 8000-gal. capacity of liquid sludge (LANL 1993, 020947, pp. 5-46, 5-47). Berms separating the beds are covered with asphalt, and the asphalt has not deteriorated (LANL 1997, 056660.4, p. 58).

6.9.7.2 Relationship to Other SWMUs and AOCs

SWMU 03-014(o) is located in the northwest corner of the former WWTP. These sludge drying beds received overflow sludge from the Imhoff tanks, SWMUs 03-014(a) and 03-014(e). SWMU 03-014(o) is a component of Consolidated Unit 03-014(a)-99.

6.9.7.3 Summary of Previous Investigations

During the 1997 Phase I RFI conducted at SWMU 03-014(o), one sampling location was selected within each of the three beds at SWMU 03-014(o). Two of the locations were near the inlet pipes on the south side of the two outer beds, and the third location was near the center of the middle bed. Samples were collected from three depth intervals at each location: one from filter (fill) material within the bed and two from successive 1-ft intervals (in tuff) beneath the bed. Nine samples were collected from the three locations and submitted for laboratory analyses of TAL metals, SVOCs, PCBs, pesticides, herbicides, isotopic plutonium and uranium, strontium-90, and tritium. Three tuff samples collected from the deepest interval at each location were also submitted for laboratory analysis of VOCs (LANL 1997, 056660.4, pp. 59–62).

Lead was detected above BV in one fill sample; cadmium, chromium, and zinc were detected above BVs in two fill samples; and copper, mercury, and silver were detected above BVs in three fill samples. Copper was detected above BV in one tuff sample, silver was detected above BV in two tuff samples, nickel was detected above BV in three tuff samples, and chromium was detected above BV in five tuff samples. The DLs for antimony and cadmium were above BVs in numerous samples. Acetone was detected in one tuff sample; acenaphthylene, anthracene, benzoic acid, carbazole, dibenz(a,h)anthracene, Aroclor-1260, 2-methyl-4-chlorophenoxyacetic acid (MCPA), and methylchlorophenoxypropionic acid (MCPP) were each detected in one fill sample. 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 were detected in two fill samples. Uranium-234 was detected above BV in one fill sample; strontium-90 was detected above FV in one fill and detected in one tuff sample; and plutonium-239/240 was detected in one tuff sample and detected above FV in two fill samples. Tritium was detected in two fill samples.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.9.7.4. Table 6.9-12 presents the samples collected and analyses requested at SWMU 03-014(o).

6.9.7.4 Site Contamination

Soil, Rock, Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-014(o). As a result, the following activities were completed as part of the 2009/2010 investigation.

- Two samples were collected in 2009 from historical sampling location 03-03204 in the center bed to define the vertical extent of contamination, and four samples were collected from two locations from each of the other beds to confirm previous sampling results. Samples were collected from 3.0–4.0 and 5.0–6.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, PCBs, and cyanide.
- Sixteen samples were collected in 2009 from four perimeter locations to define the lateral and vertical extent of contamination at SWMU 03-014(o). At each location, samples were collected from 0.0–1.0 ft, 1.0–2.0 ft, 4.0–5.0 ft, and 6.0–7.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, strontium-90, and tritium.
- Two samples were collected in 2010 from perimeter location 03-608279 to define the vertical extent of contamination. Samples were collected from 10.0–11.0 ft and 14.0–15.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, isotopic uranium, and tritium.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 and 2010 sampling locations at SWMU 03-014(o) are shown in Figure 6.9-1. Table 6.9-12 presents the samples collected and analyses requested at SWMU 03-014(o). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-014(o), a maximum concentration of 5.0 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results for 2009 are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-014(o) consist of 33 samples (6 soil and 27 tuff) collected from 9 locations.

Inorganic Chemicals

Thirty-three samples were analyzed for TAL metals (6 soil and 27 tuff), 24 samples were analyzed for cyanide (3 soil and 21 tuff), and 18 samples were analyzed for nitrate and perchlorate (3 soil and 15 tuff). Table 6.9-13 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 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 (1.0 mg/kg to 5.38 mg/kg) above the BVs in 31 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 2 samples with a maximum concentration of 2.5 mg/kg. Cadmium also had DLs (0.513 mg/kg to 0.538 mg/kg) above the BV in 3 samples. Because less than 10 soil samples were collected, statistical tests could not be performed. The detected concentrations and DLs above the BV were below the maximum soil background concentration (2.6 mg/kg) for cadmium. 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 2 soil samples and 11 tuff samples with a maximum concentration of 136 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The soil concentrations were above the maximum soil background concentration (36.5 mg/kg). The Gehan and quantile tests indicated site data for chromium in tuff are statistically different from background (Table H-8 and Figure H-26). 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 3 soil samples and 8 tuff samples with a maximum concentration of 122 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The soil concentrations were above the maximum soil background concentration (16 mg/kg). The Gehan and quantile tests indicated site data for copper in tuff are statistically different from background (Table H-8 and Figure H-26). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 2.7 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 1 soil sample and 3 tuff samples with a maximum concentration of 45.1 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The soil concentration was above the maximum soil background concentration (28 mg/kg). The Gehan and quantile tests indicated site data for lead in tuff are not statistically different from background (Table H-8 and Figure H-27). Lead is retained as a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BV (0.1 mg/kg) in four soil samples and one tuff sample with a maximum concentration of 3.8 mg/kg. Mercury 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 11.4 mg/kg. The Gehan test indicated site concentrations of nickel in tuff are statistically different from background (Table H-8). However, the maximum concentration (11.4 mg/kg) was slightly above the maximum soil background concentration (7 mg/kg) and the quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Table H-8 and Figure H-27). Nickel is not a COPC.

Nitrate was detected in two samples with a maximum concentration of 3.71 mg/kg. Nitrate is naturally occurring and the detected concentration reflects naturally occurring levels of nitrate. Nitrate is not a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.01 mg/kg to 1.09 mg/kg) above the BV in 21 samples. Selenium is retained as a COPC.

Silver was detected above the soil and Qbt 2,3,4 BVs (1 mg/kg) in six soil samples and six tuff samples with a maximum concentration of 71.3 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 3 samples with a maximum concentration of 131 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The maximum concentration was above the maximum soil background concentration (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Twenty-seven samples were analyzed for SVOCs (6 soil and 21 tuff), 21 samples were analyzed for VOCs (3 soil and 18 tuff), 9 samples were analyzed for pesticides (3 soil and 6 tuff), 33 samples were analyzed for PCBs (6 soil and 27 tuff), 9 samples were analyzed for herbicides (3 soil and 6 tuff), and 18 samples were analyzed for TPH-DRO (3 soil and 15 tuff). Table 6.9-14 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-014(o) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; 2-hexanone; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; MCPA; MCPP; methylene chloride; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Radionuclides

Eighteen samples were analyzed for americium-241 (3 soil and 15 tuff), 27 samples were analyzed for isotopic plutonium (6 soil and 21 tuff), 25 samples were analyzed for strontium-90 (6 soil and 19 tuff), 26 samples were analyzed for tritium (5 soil and 21 tuff), and 11 samples were analyzed for isotopic uranium (3 soil and 8 tuff). Table 6.9-15 summarizes the analytical results for radionuclides. Plate 14 shows the spatial distribution of detected radionuclides.

Plutonium-239/240 was detected above the soil FV and at depths where the FV is not applicable in three samples with a maximum activity of 0.186 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV and at depths where the FV is not applicable in two samples with a maximum activity of 8.01 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in three soil samples and four tuff samples with a maximum activity of 2.906 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 2.68 pCi/g. Uranium-234 is retained as a COPC.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 03-014(o) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-014(o) include antimony, chromium, copper, cyanide, lead, mercury, selenium, silver, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.0 mg/kg to 5.38 mg/kg) above the BVs in 29 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 6 times to 30 times the DLs, further sampling for extent of antimony is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples and 11 tuff samples with a maximum concentration of 136 mg/kg. Chromium concentrations decreased with depth within the sludge-drying beds and decreased laterally in all directions. Concentrations at locations 03-608277, 03-608278, and 03-608280 were less than the maximum Qbt 2,3,4 background concentration (13 mg/kg). The concentration at location 03-608279 was within 5 mg/kg of the maximum Qbt 2,3,4 background concentration. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 850 times to 15,000 times the concentrations above the BVs. The lateral and vertical extent of chromium are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in three soil samples and eight tuff samples with a maximum concentrations of 122 mg/kg. Copper concentrations decreased with depth at all locations and decreased laterally around the perimeter of the beds. The lateral and vertical extent of copper are defined.

Cyanide was detected above the soil BV in one sample at a concentration of 2.7 mg/kg. The concentration was at location 03-608280, which is south of and outside of the sludge drying beds, and downslope of SWMUs 03-014(k,l,m,n). Cyanide was detected at a higher concentration (9.48 mg/kg) in a sample collected north of SWMUs 03-014(k,l,m,n) and upgradient of the SWMU 03-014(o) sludge beds. Cyanide was not detected above the BV within the SWMU 03-014(o) sludge beds or at locations to the north, east, or south of the sludge beds. Cyanide concentrations decreased with depth at location 03-608280. The lateral and vertical extent of cyanide are defined.

Lead was detected above the soil and Qbt 2,3,4 BVs in one soil sample and three tuff samples with a maximum concentration of 45.1 mg/kg. Lead concentrations decreased with depth at all locations and laterally around the perimeter of the beds. The lateral and vertical extent of lead are defined.

Mercury was detected above the soil and Qbt 2,3,4 BV in four soil samples and one tuff sample with a maximum concentration of 3.8 mg/kg. Mercury concentrations decreased with depth at all locations and laterally around the perimeter of the beds. The lateral and vertical extent of mercury are defined.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.01 mg/kg to 1.09 mg/kg) above the BV in 21 samples. Because selenium was not detected above the BV and the residential SSL was approximately 360 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil and Qbt 2,3,4 BV in six soil samples and six tuff samples with a maximum concentration of 71.3 mg/kg. Silver concentrations decreased with depth at all locations and decreased laterally around the perimeter of the beds. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV in three samples with a maximum concentration of 131 mg/kg. Zinc concentrations decreased with depth at all locations and decreased laterally around the perimeter of the beds. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-014(o) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; 2-hexanone; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; MCPA; MCPP; methylene chloride; phenanthrene; pyrene; and TPH-DRO.

Acenaphthene was detected in one sample at a concentration of 0.1 mg/kg. However, the concentration was outside of the sludge drying beds, and the residential SSL was approximately 34,400 times the concentration. Further sampling for extent of acenaphthene is not warranted.

Acenaphthylene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene were detected in one to three samples. The concentrations decreased with depth and at the perimeter sampling locations. The lateral and vertical extent of these COPCs are defined.

Acetone was detected in three samples with a maximum concentration of 0.00257 mg/kg. Concentrations were below the EQLs, and the residential SSL was approximately 26,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1242 was detected in two samples with a maximum concentration of 0.0918 mg/kg. Concentrations decreased with depth and the residential SSL was approximately 24 times to 120 times the detected concentrations. The vertical extent of Aroclor-1242 is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 17 samples with a maximum concentration of 0.551 mg/kg. Aroclor-1254 concentrations decreased with depth or did not substantially change with depth (0.01 mg/kg or less). Aroclor-1254 concentrations decreased in the samples collected in the drainage to the north as part of the investigation for SWMU 03-014(u). The residential SSL was approximately 2 times the maximum concentration and the industrial SSL was approximately 15 times the maximum concentration. The residential HQ was 0.1 and the industrial cancer risk was 4×10^{-8}. The other concentrations were approximately an order of magnitude or more lower than the maximum concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in 20 samples with a maximum concentration of 1.22 mg/kg. Aroclor-1260 concentrations decreased with depth or did not substantially change with depth (0.03 mg/kg or less). Aroclor-1260 concentrations decreased in the samples collected in the drainage to the north as part of the investigation for SWMU 03-014(u). The residential SSL was approximately 2 times the maximum concentration and the industrial SSL was approximately 7 times the maximum concentration. The residential and industrial cancer risks were approximately 1×10^{-6}. The other concentrations were approximately an order of magnitude or more lower than the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate, 2-hexanone, and 4-isopropyltoluene were detected in two, one, and one samples, respectively, at concentrations below the EQLs. The residential SSLs were approximately 3900 times, 54,000 times, and 6,500,000 times the maximum detected concentrations. Further sampling for extent of bis(2-ethylhexyl)phthalate, 2-hexanone, and 4-isopropyltoluene is not warranted.

MCPA and MCPP were each detected in one sample at concentrations of 0.956 mg/kg and 0.993 mg/kg, respectively. Concentrations decreased with depth and decreased laterally at the perimeter sampling locations. The lateral and vertical extent of MCPA and MCPP are defined.

Methylene chloride was detected in 13 samples with a maximum concentration of 0.00349 mg/kg. Concentrations were similar at all locations (the difference between the minimum and maximum concentrations was 0.0098 mg/kg) and were below the EQLs. The residential SSL was approximately 117,000 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

TPH-DRO was detected in seven samples with a maximum concentration of 7.79 mg/kg. TPH-DRO concentrations decreased with depth and/or were below the EQLs. The residential screening guideline for diesel No. 2/crankcase oil was approximately 128 times the maximum concentration. Further sampling for extent of TPH-DRO is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 03-014(o) include plutonium-239/240, strontium-90, tritium, and uranium-234.

Plutonium-239/240 was detected above the soil FV or at depths where the FV is not applicable in three samples with a maximum activity of 0.186 pCi/g. Plutonium-239/240 activities decreased with depth at all locations and decreased laterally at the perimeter locations. The lateral and vertical extent of plutonium-239/240 are defined.

Strontium-90 was detected above the soil FV or at depths where the FV is not applicable in two samples with a maximum activity of 8.01 pCi/g. Strontium-90 activities decreased with depth at all locations and decreased laterally at the perimeter locations. The lateral and vertical extent of strontium-90 are defined.

Tritium was detected in three soil samples and four tuff samples with a maximum activity in soil of 2.906 pCi/g. Tritium activities decreased with depth at all locations and decreased laterally at the perimeter locations. The lateral and vertical extent of tritium are defined.

Uranium-234 was detected above the soil BV in one sample at an activity of 2.68 pCi/g. The activity is similar to the BV (2.59 pCi/g), decreased with depth, and decreased laterally at the perimeter locations. The lateral and vertical extent of uranium-234 are defined.

6.9.7.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.08 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.002.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.4, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 14 mrem/yr, which is below the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.004.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial and construction worker scenarios at SWMU 03-014(o). There is potential unacceptable cancer risk for the residential scenario but the residential HI and dose are less than the NMED and DOE target levels at SWMU 03-014(o).

6.9.7.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-014(o).

6.9.8 SWMU 03-014(u), Structure Associated with Former WWTP

6.9.8.1 Site Description and Operational History

SWMU 03-014(u) is the former location of a 1500-gal. holding tank (structure 03-1901) that collected effluent from the former TA-03 WWTP sludge beds [SWMUs 03-014(k,l,m,n,o)]. The holding tank was located approximately 50 ft northeast of the chlorination system dosing and contact chamber (Figure 6.9-1). The tank was installed in 1988 (LANL 1990, 007511, p. 3-014). Effluent from the sludge beds flowed through a subsurface drain system to the tank. The contents of the holding tank were recirculated by truck to the head of the plant for additional treatment (LANL 1993, 020947, p. 5-47). The SWMU 03-014(u) holding tank was removed in 1992 following the decommissioning of the TA-03 WWTP (LANL 2008, 099214).

6.9.8.2 Relationship to Other SWMUs and AOCs

Wastewater from the former sludge drying beds, SWMUs 03-014(k,l,m,n,o), was collected in the SWMU 03-014(u) holding tank and trucked back to the WWTP headworks at SWMU 03-014(i). SWMU 03-014(u) is located on the north side of the former TA-03 WWTP, next to AOC 03-014(c2), and is a component of Consolidated Unit 03-014(a)-99.

6.9.8.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-014(u).

6.9.8.4 Site Contamination

Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-014(u) to assess potential contamination:

- Five samples were collected from three locations within and next to the location of the former tank and drainline. Samples were collected from 0.0–1.0 ft bgs, at the base of the tank, and at the soil-tuff interface. Only one sample was collected at location 03-608283 (see deviations in Appendix B). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, isotopic plutonium, and isotopic uranium. One sample was also analyzed for strontium-90.
- Ten samples were collected from five locations in the drainage north of the site. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, nitrate, cyanide, perchlorate, americium-241, and isotopic plutonium. Six samples were analyzed for isotopic uranium and four samples were analyzed for strontium-90.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-014(u) are shown in Figure 6.9-1. Table 6.9-16 presents the samples collected and analyses requested at SWMU 03-014(u). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-014(u), a maximum concentration of 162 ppm was detected at a depth of 0.0–1.0 ft bgs and in the corresponding field duplicate sample. These samples (RE03-09-13799 and RE03-10-5399, respectively) were submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-014(u) consist of 15 samples (10 soil and 5 tuff) collected from 8 locations.

Inorganic Chemicals

Fifteen samples (10 soil and 5 tuff) were analyzed for TAL metals, nitrate, cyanide, and perchlorate. Table 6.9-17 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 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 (0.994 mg/kg to 1.21 mg/kg) above the BVs in 15 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in one sample at a concentration of 1.66 mg/kg. Cadmium also had DLs (0.529 mg/kg to 0.565 mg/kg) above the BV in five samples. The quantile and slippage tests indicated the site data for cadmium in soil are not statistically different from background (Table H-9 and Figure H-28). 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 1 soil sample and 2 tuff samples with a maximum concentration of 168 mg/kg. The Gehan and quantile tests indicated the site data for chromium in soil are not statistically different from background (Table H-9 and Figure H-28). Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration at location 03-608287 was below the maximum Qbt 2,3,4 background concentration (13 mg/kg), but the concentration at 03-608281 was above the maximum Qbt 2,3,4 background concentration. 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 1 sample each with a maximum concentration of 224 mg/kg. The Gehan and quantile tests indicated site data for copper in soil are not statistically different from background (Table H-9 and Figure H-29). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Cyanide was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in 2 samples with a maximum concentration of 27.7 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 1 soil sample and 3 tuff samples with a maximum concentration of 116 mg/kg. The Gehan and quantile tests indicated that the site data for lead in soil are not statistically different from background (Table H-9 and Figure H-29). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in 1 sample at a concentration of 500 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (752 mg/kg). Manganese is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BV (0.1 mg/kg) in three soil samples and one tuff sample with a maximum concentration of 1.99 mg/kg. Mercury is retained as a COPC.

Nitrate was detected in one sample at a concentration of 4.11 mg/kg. Nitrate is naturally occurring and the concentration likely reflects naturally occurring levels of nitrate. Nitrate is not a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (0.992 mg/kg to 1.14 mg/kg) above the BV in five samples. Selenium is retained as a COPC.

Silver was detected above the soil and Qbt 2,3,4 BV (1 mg/kg) in three soil samples and one tuff sample with a maximum concentration of 66.7 mg/kg. Silver 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 4 soil samples and 1 tuff sample with a maximum concentration of 110 mg/kg. The Gehan and quantile tests indicated site data for zinc in soil are statistically different from background (Table H-9 and Figure H-30). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (65.6 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Fifteen samples (10 soil and 5 tuff) were analyzed for SVOCs, VOCs, TPH-DRO, and PCBs. Table 6.9-18 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-014(u) include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; diethylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Radionuclides

Fifteen samples were analyzed for americium-241 (10 soil and 5 tuff), 15 samples were analyzed for isotopic plutonium (10 soil and 5 tuff), 5 samples were analyzed for strontium-90 (3 soil and 2 tuff), and 10 samples were analyzed for isotopic uranium (7 soil and 3 tuff). Table 6.9-19 summarizes the analytical results for radionuclides. Plate 14 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 0.0285 pCi/g. Plutonium-238 is retained as a COPC.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 03-014(u) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-014(u) include antimony, chromium, copper, cyanide, lead, mercury, selenium, silver, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.994 mg/kg to 1.21 mg/kg) above the BVs in 29 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 26 times the maximum DL, further sampling for extent of antimony 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 168 mg/kg. Concentrations decreased with depth at location 03-608281 and were below the maximum Qbt 2,3,4 background concentration (13 mg/kg) at location 03-608287. Chromium concentrations decreased downgradient. The lateral and vertical extent of chromium are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 224 mg/kg. Concentrations decreased with depth at location 03-608281 and decreased downgradient. The lateral and vertical extent of copper are defined.

Cyanide was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 27.7 mg/kg. Concentrations decreased downgradient. The residential SSL was less than 2 times the maximum concentration (the residential HQ was 0.6), and the industrial SSL was approximately 24 times the maximum concentration (cyanide was not a COPC for the industrial scenario). The residential and industrial SSLs were approximately 42 times and 620 times the other cyanide concentration (1.1 mg/kg). 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 three tuff samples with a maximum concentration of 116 mg/kg. Concentrations decreased with depth at location 03-608281 and decreased downgradient. Concentrations did not change substantially with depth at location 03-608287 (the shallower sample had a concentration of 20.6 mg/kg at this location, which is below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]). Concentrations increased with depth at location 03-608284, but the residential and industrial SSLs were approximately 21 times and 43 times the maximum concentration at this location (the residential and industrial HQs were 0.1 and 0.07). The lateral extent of lead is defined and further sampling to define vertical extent is not warranted.

Mercury was detected above the soil BV in four samples with a maximum concentration of 1.99 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of mercury are defined.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.992 mg/kg to 1.14 mg/kg) above the BV in five samples. Because selenium was not detected above the BV and the residential SSL was approximately 340 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was detected above the soil and Qbt 2,3,4 BVs in four samples with a maximum concentration of 66.7 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil and Qbt 2,3,4 BVs in four soil samples and one tuff sample with a maximum concentration of 110 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-014(u) acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; diethylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; and TPH-DRO.

Acenaphthene was detected in one sample at a concentration of 0.0377 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of acenaphthene are defined.

Anthracene was detected in two samples with a maximum concentration of 0.01 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of anthracene are defined.

Aroclor-1254 and Aroclor-1260 were detected in 15 samples with maximum concentrations of 0.581 mg/kg and 0.417 mg/kg, respectively. Aroclor-1254 and Aroclor-1260 concentrations decreased with depth at all locations, except at location 03-608282, and decreased downgradient. The residential SSLs were approximately 3.5 times and 8 times the concentrations at location 03-608282, and the industrial SSLs were approximately 26 times and 30 times the concentrations at location 03-608282. The lateral extent of Aroclor-1254 and Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

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 were detected in 6 to 11 samples. Concentrations decreased or did not substantially change with depth (0.06 mg/kg or less) and decreased downgradient (either not detected or detected below EQL at location 03-609990). The lateral and vertical extent of these COPCs are defined.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 0.341 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dibenz(a,h)anthracene was detected in one sample at a concentration of 0.0276 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of dibenz(a,h)anthracene are defined.

Diethylphthalate was detected in one sample at a concentration of 0.0916 mg/kg. The concentration decreased with depth, was below the EQL, and decreased downgradient. The lateral and vertical extent of diethylphthalate are defined.

Methylene chloride was detected in four samples with a maximum concentration of 0.0035 mg/kg. Concentrations were similar (difference between the minimum and maximum concentrations was 0.0011 mg/kg) and were below the EQLs. The lateral and vertical extent of methylene chloride are defined.

TPH-DRO was detected 15 samples with a maximum concentration of 270 mg/kg. Concentrations decreased with depth or were below the EQLs and decreased downgradient. The lateral and vertical extent of TPH-DRO are defined.

Radionuclides

The radionuclide COPC at SWMU 03-014(u) includes plutonium-238.

Plutonium-238 was detected above the soil FV in one sample at an activity of 0.0285 pCi/g. Activities decreased with depth and downgradient. The lateral and vertical extent of plutonium-238 are defined.

6.9.8.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.09, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.0007 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 7×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.005 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.07.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is approximately 1 (1.1) without lead and is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The lead EPC is below the residential SSL (400 mg/kg). The total dose is 0.009 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, construction worker, and residential scenarios at SWMU 03-014(u).

6.9.8.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-014(u).

6.9.9 SWMU 03-056(d), Drum Storage

6.9.9.1 Site Description and Operational History

SWMU 03-056(d) is an inactive drum-storage area located on the northeast side of the inactive Plant 1 trickling filter [SWMU 03-014(c)] associated with the former TA-03 WWTP (Figure 6.9-1). Use of the storage area began in 1965. The storage area consists of an asphalt base and two bermed areas that measure 25 ft × 5 ft × 10 in. deep. The berms were constructed in 1989. The asphalt floor of the bermed area was covered with oil-absorbing material (LANL 1995, 057590, p. 6-48). Before 1989, only containers of lubricating oil were stored at this site. Inactive containers were placed on pallets over bare soil. Active containers were mounted in racks with drip pans beneath. Use of the storage area ceased in 1992 when the TA-46 SWSC plant came online and the TA-03 WWTP was decommissioned.

6.9.9.2 Relationship to Other SWMUs and AOCs

SWMU 03-056(d) is located between the inactive trickling filter, SWMU 03-014(c), and the inactive secondary clarifying tank, SWMU 03-014(d) at the former TA-03 WWTP. Materials used at the former TA-03 WWTP were stored at the SWMU 03-056(d) storage area, which is a component of Consolidated Unit 03-014(a)-99.

6.9.9.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-056(d).

6.9.9.4 Site Contamination

Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-056(d) to assess potential contamination.

- Two samples were collected from one location. Samples were collected from 0.0–1.0 ft bgs and at the soil-tuff interface. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling location at SWMU 03-056(d) is shown in Figure 6.9-1. Table 6.9-20 presents the samples collected and analyses requested at SWMU 03-056(d). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-056(d), no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-056(d) consist of two soil samples collected from one location.

Inorganic Chemicals

Two soil samples were analyzed for TAL metals and cyanide. Table 6.9-21 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 12 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.07 mg/kg) above the BV in two samples. The DLs were above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had a DL (0.533 mg/kg) above the BV in one sample. The DL was below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in 1 sample at a concentration of 22.6 mg/kg. Because there were less than 10 soil samples, statistical tests could not be performed. The concentration was below the maximum soil background concentration (36.5 mg/kg). Chromium is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in 1 sample at a concentration of 21.8 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was above the maximum soil background concentration (16 mg/kg). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 0.554 mg/kg. Cyanide is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.161 mg/kg. Mercury is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 12 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 1 sample at a concentration of 52.3 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

Two soil samples were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.9-22 summarizes the analytical results for detected organic chemicals. Plate 13 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-056(d) include Aroclor-1254, Aroclor-1260, and TPH-DRO. All detected organic chemicals are retained as COPCs.

Nature and Extent of Contamination

The extent of inorganic and organic COPCs at SWMU 03-056(d) is discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-056(d) include antimony, copper, cyanide, mercury, and silver.

Antimony was not detected above the soil BV but had DLs (1.07 mg/kg) above the BV in two samples. Because antimony was not detected above the BV and the residential SSL was approximately 29 times the maximum DL, further sampling for extent of antimony is not warranted.

Copper was detected above the soil BV in one sample at a concentration of 21.8 mg/kg. Copper concentrations decreased in samples collected to the west, south, east, northeast, and north as part of the investigations of SWMUs 03-014(g), 03-014(d), 03-014(h), 03-014(j), and 03-014(n) (locations 03-608270, 03-608247, 03-608257, 03-608256, and 03-608262, respectively). The residential SSL was approximately 145 times the maximum concentration. The lateral extent of copper 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 0.554 mg/kg. Cyanide concentrations decreased or did not change substantially at location 03-608262 to the north, at location 03-608256 to the northeast [sampled as part of the investigations of SWMU 03-014(j), and SWMUs 03-014(d), and 03-014(h), respectively], at 03-608257 to the east, and at location 03-608270 to the west. Cyanide was detected at higher concentrations at location 03-608247 to the south [sampled as part of the investigation for SWMUs 03-014(c) and 03-014(g)]. The residential SSL was approximately 85 times the maximum concentration, and the residential HQ was approximately 0.01. Further sampling for extent of cyanide is not warranted.

Mercury was detected above the soil BV in one sample at a concentration of 0.161 mg/kg. Mercury concentrations decreased at location 03-608263 to the north, at location 03-608256 to the northeast, at 03-608257 to the east, and at locations 03-608270 to the west. Mercury was detected at a higher concentration at location 03-608247 to the south [sampled as part of the investigation of SWMUs 03-014(c) and 03-014(g)]. The residential SSL was approximately 145 times the concentration above the BV. Further sampling for extent of mercury is not warranted.

Silver was detected above the soil BV in one sample at a concentration of 12 mg/kg. Silver concentrations decreased in samples collected to the west, south, east, northeast, and north at locations 03-608270, 03-608247, 03-608257, 03-608256, and 03-608263, respectively. The residential SSL was approximately 33 times the concentration above the BV and the residential HQ was approximately 0.03. Further sampling for extent of silver is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-056(d) include Aroclor-1254, Aroclor-1260, and TPH-DRO.

Aroclor-1254 was detected in one sample at a concentration of 0.0539 mg/kg and Aroclor-1260 was detected in two samples with a maximum concentration of 0.0769 mg/kg. Concentrations decreased at location 03-608263 to the north, at location 03-608256 to the northeast, at location 03-608257 to the east, and at location 03-608270 to the west. Concentrations increased at location 03-608247 to the south [sampled as part of the investigation of SWMUs 03-014(c) and 03-014(g)]. The residential SSLs were approximately 21 times and 29 times the maximum concentrations. Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted.

TPH-DRO was detected in one sample at a concentration of 3.19 mg/kg, which was below the EQL. The residential screening guideline for diesel No. 2/crankcase oil was approximately 315 times concentration. Further sampling for extent of TPH-DRO is not warranted.

6.9.9.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2012, 219971). An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the 0.0–1.0 ft depth interval.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.04, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.002.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.003.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-056(d).

6.9.9.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-056(d).

6.10 Consolidated Unit 03-015-00

Consolidated Unit 03-015-00 includes SWMU 03-015 and AOC 03-053 (Figure 6.3-1). SWMU 03-015 is a former NPDES-permitted outfall that received effluent from janitorial sinks and roof and floor drains from building 03-141 until the lines to the outfall were decommissioned in early 1993 (LANL 1996, 052930, p. 121). AOC 03-053 consists of floor drains in the basement of building 03-141, which housed electrochemical and depleted uranium– (DU-) processing facilities. The floor drains discharged to SWMU 03-015 and were rerouted to the TA-50 radioactive liquid waste (RLW) line before 1992 (LANL 1995, 057590, p. 5-24-1).

6.10.1 SWMU 03-015, Outfall

6.10.1.1 Site Description and Operational History

SWMU 03-015 is an outfall located between Eniwetok Drive and the security fence northeast of the building 03-141 (Figure 6.3-1) (LANL 1996, 052930, p. 121). This SWMU is a formerly NPDES-permitted outfall EPA 04A140 that was removed from the permit in 1995 (LANL 1999, 064617, p. 2-7). The outfall historically received effluent from janitorial sinks as well as from floor and roof drains of building 03-141. From 1962 to 1990, building 03-141 housed electrochemical and DU-processing facilities. Powder characterization, plasma flame spray processing, beryllium processing, and DU-processing operations were also performed. In 1992, the basement floor drains in building 03-141 were rerouted to the TA-50 RLW line, and the roof drains were rerouted to an existing storm sewer outfall in Mortandad Canyon. Lines draining to SWMU 03-015 were decommissioned in 1993 (LANL 1995, 057590, p. 5-24-1).

6.10.1.2 Relationship to Other SWMUs and AOCs

This former outfall received wastewater from the janitorial sinks, floor drains, and roof drains of building 03-141. AOC 03-053 consists of floor drains in the basement of building 03-141 that directed wastewater to the outfall at SWMU 03-015. SWMU 03-015 is located about 55 ft east of building 03-141 and the storage area designated as SWMU 03-056(l). The basement floor drains and outfall make up Consolidated Unit 03-015-00.

6.10.1.3 Summary of Previous Investigations

During the 1994 Phase I RFI conducted at SWMU 03-015, four surface soil samples and one sediment sample were collected from five locations downgradient of the outfall in the associated drainage channel. All samples were collected from a depth 0.0–1.5 ft bgs and analyzed for TAL metals, SVOCs, gross-alpha, -beta, and -gamma radiation, isotopic plutonium and uranium, and tritium and by gamma spectroscopy. The fourth soil sample was analyzed for TAL metals, SVOCs, gross-alpha, -beta, and -gamma radiation, and tritium. The sediment sample was analyzed for TAL metals, gross-alpha, -beta, and -gamma radiation, and tritium (LANL 1996, 052930, pp. 121–124).

Barium and lead were detected above BVs in the sediment sample; lead, mercury, nickel, and silver were detected above BVs in one soil sample. The DL for selenium was above BV in one sample. Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, and phenanthrene were detected in one soil sample; fluoranthene and pyrene were detected in two soil samples. Uranium-234, uranium-235, and uranium-238 were detected above BV in one soil sample. Europium-152 and gross-alpha radiation were detected in one soil sample; gross-beta radiation was detected in two soil samples.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.10.1.4. Table 6.10-1 presents the samples collected and analyses requested at SWMU 03-015.

6.10.1.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-015. Sampling was conducted to characterize SWMU 03-015 and AOC 03-053 and presented together because they are adjacent sites, represent a common release, and share sampling locations. As a result, the following activities were completed as part of the 2009 investigation.

- Twenty samples were collected from 10 locations (including 1 location beneath the former drainline) to characterize SWMU 03-015 and AOC 03-053. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs, except at 1 location where samples were collected from 2.5–3.5 ft and 5.5–6.5 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, perchlorate, americium-241, isotopic plutonium, and isotopic uranium.
- All soil samples were field-screened for VOCs and all samples were screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-015 are shown in Figure 6.3-1. Table 6.10-1 presents the samples collected and analyses requested at SWMU 03-015. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors, at SWMU 03-015, a maximum concentration of 125 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

Soil, Rock, and Sediment Sampling Analytical Results

A subsequent site visit determined that samples collected from a “drainage” to the northeast of the sites at locations 03-608294, 03-608295, and 03-608296 (Figure 6.3-1) were not related to the sites (i.e., the drainage does not receive runoff from the sites). These samples are not included in the data set for

SWMU 03-015 and AOC 03-053, and the decision-level data consist of 15 samples (14 soil and 1 sediment) collected from 8 locations.

Inorganic Chemicals

Fifteen samples were analyzed for TAL metals (14 soil and 1 sediment), and 14 soil samples were analyzed for perchlorate. Table 6.10-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 15 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in 3 samples with a maximum concentration of 7.39 mg/kg and had DLs (1.03 mg/kg to 1.31 mg/kg) above the BV in 16 samples. The quantile and slippage tests indicated site concentrations of antimony in soil are statistically different from background (Table H-10 and Figure H-31). Antimony is retained as a COPC.

Barium was detected above the sediment BV (127 mg/kg) in 1 sample at a concentration of 181 mg/kg. Because less than 10 sediment samples were collected, statistical tests could not be performed. The sediment concentration was above the maximum sediment background concentration for barium (127 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 0.57 mg/kg and had DLs (0.542 mg/kg to 619 mg/kg) above the BV in eight samples. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-10 and Figure H-31). Cadmium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in three samples with a maximum concentration of 45.2 mg/kg. The Gehan test indicated site concentrations of chromium in soil are statistically different from background (Table H-10 and Figure H-32). Chromium is retained as a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in two samples with a maximum concentration of 26.6 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-10 and Figure H-32). Cobalt is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in two samples with a maximum concentration of 18.8 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Table H-10 and Figure H-33). Copper is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.3 mg/kg) in 6 soil samples and 1 sediment sample with a maximum concentration of 197 mg/kg. Because there were less than 10 sediment samples, statistical tests could not be performed. The sediment concentration was above the maximum sediment background concentration (25.6 mg/kg). The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Table H-10 and Figure H-33). Lead is retained as a COPC.

Manganese was detected above the soil BV (671 mg/kg) in four samples with a maximum concentration of 1320 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Table H-10 and Figure H-34). Manganese is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 0.211 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil BV (15.4 mg/kg) in one sample at a concentration of 28.7 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not different from background (Table H-10 and Figure H-34). Nickel is not a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.00119 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected above the sediment BV (0.3 mg/kg) but had a DL (0.61 mg/kg) above the BV in one sample. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.36 mg/kg. Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in two samples with a maximum concentration of 3260 mg/kg. These samples were collected near Eniwetok Drive and the access road next to the motor pool and are probably impacted by road salts. Sodium was not detected elsewhere at SWMU 03-015. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Table H-10 and Figure H-35). Sodium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in five samples with a maximum concentration of 129 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-10 and Figure H-35). Zinc is retained as a COPC.

Organic Chemicals

Fourteen soil samples were analyzed for SVOCs, VOCs, TPH-DRO, and PCBs. Table 6.10-3 summarizes the analytical results for detected organic chemicals. Plate 3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-015 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Radionuclides

Fourteen soil samples were analyzed for americium-241, 1 sediment sample was analyzed for gamma-emitting radionuclides, 14 soil samples were analyzed for isotopic plutonium, and 14 soil samples were analyzed for isotopic uranium. Table 6.10-4 summarizes the analytical results for radionuclides. Plate 16 shows the spatial distribution of detected radionuclides.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in one sample at an activity of 2.36 pCi/g. Uranium-238 is retained as a COPC.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 03-015 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-015 include antimony, barium, chromium, copper, lead, mercury, perchlorate, selenium, silver, and zinc.

Antimony was detected above the soil BV in three samples with a maximum concentration of 7.39 mg/kg. Concentrations decreased with depth at both locations and laterally/downgradient. The lateral and vertical extent of antimony are defined.

Barium was detected above the sediment BV in one sample at a concentration of 181 mg/kg. The concentration is below the soil BV (295 mg/kg), and the residential SSL was approximately 85 times the concentration (the residential HQ was 0.008). Further sampling for extent of barium is not warranted.

Chromium was detected above the soil BV in three samples with a maximum concentration of 45.2 mg/kg. Concentrations decreased laterally/downgradient with distance from the outfall. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 2600 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 BV in two samples with a maximum concentration of 18.8 mg/kg. Copper concentrations decreased with depth and decreased laterally/downgradient with distance from the outfall. The lateral and vertical extent of copper are defined.

Lead was detected above the soil and sediment BVs in five soil samples and one sediment sample with a maximum concentration of 197 mg/kg. The sediment concentration (29.3 mg/kg) was only slightly above the BV (25.6 mg/kg). Lead concentrations decreased with depth at three locations and decreased laterally/downgradient with distance from the outfall. The residential SSL was approximately 2 times and the industrial SSL was approximately 4 times the maximum concentration. The residential and industrial HQs were 0.2 and 0.04. The lateral extent of lead is defined, and further sampling for vertical extent is not warranted.

Mercury was detected above the soil BV in two samples with a maximum concentration of 0.211 mg/kg. Mercury concentrations decreased with depth and decreased laterally/downgradient. The lateral and vertical extent of mercury are defined.

Perchlorate was detected in two samples with a maximum concentration of 0.00119 mg/kg. Perchlorate concentrations were below the EQLs and decreased laterally/downgradient. The residential SSL was approximately 50,000 times the maximum concentration. The lateral and vertical extent of perchlorate are defined.

Selenium was not detected above the sediment BV but had a DL (0.61 mg/kg) above the BV in one sample. Because selenium was not detected above the BV and the residential SSL was approximately 640 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 1.36 mg/kg. Silver concentrations decreased with depth and decreased laterally/downgradient. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV in five samples with a maximum concentration of 129 mg/kg. Zinc concentrations decreased with depth at all locations and decreased laterally/downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-015 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO.

Acetone was detected in two samples with a maximum concentration of 0.00842 mg/kg. The residential SSL was approximately 7,900,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1254 was detected in four samples with a maximum concentration of 1.28 mg/kg. The maximum concentration decreased with depth at location 03-608293 and decreased laterally/downgradient. Concentrations increased with depth at locations 03-608290 and 03-608297, but the residential and industrial SSLs were more than 29 times and 211 times the maximum detected concentrations at these locations. 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 0.487 mg/kg. Aroclor-1260 concentrations decreased with depth at three locations and decreased laterally and downgradient. Concentrations increased with depth at location 03-608290, but the residential and industrial SSLs were more than 87 times and 324 times the maximum detected concentration at this location. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Acenaphthene; 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 were detected in three to nine samples. Concentrations decreased with depth at all locations, except for benzo(g,h,i)perylene at location 03-608297. The residential SSL was approximately 22,000 times the benzo(g,h,i)perylene concentration. Concentrations decreased laterally and downgradient. The lateral extent of these COPCs is defined, and further sampling for vertical extent is not warranted.

Benzo(k)fluoranthene was detected in one sample at a concentration of 0.11 mg/kg. The concentration decreased laterally/downgradient. The residential SSL was approximately 135 times the concentration. The lateral extent of benzo(k)fluoranthene is defined, and further sampling for vertical extent is not warranted.

TPH-DRO was detected in 10 samples with a maximum concentration of 89.8 mg/kg. TPH-DRO concentrations decreased with depth, did not change substantially with depth (increased by 2.6 mg/kg), or were detected below the EQL. Concentrations decreased laterally/downgradient. The lateral and vertical extent of TPH-DRO are defined.

Radionuclides

The radionuclide COPC at SWMU 03-015 includes uranium-238.

Uranium-238 was detected above the soil BV in one sample at an activity of 2.36 pCi/g. The activity was similar to the BV (2.29 pCi/g), decreased with depth, and decreased laterally or downgradient with distance from the outfall. The lateral and vertical extent of uranium-238 are defined.

6.10.1.5 Summary of Human Health Risk Screening

The human health risk-screening assessments were conducted for SWMU 03-015 and AOC 03-053, and the results are summarized below.

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). Based on the uncertainties discussed in section I-4.3.2, if 95% UCLs are substituted for the maximum detected concentrations, the total excess cancer risk for the industrial scenario is 1.4×10^{-5}. This risk estimate is conservative and is not representative of the exposure because the Aroclor-1254 cancer risk is based on a single detected concentration and the PAH EPCs are biased by one elevated detected concentration for each analyte (other detected concentrations were an order of magnitude or more below the maximum detected concentration). Given this conservative risk estimate, it is concluded that the adjusted industrial cancer risk (1.4×10^{-5}) is equivalent to the NMED target risk level. The HI is 0.06, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.08 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.05.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.07 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is approximately 2, which is above the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.05.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial and construction worker scenarios at SWMU 03-015. There are potential unacceptable cancer and noncancer risks for the residential scenario, but the residential dose is less than the DOE target level at SWMU 03-015.

6.10.1.6 Summary of Ecological Risk Screening

The ecological risk-screening assessment was conducted for SWMU 03-015 and AOC 03-053 and the results are summarized below.

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-015.

6.10.2 AOC 03-053, Operational Facility

6.10.2.1 Site Description and Operational History

AOC 03-053 (Figure 6.3-1) consists of floor drains in the basement of building 03-141 at TA-03. The floor drains historically discharged to SWMU 03-015 (section 6.10.1) but were rerouted to the TA-50 RLW line before 1992. From 1962 to 1990, building 03-141 housed electrochemical and DU-processing facilities. Powder characterization, plasma flame spray processing, beryllium processing, and DU-processing operations were also performed (LANL 1995, 057590, p. 5-24-1).

6.10.2.2 Relationship to Other SWMUs and AOCs

AOC 03-053 is the designation for the basement area of building 03-141, where floor drains formerly directed wastewater to the outfall at SWMU 03-015. The basement floor drains and outfall make up Consolidated Unit 03-015-00.

6.10.2.3 Summary of Previous Investigations

Samples collected at SWMU 03-015 during the 1994 RFI (section 6.10.1.3) were used to evaluate potential contamination at AOC 03-053 (LANL 1996, 052930, p. 121).

6.10.2.4 Site Contamination

Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 03-053. As a result, the following activities were completed as part of the 2009 investigation.

- Sampling was conducted to characterize AOC 03-053 and its outfall, SWMU 03-015. Sampling activities are described in section 6.10.1.4 as part of SWMU 03-015.

The 2009 sampling locations at AOC 03-053 are shown in Figure 6.3-1. Table 6.10-1 presents the samples collected and analyses requested at AOC 03-053. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

Soil, Rock, and Sediment Field-Screening Results

Sampling activities are described in section 6.10.1.4 as part of SWMU 03-015.

Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-053 consist of 15 samples (14 soil and 1 sediment) collected from 8 locations. Sampling analytical results are described in section 6.10.1.4 as part of SWMU 03-015.

Nature and Extent of Contamination

Nature and extent of contamination are evaluated in section 6.10.1.4 as part of SWMU 03-015.

6.10.2.5 Summary of Human Health Risk Screening

The human health risk screening results are summarized in section 6.10.1.5 as part of SWMU 03-015.

6.10.2.6 Summary of Ecological Risk Screening

The ecological risk screening results are summarized in section 6.10.1.6 as part of SWMU 03-015.

6.11 SWMU 03-021, Outfall

6.11.1 Site Description and Operational History

SWMU 03-021 is an outfall and associated daylight channel located approximately 60 ft north of the north exterior wall of the liquid and compressed gas facility (building 03-170) (Figure 6.5-1). The outfall is a formerly NPDES-permitted outfall (EPA 04A094) and was removed from the 1997 permit (LANL 1999, 064617, p. 2-7). From 1964 to 1976, the outfall discharged caustic wash and rinse water from compressed-gas-cylinder cleaning operations. Cylinders were washed and stripped of paint using a caustic soda solution before they were repainted. Cylinders were screened for radioactive contamination and cleaned of any exterior oil, dirt, and grease before they were brought to building 03-170. Washing and stripping were done in a below-floor-grade pit in the northern part of building 03-170. A 2-in.-diameter iron outfall pipe in an open exterior ditch carried the caustic wash and rinse water from the pit. The end of the outfall pipe discharged into a northeast-trending surface ditch that continued about 180 ft to the main north-south drainage ditch. This outfall was not used after 1976, when the compressed gas suppliers assumed cylinder washing and painting responsibilities. The outfall was buried when 5 to 10 ft of fill material was placed over the former outfall area and graded during site preparation activities for the construction of building 03-1650, the compressed-gas cylinder storage shed (LANL 1995, 057590, pp. 5-14-1–5-14-3).

6.11.2 Relationship to Other SWMUs and AOCs

SWMU 03-021 is located about 60 ft north of the liquid and compressed gas facility, building 03-170, and about 160 ft west of the surface disposal site, SWMU 03-009(i). It is not related to any other SWMUs or AOCs.

6.11.3 Summary of Previous Investigations

During the 1997 RFI conducted at SWMU 03-021, one soil sample was collected from one location within the area of the former outfall area at a depth of 0.0–1.0 ft bgs. Ten soil samples were collected from five locations along two transects positioned across the former location of the channel (LANL 1997, 056660.4, pp. 79–82). Four samples were collected from two locations at depths of 2.0–3.0 ft and 3.0–4.0 ft bgs; four samples were collected from two locations at depths of 3.0–4.0 ft and 4.0–5.0 ft bgs; two samples were collected from the fifth location at depths of 2.75 ft–3.75 ft and 3.75 ft–4.25 ft bgs. All samples were analyzed for metals and SVOCs, and one sample was also analyzed for VOCs.

Cobalt, copper, iron, and nickel were detected above BVs in one sample. Chromium and thallium were detected above BVs in three samples; zinc was detected above BV in six samples; lead was detected above BV in nine samples. VOCs and SVOCs were not detected. The DL for antimony was greater than its BV in two samples.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.11.4. Table 6.11-1 presents the samples collected and analyses requested at SWMU 03-021.

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 SWMU 03-021. As a result, the following activities were completed as part of the 2009 investigation.

- Four samples were proposed for collection at historical sampling locations 03-03329 and 03-03331 to define the vertical extent of contamination and confirm Phase I RFI results. Location 03-03329 was moved 5 ft north, and location 03-0331 was moved 5 ft south at the request of Utilities and Infrastructure–UMAP because of a buried water line (see deviations in Appendix B); these locations are now identified as 03-611943 and 03-611944. At each location, samples were collected from 4.0–5.0 ft and 5.0–6.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, PCBs, and cyanide.
- Twelve samples were collected from six locations downgradient of the outfall and drainlines to define the extent of contamination in the drainage. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, PCBs, VOCs, SVOCs, and cyanide.
- All soil samples were field-screened for VOCs and for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-021 are shown in Figure 6.5-1. Table 6.11-1 presents the samples collected and analyses requested at SWMU 03-021. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.11.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-021, no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-021 consist of 27 samples (20 soil and 7 tuff) collected from 14 locations.

Inorganic Chemicals

Twenty-seven samples were analyzed for TAL metals (20 soil and 7 tuff), and 16 samples were analyzed for cyanide (10 soil and 6 tuff). Table 6.11-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 6 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in 4 samples with a maximum concentration of 1.24 mg/kg. Antimony had DLs (0.79 to 1.17 mg/kg) above the soil and Qbt 2,3,4 BVs in 11 samples. The quantile test indicated site concentrations of antimony in soil are statistically different from background (Table H-11 and Figure H-36). Antimony is retained as a COPC

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 1 sample at a concentration of 63.1 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration for barium (51.6 mg/kg). Barium is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had a DL (0.587 mg/kg) above the BV in one sample. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-11 and Figure H-36). 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 3 soil samples and 2 tuff samples with a maximum concentration of 101 mg/kg. The Gehan and quantile tests indicated site concentrations chromium in soil are not statistically different from background (Table H-11 and Figure H-37). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration for chromium (13 mg/kg). Chromium is retained as a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 11.2 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-11 and Figure H-37). Cobalt is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in one sample at a concentration of 22.9 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Table H-11 and Figure H-38). Copper is not a COPC.

Iron was detected above the soil BV (21,500 mg/kg) in one sample at a concentration 33,200 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are not statistically different from background (Table H-11 and Figure H-38). 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 10 soil samples and 3 tuff samples with a maximum concentration of 358 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Table H-11 and Figure H-39). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Manganese was detected above the soil BV (671 mg/kg) in one sample at a concentration of 746 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Table H-11 and Figure H-39). Manganese is not a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in 1 sample each with a maximum concentration of 24.5 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Table H-11 and Figure H-40). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration for nickel (7 mg/kg). Nickel is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.63 mg/kg to 1.14 mg/kg) above the BV in seven samples. Selenium is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in three samples with a maximum concentration of 2.1 mg/kg. The slippage test indicated site concentrations of thallium in soil are statistically different from background (Table H-11 and Figure H-40). Thallium 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 9 soil samples and 2 tuff samples with a maximum concentration of 193 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table H-11 and Figure H-41). Because less than 10 tuff samples were collected, statistical tests could not be performed. One tuff concentration was above the maximum Qbt 2,3,4 background concentration for zinc (65.6 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Twenty-three samples were analyzed for SVOCs (20 soil and 3 tuff), 13 samples were analyzed for VOCs (11 soil and 2 tuff), and 16 samples were analyzed for PCBs (10 soil and 6 tuff). Table 6.11-3 summarizes the analytical results for detected organic chemicals. Plate 7 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-021 include acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene. All detected organic chemicals are retained as COPCs.

6.11.4.4 Nature and Extent of Contamination

The extent of inorganic and organic COPCs at SWMU 03-021 is discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-021 include antimony, barium, chromium, lead, nickel, selenium, thallium, and zinc.

Antimony was detected above the soil BV in four samples with a maximum concentration of 1.24 mg/kg. Concentrations decreased with depth at two locations and decreased downgradient. The concentration at depth at location 03-608304 was below the maximum soil background concentration (1 mg/kg). The lateral and vertical extent of antimony are defined.

Barium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 63.1 mg/kg. Barium was not detected above the BV in adjacent sampling locations and decreased downgradient. The residential SSL was approximately 250 times the concentration above the BV. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in three soil samples and two tuff samples with a maximum concentration of 101 mg/kg. Concentrations decreased with depth at one location 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 SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 1100 times the maximum concentration. The lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in 10 soil samples and 3 tuff samples with a maximum concentration of 358 mg/kg. Concentrations decreased with depth or were below the maximum soil background concentration (28 mg/kg) at 4 locations and decreased downgradient. Samples were collected at locations 03-611943 and 03-611944 to define the vertical extent at historical locations 03-03329 and 03-03331. Concentrations decreased with depth at these locations. The lateral and vertical extent of lead are defined.

Nickel was detected above the soil and Qbt 2,3,4 BVs in one sample each with a maximum concentration of 24.5 mg/kg. The soil concentration (24.5 mg/kg) was below the maximum soil background concentration (29 mg/kg). The residential SSL was approximately 64 times to 125 times the concentrations. Further sampling for extent of nickel is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.63 mg/kg to 1.14 mg/kg) above the BV in seven samples. Because selenium was not detected above the BV and the residential SSL was approximately 340 times the maximum DL, and further sampling for extent is not warranted.

Thallium was detected above the soil BV in three samples with a maximum concentration of 2.1 mg/kg. Concentrations decreased with depth at one location and decreased downgradient. The only surface sample was collected at location 03-03326 had the maximum detected thallium concentration. The concentration was above the residential SSL by less than a factor of 3, and the industrial SSL was approximately 5 times the maximum concentration. The residential and industrial HQs were 0.6 and 0.2. The lateral extent of thallium is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above the soil and Qbt 2,3,4 BVs in nine soil samples and two tuff samples with a maximum concentration of 193 mg/kg. Concentrations were below the maximum soil background concentration (75.5 mg/kg) at four locations and decreased downgradient. Samples were collected at locations 03-611943 and 03-611944 to define the vertical extent at historical locations 03-03329 and 03-03331. Concentrations decreased with depth at these locations. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-021 include acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene.

Acetone was detected in one sample at a concentration of 0.0144 mg/kg. The residential SSL was approximately 4,600,000 times the concentration. Further sampling for extent of acetone is not warranted.

Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in one to four samples. Concentrations decreased with depth or were below the EQLs and decreased downgradient. The lateral and vertical extent of these COPCs are defined.

Aroclor-1254 and Aroclor-1260 were detected in five samples with maximum concentrations of 0.0492 mg/kg and 0.0344 mg/kg, respectively. Concentrations decreased with depth at one location and decreased downgradient. The residential SSLs were approximately 23 times and 65 times the maximum concentrations. The lateral extent of Aroclor-1254 and Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

6.11.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risk exists for the industrial, construction worker, and residential scenarios at SWMU 03-021.

6.11.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-021.

6.12 AOC 03-038(d), Waste Lines

6.12.1 Site Description and Operational History

AOC 03-038(d) consists of the former industrial waste lines from buildings 03-32 (Center for Materials Science) and 03-34 (Cryogenics Building “B”) (Figure 6.12-1). Between the 1950s and the 1970s, these waste lines connected the two buildings to the former industrial waste sewer, which was replaced with a RLW line in 1986 that connected building 03-34 to the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Drainlines from building 03-32 were connected to the sanitary sewer in 1986. Industrial waste lines throughout TA-03 were removed between 1981 and 1986 as part of the Laboratory’s Industrial Waste Line Removal Project; no evidence of a release was observed during removal activities (LANL 1995, 057590, p. 6-45).

6.12.2 Relationship to Other SWMUs and AOCs

Drainlines associated with AOC 03-038(d) discharged to the same industrial waste lines as AOC 03-038(c).

6.12.3 Summary of Previous Investigations

No previous investigations have been conducted at AOC 03-038(d).

6.12.4 Site Contamination

6.12.4.1 Soil, Rock, and Sediment Sampling

The depth intervals sampled during the 2009 investigation were not below the location of the former drainline. Therefore, the analytical results are not representative of this site, and the 2009 sampling locations and the samples collected and analyses requested at AOC 03-038(d) are not presented. The geodetic coordinates of sampling locations are also not presented in Table 3.2-1.

6.12.4.2 Soil, Rock, and Sediment Field-Screening Results

Because the 2009 analytical results are not representative of this site, the field-screening results are not presented or discussed.

6.12.4.3 Soil, Rock, and Sediment Sampling Analytical Results

The depth intervals sampled during the 2009 investigation were not below the location of the former drainline. Therefore, the analytical results are not representative of this site. AOC 03-038(d) will be resampled below the drainline during the Phase II investigation.

6.12.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 03-038(d) are not defined.

6.12.5 Summary of Human Health Risk Screening

A human health risk assessment has not been performed for AOC 03-038(d) because representative data for the site are not available.

6.12.6 Summary of Ecological Risk Screening

An ecological risk assessment has not been performed for AOC 03-038(d) because representative data for the site are not available.

6.13 SWMU 03-045(a), Outfall

6.13.1 Site Description and Operational History

SWMU 03-045(a) is an inactive outfall from the TA-03 power plant (building 03-22) (Figure 6.6-1). The outfall operated from the 1950s to 1993 The primary outflow from building 03-22 to the SWMU 03-045(a) outfall was noncontact water from steam condensate. In addition, water from floor drains in the building basement, first floor, mezzanine, heater floor, platform, and roof drains previously discharged to this outfall. In 1989, an oil/water separator was installed near the outfall to prevent oil from building operations reaching the outfall. In 1993, the separator was removed and the discharge pipe was capped, causing this outfall to become inactive (LANL 1995, 057590, p. 6-71). In mid-1991, a diesel fuel release of approximately 100 to 200 gal. occurred from the two aboveground diesel-fuel tanks at building 03-22. As the system was being pressurized, a faulty fitting on a fuel line to the diesel tanks caused the release (LANL 1995, 057590, p. 6-79). The release occurred directly above SWMU 03-045(a) and flowed down the slope south of the steam plant into the drainage channel (LANL 1996, 055035, Attachment B, p. 1, Attachment D, p. 1). The spill was contained approximately 120 yd east of the leak. The drainage was blocked, and an extensive cleanup was performed to remove all diesel fuel and diesel-contaminated soil (LANL 1995, 057590, p. 6-79). Remediation activities included removing contaminated soil and sediment in and around SWMU 03-045(a) and backfilling the excavation with clean fill (LANL 1995, 057590, p. 6-71).

6.13.2 Relationship to Other SWMUs and AOCs

The capped discharge point for this former outfall is located approximately 260 ft west of the active power plant outfall, SWMU 03-045(b), in the same drainage channel that is a tributary to Sandia Canyon. In addition, storm water runoff from parking lots and building roof drains in the northwestern portion of TA-03 are discharged to the same drainage channel from a large corrugated metal pipe 100 ft west of the SWMU 03-045(a) outfall.

6.13.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-045(a).

6.13.4 Site Contamination

6.13.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-045(a) to assess potential contamination:

- Eight samples were collected from four locations to define the nature and extent of contamination. Sampling locations were biased to the outfall area and areas of sediment accumulation. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, TPH-GRO, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-045(a) are shown in Figure 6.6-1. Table 6.13-1 presents the samples collected and analyses requested at SWMU 03-045(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.13.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-045(a), no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.13.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(a) consist of eight samples (three soil and five tuff) collected from four locations.

Inorganic Chemicals

Eight samples (three soil and five tuff) were analyzed for TAL metals and cyanide. Table 6.13-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 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 (1.18 mg/kg to 1.29 mg/kg) above the BVs in five samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had a DL (0.615 mg/kg) above the BV in one sample. Because nondetects in the combined site and background datasets were more than 80%, statistical analyses could not be performed. However, the DL was below the maximum soil background concentration (2.6 mg/kg). 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 1 soil sample and 4 tuff samples with a maximum concentration of 88.2 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentration in soil and 2 concentrations in tuff were above the maximum soil and Qbt 2,3,4 background concentration (36.5 mg/kg and 13 mg/kg, respectively). 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 1 soil and 2 tuff samples with a maximum concentration of 34 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentration in soil and a concentration in tuff were above the maximum soil and Qbt 2,3,4 background concentrations (16 mg/kg and 6.2 mg/kg, respectively). Copper 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 3 soil samples and 1 tuff sample with a maximum concentration of 365 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentration in tuff was below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg), but the concentrations in soil were above the maximum soil background concentration (28 mg/kg). Lead is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.374 mg/kg. Mercury is retained as a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.12 mg/kg to 1.32 mg/kg) above the BV in five samples. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.76 mg/kg. Silver 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 3 soil samples and 1 tuff sample with a maximum concentration of 161 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The concentration in tuff was below the maximum Qbt 2,3,4 background concentration (65.6 mg/kg), but 2 concentrations in soil were above the maximum soil background concentration (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Eight samples (three soil and five tuff) were analyzed for SVOCs, VOCs, PCBs, TPH-DRO, and TPH-GRO. Table 6.13-3 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(a) include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene;

2-methylnaphthalene; naphthalene; phenanthrene; pyrene; TPH-DRO; and TPH-GRO. All detected organic chemicals are retained as COPCs.

6.13.4.4 Nature and Extent of Contamination

The extent of inorganic and organic COPCs at SWMU 03-045(a) is discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(a) include antimony, chromium, copper, lead, mercury, selenium, silver, and zinc.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.18 mg/kg to 1.29 mg/kg) above the BVs in two soil samples and three tuff 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.

Chromium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 88.2 mg/kg. Concentrations decreased with depth at location 03-608317 and were below the maximum Qbt 2,3,4 background concentration (13 mg/kg) at locations 03-608316 and 03-608319. Chromium concentrations decreased down the drainage. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 1330 times to 16,000 times the concentrations above the BVs. 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 one soil sample and two tuff samples with a maximum concentration of 34 mg/kg. Copper concentrations decreased with depth at location 03-608319, and the copper concentration at depth at location 03-608318 was below the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). The residential SSL was 92 times to 600 times the concentrations above the BVs. The vertical extent of copper is defined, and further sampling for lateral extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in three soil samples and one tuff sample with a maximum concentration of 365 mg/kg. Lead concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of lead are defined.

Mercury was detected above the soil BV in one sample at a concentration of 0.374 mg/kg. Mercury concentrations decreased with depth at this location. The residential SSL was approximately 63 times the detected concentration above the BV. The vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.12 mg/kg to 1.32 mg/kg) above the BV in five samples. Because selenium was not detected above the BV, and the residential SSL was approximately 300 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 1.76 mg/kg. Silver concentrations decreased with depth at this location. The residential SSL was approximately 220 times the detected concentration above the BV. The vertical extent of silver is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil and Qbt 2,3,4 BVs in three soil samples and one tuff sample with a maximum concentration of 161 mg/kg. Zinc concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 03-045(a) include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; TPH-DRO.

Acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene concentrations were detected in one to four samples. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of these organic COPCs are defined.

Aroclor-1254 was detected in four samples with a maximum concentration of 0.137 mg/kg. Concentrations decreased with depth at location 03-608319, where the highest concentration was detected. The residential SSL was approximately 8 times to 75 times the detected concentrations and the industrial SSL was 60 times to 550 times the detected concentrations. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in six samples with a maximum concentration of 0.366 mg/kg. Concentrations decreased with depth at location 03-608319, where the highest concentration was detected. The residential SSL was approximately 6.6 times to 1200 times the detected concentrations, and the industrial SSL was approximately 22 times to 4600 times the detected concentrations. Further sampling for of Aroclor-1260 is not warranted.

Fluorene was detected in two samples with a maximum concentration of 1.05 mg/kg. The fluorene concentration decreased with depth at location 03-608317 and was below the EQL at downgradient location 03-608319. The lateral and vertical extent of fluorene are defined.

Isopropyltoluene(4-) was detected in one soil sample at a concentration of 0.023 mg/kg. The 4-isopropyltoluene concentration decreased with depth at location 03-608319. The residential SSL was approximately 140,000 times the detected concentration. The vertical extent of 4-isopropyltoluene is defined, and further sampling for lateral extent is not warranted.

TPH-DRO was detected in five samples with a maximum concentration of 273 mg/kg. Concentrations decreased with depth at locations 03-608317 and 03-608319 and decreased downgradient. The concentration of TPH-DRO at location 03-608316 was below the EQL. The residential screening guideline for diesel No. 2/crankcase oil was approximately 3.7 times to 155 times the TPH-DRO concentrations. The lateral and vertical extent of TPH-DRO are defined.

TPH-GRO was detected in two samples with a maximum concentration of 0.0191 mg/kg. The TPH-GRO concentrations were detected below the EQLs and decreased downgradient. The lateral and vertical extent of TPH-GRO are defined.

6.13.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). Based on the uncertainties discussed in section I-4.3.2, if 95% UCLs are substituted for the maximum detected concentrations, the total excess cancer risk for the industrial scenario is 8×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.2. Potential risk from TPH-GRO is based on constituents. The potential risks for the industrial scenario are below the NMED target levels.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.07. Potential risk from TPH-GRO is based on constituents. The potential risks for the construction worker scenario are below the NMED target levels.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is approximately 0.2 without lead, which is less than the NMED target HI of 1 (NMED 2012, 219971). The lead EPC is below the residential SSL (400 mg/kg). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.1. Potential risk from TPH-GRO is based on constituents. The total excess cancer risk for the residential scenario is from PAHs.

Based on the risk-screening assessment results, no potential unacceptable risk exists for the industrial and construction worker scenarios at SWMU 03-045(a). There is a potential unacceptable cancer risk for the residential scenario, but the residential HI is below the NMED target level.

6.13.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(a).

6.14 SWMU 03-045(e), Outfall

6.14.1 Site Description and Operational History

SWMU 03-045(e) is an inactive outfall (Figure 6.2-1) from a floor drain in the oil pump house (structure 03-57) located at the TA-03 power plant, building 03-22. One line from each of two diesel fuel storage tanks (structures 03-26 and 03-27) passes through the pump house to the power plant. The diesel fuel is backup fuel for the power plant. Valves in the pump house operate each line and allow diesel fuel to flow from one or both storage tanks. The floor drain was in place to prevent the pump house from filling with diesel fuel in the event a valve junction should rupture or leak. The floor drain and associated drainline to the outfall were plugged in 1989. A concrete apron is located at the point where the drainline discharged into Sandia Canyon (LANL 1995, 057590, pp. 6-7–6-8).

6.14.2 Relationship to Other SWMUs and AOCs

SWMU 03-045(e) is not associated with any other SWMUs or AOCs and is not a component of Consolidated Unit 03-012(b)-00. However, the outfall is located directly downgradient of the former TA-03 asphalt batch plant SWMUs and AOCs, including the former SWMU 03-045(g) outfall.

6.14.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-045(e).

6.14.4 Site Contamination

6.14.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-045(e) to assess potential contamination:

- Two samples were collected from one location at the outfall to define the nature and extent of potential contamination. Samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, TPH-DRO, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling location at SWMU 03-045(e) is shown in Figure 6.2-1. Table 6.14-1 presents the samples collected and the analyses requested for each sample associated with SWMU 03-045(e).

6.14.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 03-045(e), a maximum concentration of 222 ppm was detected at a depth of 0.0–1.0 ft bgs; the sample was submitted to a fixed laboratory for analysis of organic chemicals. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.14.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(e) consist of two soil samples collected from one location at the outfall. Data collected in 2009 as part of characterization efforts at SWMU 03-045(e) are presented in this report and are evaluated for COPC identification and extent of contamination at the outfall. Additional sampling to characterize extent below the pump house will be performed following D&D of existing structures (section 6.14.7).

Inorganic Chemicals

Two soil samples were analyzed for TAL metals and cyanide. Table 6.14-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.04 mg/kg and 1.09 mg/kg) above the BV in two samples. The DLs were also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.522 mg/kg and 0.543 mg/kg) above the BV in two samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Lead was detected above soil BV (22.3 mg/kg) in 2 samples with a maximum concentration of 99.6 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. Lead concentrations were above the maximum soil background concentration (28 mg/kg). Lead is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in 1 sample at a concentration of 1.04 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration is similar to the maximum soil background concentration (1 mg/kg). Thallium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 2 samples with a maximum concentration of 54.6 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. Concentrations were below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

Two soil samples were analyzed for SVOCs, VOCs, TPH-DRO, and PCBs. Table 6.14-3 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(e) include Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, fluoranthene, 4-isopropyltoluene, phenanthrene, pyrene, toluene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

6.14.4 Nature and Extent of Contamination

The extent of inorganic and organic COPCs at SWMU 03-045(e) is discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(e) include antimony and lead.

Antimony was not detected above the soil BV but had DLs (1.04 mg/kg and 1.09 mg/kg) above the BV in two samples. Antimony was not detected above BV, and the residential SSL was approximately 29 times the maximum DL. Lateral extent is not defined because only one location at the outfall was sampled. The site investigation of the rest of SWMU 03-045(e) is delayed.

Lead was detected above the soil BV in two samples with a maximum concentration of 99.6 mg/kg. The residential SSL was approximately 4 times the maximum concentration, and the industrial SSL was approximately 8 times the maximum concentration. The lead HQs were approximately 0.2 and 0.09, and the HIs were approximately 0.3 and 0.1, respectively. Further sampling for vertical extent is not warranted. Lateral extent is not defined because only one location at the outfall was sampled. The site investigation of the rest of SWMU 03-045(e) is delayed.

Organic Chemicals

Organic COPCs at SWMU 03-045(e) include Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, fluoranthene, 4-isopropyltoluene, phenanthrene, pyrene, toluene, and TPH-DRO.

Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, and toluene were detected in one sample each. The concentrations of Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, and toluene decreased with depth. The residential SSLs were approximately 25 times [benzo(b)fluoranthene] to 11,000,000 times (toluene) the detected concentrations. Further sampling for vertical extent of Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, and toluene is not warranted. Lateral extent is not defined because only one location at the outfall was sampled. The site investigation of the rest of SWMU 03-045(e) is delayed.

Isopropyltoluene(4-) was detected in one soil sample at a concentration of 0.00173 mg/kg. The residential SSL was approximately 1,400,000 times the concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Fluoranthene, phenanthrene, and pyrene were detected in two samples. The residential SSLs were approximately 6000 times to 96,000 times the maximum concentrations. Further sampling for vertical extent of fluoranthene, phenanthrene, and pyrene is not warranted. Lateral extent is not defined because only one location at the outfall was sampled. The site investigation of the rest of SWMU 03-045(e) is delayed.

TPH-DRO was detected in two samples with a maximum concentration of 3250 mg/kg. The residential and industrial screening guidelines for diesel No. 2/crankcase oil were exceeded by the maximum TPH-DRO concentration at depth. The vertical extent of TPH-DRO is not defined and the lateral extent is not defined because only one location at the outfall was sampled. The site investigation of the rest of SWMU 03-045(e) is delayed.

6.14.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.09, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.2.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 4×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 2. Based on the uncertainties discussed in section I-4.3.2, the TPH-DRO at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH-DRO constituents have degraded as evidenced by the detection of only four PAHs at concentrations less than 0.3 mg/kg. All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 3. Based on the uncertainties discussed in section I-4.3.2, the TPH-DRO at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH-DRO constituents have degraded as evidenced by the detection of only four PAHs at concentrations less than 0.3 mg/kg. All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-045(e).

6.14.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(e).

6.14.7 Delayed Site Investigation Rationale

No sampling was conducted beneath the oil pump house (structure 03-57) or outlet drainline because of the close proximity of active diesel fuel storage tanks, associated fuel lines, and ancillary equipment associated with the TA-03 power plant (Figure 6.6-1). The approved investigation work plan proposed site characterization activities for this portion of SWMU 03-045(e) be delayed until D&D of structure 03-57, the diesel fuel storage tanks, associated fuel lines, and ancillary equipment associated with the TA-03 power plant (LANL 2008, 103404.43; NMED 2008, 102721). Any potential contamination from past releases would be located beneath the pump house, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation. For these reasons, it was proposed that additional site characterization and investigation be delayed until the D&D of structure 03-57, along with the diesel fuel storage tanks, associated fuel lines, and ancillary equipment associated with the TA-03 power plant (LANL 2008, 103404.43).

6.15 SWMU 03-045(f), Outfall

6.15.1 Site Description and Operational History

SWMU 03-045(f) is an outfall from a sink drain that served the TA-03 utilities control center (building 03-223) from 1950 to the late 1980s (Figure 6.6-1). The outfall was located on the north side of the building and discharged to Sandia Canyon. The sink was used as a quench tank for welding and cutting. No releases of hazardous wastes or constituents from the sink to the SWMU 03-045(f) outfall have been documented (LANL 1995, 057590, p. 6-8). The sink was removed in the late 1980s.

6.15.2 Relationship to Other SWMUs and AOCs

The SWMU 03-045(f) outfall is downgradient of the SWMU 03-045(a,b,c) outfalls that are all located in the same drainage channel that is a tributary to Sandia Canyon. In addition, storm water runoff from SWMU 03-012(b) and AOC 03-047(d) discharged upgradient of the SWMU 03-045(f) outfall.

6.15.3 Summary of Previous Investigations

No previous investigations have been conducted at SWMU 03-045(f).

6.15.4 Site Contamination

6.15.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at SWMU 03-045(f) to assess potential contamination:

- Four samples were collected from two locations to define the nature and extent of contamination. Sampling locations were biased to the outfall and sediment accumulations. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, cyanide, and nitrate.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-045(f) are shown in Figure 6.6-1. Table 6.15-1 presents the samples collected and analyses requested at SWMU 03-045(f). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.15.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening at SWMU 03-045(f), no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.15.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(f) consist of four soil samples collected from two locations.

Inorganic Chemicals

Four soil samples were analyzed for TAL metals, cyanide, and nitrate. Table 6.15-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in two samples with a maximum concentration of 1.08 mg/kg and had a DL (1.04 mg/kg) above the BV in one sample. One detected concentration was below the maximum soil background concentration (1 mg/kg), and the other detected concentration and the DL were above the maximum soil background concentration. Antimony is retained as a COPC.

Organic Chemicals

Four soil samples were analyzed for SVOCs, VOCs, and PCBs. Table 6.15-3 summarizes the analytical results for detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(f) include acetone, Aroclor-1260, fluoranthene, isopropylbenzene, 4-isopropyltoluene, phenanthrene, and pyrene. All detected organic chemicals are retained as COPCs.

6.15.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-045(f) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(f) includes antimony.

Antimony was detected above the soil BV in two samples and had a DL (1.03 mg/kg) above the BV in one sample. Because the detected antimony concentrations were below or slightly above the maximum soil background concentration (1 mg/kg) and the residential SSL was 29 times the maximum detected concentration, further sampling for extent of antimony is not warranted.

Organic Chemicals

Organic chemicals detected in soil at SWMU 03-045(f) include acetone, Aroclor-1260, fluoranthene, isopropylbenzene, 4-isopropyltoluene, phenanthrene, and pyrene.

Acetone, fluoranthene, isopropylbenzene, 4-isopropyltoluene, phenanthrene, and pyrene were detected in one sample. Concentrations were below the EQLs and decreased downgradient. The residential SSLs ranged from approximately 89,000 times (fluoranthene) to 6,700,000 times (4-isopropyltoluene) the detected concentrations. The lateral and vertical extent of acetone, fluoranthene, isopropylbenzene, 4-isopropyltoluene, phenanthrene, and pyrene are defined.

Aroclor-1260 was detected in four samples with a maximum concentration of 0.0314 mg/kg. The concentrations of Aroclor-1260 decreased with depth at location 03-608322, were below the EQLs at location 03-608321, and decreased downgradient. The residential SSL was 71 times to 1000 times the detected concentrations of Aroclor-1260. The lateral and vertical extent of Aroclor-1260 are defined.

6.15.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.002, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 4×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.01, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is 1 × 10^{-7}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The HI is 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-045(f).

6.15.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(f).

6.16 SWMU 03-045(h), Outfall

6.16.1 Site Description and Operational History

SWMU 03-045(h) is a former NPDES-permitted outfall (EPA 03A024) located in TA-03 at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (structure 03-187) (Figure 6.16-1). The outfall was formerly permitted for the discharge of treated cooling water and storm water. It served a former cooling tower from 1953 until the late 1980s when the cooling tower became inactive. The cooling tower remained inactive until early 1995, when it was reactivated. In 1997, the cooling tower was removed and the outfall pipe plugged. The outfall was removed from the NPDES permit in 2007 (EPA 2007, 099009). The area at the outfall pipe is about 3-ft wide × 6-ft long. Effluent drained into a corrugated metal storm drainpipe that trended northeast and east of structure 03-187 where it combined with more storm water runoff from surrounding areas. The drainage continued south and joined a channel north of Eniwetok Drive that ultimately drained into Sandia Canyon. Routine water treatment began in 1968. Treatment included biocides and fungicides to reduce algae growth and chelating agents such as ethylenediaminetetraacetic acid to inhibit corrosion.

6.16.2 Relationship to Other SWMUs and AOCs

This former outfall and storm water drainline is located about 50 ft north of the Sigma Building cooling tower, structure 03-187. The storm drainline ends northeast of the outfall and storm water drains east in an unlined channel towards Eniwetok Drive, collecting storm water from other drainlines on the north and west of the Sigma Building from AOC 03-052(b).

6.16.3 Summary of Previous Investigations

No sampling activities have been conducted at this site before the 2009 investigation of Upper Mortandad Canyon Aggregate Area, which includes SWMU 03-045(h); however, RFI sampling activities were conducted in 1997 at AOC 03-052(b), located northeast and downgradient of the corrugated metal storm drain pipe into which SWMU 03-045(h) discharged. RFI sampling activities for AOC 03-052(b) are discussed in section 6.19.3.

6.16.4 Site Contamination

6.16.4.1 Soil, Rock, and Sediment Sampling

SWMU 03-045(h) is included in the Upper Mortandad Canyon Aggregate Area and was sampled in 2009 in accordance with the approved investigation work plan for the Upper Mortandad Canyon Aggregate Area (LANL 2007, 098954). All data collected as part of the investigation of SWMU 03-045(h) are presented in the 2009 investigation report for the Upper Mortandad Canyon Aggregate Area. In accordance with the approved investigation work plan for the Upper Sandia Canyon Aggregate Area (LANL 2008, 103404.43; NMED 2008, 102721), data from one SWMU 03-045(h) sampling location is also presented in this supplemental investigation report. The data are included because data collected to characterize AOC 03-052(b) are necessary to complete characterization of SWMU 03-045(h) beyond the end of the SWMU 03-045(h) storm drainline. Information for the SWMU 03-045(h) samples included in this supplemental investigation report is summarized below.

- Two samples were collected from location MO-604952, north of cooling tower 03-0187, from 0.0–0.5 ft and 6.0–7.0 ft bgs (the soil-tuff interface). All samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, VOCs, SVOCs, dioxins and furans, PCBs, cyanide, perchlorate, nitrate, and gamma-emitting radionuclides, tritium, and isotopic uranium.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in SCLs and were presented in the Upper Mortandad Canyon Aggregate Area investigation report (LANL 2010, 109180.28).

The 2009 sampling location at SWMU 03-045(h) is shown Figure 6.16-1. Table 6.16-1 presents the sampling depths and analyses requested for the sampling location.

6.16.4.2 Soil, Rock, and Sediment Field-Screening Results

Field-screening results are presented in the Upper Mortandad Canyon Aggregate Area investigation report (LANL 2010, 109180.28).

6.16.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-045(h) presented in this report consist of two samples (one soil and one tuff) collected from one location.

Inorganic Chemicals

One soil and one tuff sample were analyzed for TAL metals, hexavalent chromium, cyanide, nitrate, and perchlorate. Table 6.16-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 17 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 1 sample at a concentration of 10,500 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (8370 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 (1.12 mg/kg and 1.13 mg/kg) above the BVs in two samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 1 sample at a concentration of 112 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration is above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in 1 sample at a concentration of 1.4 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (1.8 mg/kg). Beryllium is not a COPC.

Cadmium was not detected the soil BV (0.4 mg/kg) but had a DL (0.567 mg/kg) above the BV in one sample. The DL was below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in 1 sample at a concentration of 4560 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 1 sample at a concentration of 15.7 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (13 mg/kg). Chromium is retained as a COPC.

Hexavalent chromium was detected in one soil sample at a concentration of 0.142 mg/kg. Hexavalent 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 4.46 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 1 sample at a concentration of 10.5 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in 1 sample at a concentration of 14 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in 1 sample at a concentration of 2570 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (2820 mg/kg). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 1 sample at a concentration of 11.4 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (7 mg/kg). Nickel is retained as a COPC.

Nitrate was detected in one soil sample and one tuff sample with a maximum concentration of 1.69 mg/kg. Nitrate is naturally occurring, and the concentrations are consistent with naturally occurring levels. Nitrate is not a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had a DL (1.14 mg/kg) above the BV in one sample. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in 1 sample at a concentration of 21.4 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was above the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium is retained as a COPC.

Organic Chemicals

One soil and one tuff sample were analyzed for SVOCs, PCBs, and dioxins and furans. One tuff sample was analyzed for VOCs. Table 6.16-3 summarizes the analytical results for detected organic chemicals. Plate 18 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-045(h) include Aroclor-1254; Aroclor-1260; benzo(b)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin, 1,2,3,7,8,9-hexachlorodibenzodioxin, total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans. All detected organic chemicals are retained as COPCs.

Radionuclides

One soil and one tuff sample were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium. No radionuclides were detected or detected above BVs/FVs at SWMU 03-045(h).

6.16.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-045(h) are discussed below. No radionuclide COPCs were identified.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-045(h) include aluminum, antimony, barium, calcium, chromium, hexavalent chromium, cobalt, copper, nickel, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in one sample at a concentration of 10,500 mg/kg. Aluminum was detected below BVs at downgradient location 03-03291 in AOC 03-052(b). The residential SSL was 7.4 times the concentration above the BV (i.e., the detected concentration is 67,500 mg/kg below the residential SSL), the residential HQ was approximately 0.1, and the residential HI was approximately 0.5. The lateral extent of aluminum is defined, and further sampling for vertical extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.12 mg/kg and 1.13 mg/kg) above the BVs in two samples. Because antimony was not detected above the BVs and the residential SSL was 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 one sample at a concentration of 112 mg/kg. Barium was detected below BV at downgradient location 03-03291 in adjacent AOC 03-052(b). The residential SSL was approximately 140 times the maximum concentration. The lateral extent of barium is defined, and further sampling for vertical extent of barium is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 4560 mg/kg. Calcium was detected below BV at downgradient location 03-03291 in adjacent AOC 03-052(b). The detected concentration is below the recommended daily allowances for an adult and child (Appendix I). The lateral extent of calcium is defined, and further sampling for vertical extent of calcium is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 15.7 mg/kg. Chromium was detected below BV at downgradient location 03-03291 in adjacent AOC 03-052(b). The residential trivalent chromium SSL was approximately 7500 times the concentration above the BV (hexavalent chromium was not detected in this sample). The lateral extent of chromium is defined, and further sampling for vertical extent of chromium is not warranted.

Hexavalent chromium was detected in one sample at a concentration of 0.142 mg/kg. The concentration decreased with depth. The residential hexavalent chromium SSL was approximately 21 times the concentration and the residential cancer risk was approximately 5×10^{-7}. Further sampling for extent of hexavalent chromium is not warranted.

Cobalt was detected above the Qbt 2,3,4 BV in one sample at a concentration of 4.46 mg/kg. Cobalt was detected above BV at downgradient location 03-03291 in AOC 03-052(b) but decreased farther downgradient at location 03-608336. The residential SSL was approximately 5 times the detected concentration, and the industrial SSL was approximately 67 times the concentration above the BV. The residential HQ was approximately 0.2, and the residential HI was approximately 0.5. The lateral extent of cobalt is defined, and further sampling for vertical extent of cobalt is not warranted.

Copper was detected above the Qbt 2,3,4 BV in one sample at a concentration of 10.5 mg/kg. Copper was detected below BV at downgradient locations 03-03291 and 03-608336 in adjacent AOC 03-052(b). The residential SSL was approximately 300 times the concentration above the BV. The lateral extent of copper is defined, and further sampling for vertical extent of copper is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 11.4 mg/kg. Nickel was detected above BV at downgradient location 03-03291 in AOC 03-052(b) but decreased farther downgradient at location 03-608336. The residential SSL was approximately 137 times the concentration above the BV. The lateral extent of nickel is defined and further sampling for vertical extent of nickel is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had a DL (1.14 mg/kg) above the BV. Because selenium was not detected above the BV and the residential SSL was approximately 340 times the 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 21.4 mg/kg. Vanadium decreased to below the maximum Qbt 2,3,4 background concentration (21 mg/kg) at downgradient locations 03-03291 and 03-608336 in AOC 03-052(b). The detected concentration is slightly above the maximum Qbt 2,3,4 background concentration, the residential SSL was approximately

18 times the maximum concentration, and the residential HQ was approximately 0.05. The lateral extent of vanadium is defined and further sampling for vertical extent of vanadium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-045(h) include Aroclor-1254; Aroclor-1260; benzo(b)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

Aroclor-1254 and Aroclor-1260 were detected in one sample at concentrations of 0.0193 mg/kg and 0.0196 mg/kg, respectively. Aroclor-1254 and Aroclor-1260 concentrations decreased with depth at this location and to below the EQLs downgradient at locations 03-608337 and 03-608338, which are associated with AOC 03-052(b). The residential SSLs were also approximately 60 times and 110 times the detected concentrations. The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

Benzo(b)fluoranthene, fluoranthene, phenanthrene, and pyrene were detected in one sample. Concentrations decreased with depth and were below the EQLs. The lateral extent is defined by AOC 03-052(b) and vertical extent of benzo(b)fluoranthene, fluoranthene, phenanthrene, and pyrene are defined.

Heptachlorodibenzodioxin(1,2,3,4,6,7,8-); total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans were detected in one or two samples. The concentrations decreased with depth, and the residential SSL for 2,3,7,8-tetrachlorodibenzodioxin was several orders of magnitude above the detected concentrations. The vertical extent of the dioxin and furan congeners is defined, and further sampling for lateral extent is not warranted.

Radionuclides

No radionuclide COPCs were identified at SWMU 03-045(h).

6.16.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.005, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.5, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-045(h).

6.16.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-045(h).

6.17 AOC 03-047(g), Drum Storage

6.17.1 Site Description and Operational History

AOC 03-047(g) is a paved area on the north side of building 03-141 at TA-03 where drums of acetone, vacuum pump oil, and ethylene glycol were stored (Figure 6.3-1). During a 1989 site reconnaissance survey, staining was found on the cement. During a site visit in September 1993, the building manager stated the area had been used for approximately 20 yr to store product oil and occasionally solvents. Only one drum was on the pad when the site visit was conducted. The drum contained mineral oil used in vacuum pumps. As oil was dispensed, spills were known to occur. Stains were evident on the concrete around the barrel; however, the staining did not continue beyond the concrete, indicating that small oil spills did not migrate off the concrete pad (LANL 1995, 057590, p. 6-46).

6.17.2 Relationship to Other SWMUs and AOCs

This formerly used drum storage area is located on the north side of building 03-141. It is located about 40 ft west of AOC 03-051(c), which was another stained area. It is not related to any other SWMUs or AOCs.

6.17.3 Summary of Previous Investigations

No previous investigations have been conducted at AOC 03-047(g).

6.17.4 Site Contamination

6.17.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at AOC 03-047(g) to assess potential contamination.

- Eight samples were collected from four locations. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, cyanide, perchlorate, and nitrate.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-047(g) are shown in Figure 6.3-1. Table 6.17-1 presents the samples collected and analyses requested at AOC 03-047(g). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.17.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 03-047(g), a maximum concentration of 196 ppm was detected at a depth of 1.0–2.0 ft bgs. This sample (RE03-09-13951) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.17.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-047(g) consist of eight soil samples collected from four locations.

Inorganic Chemicals

Eight soil samples were analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 6.17-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 15 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.07 mg/kg to 1.3 mg/kg) above the BV in eight samples. The DLs were also above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.537 mg/kg to 0.648 mg/kg) above the BV in eight samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in 4 samples at a maximum concentration of 37.4 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. Two concentrations were above the maximum soil background concentration (28 mg/kg). Lead is retained as a COPC.

Nitrate was detected in six soil samples with a maximum concentration of 2.04 mg/kg. Nitrate is naturally occurring and the concentrations are consistent with naturally occurring levels. Nitrate is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 5 samples at a maximum concentration of 69 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentrations were below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

Eight soil samples were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.17-3 summarizes the analytical results for detected organic chemicals. Plate 3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 03-047(g) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and tetrachloroethene. All detected organic chemicals are retained as COPCs.

6.17.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC 03-047(g) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 03-047(g) include antimony and lead.

Antimony was not detected above the soil BV but had DLs (1.07 mg/kg to 1.3 mg/kg) above the BV in eight samples. Because antimony was not detected above the BV and the residential SSL was approximately 24 times the maximum DL, further sampling for extent of antimony is not warranted.

Lead was detected above the soil BV in 4 samples with a maximum concentration of 37.4 mg/kg. The detected concentrations were within 10 mg/kg of the maximum soil background concentration (28 mg/kg). The residential SSL was approximately 10 times the maximum concentration and the residential HQ was approximately 0.07. Further sampling for extent of lead is not warranted.

Organic Chemicals

Organic COPCs at AOC 03-047(g) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and tetrachloroethene.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and tetrachloroethene were detected in one to three samples. The concentrations decreased with depth and decreased downgradient at location 03-608326. The lateral and vertical extent of these organic COPCs are defined.

Acetone was detected in three samples at concentrations below the EQLs, and the residential SSL was approximately 14,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1242 and Aroclor-1254 were detected in two samples with maximum concentrations of 0.364 mg/kg and 0.313 mg/kg, respectively. Concentrations decreased with depth at location 03-608327 and decreased downgradient at location 03-608326. The residential SSLs were 6 times and 3.5 times the maximum concentrations, and the industrial SSL was approximately 22 times to 26 times the maximum concentrations. The lateral extent of Aroclor-1242 and Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in three samples with a maximum concentration of 0.241 mg/kg. The concentrations decreased with depth at location 03-608327, and the residential SSL was approximately 17 times the maximum concentration. The lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

6.17.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. As discussed in section I-4.3.2, the elevated cancer risk under the residential scenario is not related to site operations but rather is from facility infrastructure and thus is not an issue for this site. The HI is 0.4, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessments, no potential unacceptable risk exists for the industrial, construction worker, and residential scenarios at AOC 03-047(g).

6.17.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-047(g).

6.18 AOC 03-051(c), Soil Contamination—Vacuum Pump Leak

6.18.1 Site Description and Operational History

AOC 03-051(c) consists of two former areas of stained asphalt at TA-03 attributed to operational leaks of vacuum pump oil (Figure 6.3-1) (LANL 1995, 057590, p. 6-84). The first area, located on the east side of building 03-141, measured approximately 6 ft × 6 ft. The second area, located at the northeast corner of the building, measured approximately 10 ft × 15 ft (LANL 1996, 053780, p. 15). Both areas were removed during a voluntary corrective action (VCA) conducted in 1995.

6.18.2 Relationship to Other SWMUs and AOCs

These two stained areas were located east of and at the northeast corner of building 03-141. The northern location is about 40 ft east of AOC 03-047(g). The southern area is collocated with the storage area, SWMU 03-056(l), which is about 50 ft upgradient of the discharge point for the former outfall, SWMU 03-015.

6.18.3 Summary of Previous Investigations

During the 1995 VCA performed at AOC 03-051(c), the stained areas of asphalt were removed along with all stained soil. The stained area next to the east side of building 03-141 was excavated to a depth of 1.5–2.0 ft bgs, and the stained area at the northeast corner of the building was excavated to a depth of 1.0 ft bgs. Soil samples were field-screened for radioactivity, PAHs, TPH, x-ray fluorescence (XRF), TAL metals, and VOCs. The first set of XRF samples showed elevated thallium levels. After the results from cleanup verification samples were received, cleanup activities resumed to remove an additional 2 to 3 in. of thallium-contaminated soil from both excavation locations. Data from two samples collected from the bottom of the excavation showed no elevated thallium levels. The excavated areas were backfilled with soil and gravel and compacted (LANL 1996, 053780, pp. 14–16). Before the area was backfilled, four soil samples were collected from four locations at a depth of 0.0–0.5 ft bgs from the bottom of each excavation to verify site cleanup. Samples were analyzed for TAL metals, SVOCs, and pesticides. Data from 1995 VCA confirmation samples are screening-level data and are summarized below. Section 2.36 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Cadmium was detected above the soil BV in four samples. SVOCs and pesticides were not detected.

6.18.4 Site Contamination

6.18.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at the northern area of AOC 03-051(c) to assess potential contamination:

- Four samples were collected from two locations to confirm the results of the VCA. At each location, samples were collected from 2.5–3.5 ft and 4.5–5.5 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, SVOCs, TPH-DRO, PCBs, cyanide, perchlorate, and nitrate.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The southern area of AOC 03-051(c) was characterized as part of the investigation of SWMU 03-056(l), which has received a certificate of completion (NMED 2011, 111821). No additional investigation is required for the southern area of AOC 03-051(c).

The 2009 sampling locations at AOC 03-051(c) are shown in Figure 6.3-1. Table 6.18-1 presents the samples collected and analyses requested at AOC 03-051(c). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.18.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors, at AOC 03-051(c), a maximum concentration of 3.3 ppm was detected at a depth of 4.5–5.5 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.18.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-051(c) consist of four soil samples collected from two locations.

Inorganic Chemicals

Four soil samples were analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 6.18-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 15 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.15 mg/kg to 1.26 mg/kg) above the BV in four samples. The DLs were above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Arsenic was detected above the soil BV (8.17 mg/kg) in 1 sample at a concentration of 8.49 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (9.3 mg/kg). Arsenic is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.574 mg/kg to 0.628 mg/kg) above the BV in three samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in 2 samples with a maximum concentration of 11.2 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentrations were above the maximum soil background concentration (9.5 mg/kg). Cobalt is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in 1 sample at a concentration of 25.6 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (28 mg/kg). Lead is not a COPC.

Manganese was detected above soil BV (671 mg/kg) in 1 sample at a concentration of 988 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (1100 mg/kg). Manganese is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 1 sample at a concentration of 114 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was above the maximum soil background concentration (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Four soil samples were analyzed for SVOCs, PCBs, and TPH-DRO. Table 6.18-3 summarizes the analytical results for detected organic chemicals. Plate 3 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 03-051(c) include acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

6.18.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC 03-051(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 03-051(c) include antimony, cobalt, and zinc.

Antimony was not detected above the soil BV but had DLs (1.15 mg/kg to 1.26 mg/kg) above the BV in four samples. Because antimony was not detected above the BV and the residential SSL was approximately 25 times the maximum DL, further sampling for extent of antimony is not warranted.

Cobalt was detected above soil BV in two samples with a maximum concentration of 11.2 mg/kg. The detected concentrations were less than 2 mg/kg above the maximum soil background concentration (9.5 mg/kg). The residential SSL was approximately 2 times the concentrations above the BV, and the industrial SSL was approximately 27 times the concentrations above the BV. Further sampling for extent of cobalt is not warranted.

Zinc was detected above the soil BV in one sample at a concentration of 114 mg/kg. Concentrations decreased with depth at location 03-608328. The residential SSL was approximately 200 times the concentration above the BV. The vertical extent is defined, and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 03-051(c) include acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene were detected in two samples. Dibenz(a,h)anthracene was detected in one sample. The concentrations either increased slightly or did not change substantially with depth. The residential SSLs for benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; and dibenz(a,h)anthracene were exceeded or were close to being exceeded in the deeper sample at location 03-608329. The industrial SSLs were 1.9 times [benzo(a)pyrene] to 17 times the concentrations in the deeper sample at location 03-608329. The residential SSLs of the other organic COPCs listed above were approximately 110 times (chrysene) to 32,000 times (anthracene) the maximum concentrations, except for indeno(1,2,3-cd)pyrene, which had a residential SSL approximately 2.7 times the maximum concentration. The industrial SSL for indeno(1,2,3-cd)pyrene was approximately 43 times the maximum concentration. Further sampling for extent of these COPCs is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0091 mg/kg. The residential SSL was approximately 240 times the detected concentration. Further sampling for extent of Aroclor-1242 is not warranted.

Aroclor-1254 and Aroclor-1260 were detected in two to three samples with maximum concentrations of 0.038 mg/kg and 0.109 mg/kg, respectively. Concentrations decreased with depth at location 03-608329. The residential SSLs were approximately 30 times and 20 times the maximum concentrations. Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted.

TPH-DRO was detected in three samples with a maximum concentration of 62.9 mg/kg. TPH-DRO concentrations decreased with depth at location 03-608329. The residential screening guideline for diesel No. 2/crankcase oil was approximately 16 times to 350 times the TPH-DRO concentrations and the maximum residential HQ was approximately 0.06. Further sampling for extent of TPH-DRO is not warranted.

6.18.5 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 AOC 03-051(c).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 8×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.4, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.05.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. As discussed in section I-4.3.2, the elevated cancer risk under the residential scenario is not related to site operations but rather is from the facility infrastructure and thus is not an issue for this site. The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.09.

Based on the risk-screening assessment, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at AOC 03-051(c).

6.18.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-051(c).

6.19 AOC 03-052(b), Storm Drainage

6.19.1 Site Description and Operational History

AOC 03-052(b) consists of five storm water collection areas at TA-03 about 20 ft north and west of the Sigma Building (building 03-66) (Figure 6.16-1). Surface runoff flows from the area around the north end of the Sigma Building to three storm water collection areas within the building fence, which channel storm water to two storm water collection areas north of the building 03-66 fence: the area to the northeast of building 03-66 discharges to a storm drain outlet just north of Eniwetok Drive, and the area to the northwest of building 03-66 flows to a single storm drain that discharges to a low-lying grassy area northwest of building 03-66 (LANL 1995, 057590, p. 5-15-1).

6.19.2 Relationship to Other SWMUs and AOCs

Storm water from SWMU 03-045(h) located upgradient of AOC 03-052(b) combines with the flow from the storm water collection area northwest of building 03-66. Storm water from the AOC 03-056(k) storage area also flowed to AOC 03-052(b).

6.19.3 Summary of Previous Investigations

During the 1997 conducted at AOC 03-052(b), two samples were collected from each of five storm water collection areas and one additional sample was collected from the storm water collection area directly north of building 03-66. Samples were collected from 0.0–1.0 ft and 1.0–5.0 ft bgs and field-screened for radioactivity and organic chemicals. Screening did not detect organic chemicals, and radioactivity was detected at or below background levels (LANL 1997, 056660.4, p. iv). All samples were analyzed for metals and isotopic uranium. One sample was also analyzed for VOCs.

Cadmium, manganese, and nickel were detected above BVs in one sample; cobalt, lead, and zinc were detected above BVs in two samples. The DLs for antimony, cadmium, and silver were above BVs for most samples. Organic chemicals and radionuclides were not detected.

All decision-level analytical data obtained during previous investigations are presented and evaluated in section 6.19.4. Table 6.19-1 presents the samples collected and analyses requested at AOC 03-052(b).

6.19.4 Site Contamination

6.19.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was needed to assess potential contamination at AOC 03-052(b). As a result, the following activities were completed as part of the 2009 investigation.

- Six samples were collected from historical locations 03-03291 and 03-03286. At each location, samples were collected from 7.0–8.0 ft and 10.0–11.0 ft bgs. Samples were also collected from 1.0–2.0 ft and 4.0-5.0 ft bgs at location 03-03291. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, and cyanide.
- Twenty samples were collected from 10 locations (2 within each area). At each location, samples were collected from 1.0–2.0 ft and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, and cyanide.

- Six samples were collected from three locations along the northern part of the drainage between the northwest and northeast polygons associated with this site. At each location, samples were collected from 1.0–2.0 and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, and cyanide.
- Four samples were collected from two locations within the storm water collection area to the northeast across Eniwetok Drive. At each location, samples were collected from 3.0–4.0 ft and 5.0–6.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-052(b) are shown in Figure 6.16-1. Table 6.19-1 presents the samples collected and analyses requested at AOC 03-052(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.19.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 03-052(b), a maximum concentration of 694 ppm was detected at a depth of 5.0–6.0 ft bgs. This sample (RE03-09-13961) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.19.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-052(b) consist of 47 samples (42 soil and 5 tuff) collected from 21 locations.

Inorganic Chemicals

Forty-seven samples were analyzed for TAL metals (42 soil and 5 tuff) and 36 samples were analyzed for cyanide (31 soil and 5 tuff). Table 6.19-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 17 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in 2 samples with a maximum concentration of 17,000 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (8370 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 (0.983 mg/kg to 7.7 mg/kg) above the BVs in 46 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). 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 3 soil samples and 2 tuff samples with a maximum concentration of 811 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Table H-12 and Figure H-42). Because there were less than 10 tuff samples, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium is retained as a COPC.

Beryllium was detected above the soil and Qbt 2,3,4 BVs (1.83 mg/kg and 1.21 mg/kg) in 1 soil sample and 2 tuff samples with a maximum concentration of 3.17 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil are statistically different from background (Table H-12 and Figure H-42). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (1.8 mg/kg). Beryllium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in one sample at a concentration of 0.61 mg/kg. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-12 and Figure H-43). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in 2 samples with a maximum concentration of 4980 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (2230 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 1 soil sample and 2 tuff samples with a maximum concentration of 20.7 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Table H-12 and Figure H-43). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Chromium is not a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in 4 soil samples and 1 tuff sample with a maximum concentration of 21.5 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-12 and Figure H-44). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (3.14 mg/kg). Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 2 samples with a maximum concentration of 7.6 mg/kg. Because than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were equivalent to or above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper 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 4 soil samples and 1 tuff sample with a maximum concentration of 64 mg/kg. The Gehan test indicated site concentrations of lead in soil are statistically different from background (Table H-12 and Figure H-44). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (15 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in 2 samples with a maximum concentration of 2690 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. Both concentrations were below the maximum Qbt 2,3,4 background concentration (2820 mg/kg). Magnesium is not a COPC.

Manganese was detected above the soil BV (671 mg/kg) in four samples with a maximum concentration of 1420 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Table H-12 and Figure H-45). Manganese is not a COPC.

Nickel was detected above the soil BV (15.4 mg/kg) in 1 sample at a concentration of 20 mg/kg and had a DL (16.9 mg/kg) above the BV in 1 sample. The DLs in 2 tuff samples (15.3 mg/kg and 16.5 mg/kg) were above the Qbt 2,3,4 BV (6.58 mg/kg). The quantile and slippage tests indicated site concentrations of nickel in soil are not statistically different from background (Table H-12 and Figure H-45). Because less than 10 tuff samples were collected, statistical tests could not be performed. Both DLs for the tuff samples were above the maximum Qbt 2,3,4 background concentration (7 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 (1.08 mg/kg to 1.19 mg/kg) above the BV in five samples. Selenium is retained as a COPC.

Silver was not detected above the soil BV (1 mg/kg) but had DLs (1.7 mg/kg to 2.2 mg/kg) above the BV in 11 samples. Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in one sample at a concentration of 1010 mg/kg. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Table H-12 and Figure H-46). Sodium is not a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in 1 sample at a concentration of 18.3 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 152 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Table H-12 and Figure H-46). Zinc is not a COPC.

Organic Chemicals

Thirty-six samples were analyzed for SVOCs and PCBs (31 soil and 5 tuff), and 37 samples were analyzed for VOCs (32 soil and 5 tuff). Table 6.19-3 summarizes the analytical results for detected organic chemicals. Plate 18 shows the spatial distribution of detected organic chemicals.

Organic chemicals were detected at AOC 03-052(b) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; 2-butanone; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; naphthalene; phenanthrene; and pyrene. All detected organic chemicals are retained as COPCs.

Radionuclides

Eleven soil samples were analyzed for isotopic uranium. No radionuclides were detected or detected above BVs/FVs at AOC 03-052(b).

6.19.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC 03-052(b) are discussed below. No radionuclide COPCs were identified at AOC 03-052(b).

Inorganic Chemicals

Inorganic COPCs at AOC 03-052(b) include aluminum, antimony, barium, beryllium, calcium, cobalt, copper, lead, nickel, selenium, and silver.

Aluminum was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 17,000 mg/kg. Concentrations decreased with depth at location 03-608336 (the concentration in the shallower sample at location 03-608336 was 16,300 mg/kg and below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) and decreased downgradient. The residential SSL was approximately 4.6 times the maximum concentration but 61,000 mg/kg below the SSL. The residential HQ for aluminum was 0.2. 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 (0.983 mg/kg to 7.7 mg/kg) above the BVs in 46 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 4 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in three soil samples and two tuff samples with a maximum concentration of 811 mg/kg. Concentrations decreased with depth at one location and decreased downgradient. The Gehan and quantile tests indicated site concentrations of barium in soil are not different from background (Table H-12 and Figure H-42). The residential SSL was approximately 19 times to 100 times the concentrations above the BVs. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Beryllium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and two tuff samples with a maximum concentration of 3.17 mg/kg. The beryllium concentration in soil was below the maximum soil background concentration (3.95 mg/kg), and concentrations decreased downgradient. The residential SSL was approximately 50 times the maximum concentration (the residential HQ of 0.008). The lateral extent of beryllium 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 4980 mg/kg. The concentrations were below the recommended daily allowances for an adult and child (Appendix I). Further sampling for extent of calcium is not warranted.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in four soil samples and one tuff sample with a maximum concentration of 21.5 mg/kg. Concentrations decreased with depth at two locations (the concentration in the shallower sample at location 03-608334 was 6.6 mg/kg and below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) and decreased downgradient. The shallower concentration at location 03-608335 was below the soil BV and slightly below the deeper concentration (8.13 mg/kg versus 9.23 mg/kg), and the deeper concentration was below the maximum soil background concentration (9.5 mg/kg) [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]. The residential SSL was 1.5 mg/kg above the maximum concentration, and cobalt had a residential HQ of 0.3. The industrial SSL was approximately 14 times the maximum concentration and cobalt had an industrial HQ of 0.07. 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 7.6 mg/kg. Concentrations decreased with depth at both locations (the concentrations in the shallower samples were 6.72 mg/kg and 9.72 mg/kg, which were below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) and decreased downgradient. The lateral and vertical extent of copper are defined.

Lead was detected above the soil and Qbt 2,3,4 BVs in four soil samples and one tuff sample with a maximum concentration of 64 mg/kg. Lead concentrations decreased with depth at four locations (the concentration in the shallower sample at location 03-608334 was 15.7 mg/kg and below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]); the concentration at location 03-608334 was below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead concentrations decreased downgradient. The residential SSL was approximately 6 times the maximum concentration, and lead had a residential HQ of 0.05. The lateral extent of lead 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 20 mg/kg and had DLs (15.3 mg/kg to 16.9 mg/kg) above the soil and Qbt 2,3,4 BVs in one soil sample and two tuff samples. The detected concentration decreased with depth and decreased downgradient. The residential SSL was 78 times the detected concentration and 92 times the maximum DL above the BV, nickel had a residential HQ of 0.006. 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 (1.08 mg/kg to 1.19 mg/kg) above the BV in five samples. Because selenium was not detected above the BV, and the residential SSL was approximately 330 times the maximum DL, further sampling for extent of selenium is not warranted.

Silver was not detected above the soil BV, but had DLs (1.7 mg/kg to 2.2 mg/kg) above the BV in 11 samples. Because silver was not detected above the BV and the residential SSL was approximately 180 times the maximum DL, further sampling for extent of silver is not warranted.

Organic Chemicals

Organic COPCs at AOC 03-052(b) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; 2-butanone; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; naphthalene; phenanthrene; and pyrene.

Acetone was detected in 18 samples with a maximum concentration of 0.0417 mg/kg. Concentrations in nine samples were below the EQLs, and concentrations decreased downgradient. The residential SSL was approximately 1,600,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene were detected in one to nine samples. Concentrations decreased with depth at most locations and decreased downgradient. Benzo(a)anthracene; benzo(a)pyrene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; phenanthrene; and pyrene concentrations were below the EQLs at depth at location 03-608331. For detected concentrations above the EQLs, the residential SSLs ranged from 2 times the concentrations [benzo(a)pyrene] to 26,000 times the concentrations (phenanthrene) at location 03-608330, and approximately 5 times the concentrations [benzo(a)pyrene] to 40,000 times the concentrations (fluoranthene) at location 03-608331. The residential cancer risk and HI for this site were 7×10^{-6} and 0.8. Further sampling for extent of these COPCs is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.36 mg/kg. The residential SSL was approximately 6 times (cancer risk was 2×10^{-6}) and the industrial SSL was approximately 23 times the concentration (not a COPC from 0.0–1.0 ft). Further sampling for extent of Aroclor-1242 is not warranted.

Aroclor-1254 was detected in 13 samples with a maximum concentration of 0.581 mg/kg. Aroclor-1254 concentrations decreased with depth at most locations and decreased downgradient. At location 03-03286, concentrations increased by 0.0024 mg/kg and the residential SSL was approximately 70 times the concentration at depth. The lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 18 samples with a maximum concentration of 1.13 mg/kg. Aroclor-1260 concentrations decreased with depth at most locations or were below the EQLs and decreased downgradient. At location 03-03286, concentrations increased by 0.0014 mg/kg, and the residential SSL was approximately 250 times the concentration at depth. The lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Butanone(2-) and 4-isopropyltoluene were detected in one sample each at concentrations of 0.00798 mg/kg and 0.000817 mg/kg, respectively. Concentrations decreased downgradient and the 4-isopropyltoluene concentration was below the EQL. The residential SSLs were approximately 4,600,000 times and 3,000,000 times the concentrations. Further sampling for extent of 2-butanone and 4-isopropyltoluene is not warranted.

Radionuclides

No radionuclides were detected above BVs/FVs at AOC 03-052(b).

6.19.5 Summary of Human Health Risk Screening Assessments

Industrial Scenario

No carcinogens were retained as COPCs under the industrial scenario. The industrial HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971).

Residential Scenario

The total excess cancer risk for the residential scenario is approximately 7×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971).

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at AOC 03-052(b).

6.19.6 Summary of 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 the relationship of detected concentrations and DLs to background concentrations, 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 03-052(b).

6.20 SWMU 03-056(a), Storage Area

6.20.1 Site Description and Operational History

SWMU 03-056(a) is an inactive used-oil accumulation facility built in 1986 at TA-03. The 12-ft × 45-ft structure is located approximately 15 ft north of building 03-271 (Figure 6.4-1). The storage area has a concrete floor that slopes toward a small sump and is surrounded by a concrete berm. The area is roofed, but the sides are open. No spills from the bermed area to the environment have been documented (LANL 1993, 020947, p. 6-36).

6.20.2 Relationship to Other SWMUs and AOCs

This storage area is north of building 03-271 and about 80 ft northeast of AOC 03-003(n), the site of a PCB spill. It is located about 100 ft east of the subsurface contamination site, AOC C-61-002. SWMU 03-056(a) is not related to any other SWMUs or AOCs.

6.20.3 Summary of Previous Investigations

In 2001, samples were collected to determine the nature and extent of any residual TPH or lead contamination at the site. Four asphalt samples were collected next to each side of the concrete storage pad, approximately 1 ft away from the edge of the pad. Soil samples were also collected directly beneath the asphalt (at depths of 0.5–1.0 ft bgs) at each of the four asphalt sampling locations for a total of eight samples (LANL 2001, 070937). All samples were submitted for laboratory analysis of TAL metals; the soil samples were also submitted for analysis of TPH-DRO.

Calcium was detected above the soil BV in all four samples; silver and zinc were detected above soil BVs in one sample. Antimony, cadmium, and silver were detected in one asphalt sample; with the exception of selenium and thallium (which were not detected), all remaining inorganic chemicals were detected in all asphalt samples. TPH was not detected in any of the soil samples.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.20.4. Table 6.20-1 presents the samples collected and analyses requested at SWMU 03-056(a).

6.20.4 Site Contamination

6.20.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-056(a). As a result, the following activities were completed as part of the 2009 investigation.

- Eight samples were collected from four locations next to the concrete (one on each side of the concrete floor). At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, TPH-DRO, and cyanide.
- All investigation samples were field-screened for VOCs and for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-056(a) are shown in Figure 6.4-1. Table 6.20-1 presents the samples collected and analyses requested at SWMU 03-056(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.20.4.2 Soil, Rock, and Sediment Field-Screening Results

Samples for vapor headspace screening were not collected at SWMU 03-056(a). No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.20.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-056(a) consist of 12 soil samples collected from 8 locations.

Inorganic Chemicals

Twelve soil samples were analyzed for TAL metals, and eight soil samples were analyzed for cyanide. Table 6.20-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 4 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 0.901 mg/kg. The DLs (0.992 mg/kg to 1.17 mg/kg) were also above the BV in seven samples. The quantile and slippage tests indicated site concentrations of antimony in soil are not statistically different from background (Table H-13 and Figure H-47). Antimony is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.496 mg/kg to 0.584 mg/kg) above the BV in eight samples. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-13 and Figure H-47). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in seven samples with a maximum concentration of 11,500 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are statistically different from background (Table H-13 and Figure H-48). Calcium is retained as a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 14.7 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-13 and Figure H-48). Cobalt is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 32.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Table H-13 and Figure H-49). Lead is not a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.6 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples in soil with a maximum concentration of 89.8 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Table H-13 and Figure H-49). Zinc is not a COPC.

Organic Chemicals

Eight soil samples were analyzed for SVOCs, VOCs, and PCBs. Twelve samples were analyzed for TPH-DRO. Table 6.20-3 summarizes the analytical results for detected organic chemicals. Plate 5 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-056(a) include acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

6.20.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 03-056(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-056(a) include calcium and silver.

Calcium was detected above the soil BV in seven samples with a maximum concentration of 11,500 mg/kg. Concentrations decreased with depth at all locations, and all concentrations were below the maximum soil background concentration (14,000 mg/kg). The lateral and vertical extent of calcium are defined.

Silver was detected above the soil BV in one sample at a concentration of 1.6 mg/kg. Silver concentrations decreased with depth. The residential SSL was approximately 240 times the concentration above the BV. The vertical extent of silver are defined, and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-056(a) include acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, and TPH-DRO.

Acetone was detected in two samples with a maximum concentration of 0.00241 mg/kg. Concentrations were below the EQLs, and the residential SSL was approximately 27,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in 1 to 4 samples. Concentrations decreased with depth. These chemicals are likely related to the asphalt covering the sampling locations. The residential SSLs were approximately 10 times [benzo(a)pyrene] to 1,500,000 times (anthracene) the maximum concentrations. The vertical extent of these COPCs is defined and further sampling to define lateral extent is not warranted.

Aroclor-1254 was detected in two samples with a maximum concentration of 0.0366 mg/kg. Concentrations decreased with depth at one location. The residential SSL was approximately 30 times to 370 times the detected concentrations. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in six samples with a maximum concentration of 0.0279 mg/kg. Concentrations did not change substantially with depth at any location (0.0018 mg/kg to 0.0279 mg/kg). The residential SSL was approximately 80 times to 600 times the concentrations. Further sampling for extent of Aroclor-1260 is not warranted.

TPH-DRO was detected in six samples with a maximum concentration of 288 mg/kg. Concentrations increase slightly with depth at three locations. The residential screening guideline for diesel No. 2/ crankcase oil was approximately 3.5 times to 325 times the concentrations. The industrial screening guideline for diesel No. 2/crankcase oil was approximately 6 times to 590 times the concentrations. The residential and industrial HQs were 0.1 and 0.06. Further sampling for extent of TPH-DRO is not warranted.

6.20.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.0001, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.06.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1 × 10^{-8}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The HI is 0.01, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.07.

Residential Scenario

The total excess cancer risk for the residential scenario is 1 × 10^{-6}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The HI is 0.03, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.1.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 03-056(a).

6.20.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-056(a).

6.21 AOC 03-056(k), Container Storage Area

6.21.1 Site Description and Operational History

AOC 03-056(k) is a container storage area on the north side of a loading dock at the northwest corner of the Sigma Building, 03-66 (Figure 6.16-1). Waste oil, solvents, and radioactively contaminated graphite were staged in this area (LANL 1990, 007511, p. 3-056). Four documented releases of radiological materials are known to have occurred at this site (LANL 1995, 057590, pp. 5-15-1, 5-15-3–5-15-4).

6.21.2 Relationship to Other SWMUs and AOCs

This container storage area is located on the loading dock at the northwest corner of the Sigma Building, building 03-66. Storm water from this area flowed into AOC 03-052(b).

6.21.3 Summary of Previous Investigations

During the 1997 RFI conducted at AOC 03-056(k), 10 soil and fill samples were collected from 6 locations at depths ranging from 0.0–4.5 ft bgs. Four asphalt samples were collected from 4 of the locations. Samples were field-screened for organic chemicals and radioactivity. Screening did not detect organic chemicals, and radioactivity was detected at or below BVs (LANL 1997, 056660.4, pp. 101, 104). All samples were submitted for laboratory analysis of isotopic uranium; all soil and fill samples were submitted for laboratory analysis of metals. One asphalt sample and 1 fill sample were analyzed for gross-alpha and -beta radiation and by gamma spectroscopy. One fill sample was also analyzed for VOCs.

Lead was detected above BV in 1 sample, and copper was detected above BV in 2 fill samples. DLs for antimony, cadmium, and silver were above BVs in the 10 soil and fill samples. Carbon disulfide and 2-butanone were detected in 1 sample. Gross-alpha and -beta radiation were detected in 1 fill sample; uranium-235 was detected above BV in one fill sample, and uranium-238 was detected above BV in 3 fill samples. Uranium-234, uranium-235, and uranium-238 were detected in all asphalt samples; gross-alpha and -beta radiation, cesium-134, and cesium-137 were detected in 1 asphalt sample.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 6.21.4. Table 6.21-1 presents the samples collected and analyses requested at AOC 03-056(k).

6.21.4 Site Contamination

6.21.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 03-056(k). As a result, the following activities were completed as part of the 2009 investigation.

- Two samples were collected from sampling location 03-03290. Samples were collected from 3.0–4.0 ft and 6.0–7.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, cyanide, americium-241, isotopic plutonium, and isotopic uranium.
- Two samples were collected from sampling location 03-03281 to define the extent of organic chemical contamination detected. Samples were collected from 3.0–4.0 ft and 6.0–7.0 ft bgs. All samples were analyzed at off-site fixed laboratories for VOCs, SVOCs, and PCBs.
- Nine samples were collected from three new locations to the south, west, and northeast of the historical sampling locations to define the lateral and vertical extents of inorganic chemical contamination. At each location, samples were collected from 0.0–1.0 ft, 3.0–4.0 ft, and 6.0–7.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, cyanide, americium-241, isotopic plutonium, and isotopic uranium.
- Eight samples were collected from four new locations to characterize the organic chemical contamination at the AOC. Samples were collected from 1.0–2.0 ft and 3.0–4.0 ft bgs. All samples were analyzed at off-site fixed laboratories for VOCs, SVOCs, and PCBs.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 03-056(k) are shown in Figure 6.16-1. Table 6.21-1 presents the samples collected and analyses requested at AOC 03-056(k). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.21.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 03-056(k), a maximum concentration of 8.9 ppm was detected at a depth of 3.0–4.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.21.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 03-056(k) consist of 35 soil samples collected from 13 locations.

Inorganic Chemicals

Twenty-one soil samples were analyzed for TAL metals, and 11 soil samples were analyzed for cyanide. Table 6.21-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 17 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.07 mg/kg to 7.6 mg/kg) above the BV in 21 samples. The DLs were above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Barium was detected above the soil BV (295 mg/kg) in one sample at a concentration of 296 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Table H-14 and Figure H-50). Barium is not a COPC.

Beryllium was detected above the soil BV (1.83 mg/kg) in one sample at a concentration of 1.92 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil are not statistically different from background (Table H-14 and Figure H-50). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.52 mg/kg to 0.63 mg/kg) above the BV in 20 samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-14 and Figure H-51). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 6180 mg/kg. The Gehan test indicated site concentrations of calcium in soil are statistically different from background. However, the maximum concentration was below the maximum soil background concentration (14,000 mg/kg) and the quantile and slippage tests indicated site concentrations of calcium in soil are not statistically different from background (Table H-14 and Figure H-51). Calcium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 25.1 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium are not statistically different from background (Table H-14 and Figure H-52). Chromium is not a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 15 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt are not statistically different from background (Table H-14 and Figure H-52). Cobalt is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in two samples with a maximum concentration of 28.2 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Table H-14 and Figure H-53). 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 33.1 mg/kg. The Gehan test indicated site concentrations of lead in soil are statistically different from background (Table H-14). However, the maximum concentration (33.1 mg/kg) was slightly above the maximum soil background concentration (28 mg/kg), and the quantile and slippage tests indicated site concentrations of lead in soil are not statistically different from background (Table H-14 and Figure H-53). Lead is not a COPC.

Manganese was detected above the soil BV (671 mg/kg) in two samples with a maximum concentration of 1200 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Table H-14 and Figure H-54). Manganese is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.113 mg/kg. Mercury is retained as a COPC.

Silver was not detected above the soil BV (1 mg/kg) but had DLs (1.8 mg/kg to 2.2 mg/kg) above the BV in 10 samples. Silver is retained as a COPC.

Organic Chemicals

Twenty-one soil samples were analyzed for SVOCs, 22 soil samples were analyzed for VOCs, and 21 soil samples were analyzed for PCBs. Table 6.21-3 summarizes the analytical results for detected organic chemicals. Plate 18 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 03-056(k) include acenaphthene, acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; 2-butanone; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 4-methyl-2-pentanone; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene. All detected organic chemicals are retained as COPCs.

Radionuclides

Eleven soil samples were analyzed for americium-241, 2 soil samples were analyzed for gamma-emitting radionuclides, 2 soil samples were analyzed for gross alpha/beta, 11 soil samples were analyzed for isotopic plutonium, and 25 samples were analyzed for isotopic uranium. Table 6.21-4 summarizes the analytical results for radionuclides. Plate 19 shows the spatial distribution of detected radionuclides.

Uranium-235/236 was detected above the soil BV (0.2 pCi/g) in one sample at an activity of 0.203 pCi/g. Uranium-235/236 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 10.07 pCi/g. Uranium-238 is retained as a COPC.

6.21.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 03-056(k) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 03-056(k) include antimony, copper, mercury, and silver.

Antimony was not detected above the soil BV but had DLs (1.07 mg/kg to 7.6 mg/kg) above the BV in 21 samples. Because antimony was not detected above the BV and the residential SSL was approximately 4 times to 30 times the DLs, further sampling for extent of antimony is not warranted.

Copper was detected above the soil BV in two samples with a maximum concentration of 28.2 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of copper are defined.

Mercury was detected above the soil BV in one sample at a concentration of 0.113 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of mercury are defined.

Silver was not detected above the soil BV but had DLs (1.8 mg/kg to 2.2 mg/kg) above the BV in 10 samples. Because silver was not detected above the BV and the residential SSL was approximately 180 times the maximum DL, further sampling for extent of silver is not warranted.

Organic Chemicals

Organic COPCs at AOC 03-056(k) include acenaphthene, acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; 2-butanone; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 4-methyl-2-pentanone; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene.

Acetone was detected in 13 samples with a maximum concentration of 0.386 mg/kg. Concentrations decreased with depth or were below EQLs at three locations. Acetone concentrations decreased downgradient in the samples collected from adjacent AOC 03-052(b). The residential SSL was approximately 170,000 times the maximum concentration. The lateral extent of acetone is defined, and further sampling for vertical extent is not warranted.

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in 9 to 16 samples. Concentrations decreased with depth or were below the EQLs at all locations, except at locations 03-03281 and 03-608356. Concentrations at these locations increased by less than 0.1 mg/kg. The lateral and vertical extent of these COPCs are defined.

Aroclor-1254 was detected in nine samples with a maximum concentration of 0.0403 mg/kg. Aroclor-1254 concentrations decreased with depth at six locations and decreased downgradient in the samples collected from adjacent AOC 03-052(b). The residential SSL was approximately 28 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 14 samples with a maximum concentration of 0.0535 mg/kg. Aroclor-1260 concentrations decreased with depth at 6 locations and decreased downgradient in the samples collected from adjacent AOC 03-052(b). The residential SSL was approximately 42 times the maximum concentration. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Butanone(2-) was detected in 10 samples with a maximum concentration of 0.0213 mg/kg. Butanone(2-) concentrations decreased with depth or were below EQLs at 4 locations. Concentrations decreased at downgradient locations in the samples collected from adjacent AOC 03-052(b). The residential SSL was approximately 1,750,000 times the maximum concentration. The lateral extent of 2-butanone is defined, and further sampling for vertical extent is not warranted.

Carbon disulfide was detected in two samples with a maximum concentration of 0.004 mg/kg. Concentrations were below the EQLs, and the residential SSL was approximately 380,000 times the maximum concentration. Further sampling for extent of carbon disulfide is not warranted.

Dibenz(a,h)anthracene and dibenzofuran were each detected in one sample at concentrations of 0.0912 mg/kg and 0.409 mg/kg, respectively. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of dibenz(a,h)anthracene and dibenzofuran are defined.

Isopropyltoluene(4-) was detected in four samples with a maximum concentration of 7.64 mg/kg. Concentrations were below EQLs at two locations and decreased downgradient. The residential SSL was approximately 320 times the maximum concentration. The lateral extent of 4-isopropyltoluene is defined, and further sampling for vertical extent is not warranted.

Methylnaphthalene(2-) and naphthalene were detected in two and three samples with maximum concentrations of 0.236 mg/kg and 0.705 mg/kg, respectively. Concentrations decreased with depth and decreased laterally/downgradient. The lateral and vertical extent of 2-methylnaphthalene and naphthalene are defined.

Methyl-2-pentanone(4-) was detected in one sample at a concentration of 0.00274 mg/kg. The concentration was below the EQL, and the residential SSL was approximately 2,100,000 times the concentration. Further sampling for extent of 4-methyl-2-pentanone is not warranted.

Toluene was detected in nine samples with a maximum concentration of 0.00294 mg/kg. Toluene concentrations decreased with depth at location 03-03281, and concentrations were below the EQL at five locations. Toluene concentrations decreased at downgradient in the samples collected from adjacent AOC 03-052(b). The residential SSL was approximately 1,800,000 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 0.000581 mg/kg. The concentration was below the EQL, and the residential SSL was approximately 100,000 times the concentration. Further sampling for extent of 1,2,4-trimethylbenzene is not warranted.

Xylene(1,3-)+1,4-xylene was detected in two samples with a maximum concentration of 0.000561 mg/kg. The concentrations were below the EQLs, and the residential SSL was approximately 1,450,000 times the maximum concentration. Further sampling for extent of 1,3-xylene+1,4-xylene is not warranted.

Radionuclides

Radionuclide COPCs at AOC 03-056(k) include uranium 235/236 and uranium-238.

Uranium-235/236 was detected above the soil BV in one sample at an activity of 0.203 pCi/g. The activity is equivalent to the BV and decreased with depth. Uranium-235/236 was not detected above the soil BV in samples from surrounding locations. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in three samples with a maximum activity of 10.07 pCi/g. Uranium-238 activities decreased with depth and was not detected above the soil BV in samples from surrounding locations. The lateral and vertical extent of uranium-238 are defined.

6.21.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.02, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.08, which is below the NMED target HI of 1 (NMED 2012, 219971). 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.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.3, which is below the NMED target HI of 1 (NMED 2012, 219971). 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.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial and construction worker scenarios at AOC 03-056(k). There is potential unacceptable cancer risk for the residential scenario, but the residential HI and dose are less than the NMED and DOE target levels at AOC 03-056(k).

6.21.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 03-056(k).

6.22 SWMU 03-059, Storage Area—PCB Site

SWMU 03-059 and AOC 03-003(n) make up Consolidated Unit 03-059-00. In June 2011, NMED issued a certificate of completion without controls for AOC 03-003(n), and thus it is not included in this supplemental investigation report (NMED 2011, 111821).

6.22.1 Site Description and Operational History

SWMU 03-059 is a former salvage yard at TA-03 consisting of two areas (Figure 6.4-1). The first area is about 250 ft × 115 ft and is located next to the south side of building 03-271. The perimeter is fenced, except for the part that abuts building 03-271. With the exception of two small portions of the yard, it is asphalt-paved. The second area is about 100 ft × 60 ft, asphalt-paved, and fenced. Paving over both areas occurred incrementally over a period of years.

6.22.2 Relationship to Other SWMUs and AOCs

This former salvage yard is located south of building 03-271. It is a component of Consolidated Unit 03-059-00, along with AOC 03-003(n). Storm water from SWMU 03-059 flows toward SWMU 03-029, a component of Consolidated Unit 03-009(a)-00.

6.22.3 Summary of Previous Investigations

During the 1994 RFI conducted at SWMU 03-059, 10 asphalt samples were collected from 10 locations within the salvage yard at a depth of 0.0–0.5 ft bgs. Samples were analyzed for PCBs, gross-alpha, -beta, and -gamma radiation, and tritium. Data from the 1994 RFI are screening-level data and are summarized below. Section 2.44.2 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Tritium was detected in three samples and PCBs were not detected.

6.22.4 Site Contamination

6.22.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 03-059. As a result, the following activities were completed as part of the 2009 investigation.

- Thirty-four samples were collected from 17 locations to define the nature and extent of potential contamination. The samples at 11 locations were accessed beneath asphalt using an electric concrete coring device and an asphalt core bit. At each location, samples were collected from 0.0–1.0 ft and 2.0–3.0 ft beneath the asphalt. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, cyanide, perchlorate, nitrate, and tritium.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 03-059 are shown in Figure 6.4-1. Table 6.22-1 provides the sampling locations, depths, and analytical suites. Coordinates of sampling locations are presented in Table 3.2-1.

6.22.4.2 Soil, Rock, and Sediment Field-Screening Results

Samples for vapor headspace screening were not collected at SWMU 03-059. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.22.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 03-059 consist of 34 soil samples collected from 17 locations.

Inorganic Chemicals

Thirty-four soil samples were analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 6.22-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 4 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Antimony was detected above the soil BV (0.83 mg/kg) in 7 samples with a maximum concentration of 2.23 mg/kg. In addition, the DLs (1.02 mg/kg to 1.28 mg/kg) were above the BV in 22 samples. The quantile and slippage tests indicated the site concentrations of antimony in soil are statistically different from background (Table H-15 and Figure H-55). Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 3 samples with a maximum concentration of 2.64 mg/kg. In addition, the DLs (0.508 mg/kg to 0.638 mg/kg) were above the BV in 27 samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-15 and Figure H-55). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in four samples with a maximum concentration of 13,100 mg/kg. The Gehan and quantile tests indicated the site concentrations of calcium in soil are not statistically different from background (Table H-15 and Figure H-56). Calcium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 26.5 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Table H-15 and Figure H-56). Chromium is not a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in two samples with a maximum concentration of 21.8 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-15 and Figure H-57). Cobalt is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in three samples with a maximum concentration of 29.3 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Table H-15 and Figure H-57). Copper is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in seven samples with a maximum concentration of 48.1 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Table H-15 and Figure H-58). Lead is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in four samples with a maximum concentration of 0.653 mg/kg. Mercury is retained as a COPC.

Nitrate was detected in 16 soil samples with a maximum concentration of 1.98 mg/kg. Nitrate is naturally occurring and the concentrations reflect naturally occurring concentrations of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three soil samples with a maximum concentration of 0.00171 mg/kg. Perchlorate is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in one sample at a concentration of 1.73 mg/kg. The quantile and slippage tests indicated the site concentrations of thallium in soil are not statistically different from background (Table H-15 and Figure H-58). Thallium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in five samples with a maximum concentration of 133 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Table H-15 and Figure H-59). Zinc is not a COPC.

Organic Chemicals

Thirty-four soil samples were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 6.22-3 summarizes the analytical results for detected organic chemicals. Plate 5 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 03-059 include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO. All detected organic chemicals are retained as COPCs.

Radionuclides

Thirty-four soil samples were analyzed for tritium. Table 6.22-4 summarizes the analytical results for radionuclides. Plate 20 shows the spatial distribution of detected radionuclides.

Tritium was detected in 10 samples with a maximum activity of 1.36 pCi/g. Tritium is retained as a COPC.

6.22.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 03-059 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 03-059 include antimony, mercury, and perchlorate.

Antimony was detected above the soil BV in seven samples with a maximum concentration of 2.23 mg/kg. Concentrations decreased with depth and decreased downgradient in drainage samples at locations 03-608185 and 03-608186. The residential SSL was approximately 14 times the maximum detected concentration above the BV. Further sampling for extent of antimony is not warranted.

Mercury was detected above the soil BV in four samples with a maximum concentration of 0.653 mg/kg. Concentrations decreased with depth at all locations. Mercury was not detected above the BV in the drainage samples to the south at locations 03-608185 and 03-608186. The lateral and vertical extent of mercury are defined.

Perchlorate was detected in three soil samples with a maximum concentration of 0.00171 mg/kg. Concentrations were below the EQLs, and the residential SSL was approximately 32,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Organic Chemicals

Organic COPCs at SWMU 03-059 include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; 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; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TPH-DRO. Acenaphthylene, acetone, benzoic acid, and methylene chloride were detected in one sample each at concentrations of 0.0228 mg/kg, 0.004 mg/kg, 0.496 mg/kg, and 0.00246 mg/kg, respectively. The concentrations decreased with depth, were below the EQLs, and decreased laterally. The lateral and vertical extent of acenaphthylene, acetone, benzoic acid, and methylene chloride are defined.

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 were detected in 4 to 14 samples. Concentrations decreased with depth, except at locations 03-608377 and 03-608386 (concentrations were approximately 0.1 mg/kg or less). Concentrations decreased laterally, except to the northeast at location 03-608372, and these COPCs were not detected in the downgradient drainage samples at locations 03-608385 and 03-608386. The residential SSL for benzo(a)pyrene was approximately 2 times to 10 times the concentrations, except at location 03-608372, where the concentration exceeded the SSL by 0.09 mg/kg (residential cancer risk was 3×10^{-6}). The industrial SSL for benzo(a)pyrene was approximately 10 times to 160 times the concentrations, including at location 03-608372. Further sampling for extent is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0182 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in 16 samples with a maximum concentration of 12.3 mg/kg. Aroclor-1254 concentrations decreased with depth at 8 locations. The residential SSL was approximately 70 times to 80 times the concentrations at locations 03-608384 and 03-608386, where concentrations increased with depth. Concentrations increased slightly to the northeast (<0.1 mg/kg), and the residential SSL was approximately 8 times to 10 times the concentrations. Concentrations decreased to the south at downgradient drainage locations 03-608185 and 03-608186. The lateral extent of Aroclor-1254 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 22 samples with a maximum concentration of 5.25 mg/kg. Aroclor-1260 concentrations decreased with depth at all locations, except location 03-608386. The residential SSL was approximately 45 times, and the industrial SSL was approximately 166 times the maximum concentration at location 03-608386. Concentrations increased slightly to the northeast (<0.05 mg/kg), and the residential SSL was approximately 16 times the concentrations. Concentrations decreased to the south at downgradient drainage locations 03-608185 and 03-608186. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in 10 samples with a maximum concentration of 1.13 mg/kg. Concentrations decreased with depth and/or were below the EQLs. Concentrations increased slightly to the west (approximately 1 mg/kg), and the residential SSL was approximately 300 times the maximum concentration. The vertical extent of bis(2-ethylhexyl)phthalate is defined, and further sampling for lateral extent is not warranted.

Butylbenzylphthalate was detected in one sample at a concentration was 1.83 mg/kg. Concentrations decreased with depth and the residential SSL was approximately 1400 times the concentration. The vertical extent of butylbenzylphthalate is defined, and further sampling for lateral extent is not warranted.

Dibenz(a,h)anthracene was detected in two samples with a maximum concentration of 0.028 mg/kg. The concentrations were below the EQLs, and the residential SSL was approximately 5 times and the industrial SSL was approximately 85 times the maximum concentration. Further sampling for extent of dibenz(a,h)anthracene is not warranted.

Methylnaphthalene(2-) and naphthalene were detected in two samples with maximum concentrations of 0.0138 mg/kg and 0.0291 mg/kg. The concentrations were below the EQLs, and concentrations decreased laterally. The residential SSLs were approximately 17,000 times and 1500 times the respective maximum concentrations. The lateral and vertical extent of 2-methylnaphthalene and naphthalene are defined.

TPH-DRO was detected in 10 samples with a maximum concentration of 70.1 mg/kg. Concentrations decreased with depth or were below the EQLs, except at location 03-608386. TPH-DRO was only detected at one location (location 03-608386) inside the fenced area. The residential screening guideline for diesel No. 2/crankcase oil was approximately 14 times to 340 times and the industrial screening guideline was approximately 26 times to 600 times the concentrations. Further sampling for extent of TPH-DRO is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 03-059 include tritium.

Tritium was detected in 10 samples with a maximum activity of 1.36 pCi/g. Tritium activities decreased with depth at three locations and decreased laterally. The residential SAL was 625 times the maximum activity. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

6.22.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 7×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.003, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.04.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00007 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.006.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is approximately 2, which is above the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.005 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.01.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial and construction worker scenarios at SWMU 03-059. There is potential unacceptable noncancer risk for the residential scenario, but the residential cancer risk and dose are equivalent to or less than the NMED and DOE target levels at SWMU 03-059.

6.22.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, potential ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl at exist SWMU 03-059.

6.23 AOC C-03-022, Kerosene Tanker Trailer

6.23.1 Site Description and Operational History

AOC C-03-022 is the former location of a tanker trailer used to store and distribute kerosene for former asphalt batch plant operations (Figure 6.2-1). The tanker trailer was located in a bermed materials storage area on a hill directly north of the former TA-03 asphalt batch plant. The tanker was in service for approximately 15 yr and supplied kerosene through a gravity-feed line that had a valve near the oil distributor tank (AOC C-03-016) located approximately 12 ft south (directly below the hill) of the tanker. The tanker and gravity-feed line were removed in 1989, and kerosene was replaced with No. 2 diesel fuel. No record of release is associated with this storage tanker.

6.23.2 Relationship to Other SWMUs and AOCs

This former trailer location supplied kerosene to the former asphalt batch plant, Consolidated Unit 03-009(a)-00, through a pipe that passed the oil distributor tank, AOC C-03-016. AOC C-03-022 is not a component of Consolidated Unit 03-009(a)-00.

6.23.3 Summary of Previous Investigations

No previous investigations have been conducted at AOC C-03-022.

6.23.4 Site Contamination

6.23.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at AOC C-03-022 to assess potential contamination:

- Eight samples were collected from four locations on each side of the former tanker site to define the nature and extent of potential contamination. The samples at two locations were accessed beneath asphalt using an electric concrete coring device and an asphalt core bit. At each location, samples were collected from 1.0–2.0 ft and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals and TPH-DRO.
- All investigation samples were field-screened for gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC C-03-022 are shown in Figure 6.2-1. Table 6.23-1 presents the samples collected and analyses requested at AOC C-03-022. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

6.23.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening at AOC-C-03-022, no organic vapors were detected. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

6.23.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-03-022 consist of eight soil samples collected from four locations.

Inorganic Chemicals

Eight soil samples were analyzed for TAL metals. Table 6.23-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 1 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil BV (0.83 mg/kg) but had DLs (1.03 mg/kg to 1.12 mg/kg) above the BV in eight samples. The DLs were above the maximum soil background concentration (1 mg/kg). Antimony is retained as a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.517 mg/kg to 0.56 mg/kg) above the BV in eight samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in 2 samples with a maximum concentration of 34,100 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentrations were below the maximum soil background concentration (14,000 mg/kg). Calcium is retained as a COPC.

Magnesium was detected above the soil BV (4610 mg/kg) in 2 samples with a maximum concentration of 5080 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentrations were below the maximum soil background concentration (10000 mg/kg). Magnesium is not a COPC.

Organic Chemicals

Eight soil samples were analyzed for TPH-DRO. Table 6.23-3 summarizes the analytical results for detected organic chemicals. Plate 2 shows the spatial distribution of detected organic chemicals.

TPH-DRO was detected at AOC C-03-022 is retained as a COPC.

6.23.4.4 Nature and Extent of Contamination

The nature and extent for inorganic and organic COPCs at AOC C-03-022 are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC C-03-022 include antimony and calcium.

Antimony was not detected above the soil BV but had DLs (1.03 mg/kg to 1.12 mg/kg) above the BV in eight samples. Because antimony was not detected above the BV and the residential SSL was approximately 28 times the maximum DL, further sampling for extent of antimony is not warranted.

Calcium was detected above the soil BV in two samples with a maximum concentration of 34,100 mg/kg. The maximum concentration is below the recommended daily allowances for an adult and child (Appendix I). Further sampling for extent of calcium is not warranted.

Organic Chemicals

TPH-DRO was detected in three samples with a maximum concentration of 27,900 mg/kg. Concentrations of TPH-DRO increased with depth at location 03-608389. The residential screening guideline for diesel No. 2/crankcase oil was exceeded by a factor of approximately 28. TPH-DRO was either not detected or decreased with depth at the other locations. The lateral and vertical extent of TPH-DRO are not defined. The constituents of TPH-DRO were not analyzed for at this site.

6.23.5 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 AOC C-03-022.

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.009, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 16.

Residential Scenario

No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.04, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 28. The constituents of the TPH-DRO were not analyzed for at this site.

Based on the risk-screening assessment results, TPH-DRO ratios for the construction worker and residential scenarios are elevated at AOC C-03-022. The constituents of the TPH-DRO were not analyzed for at this site. The industrial scenario was not evaluated at AOC C-03-022.

6.23.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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-03-022.

7.0 TA-60 BACKGROUND AND FIELD-INVESTIGATION RESULTS

Five sites (four SWMUs and one AOC) located in TA-60 are addressed in this supplemental investigation report (Table 1.1-1). Each site is described separately in sections 7.2 through 7.6, including site description and operational history; relationship to other SWMUs and AOCs; if applicable, historical and 2009 investigation activities conducted; site contamination results based on qualified data (decision-level data from the current and previous investigations); and summaries of human health and ecological risk-screening assessments.

The following sections present inorganic chemical, organic chemical, and radionuclide concentrations detected at TA-60 in Plates 21 through 23.

7.1 Background of TA-60

TA-60, also known as Sigma Mesa Site, was created from the eastern portion of TA-03 and lies on Sigma Mesa, between Sandia and Mortandad Canyons. All buildings at TA-60 are located on the western end of the mesa and contain Laboratory support and maintenance operations and subcontractor-service facilities. The NTS Test Fabrication Facility; the NTS test tower (buildings 60-17 and 60-18); several small abandoned experimental areas, including a solar pond and a test drill hole; and storage sites for pesticides, topsoil, and recyclable asphalt are also located at TA-60 (LANL 1999, 064617, p. 2-25).

7.1.1 Operational History

TA-60 was created in 1989 when the Laboratory redefined its TAs and designated a portion of TA-03 to TA-60. The operational history of TA-60 is described in section 6.1.1.

7.1.2 Summary of Releases

Potential contaminants at TA-60 may have been released into the environment through drainages, outfalls, liquid spills, leaks, or operational releases.

7.1.3 Current Site Usage and Status

TA-60, also known as Sigma Mesa, provides physical support and infrastructure activities for the Laboratory. Support services and physical support areas for Laboratory subcontractors are also located at TA-60. The TA includes a number of fuel tanks, a fuel pumping station, an asphalt batch plant, and numerous storage areas, including transportainers, trailers, buildings, and outdoor materials and equipment storage areas. Approximately half of TA-60 is developed. Roads and paved parking areas surround most of the buildings; however, the eastern two-thirds of Sigma Mesa is mostly unpaved.

7.2 SWMU 60-002, Storage Areas

7.2.1 Site Description and Operational History

SWMU 60-002 consists of three former storage areas (designated as West, Central, and East) on Sigma Mesa at TA-60 (Figures 7.2-1, 7.2-2, 7.2-3, respectively). The former western storage area (Figure 7.2-1) measures approximately 150 ft × 300 ft and is located approximately 300 ft southeast of building 60-2, on the north side of the unimproved portion of Eniwetok Drive that traverses the mesa. Historically, piles of concrete blocks, wooden poles, tuff, fill, and cables were stored at this location. A large mound of fill, with pieces of cured asphalt and concrete, was situated in the northern portion of the site. The central storage area (Figure 7.2-2) was located approximately 50 ft north of the Roads and Grounds salt and sand storage facility (building 60-178) and consisted of a 50-ft-diameter mound of fill approximately 10 ft high with construction debris, including concrete fence post supports, pipe, metal strips, and wood. The eastern storage area is on the south side of the unimproved portion of Eniwetok Drive about 300 ft west of SWMU 60-007(a) near the east end of Sigma Mesa (Figure 7.2-3). This area was used to stage piles of broken cured asphalt removed from roadways and parking lots for recycling (LANL 2005, 100704). The eastern storage area is currently the site of the Laboratory's asphalt batch plant (Shaw Environmental Inc. 2003, 085517, p. 1).

7.2.2 Relationship to Other SWMUs and AOCs

The western storage area of SWMU 60-002 was located approximately 150 ft southeast of the AOC 60-004(f) storage area. The central storage area of SWMU 60-002 was located approximately 300 ft east of the SWMU 60-006(a) septic system. The eastern storage area of SWMU 60-002 was located approximately 300 ft west of SWMU 60-007(a). None of the former SWMU 60-002 storage areas are associated with another SWMU or AOC.

7.2.3 Summary of Previous Investigations

The SWMU 60-002 central storage area debris pile was removed and disposed of off-site in 2002 to accommodate a new fenced equipment storage yard. Six confirmation samples were collected from two depths of 0.0–1.0 ft and 1.5–2.0 ft bgs from three locations beneath the former debris pile. Five samples were submitted for analysis of TAL metals, VOCs, SVOCs, PCBs, and TPH. One sample was analyzed for VOCs, PCBs, and TPH (LANL 2005, 100704, p. 5). Manganese was detected above the soil BV in one sample. Acenaphthene, Aroclor-1254, Aroclor-1260, and TPH-GRO were each detected at trace concentrations in two samples.

The piles of cured asphalt were removed from the SWMU 60-002 eastern storage area to accommodate a new asphalt batch plant (structures 60-234, 60-235, 60-236, 60-237, and 60-280) (LANL 2003, 080912, p. 4). Before the construction and start-up of the new asphalt batch plant, 10 soil and tuff samples were collected from 5 boreholes at 2 depth intervals ranging from 3.0–6.0 ft and 13.5 to 17.0 ft bgs. Three tuff samples were collected from the sixth borehole at depths of 4.0–4.5 ft, 8.5–9.0 ft, and 14.5–15.0 ft bgs. All samples were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, and TPH-DRO. Barium, cobalt, and zinc were each detected above soil BVs in 1 sample; calcium and nickel were detected above soil BVs in 2 samples. Beryllium, cobalt, copper, manganese, and selenium were each detected above tuff BVs in 1 sample; iron and lead were detected above tuff BVs in 2 samples; arsenic, barium, calcium, chromium, magnesium, nickel, and vanadium were detected above tuff BVs in 3 samples; aluminum was detected above the tuff BV in 4 samples. Fluoranthene, fluorene, and pyrene were each detected in 1 soil sample; 2-hexanone was detected in 1 tuff sample; acetone was detected in 5 tuff samples; and TPH-DRO was detected in all samples. The DLs for cadmium and selenium in numerous soil and tuff samples were higher than BVs.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 7.2.4. Tables 7.2-1 and 7.2-2 present the samples collected and analyses requested for each sample associated with SWMU 60-002.

7.2.4 Site Contamination

7.2.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 60-002 (west). As a result, the following activities were completed as part of the 2009 investigation.

- Twelve samples were collected from six locations at SWMU 60-002 (west) to define the nature and extent of contamination. At each location, samples were collected from 1.0–2.0 ft and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, TPH-GRO, PCBs, and cyanide.
- No sampling was conducted at SWMU 60-002 (central) and SWMU 60-002 (east) because the nature and extent of contamination have been defined (NMED 2006, 094614).
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 60-002 (west) are shown in Figure 7.2-1. Table 7.2-1 presents the samples collected and analyses requested at SWMU 60-002 (west), and Table 7.2-2 presents samples previously collected and analyses requested at SWMU 60-002 (central and east). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

7.2.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 60-002 (West), a maximum concentration of greater than 1500 ppm was detected at a depth of 1.0–2.0 ft bgs. This sample (RE03-09-14102) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

7.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

SWMU 60-002 (West)

Decision-level data collected at SWMU 60-002 (West) consist of 12 samples (7 soil and 5 tuff) collected from 6 locations.

Twelve samples (seven soil and five tuff) were analyzed for TAL metals and cyanide. Table 7.2-3 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs for SWMU 60-002 (West). Plate 21 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 5 samples with a maximum concentration of 16,000 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (8370 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 1.16 mg/kg) above the BVs in 12 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). 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 1 soil sample and 5 tuff samples with a maximum concentration of 331 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentration was below the maximum soil background concentration (410 mg/kg), and the tuff concentrations were above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in 1 sample at a concentration of 1.37 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (1.8 mg/kg). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.514 mg/kg to 0.544 mg/kg) above the BV in five samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in 1 soil sample and 4 tuff samples with a maximum concentration of 11,200 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentration was below the maximum soil background concentration (14,000 mg/kg), and the tuff concentrations were above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 5 samples with a maximum concentration of 14.6 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration was above the maximum Qbt 2,3,4 background concentration (13 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 7.24 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 4 samples with a maximum concentration of 8.74 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in 1 sample at a concentration of 14,900 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg). Iron is not a COPC.

Lead was detected above Qbt 2,3,4 BV (11.2 mg/kg) in 5 samples with a maximum concentration of 69.3 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. Two concentrations were above the maximum Qbt 2,3,4 background concentration (15 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in 5 samples with a maximum concentration of 2820 mg/kg. Because less than 10 tuff samples, statistical tests could not be performed. The concentrations were below or equivalent to the maximum soil background concentration (2820 mg/kg). Magnesium is not a COPC.

Manganese was detected above Qbt 2,3,4 BV (482 mg/kg) in 1 sample at a concentration of 502 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (752 mg/kg). Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 5 samples with a maximum concentration of 10.3 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. Four concentrations were above the maximum Qbt 2,3,4 background concentration (7 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 (1.05 mg/kg to 1.13 mg/kg) above the BV in five samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in 3 samples with a maximum concentration of 31.2 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium is retained as a COPC.

SWMU 60-002 (Central)

Decision-level data collected at SWMU 60-002 (Central) consist of 6 soil samples collected from three locations.

Five soil samples were analyzed for TAL metals. Table 7.2-4 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs for SWMU 60-002 (Central and East). Figure 7.2-4 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Manganese was detected above soil BV (671 mg/kg) in 1 sample at a concentration of 726 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (1100 mg/kg). Manganese is not a COPC.

SWMU 60-002 (East)

Decision-level data collected at SWMU 60-002 (East) consist of 13 samples (4 soil and 9 tuff) collected from 6 locations.

Thirteen samples (four soil and nine tuff) were analyzed for TAL metals. Table 7.2-4 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs for SWMU 60-002 (Central and East). Figure 7.2-5 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 4 samples with a maximum concentration of 23,720 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (8370 mg/kg). Aluminum is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 3 samples with a maximum concentration of 3.97 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were below the maximum Qbt 2,3,4 background concentration (5 mg/kg). Arsenic is not 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 3 tuff samples with a maximum concentration of 375 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentration was below the maximum soil background concentration (410 mg/kg), and the tuff concentrations were above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in 1 sample at a concentration of 1.69 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (1.8 mg/kg). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.533 mg/kg to 0.55 mg/kg) above the BV in three samples. The DLs were below the maximum soil background concentration (2.6 mg/kg). Cadmium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in 2 soil samples and 3 tuff samples with a maximum concentration of 8230 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentrations were below the maximum soil background concentration (14,000 mg/kg), and the tuff concentrations were above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 3 samples with a maximum concentration of 10.1 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were below the maximum Qbt 2,3,4 background concentration (13 mg/kg). Chromium is not a COPC.

Cobalt was detected above the soil and Qbt 2,3,4 BVs (8.64 mg/kg and 3.14 mg/kg) in 1 soil sample and 1 tuff sample with a maximum concentration of 10 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentration was above the maximum soil background concentration (9.5 mg/kg), and the tuff concentration was above the maximum Qbt 2,3,4 background concentration (3.14 mg/kg). Cobalt is retained as a COPC.

Copper was detected at the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg) in 1 soil sample and 1 tuff sample with a maximum concentration of 14.7 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentration was equal to the soil BV and below the maximum soil background concentration (16 mg/kg). The tuff concentration was above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in 2 samples with a maximum concentration of 17,600 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg). Iron is not a COPC.

Lead was detected above Qbt 2,3,4 BV (11.2 mg/kg) in 3 samples with a maximum concentration of 15 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in 3 samples with a maximum concentration of 3520 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The maximum concentration was above the maximum soil background concentration (2820 mg/kg). Magnesium is retained as a COPC.

Manganese was detected above Qbt 2,3,4 BV (482 mg/kg) in 1 sample at a concentration of 539 mg/kg. Because there were less than 10 tuff samples, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (752 mg/kg). Manganese is not a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in 2 soil samples and 3 tuff samples with a maximum concentration of 17.1 mg/kg. Because less than 10 soil and tuff samples were collected, statistical tests could not be performed. The soil concentrations were below the maximum soil background concentration (29 mg/kg), and the tuff concentrations were above the maximum Qbt 2,3,4 background concentration (7 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 (0.48 mg/kg to 0.583 mg/kg) above the BV in eight samples. Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 1 sample at a maximum concentration of 74.8 mg/kg. Because less than 10 soil samples were collected, statistical tests could not be performed. The concentration was below the maximum soil background concentration (75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

SWMU 60-002 (West)

Decision-level data collected at SWMU 60-002 (West) consist of 12 samples (7 soil and 5 tuff) collected from six locations.

Twelve samples (seven soil and five tuff) were analyzed for SVOCs, VOCs, PCBs, TPH-DRO, and TPH-GRO. Table 7.2-5 summarizes the analytical results for detected organic chemicals for SWMU 60-002 (West). Plate 22 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 60-002 (West) include acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; TPH-DRO; and TPH-GRO. All detected organic chemicals are retained as COPCs.

SWMU 60-002 (Central)

Decision-level data collected at SWMU 60-002 (Central) consist of 6 soil samples collected from 3 locations.

Six soil samples were analyzed for VOCs, PCBs, and TPH-GRO. Five soil samples were analyzed for SVOCs and TPH-DRO. Table 7.2-6 summarizes the analytical results for detected organic chemicals for SWMU 60-002 (central and east). Figure 7.2-6 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 60-002 (central) include acenaphthene, Aroclor-1254, Aroclor-1260, and TPH-GRO. All detected organic chemicals are retained as COPCs.

SWMU 60-002 (East)

Decision-level data collected at SWMU 60-002 (East) consist of 13 samples (4 soil and 9 tuff) collected from 6 locations.

Thirteen samples (four soil and nine tuff) were analyzed for SVOCs, VOCs, TPH-DRO, and TPH-GRO. Table 7.2-6 summarizes the analytical results for detected organic chemicals for SWMU 60-002 (Central and East). Figure 7.2-7 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 60-002 (east) include acetone, fluoranthene, fluorene, 2-hexanone, pyrene, and TPH-DRO. All detected organic chemicals are retained as COPCs.

7.2.4.4 Nature and Extent of Contamination

SWMU 60-002 is made up of three former storage areas designated as East, Central, and West. No sampling was proposed for the central and eastern areas because the nature and extent of contamination have been defined previously (LANL 2008, 103404.43; NMED 2008, 102721). TPH was detected at SWMU 60-002 (East and Central) during previous investigations. TPH results were compared with, and were found to be below, NMED’s TPH screening guidelines for industrial and residential land uses (NMED 2006, 094614).

Inorganic Chemicals

SWMU 60-002 (West)

Inorganic COPCs at SWMU 60-002 (West) include aluminum, antimony, barium, calcium, chromium, cobalt, copper, lead, nickel, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 16,000 mg/kg. Aluminum was detected at similar or higher concentrations in soil at 1.0–2.0 ft bgs at locations 03-608393 (10,600 mg/kg), 03-608397 (13,900 mg/kg), and 03-608398 (19,800 mg/kg) but not at concentrations above the soil BV. Concentrations did not substantially change or they decreased with depth at these locations. The residential SSL was approximately 5 times the maximum concentration and was approximately 62,000 mg/kg to 69,000 mg/kg below the residential SSL. Further sampling for the extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs above the BVs (1.03 mg/kg to 1.16 mg/kg) in 12 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 27 times the maximum DL, further sampling for extent of antimony is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and five tuff samples with a maximum concentration of 331 mg/kg. Concentrations decreased with depth at all locations. Barium was detected at higher concentrations in soil from 1.0–2.0 ft bgs at locations 03-608393 (111 mg/kg) and 03-608397 (167 mg/kg) but not at concentrations above the soil BV (Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx). The residential SSL was approximately 47 times to 240 times the concentrations above the BVs. Further sampling for extent of barium is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 11,200 mg/kg. Concentrations decreased with depth at location 03-608398. The maximum concentration is below the recommended daily allowances for an adult and child (Appendix I). Further sampling for extent of calcium is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 14.6 mg/kg. Concentrations decreased with depth at location 03-608394 and were below the maximum Qbt 2,3,4 background concentration (13 mg/kg) at the other locations. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 8000 times to 14,800 times the concentrations above the BV. 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 7.24 mg/kg. Concentrations decreased with depth at location 03-608394. Concentrations were similar across the site (ranging from 1.57 mg/kg to 7.24 mg/kg). The residential SSL was approximately 3 times to 15 times the concentrations above the BV, and the industrial SSL was approximately 41 times to 63 times the concentrations above the BV. The residential HQ was approximately 0.2 and residential HI was approximately 0.6. Further sampling for extent of cobalt is not warranted.

Copper was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 8.74 mg/kg. Concentrations did not change substantially with depth at location 03-608394 (0.14 mg/kg). Copper concentrations were similar across the site (ranging from 5.15 mg/kg to 12.3 mg/kg). The residential SSL was approximately 360 times to 470 times the concentrations above the BV. Further sampling for extent of copper is not warranted.

Lead was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 69.3 mg/kg. Lead concentrations were similar across the site (ranging from 9.24 mg/kg to 16.8 mg/kg), except for the maximum concentration. The residential SSL was approximately 6 times the maximum concentration and approximately 24 times the other concentrations above the BV. The industrial SSL was approximately 12 times the maximum concentration and approximately 48 times the other concentrations above the BV. The residential lead HQ was approximately 0.1 and residential HI was approximately 0.6. Further sampling for extent of lead is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 10.3 mg/kg. Nickel concentrations were similar across the site (ranging from 6.78 mg/kg to 10.3 mg/kg). The residential SSL was approximately 150 times to 230 times the concentrations above the BV. Further sampling for extent of nickel is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.05 mg/kg to 1.13 mg/kg) above the BV in five samples. Because selenium was not detected and the residential SSL was approximately 346 times the maximum DL, further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 31.2 mg/kg. Concentrations decreased with depth at location 03-608394. Vanadium concentrations in soil samples from 1.0–2.0 ft bgs at locations 03-608393 (23.3 mg/kg) and 03-608398 (26.2 mg/kg) were similar to the concentrations in the tuff samples from 4.0–5.0 ft bgs (Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx). Concentrations were also similar across the site (ranging from 12.6 mg/kg to 31.6 mg/kg). The residential SSL was approximately 12 times to 17 times the concentrations above the BV, and the residential HQ is approximately 0.07. Further sampling for extent of vanadium is not warranted.

SWMU 60-002 (Central)

No inorganic COPCs were identified at SWMU 60-002 (Central).

SWMU 60-002 (East)

Inorganic COPCs at SWMU 60-002 (East) include aluminum, barium, calcium, cobalt, copper, magnesium, nickel, and selenium.

Aluminum was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 23,720 mg/kg. Concentrations decreased with depth at all locations (the shallower sample result was 27,840 mg/kg at location 03-22517, which was below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]). The residential SSL was approximately 3.3 times the maximum concentration and approximately 54,000 mg/kg below the SSL. Further sampling for extent of aluminum is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and three tuff samples with a maximum concentration of 375 mg/kg. Concentrations decreased with depth at all locations. The residential SSL was approximately 40 times the maximum concentration. Further sampling for extent of barium is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 8230 mg/kg. Concentrations decreased with depth at all locations, and the maximum concentration was below the recommended daily allowance for calcium (Appendix I). Further sampling for extent of calcium is not warranted.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in two samples with a maximum concentration of 10 mg/kg. Concentrations decreased with depth at all locations. The concentrations above the BVs were approximately 0.7 mg/kg and 0.5 mg/kg above the respective maximum background concentrations (3.14 mg/kg and 9.5 mg/kg), the residential SSL was approximately 2.3 times the maximum concentration, and the residential HQ was approximately 0.3. The industrial SSL was approximately 30 times the maximum concentration. Further sampling for extent of cobalt is not warranted.

Copper was detected at the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 14.7 mg/kg. Concentrations decreased with depth at location 03-25518, and the tuff concentration was approximately 1.8 mg/kg above the maximum background concentration (6.2 mg/kg). The residential SSL was approximately 210 times the maximum concentration. Further sampling for extent of copper is not warranted.

Magnesium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3520 mg/kg. Concentrations decreased with depth at all locations (the shallower sample result was 4370 mg/kg at location 03-22519, which was below the soil BV [Appendix G, Upper Sandia All Analysis

SWMU & AOC Results.xlsx]). The maximum concentration was below the recommended daily allowance for magnesium (Appendix I). Further sampling for extent of magnesium is not warranted.

Nickel was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 17.1 mg/kg. Concentrations decreased with depth at locations 03-25517, 03-25520, and 03-25521. Concentrations increased slightly with depth at locations 03-22519 and 03 22522 (concentrations increased by approximately 3.3 mg/kg and 2.6 mg/kg, respectively). The residential SSL was approximately 90 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (0.48 mg/kg to 0.583 mg/kg) above the BV in eight samples. Because selenium was not detected above the BV and the residential SSL was approximately 670 times the maximum DL, further sampling for extent of selenium is not warranted.

Organic Chemicals

SWMU 60-002 (West)

Organic COPCs at SWMU 60-002 (West) include acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; TPH-DRO; and TPH-GRO.

Acetone; 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 were detected in one or two samples. Concentrations decreased with depth at all locations. The residential SSLs were approximately 10 times to 300,000 times the concentrations, except for benzo(a)pyrene where the residential SSL was approximately 1.2 times the concentration. The industrial SSL for benzo(a)pyrene was approximately 20 times the concentration. Further sampling for extent of these organic COPCs is not warranted.

TPH-DRO was detected in five samples with a maximum concentration of 90.5 mg/kg. Concentrations decreased with depth at locations 03-608394, 03-608396, and 03-608397 and were below EQLs at locations 03-608395 and 03-608396. TPH-DRO concentrations decreased laterally from the maximum concentration at location 03-608397. The residential screening guideline for diesel No. 2/crankcase oil was approximately 11 times to 340 times the detected concentrations. The lateral and vertical extent of TPH-DRO are defined.

TPH-GRO was detected in 11 samples with a maximum concentration of 3.15 mg/kg. Concentrations decreased with depth or did not substantially change with depth at all locations. Most concentrations were also below or slightly above the EQLs. TPH-GRO concentrations decreased laterally from the maximum concentration at location 03-608397. The lateral and vertical extent of TPH-GRO are defined.

SWMU 60-002 (Central)

Organic COPCs at SWMU 60-002 (Central) include acenaphthene, Aroclor-1254, Aroclor-1260, and TPH-GRO.

Acenaphthene was detected in two samples with a maximum concentration of 0.0244 mg/kg. Both concentrations were below the EQLs, and the residential SSL was approximately 140,000 times the maximum concentration. Further sampling for extent of acenaphthene is not warranted.

Aroclor-1254 and Aroclor-1260 were each detected in two samples with maximum concentrations of 0.0202 mg/kg and 0.0162 mg/kg, respectively. Concentrations decreased with depth at location 03-25582, and the Aroclor-1260 concentration was below the EQL at location 03-25580. The residential SSLs were approximately 56 times and 140 times the maximum concentrations. Further sampling for extent of Aroclor-1254 and Aroclor-1260 is not warranted.

TPH-GRO was detected in two samples with a maximum concentration of 0.173 mg/kg. The concentration at location 03-25581 was below the EQL. The maximum concentration was at depth at location 03-25582, and was approximately 3 times the EQL (0.0545 mg/kg). Further sampling for extent of TPH-GRO is not warranted.

SWMU 60-002 (East)

Organic COPCs at SWMU 60-002 (East) include acetone, fluoranthene, fluorene, 2-hexanone, pyrene, and TPH-DRO.

Acetone was detected in five samples with a maximum concentration of 0.0118 mg/kg. The concentrations decreased slightly with depth or were below the EQLs at locations 03-25517, 03-25518, and 03 25521. The residential SSL was approximately 5,600,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Fluoranthene, fluorene, and pyrene were each detected in one sample at concentrations of 0.0357 mg/kg, 0.0056 mg/kg, and 0.0443 mg/kg, respectively. The concentrations decreased with depth and were below the EQLs for fluoranthene and fluorene. The residential SSLs were approximately 64,000 times, 410,000 times, and 39,000 times the concentrations, respectively. Further sampling for extent of fluoranthene, fluorene, and pyrene is not warranted.

Hexanone(2) was detected in one sample at a concentration of 0.0088 mg/kg. The residential SSL was approximately 24,000 times the concentration. Further sampling for extent of 2-hexanone is not warranted.

TPH-DRO was detected in 12 samples with a maximum concentration of 12.9 mg/kg. Concentrations decreased with depth or did not substantially change with depth (no change to approximately 10 mg/kg increase) at all locations. The residential screening guideline for diesel No. 2/crankcase oil was approximately 80 times and the industrial screening guideline for diesel No. 2/crankcase oil was approximately 140 times the maximum concentration. Further sampling for extent of TPH-DRO is not warranted.

7.2.5 Summary of Human Health Risk Screening

SWMU 60-002 (West)

Industrial Scenario

No samples were collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for SWMU 60-002 (former western storage area).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 8×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.01. Potential risk for TPH-GRO is based on constituents. The potential risks for the construction worker scenario were below the NMED target levels.

Residential Scenario

The total excess cancer risk for the residential scenario is 1 × 10^{-5}. The use of the maximum detected concentrations to represent exposure overestimates the potential risk to a receptor. Given this conservative risk estimate, it is concluded that the residential cancer risk is at least equivalent to the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.03. Potential risk for TPH-GRO is based on constituents. The potential risks for the residential scenario were equivalent to or below the NMED target levels.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 60-002 (West).

SWMU 60-002 (Central)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4 × 10^{-8}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The industrial HI is 0.0000007, which is below the NMED target HI of 1 (NMED 2012, 219971). TPH-GRO was identified as a COPC. Potential risk for TPH-GRO is based on constituents, but typical constituents associated with gasoline are not identified as COPCs at this site.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2 × 10^{-9}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The construction worker HI is 0.005, which below the NMED target HI of 1 (NMED 2012, 219971). TPH-GRO was identified as a COPC. Potential risk for TPH-GRO is based on constituents, but typical constituents associated with gasoline are not identified as COPCs at this site.

Residential Scenario

The total excess cancer risk for the residential scenario is 7 × 10^{-8}, which is below the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The residential HI is 0.02, which is below the NMED target HI of 1 (NMED 2012, 219971). TPH-GRO was identified as a COPC. Potential risk for TPH-GRO is based on constituents, but typical constituents associated with gasoline are not identified as COPCs at this site.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 60-002 (Central).

SWMU 60-002 (East)

Industrial Scenario

No samples were collected from the 0.0–1.0 ft depth interval and the industrial scenario was not evaluated for SWMU 60-002 (the former eastern storage area).

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). If 95% UCLs are calculated for aluminum and cobalt, the resultant HQs are approximately 0.4 and the construction worker HI is 0.8, which is less than the NMED target level. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.007.

Residential Scenario

No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.01.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 60-002 (East).

7.2.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 60-002 (West, Central, East).

7.3 AOC 60-004(f), Storage Area

7.3.1 Site Description and Operational History

AOC 60-004(f) consists of two formerly used unpaved bermed pads, Pad 2 and Pad 3, located at TA-60 southeast of building 60-2 (Figure 7.2-1). Pad 2 was 12 ft × 65 ft, and Pad 3 was 12 ft × 40 ft. Both pads stored 55-gal. containers that dispensed Stoddard solvent, antifreeze, motor oil, grease, transmission fluid, and window-washing fluid. The pads were constructed in 1978 when the maintenance warehouse (building 60-2) was built. In 1985, 6-in. asphalt berms were built at the open ends of both pads to mitigate rainfall run-on and runoff. In 1990, all containers were removed from the pads. Both pads were stained and had a petroleum odor (LANL 1993, 020947, pp. 5-15–5-16).

7.3.2 Relationship to Other SWMUs and AOCs

AOC 60-004(f) is not related to any other SWMUs or AOCs.

7.3.3 Summary of Previous Investigations

During the 1994 RFI conducted at AOC 60-004(f), 13 samples were collected from 5 locations at Pad 2, and 11 samples were collected from 5 locations at Pad 3. At Pad 2, 4 samples (1 sediment, 1 soil, and 2 tuff) were collected from 1 location at depths ranging from 0.0–7.0 ft bgs; 4 samples (2 soil and 2 tuff) were collected from a second location at depths ranging from 1.0–6.0 ft bgs; 3 soil samples were collected from 3 locations at depths ranging from 1.0–2.0 ft bgs; and 2 sediment samples were collected from 2 locations at a depth of 0.0–1.5 ft bgs. At Pad 3, 4 samples (2 soil and 2 tuff) were collected from depths ranging from 1.0–6.5 ft bgs; 4 samples (2 soil and 2 tuff) were collected from a second location at depths ranging from 1.0–6.0 ft bgs; and 3 samples (2 soil and 1 tuff) were collected from a third location at depths ranging from 2.0–6.0 ft bgs. All samples were analyzed for radionuclides. Approximately half the samples were submitted for laboratory analyses of TAL metals, VOCs, SVOCs, PCBs, and pesticides (LANL 1996, 052930, pp. 167–169).

Aluminum was detected above BV in 4 tuff samples; arsenic was detected above BVs in 1 sediment and 1 tuff sample; barium was detected above BVs in 2 sediment and 5 tuff samples; calcium was detected above BV in 2 tuff samples; chromium was detected above BV in 4 tuff samples; copper was detected above BVs in 1 sediment and 1 soil sample; lead was detected above BV in 1 tuff sample; magnesium was detected above BV in 4 tuff samples; manganese was detected above BV in 1 soil sample; mercury was detected above BV in 4 tuff samples; nickel was detected above BV in 1 tuff sample; zinc was detected above BVs in 1 sediment and 3 soil samples. Aroclor-1254 and Aroclor-1260 were detected in 1 tuff sample. Tritium was detected in 1 soil, 1 sediment, and 8 tuff samples. VOCs, SVOCs, and pesticides were not detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 7.3.4. Table 7.3-1 presents the samples collected and analyses requested at AOC 60-004(f).

7.3.4 Site Contamination

7.3.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC 60-004(f). As a result, the following activities were completed as part of the 2009 investigation.

- Twenty samples were collected from five locations. At each location, samples were collected from 0.0–1.0 ft, 2.0–3.0 ft, 4.0–5.0 ft, and 9.0–10.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, PCBs, VOCs, SVOCs, TPH-DRO, cyanide, and tritium.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC 60-004(f) are shown in Figure 7.2-1. Table 7.3-1 presents the samples collected and analyses requested at AOC 60-004(f). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

7.3.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC 60-004(f), a maximum concentration of 76.1 ppm was detected at a depth of 9.0–10.0 ft bgs. This sample (RE03-09-14227) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

7.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC 60-004(f) consist of 20 samples (14 soil and 6 tuff) collected from five locations.

Inorganic Chemicals

Twenty samples (14 soil and 6 tuff) were analyzed for TAL metals and cyanide. Table 7.3-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 21 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 2 samples with a maximum concentration of 13,500 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The concentrations were above the maximum Qbt 2,3,4 background concentration (8370 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 (1.01 mg/kg to 1.21 mg/kg) above the BVs in 19 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 4 samples with a maximum concentration of 170 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (51.6 mg/kg). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 1 sample at a concentration of 0.693 mg/kg. In addition, the DLs (0.533 mg/kg to 0.606 mg/kg) were above the BV in 13 samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-16 and Figure H-60). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in 3 samples with a maximum concentration of 3590 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (2230 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 2 soil samples and 4 tuff samples with a maximum concentration of 38.2 mg/kg. The Gehan and quantile tests indicated the site concentrations of chromium in soil are statistically different from background (Table H-16 and Figure H-60). Because less than 10 tuff samples were collected, statistical tests could not be performed. Three tuff concentrations were above the maximum Qbt 2,3,4 background concentration (13 mg/kg). 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 1 sample each with a maximum concentration of 9.79 mg/kg. The Gehan and quantile tests indicated the site concentrations of cobalt in soil are not statistically different from background (Table H-16 and Figure H-61). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (3.14 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 2 soil samples and 3 tuff samples with a maximum concentration of 65.3 mg/kg. The Gehan test indicated the site concentrations of copper in soil are statistically different from background (Table H-16 and Figure H-61). Because less than 10 tuff samples were collected, statistical tests could not be performed. Two tuff concentrations were above the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in 1 sample at a concentration of 15,100 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (19,500 mg/kg). 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 2 soil samples and 3 tuff samples with a maximum concentration of 61.1 mg/kg. The Gehan and quantile tests indicated the site concentrations of lead in soil are not statistically different from background (Table H-16 and Figure H-62). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentrations were above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in 2 samples with a maximum concentration of 2720 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The concentration was below the maximum Qbt 2,3,4 background concentration (2820 mg/kg). Magnesium is not a COPC.

Manganese was detected above the soil BV for (671 mg/kg) in one sample at a concentration of 839 mg/kg. The Gehan and quantile tests indicated the site concentrations of manganese in soil are not statistically different from background (Table H-16 and Figure H-62). Manganese is not a COPC.

Mercury was detected above the soil BV for (0.1 mg/kg) in one sample at a concentration of 0.583 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 2 samples with a maximum concentration of 8.1 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. One tuff concentration was above the maximum Qbt 2,3,4 background concentration (7 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 (1.09 mg/kg to 1.14 mg/kg) above the BV in six samples. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.21 mg/kg. Silver is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in one sample at a concentration of 0.937 mg/kg. The Gehan and quantile tests indicated the site concentrations of thallium in soil are not statistically different from background (Table H-16 and Figure H-63). Thallium is not a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in 1 sample at a concentration of 25.6 mg/kg. Because less than 10 samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (21 mg/kg). Vanadium is retained as a COPC.

Zinc was detected above soil and Qbt 2,3,4 BVs (48.8 mg/kg and 63.5 mg/kg) in 5 soil samples and 1 tuff sample with a maximum concentration of 183 mg/kg. The Gehan and quantile tests indicated the site concentrations of zinc in soil are statistically different from background (Table H-16 and Figure H-63). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (65.6 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Twenty samples (14 soil and 6 tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 7.3-3 summarizes the analytical results for detected organic chemicals. Plate 22 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 60-004(f) include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; cis-1,2-dichloroethene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; TCE; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,3-xylene+1,4-xylene. All detected organic chemicals are retained as COPCs.

Radionuclides

Twenty samples (14 soil and 6 tuff) were analyzed for tritium. Table 7.3-4 summarizes the analytical results for radionuclides. Plate 23 shows the spatial distribution of detected radionuclides.

Tritium was detected in eight soil samples and six tuff samples with a maximum activity of 0.301 pCi/g. Tritium is retained as a COPC.

7.3.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 60-004(f) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 60-004(f) include aluminum, antimony, barium, calcium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc.

Aluminum was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 13500 mg/kg. Concentrations decreased with depth, and aluminum was not detected above the BV downgradient. The residential SSL was approximately 6 times to 7 times the concentrations, which were more than 60,000 mg/kg less than the SSL. Further sampling for extent of aluminum is not warranted.

Antimony was not detected the soil and Qbt 2,3,4 BVs but had DLs (1.01 mg/kg to 1.21 mg/kg) above the BVs in 19 samples. Because antimony was not detected above the BVs and the residential SSL was approximately 26 times the maximum DL, further sampling for extent is not warranted.

Barium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 170 mg/kg. Barium concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of barium are defined.

Calcium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3590 mg/kg. Calcium concentrations decreased with depth and decreased laterally. The lateral and vertical extent of calcium are defined.

Chromium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and four tuff samples with a maximum concentration of 38.2 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient in SWMU 60-007(b). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 3000 times the maximum concentration. The lateral and vertical extent of chromium are defined.

Cobalt was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 9.79 mg/kg. Cobalt concentrations decreased with depth at both locations and decreased downgradient. The maximum concentration was approximately the same as the maximum soil background concentration (9.5 mg/kg). The residential SSL was approximately 2.4 times (the residential HQ was 0.3) and the industrial SSL was approximately 30 times the maximum concentration (not an industrial COPC). The lateral and vertical extent for cobalt are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 65.3 mg/kg. Copper concentrations decreased with depth at both locations and increased downgradient. The residential SSL was approximately 48 times and the industrial SSL was approximately 700 times the maximum concentration. The vertical extent of copper is defined, and further sampling for lateral 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 61.1 mg/kg. Lead concentrations decreased with depth at both locations and increased downgradient. The residential SSL was approximately 6 times (the residential HQ was 0.05) and the industrial SSL was approximately 13 times the maximum concentration (not an industrial COPC). The vertical extent of lead is defined, and further sampling for lateral extent is not warranted.

Mercury was detected above the soil BV in one sample at a concentration of 0.583 mg/kg. Concentrations decreased with depth and decreased downgradient in SWMU 60-007(b). The residential SSL was approximately 40 times and the industrial SSL was approximately 585 times the maximum concentration. The vertical extent of mercury is defined, and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 8.1 mg/kg. Nickel concentrations decreased with depth at both locations and decreased downgradient. The lateral and vertical extent of nickel are defined.

Selenium was not detected above the Qbt 2,3,4 BV but had DLs (1.09 mg/kg to 1.14 mg/kg) above the BV in six samples. Because selenium was not detected above the BV and the residential SSL was approximately 340 times the maximum DL, further sampling for extent is not warranted.

Silver was detected above the soil BV in one sample at a concentration of 1.21 mg/kg. Concentrations decreased with depth and the concentration was slightly above the BV. The residential SSL was approximately 320 times the concentration. The vertical extent of silver is defined and further sampling for lateral extent is not warranted.

Vanadium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 25.6 mg/kg. Vanadium concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of vanadium are defined.

Zinc was detected above the soil and Qbt 2,3,4 BVs in five soil samples and one tuff sample with a maximum concentration of 183 mg/kg. Zinc concentrations decreased with depth at all locations and decreased downgradient in SWMU 60-007(b). The residential SSL was approximately 130 times the maximum concentration. The vertical extent for zinc is defined, and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 60-004(f) include include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; cis-1,2-dichloroethene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; TCE; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,3-xylene+1,4-xylene.

Acetone was detected in five samples with a maximum concentration of 0.00703 mg/kg. Acetone concentrations decreased with depth or were below the EQLs. Concentrations decreased downgradient and the residential SSL was approximately 9,000,000 times the maximum concentration. The lateral and vertical extent of acetone are defined.

Acenaphthene; 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; naphthalene; phenanthrene; and pyrene were detected in one sample and 2-methylnaphthalene was detected in three samples. Concentrations decreased with depth and decreased downgradient in SWMU 60-007(b). Concentrations of benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; and dibenz(a,h)anthracene were above the residential SSL and the benzo(a)pyrene concentration was slightly below the industrial SSL. The industrial SSLs of the other COPCs were approximately 5 times [dibenz(a,h)anthracene] to 25,000 times (anthracene) the maximum concentrations. The vertical extent is defined, and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in three samples with a maximum concentration of 0.116 mg/kg. Aroclor-1254 concentrations decreased with depth at both locations and decreased downgradient in SWMU 60-007(b). The residential SSL was approximately 10 times and the industrial SSL was approximately 70 times the maximum concentration. The vertical extent of Aroclor-1254 is defined, and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in four samples with a maximum concentration of 0.153 mg/kg. Aroclor-1260 concentrations decreased with depth at all locations and decreased downgradient in SWMU 60-007(b). The residential SSL was approximately 15 times and the industrial SSL was approximately 54 times the maximum concentration. The vertical extent of Aroclor-1260 is defined, and further sampling for lateral extent is not warranted.

Benzene, di-n-butylphthalate, dibenzofuran, cis-1,2-dichloroethene, toluene, TCE, and 1,3-xylene+1,4-xylene were detected in one sample each. Concentrations decreased with depth and were below the EQLs. The residential SSLs were approximately 500 times (dibenzofuran) to 7,000,000 times (toluene) the maximum concentrations. Further sampling for extent of these COPCs is not warranted.

Bis(2-ethylhexyl)phthalate and 1,3,5-trimethylbenzene were detected in two samples and 1,2,4-trimethylbenzene was detected in three samples with maximum concentrations of 0.0949 mg/kg, 0.000621 mg/kg , and 0.00102 mg/kg, respectively. The 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene concentrations decreased with depth and were below the EQLs. The bis(2-ethylhexyl)phthalate concentrations did not change substantially with depth (0.0039 mg/kg difference) and were below the EQLs. The residential SSLs were approximately 3600 times, 1,250,000 times, and 61,000 times the maximum concentrations. The vertical extent of these COPCs is defined, and further sampling for lateral extent is not warranted.

Methylene chloride was detected in seven samples with a maximum concentration of 0.00292 mg/kg. Concentrations did not change substantially with depth (0.00058 mg/kg or less) and decreased downgradient. All results were below the EQLs. The residential and industrial SSLs were approximately 140,000 times and 1,600,000 times the maximum concentration. Lateral extent is defined, and further sampling for vertical extent is not warranted.

TPH-DRO was detected in 11 samples with a maximum concentration of 20.1 mg/kg. TPH-DRO concentrations decreased with depth at all locations and increased slightly downgradient (14 mg/kg). The residential screening guideline for diesel No. 2/crankcase oil was approximately 50 times the maximum concentration. The vertical extent of TPH-DRO is defined, and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclides COPCs at AOC 60-004(f) include tritium.

Tritium was detected in eight soil samples and six tuff samples with a maximum activity of 0.301 pCi/g. Tritium activities decreased with depth at two locations and decreased laterally. The residential SAL was approximately 2800 times the maximum concentration. The lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

7.3.5 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 AOC 60-004(f).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00006 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.004.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.8, which is below the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.07.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial and construction worker scenarios at AOC 60-004(f). There is potential unacceptable cancer risk for the residential scenario, but the residential HI and dose are less than the NMED and DOE target levels at AOC 60-004(f).

7.3.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 60-004(f).

7.4 SWMU 60-006(a), Septic System

7.4.1 Site Description and Operational History

SWMU 60-006(a) is the former location of a decommissioned septic system located at TA-60 on Sigma Mesa near the northeast corner of the fence surrounding buildings 60-17 and 60-19 (Figure 7.2-2). The septic system consisted of a 1000-gal. septic tank and associated 4-ft-wide × 50-ft-deep seepage pit. No outfall is associated with this system. This septic system formerly served buildings 60-17 (NTS test rack fabrication facility) and 60-19 (NTS test tower). Building 60-17 began operating in 1986 to fabricate equipment for testing activities carried out at NTS. From 1986 to 1989, wastewater generated from facility bathrooms and seven floor drains, including one in a paint booth, discharged to the septic system. In 1989, building 60-17 was connected to the sanitary sewer.

7.4.2 Relationship to Other SWMUs and AOCs

SWMU 60-006(a) is located approximately 50 ft north of building 60-198 and 300 ft west of the former location of the SWMU 60-002 central storage area. SWMU 60-006(a) is not associated with any other SWMUs or AOCs.

7.4.3 Summary of Previous Investigations

During the 1994 RFI conducted at SWMU 60-006(a), the tank was found to be full; two sludge samples were collected for waste characterization purposes (LANL 1996, 052930, pp. 181–182). The sludge samples were submitted for analysis of TAL metals, SVOCs, gross-alpha, -beta, and -gamma radiation, and tritium (LANL 1996, 052930, pp. 183, 185). Data from the 1994 RFI are screening-level data and are summarized below. Section 3.5 of the HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Because no BVs for sludge (waste characterization samples only) are available, only inorganic chemicals and tritium were reported as detected in both samples. SVOCs were not detected.

7.4.4 Site Contamination

7.4.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 60-006(a). As a result, the following activities were completed as part of the 2009 investigation.

- The SWMU 60-006(a) septic tank was excavated in accordance with the approved work plan (LANL 2008, 103404.43; NMED 2008, 102721) (see section 3.2.9). Management of waste generated from the excavation of the septic tank, outlet drainline, and associated IDW is described in Appendix D.

- Nine confirmation samples were collected from three locations at and near the inlet and outlet areas of the tank's former location to determine if a release to the environment has occurred. Samples were collected from the following depths below the tank: 5.0–6.0 ft, 9.0–10.0 ft, and 14.0–15.0 ft. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, cyanide, nitrate, perchlorate, isotopic uranium, isotopic plutonium, americium-241, and tritium.
- Seven samples were collected from one borehole approximately 4 ft downgradient of the seepage pit and extended to 3 ft below the bottom of the pit to determine the nature and vertical extent of potential contamination (Appendix B). Samples were collected from 10.0–11.0 ft, 14.0–15.0 ft, 18.0–19.0 ft, 23.0–24.0 ft, 35.0–36.0 ft, 55.0–56.0 ft, and 60.0–61.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, cyanide, nitrate, perchlorate, isotopic uranium, isotopic plutonium, americium-241, and tritium.
- An associated seepage pit was not removed as per the approved investigation work plan because of site conditions (see deviations in Appendix B).
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 60-006(a) are shown in Figure 7.2-2. Table 7.4-1 presents the samples collected and analyses requested at SWMU 60-006(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

7.4.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 60-006(a), a maximum concentration of 0.5 ppm was detected in several samples. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

7.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 60-006(a) consist of 16 tuff samples collected from 4 locations.

Inorganic Chemicals

Sixteen tuff samples were analyzed for TAL metals, cyanide, nitrate, and perchlorate. Table 7.4-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 7.4-1 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 18,300 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Table H-17 and Figure H-64). Aluminum is not a COPC.

Antimony was not detected above the Qbt 2,3,4 BV (0.5 mg/kg) but had DLs (0.981 mg/kg to 1.26 mg/kg) above the BV in 15 samples. The DLs were also above the maximum Qbt 2,3,4 background concentrations (0.4 mg/kg). 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 3.11 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are not statistically different from background (Table H-17 and Figure H-64). Arsenic is not a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in two samples with a maximum concentration of 2.09 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Table H-17 and Figure H-65). Beryllium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in one sample at a concentration of 2970 mg/kg. The Gehan and quantile tests indicated the site concentrations of calcium in tuff are not statistically different from background (Table H-17 and Figure H-65). Calcium is not a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in two samples with a maximum concentration of 12 mg/kg. The Gehan and quantile tests indicated the site concentrations of chromium in tuff are not statistically different from background (Table H-17 and Figure H-66). Chromium is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in two samples with a maximum concentration of 7.27 mg/kg. The Gehan test indicated the site concentrations of copper in tuff are statistically different from background (Table H-17). However, the maximum concentration (7.27 mg/kg) was slightly above the maximum soil background concentration (6.2 mg/kg), and the quantile and slippage tests indicated site concentrations of copper in tuff are not statistically different from background (Table H-17 and Figure H-66). Copper is not a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in one sample at a concentration of 11.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Table H-17 and Figure H-67). 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 1810 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Table H-17 and Figure H-67). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in three samples with a maximum concentration of 13.2 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in tuff are not statistically different from background (Table H-17 and Figure H-68). Nickel is not a COPC.

Nitrate was detected in eight samples with a maximum concentration of 65 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.00294 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 (1.02 mg/kg to 1.29 mg/kg) above the BV in 16 samples. Selenium is retained as a COPC.

Organic Chemicals

Sixteen tuff samples were analyzed for SVOCs, VOCs, and PCBs. Table 7.4-3 summarizes the analytical results for detected organic chemicals. Figure 7.4-2 shows the spatial distribution of detected organic chemicals.

The organic chemicals detected at SWMU 60-006(a) include acetone, Aroclor-1242, Aroclor-1254, Aroclor-1260, and styrene. All detected organic chemicals are retained as COPCs.

Radionuclides

Sixteen tuff samples were analyzed for americium-241, isotopic plutonium, tritium, and isotopic uranium. Table 7.4-4 summarizes the analytical results for radionuclides. Figure 7.4-3 shows the spatial distribution of detected radionuclides.

Tritium was detected in three samples with a maximum activity of 0.0682 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in one sample at an activity of 0.0922 pCi/g. Uranium-235/236 is retained as a COPC.

7.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 60-006(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 60-006(a) include antimony, nitrate, perchlorate, and selenium.

Antimony was not detected above the Qbt 2,3,4 BV but had DLs (0.981 mg/kg to 1.26 mg/kg) above the BV in 15 samples. Because antimony was not detected above the BV and the residential SSL was approximately 25 times the maximum DL, further sampling for extent of antimony is not warranted.

Nitrate was detected in eight samples with a maximum concentration of 65 mg/kg. Concentrations increased with depth in the borehole downgradient of the seepage pit. The residential SSL was approximately 2000 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.00294 mg/kg. Perchlorate decreased with depth at both locations. The residential SSL was approximately 20,000 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 (1.02 mg/kg to 1.29 mg/kg) above the BV in 16 samples. Because selenium was not detected above the BV and the residential SSL was approximately 300 times the maximum DL, further sampling for extent of selenium is not warranted.

Organic Chemicals

The organic COPCs at SWMU 60-006(a) include acetone, Aroclor-1242, Aroclor-1254, Aroclor-1260, and styrene.

Acetone was detected in two samples with a maximum concentration of 0.0021 mg/kg. Concentrations decreased with depth and were below the EQLs. Concentrations decreased laterally and downgradient. The lateral and vertical extent of acetone are defined.

Aroclor-1242 was detected in one sample at a concentration of 0.0356 mg/kg. Concentrations increased with depth and decreased laterally/downgradient. The residential SSL was approximately 60 times the concentration. The lateral extent of Aroclor-1242 is defined, and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in one sample at a concentration of 0.0176 mg/kg. Concentrations increased with depth and decreased laterally/downgradient. The residential SSL was approximately 65 times the 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 0.0044 mg/kg. Concentrations increased with depth and decreased laterally/downgradient. The residential SSL was approximately 500 times the concentration. The lateral extent of Aroclor-1260 is defined, and further sampling for vertical extent is not warranted.

Styrene was detected in one sample at a concentration of 0.000764 mg/kg. The concentration was below the EQL and the residential SSL was approximately 9,500,000 times the concentration. Further sampling for extent of styrene is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 60-006(a) include tritium and uranium-235/236. Table 7.4-4 summarizes the analytical results for radionuclides.

Tritium was detected in three samples with a maximum activity of 0.0682 pCi/g. Tritium was detected in the bottom of two boreholes and was not detected in the downgradient borehole. The residential SAL was approximately 12,4000 times the maximum activity. The lateral extent of tritium is defined, and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in one sample at an activity of 0.0922 pCi/g. Uranium-235/236 activities decreased with depth and the activity is similar to the BV. The residential SAL was approximately 420 times the activity. The vertical extent of uranium-235/236 is defined and further sampling for lateral extent is not warranted.

7.4.5 Summary of Human Health Risk Screening

All of the samples collected at SWMU 60-006(a) were collected below 10 ft bgs (the shallowest sample was from 10.0–11.0 ft bgs) and as deep as 61 ft bgs. Therefore, no complete exposure pathways to receptors exist at this site, and human health risk was not evaluated.

7.4.6 Summary of Ecological Risk Screening

All of the samples collected at SWMU 60-006(a) were collected below 5 ft bgs (shallowest sample was from 10.0–11.0 ft bgs) and as deep as 61 ft bgs. Therefore, no complete exposure pathways to receptors exist at this site, and ecological risk was not evaluated.

7.5 SWMU 60-007(a), Release

7.5.1 Site Description and Operational History

SWMU 60-007(a) is a 50-ft × 100-ft former storage area located at TA-60 near the east end of Sigma Mesa (Figure 7.2-3). This storage area was used to store equipment for the drilling of a geothermal well. Small spills of oil, hydraulic fluid, and similar materials were released. In 1992, areas of stained soil were removed, placed in containers, and disposed of by the user group. The remediated areas were covered with gravel. No sampling was conducted by the user group to confirm removal of the contamination (LANL 1996, 052930, pp. 189–190).

7.5.2 Relationship to Other SWMUs and AOCs

This former storage area was located about 40 ft southeast of AOCs 60-004(b) and 60-004(d), and roughly 200 ft west of SWMU 60-002 (east) storage area. SWMU 60-007(a) is not associated with any other SWMUs or AOCs.

7.5.3 Summary of Previous Investigations

During the 1994 RFI conducted at SWMU 60-007(a), 11 soil samples were collected from 8 locations and field-screened for PCBs and organic chemicals. With the exception of 1 sample, field test kits did not detect PCBs. Organic chemicals were detected at elevated readings, but moisture interference was suspected as the cause (LANL1996, 052930, pp. 192–194). One fill and 5 soil samples were collected from 5 locations at depths of 0.0–1.0 ft bgs. Two samples were analyzed for TAL metals, 5 were analyzed for VOCs, 2 were analyzed for SVOCs, and 3 were analyzed for PCBs. Five additional soil and fill samples were collected from 4 locations art depths of 0.0–1.0 ft bgs and analyzed for gross-alpha, -beta, and -gamma radiation.

Barium was detected above BV in one sample. Toluene was detected in one sample. SVOCs and PCBs were not detected.

Sampling was also performed at SWMU 60-007(a) in 2001 (LANL 2001, 070937, pp. 1, 4). Six fill samples were collected from six locations at depths of 0.0–0.25 ft bgs and 0.0–0.5 ft bgs. All samples were submitted for laboratory analyses of TAL metals, PCBs, and TPH (LANL 2001–2002, 100703, pp. 2–3).

Thallium was detected above BV in one sample. TPH-DRO and TPH-LRO were detected in two and three samples, respectively. No PCBs were detected.

All decision-level analytical data collected during previous investigations are presented and evaluated in section 7.5.4. Table 7.5-1 presents the samples collected and analyses requested at SWMU 60-007(a).

7.5.4 Site Contamination

7.5.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 60-007(a). As a result, the following activities were completed as part of the 2009 investigation.

- Twelve samples were collected from four locations to confirm the results of the previous investigation. At each location, samples were collected from 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 60-007(a) are shown in Figure 7.2-3. Table 7.5-1 presents the samples collected and analyses requested at SWMU 60-007(a). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

7.5.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 60-007(a), a maximum concentration of 4.7 ppm was detected at a depth of 0.0–1.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

7.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 60-007(a) consist of 24 soil samples collected from 15 locations.

Inorganic Chemicals

Twenty soil samples were analyzed for TAL metals, and 12 soil samples were analyzed for cyanide. Table 7.5-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 7.5-1 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in 11 samples with a maximum concentration of 1.9 mg/kg. In addition, a DL (1.07 mg/kg) in one sample was above the BV. The quantile and slippage tests indicated the site concentrations of antimony in soil are statistically different from background (Table H-18 and Figure H-69). Antimony is retained as a COPC.

Barium was detected above the soil BV (295 mg/kg) in one sample at a concentration of 331 mg/kg. The Gehan and quantile tests indicated site concentrations of barium are not statistically different from background (Table H-18 and Figure H-69). Barium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.504 mg/kg to 0.555 mg/kg) above the BV in nine samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-18 and Figure H-70). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 6900 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium are not statistically different from background (Table H-18 and Figure H-70). Calcium is not a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in one sample at a concentration of 0.75 mg/kg. The quantile and slippage tests indicated the site concentrations of thallium in soil are not statistically different from background (Table H-18 and Figure H-71). Thallium is not a COPC.

Organic Chemicals

Fourteen soil samples were analyzed for SVOCs, 17 soil samples were analyzed for VOCs, 21 soil samples were analyzed for PCBs, and 18 samples were analyzed for TPH-DRO. Table 7.5-3 summarizes the analytical results for detected organic chemicals. Figure 7.5-2 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 60-007(a) include toluene, TPH-DRO, and TPH-LRO. TPH-LRO was detected in three 2001 samples with a maximum concentration of 490 mg/kg. However, the TPH-LRO analysis was not requested, and the results are probably because of an analytical misinterpretation: the concentrations represent constituents associated with TPH-DRO. The analytical laboratory analyzing these samples calibrated for only TPH-DRO because it was the only TPH requested: a one-point motor oil standard was analyzed as a response factor for any chromatographic response outside the diesel range, and that calibration factor was used to give a number for lubricating oil quantitation. The TPH-LRO results do not meet current Laboratory quality standards and are screening-level only; TPH-LRO is not a COPC.

Toluene and TPH-DRO are retained as COPCs.

7.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 60-007(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 60-007(a) include antimony.

Antimony was detected above the soil BV in 11 samples with a maximum concentration of 1.9 mg/kg. Concentrations decreased with depth at 2 locations. The residential SSL was approximately 16 times to 33 times and the industrial SSL was approximately 240 times to 475 times the concentrations above the BV. Further sampling for extent of antimony is not warranted.

Organic Chemicals

Organic COPCs at SWMU 60-007(a) include toluene and TPH-DRO.

Toluene was detected in one sample at a concentration of 0.001 mg/kg. The concentration was below the EQL, and the residential SSL was approximately 5,270,000 times the concentration. Further sampling for extent of toluene is not warranted.

TPH-DRO was detected in 13 samples with a maximum concentration of 1100 mg/kg. Locations 60-10004 and 60-10005 where the elevated TPH-DRO was detected were sampled at only one depth (the surface) as were all other locations sampled within the SWMU boundary. TPH-DRO concentrations were below the EQLs at all downgradient locations. The residential screening guideline for diesel No. 2/crankcase oil was slightly exceeded at location 60-10004 and was approximately 3 times the next highest concentration at location 60-10005. The industrial screening guideline was approximately 2 times to 5 times the concentrations at locations 60-10004 and 60-10005. The lateral extent of TPH-DRO is defined, but vertical extent is not defined.

7.5.5 Summary of Human Health Risk Screening

Industrial Scenario

No carcinogenic COPCs were identified for the industrial scenario. The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.4.

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.01, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.2.

Residential Scenario

No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.04, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.4.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 60-007(a).

7.5.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 60-007(a).

7.6 SWMU 60-007(b), Release

7.6.1 Site Description and Operational History

SWMU 60-007(b) is a storm drainage ditch at TA-60 that starts approximately 600 ft from a paved area directly north of the motor pool building (building 60-1) and extends to the bottom of Sandia Canyon (Figure 7.6-1). Two parking lots located east of building 60-1 drain to a ditch that eventually joins the SWMU 60-007(b) drainage ditch. Other former sources of potential contamination to the ditch are a steam-cleaning pad, a used-oil storage tank, and an oil/water separator. In addition, equipment that used PCB-containing oil was stored on an asphalt area east of building 60-1 (LANL 1993, 020947, pp. 5-14–5-15). In 1986, the user group removed stained soil from the ditch (LANL 1996, 052930, p. 195).

7.6.2 Relationship to Other SWMUs and AOCs

This channel system drains storm water from areas surrounding the motor pool building. It is located in the drainage areas northwest of buildings 60-2 and 60-3, and northwest and west of the motor pool building.

7.6.3 Summary of Previous Investigations

During the 1994 RFI conducted at SWMU 60-007(b), eight samples were collected from seven locations in the east/west drainage ditch north of building 60-1 and field-tested for PCBs; PCBs were not detected. In the north-south drainage ditch east of building 60-1, seven locations were field-screened for organic chemicals. No organic chemicals were detected. Six soil and sediment samples were collected from four locations at depths ranging from 0.0–1.5 ft bgs. Two sediment samples were analyzed for metals; one soil and one sediment sample were analyzed for VOCs; two sediment samples were analyzed for SVOCs; and two samples were analyzed for PCBs. All samples were analyzed for gross-alpha and -beta radiation, and tritium (LANL 1996, 052930, pp. 195–199). Data from the 1994 RFI are screening-level data and are summarized below. The HIR presents a more detailed discussion of the screening-level results (LANL 2008, 100693).

Calcium was detected above BV in one sample. Bis(2-ethylhexyl)phthalate was detected in one sample. Tritium was detected in three samples. VOCs and PCBs were not detected.

7.6.4 Site Contamination

7.6.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 60-007(b). As a result, the following activities were completed as part of the 2009 investigation.

- Twenty samples were collected from 12 locations within the drainage. At each location, samples were collected from 0.0–1.0 ft and 1.0–2.0 ft bgs. At locations 03-608417, 03-608418, 03-608419, and 03-608420, tuff was encountered before 1 ft bgs, so sediment samples were collected from one depth only (see deviations in Appendix B). All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, TPH-DRO, PCBs, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at SWMU 60-007(b) are shown in Figure 7.6-1. Table 7.6-1 presents the samples collected and analyses requested at SWMU 60-007(b). The geodetic coordinates of sampling locations are presented in Table 3.2-1.

7.6.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at SWMU 60-007(b), a maximum concentration of 930 ppm was detected at a depth of 0.0–1.0 ft bgs. This sample (RE03-09-14277) was submitted for organic chemical analysis. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

7.6.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 60-007(b) consist of 20 samples (13 soil and 7 tuff) collected from 12 locations.

Inorganic Chemicals

Twenty samples (13 soil and 7 tuff) were analyzed for TAL metals and cyanide. Table 7.6-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 21 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 1 sample at a concentration of 8660 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (8370 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 1.21 mg/kg) above the BVs in 20 samples. The DLs were also above the maximum soil and Qbt 2,3,4 background concentrations (1 mg/kg and 0.4 mg/kg, respectively). Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 1 sample at a concentration of 93.7 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (51.6 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 0.42 mg/kg. In addition, the DLs (0.516 mg/kg to 0.572 mg/kg) were above the BV in nine samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-19 and Figure H-72). Cadmium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in 1 soil sample and 1 tuff sample with a maximum concentration of 7330 mg/kg. The Gehan and quantile tests indicated the site concentrations of calcium in soil are not statistically different from background (Table H-19 and Figure H-72). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 2 samples with a maximum concentration of 23.5 mg/kg. Because less than 10 tuff samples were collected, statistical tests could not be performed. One concentration was above the maximum Qbt 2,3,4 background concentration (13 mg/kg). 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 1 soil sample and 1 tuff sample with a maximum concentration of 38.9 mg/kg. The Gehan and quantile tests indicated the site concentrations of copper in soil are not statistically different from background (Table H-19 and Figure H-73). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (6.2 mg/kg). Copper 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 1 soil sample and 1 tuff sample with a maximum concentration of 22.6 mg/kg. The Gehan and quantile tests indicated the site concentrations of lead in soil are not statistically different from background (Table H-19 and Figure H-73). Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). Lead is not a COPC.

Potassium was detected above the soil BV (3460 mg/kg) in one sample at a concentration of 3630 mg/kg. The Gehan and quantile tests indicated the site concentrations of potassium in soil are not statistically different from background (Table H-19 and Figure H-74). Potassium is not a COPC.

Selenium was not detected above the Qbt 2,3,4 BV (0.3 mg/kg) but had DLs (1.12 mg/kg to 1.16 mg/kg) above the BV in seven samples. Selenium is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in four samples with a maximum concentration of 9420 mg/kg. The Gehan and quantile tests indicated the site concentrations of sodium in soil are not different from background (Table H-19 and Figure H-74). Sodium is not a COPC.

Zinc was detected above the soil and Qbt 2,3,4 BVs (48.8 mg/kg and 63.5 mg/kg) in 6 soil samples and 1 tuff sample with a maximum concentration of 130 mg/kg. The Gehan and quantile tests indicated the site concentrations of zinc in soil are statistically different from background (Table H-19 and Figure H-75).

Because less than 10 tuff samples were collected, statistical tests could not be performed. The tuff concentration was below the maximum Qbt 2,3,4 background concentration (65.6 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Twenty samples (13 soil and 7 tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 7.6-3 summarizes the analytical results for detected organic chemicals. Plate 22 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 60-007(b) include acenaphthene; acetone; anthracene; 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; chloromethane; chrysene; 4,4’-DDT; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; phenanthrene; pyrene; toluene; TPH-DRO; and 1,2,4-trimethylbenzene. All detected organic chemicals are retained as COPCs.

7.6.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 60-007(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 60-007(b) include aluminum, antimony, barium, calcium, chromium, selenium, and zinc.

Aluminum was detected above the Qbt 2,3,4 BV in one sample at a concentration of 8660 mg/kg. Concentrations decreased downgradient. The residential SSL was approximately 9 times the concentration, which was more than 69,000 mg/kg less than the SSL. The lateral extent of aluminum is defined, and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.03 mg/kg to 1.21 mg/kg) above the BVs in 20 samples. Because antimony was not detected above the 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 one sample at a concentration of 93.7 mg/kg. Concentrations decreased downgradient. The residential SSL was approximately 165 times the concentration. The lateral extent of barium is defined, and further sampling for vertical extent is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 7330 mg/kg. Calcium concentrations decreased with depth at location 03-608423 and decreased downgradient. The other concentration was slightly above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Calcium concentrations were below the recommended daily allowance for an adult and child (Appendix I). Further sampling for extent of calcium is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 23.5 mg/kg. Chromium concentrations decreased with depth at location 60-608424 (the shallower sample had a concentration of 10.8 mg/kg at this location, which is below the soil BV [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]) 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 SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 5000 times the maximum concentration above the BV. The lateral extent of chromium 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 (1.12 mg/kg to 1.16 mg/kg) in seven samples. Because selenium was not detected above the BV and the residential SSL was approximately 340 times the maximum DL, further sampling for extent of selenium is not warranted.

Zinc was detected above soil and Qbt 2,3,4 BVs in six soil samples and one tuff sample with a maximum concentration of 130 mg/kg. The zinc concentration in tuff did not exceed the maximum background concentration (65.6 mg/kg). Zinc concentrations decreased with depth at locations 60-608422, 60-608423, and 60-608424. The deeper samples proposed in the work plan were not collected in the tuff from the three drainage locations (see deviations in Appendix B). Zinc concentrations decreased downgradient. The residential SSL was approximately 180 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 60-007(b) include acenaphthene; acetone; anthracene; 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; chloromethane; chrysene; 4,4’-DDT; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; phenanthrene; pyrene; toluene; TPH-DRO; and 1,2,4-trimethylbenzene.

Acetone was detected in two samples with a maximum concentration of 0.00966 mg/kg. One concentration was below the EQL, and the residential SSL was approximately 7,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Bis(2-ethylhexyl)phthalate was detected in four samples with a maximum concentration of 0.389 mg/kg. Concentrations decreased with depth, except at location 03-608418, where only one depth was sampled. Concentrations were below the EQLs at all locations. The residential SSL was approximately 900 times the maximum concentration. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Chloromethane was detected in one sample at a concentration of 0.0418 mg/kg. Concentrations decreased with depth and decreased downgradient. The lateral and vertical extent of chloromethane are defined.

DDT(4,4-) was detected in two samples with a maximum concentration of 0.0217 mg/kg. The concentrations did not change substantially with depth (approximately 0.003 mg/kg) and decreased downgradient. The residential SSL was approximately 800 times the maximum concentration. The lateral extent of 4,4’-DDT is defined, and further sampling for vertical extent is not warranted.

Isopropyltoluene(4-) and 1,2,4-trimethylbenzene were detected in one sample at concentrations of 0.000537 mg/kg and 0.000413 mg/kg. Concentrations decreased with depth, were below the EQLs, and decreased downgradient. The lateral and vertical extent of 4-isopropyltoluene and 1,2,4-trimethylbenzene are defined.

Toluene was detected in two samples with a maximum concentration of 0.00103 mg/kg. Concentrations decreased with depth or were below the EQL, and decreased downgradient. The residential SSL was approximately 5,000,000 times the maximum concentration. The lateral and vertical extent of toluene are defined.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene were detected in two to nine samples. Concentrations decreased with depth, were below EQLs, or did not change substantially with depth (0.02 mg/kg or less). Concentrations decreased downgradient. The lateral and vertical extent of these COPCs are defined.

Aroclor-1254 was detected in one sample at a concentration of 0.0033 mg/kg. Concentrations decreased with depth and were detected at the farthest downgradient location. The residential SSL was approximately 340 times the concentration. The vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in two samples with a maximum concentration of 0.0038 mg/kg. Aroclor-1260 decreased with depth at both locations, and did not change substantially downgradient (0.001 mg/kg). The residential SSL was approximately 580 times the maximum concentration. The vertical extent of Aroclor-1260 is defined, and further sampling for lateral extent is not warranted.

TPH-DRO was detected in 16 samples with a maximum concentration of 136 mg/kg. The four locations (03-608417, 03-608418, 03-608419, and 03-608420) with the highest TPH-DRO concentrations were in a shallow north-trending drainage between two parking lots that receive storm water runoff from a heavily trafficked road as well as from neighboring parking areas. These locations are likely impacted by runoff from vehicle traffic and not by Laboratory operations. The residential screening guideline was approximately 8 times and the industrial screening guideline was approximately 13 times the maximum concentration (detected at location 03-608418). Concentrations decreased with depth at all other locations and decreased laterally and downgradient. The lateral and vertical extent of TPH-DRO are defined.

7.6.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 7×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.01, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO industrial HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.04.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.1, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.05.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at SWMU 60-007(b).

7.6.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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 60-007(b).

8.0 TA-61 BACKGROUND AND FIELD-INVESTIGATION RESULTS

Two sites (one SWMU and one AOC) located in TA-61 are addressed in this supplemental investigation report (Table 1.1-1). Each site is described separately in sections 8.2 and 8.3, including site description and operational history; relationship to other SWMUs and AOCs; and, if applicable: historical and 2009 investigation activities conducted; site contamination results based on qualified data (decision-level data from the current and previous investigations); and summaries of human health and ecological risk screening assessments.

8.1 Background of TA-61

TA-61 was created from a portion of TA-03 and is bounded on the north by Los Alamos Canyon and on the south by Sandia Canyon (LANL 1999, 064617, p. 2-27). TA-61 contains physical support and infrastructure facilities, including the Los Alamos County solid waste transfer station, sewer pump stations, general storage sheds, a blower house, a private batch concrete batch plant, and general warehouse storage for maintenance activities. A small parcel of private property, the Royal Crest Manufactured Home Community, is surrounded by TA-61. The inactive Los Alamos County landfill site occupies most of TA-61. The landfill was created in 1974 when large trenches and disposal areas were excavated from the north wall of Sandia Canyon and was operated until 2009.

8.1.1 Operational History

TA-61 was created in 1989 when the Laboratory redefined its TAs and designated a portion of TA-03 to TA-61. TA-61 contains the Los Alamos County landfill, which accepts nonhazardous waste from County residents and the Laboratory. This landfill has been closed under RCRA Subtitle D and replaced with a solid waste transfer station.

8.1.2 Summary of Releases

Potential contaminants at TA-61 may have been released into the environment through drainages, outfalls, liquid spills, leaks, or operational releases.

8.1.3 Current Site Usage and Status

TA-61 is located on Sigma Mesa, which is bounded by Los Alamos Canyon on the north and Sandia Canyon on the south. It includes physical support and infrastructure facilities, such as a solid waste transfer station, sewer pump stations, general storage sheds, and general warehouse storage for maintenance activities performed throughout the Laboratory.

8.2 AOC C-61-002, Subsurface Contamination

8.2.1 Site Description and Operational History

AOC C-61-002 is an area of subsurface contamination located in TA-61, approximately 15 ft north of former building 61-16, a former storage building (Figure 6.4-1). The subsurface contamination was found in 1995 during a drill rig test. During the drilling test, a petroleum odor was noted, and diesel contamination was detected at 7.0–8.0 ft bgs. A tuff sample was collected and submitted for analysis of TPH-DRO. The results showed the presence of diesel contamination. Interviews conducted with site personnel after the drilling was completed indicated the source of the diesel may have been the previous road maintenance work performed in the area (LANL 1995, 049550, p. 2).

8.2.2 Relationship to Other SWMUs and AOCs

AOC C-61-002 is not related to any other SWMUs or AOCs.

8.2.3 Summary of Previous Investigations

No previous investigations have been conducted at AOC C-61-002.

8.2.4 Site Contamination

8.2.4.1 Soil, Rock, and Sediment Sampling

As part of the 2009 investigation, the following characterization efforts were completed at AOC C-61-002 to assess potential contamination:

- Thirty samples were collected from five boreholes to define the nature and extent of contamination. At each location, samples were collected from 3.0–4.0 ft, 5.0–6.0 ft, 7.0–8.0 ft, 9.0–10.0 ft, 11.0–12.0 ft, and 14.0–15.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, VOCs, SVOCs, PCBs, TPH-DRO, and cyanide.
- All investigation samples were field-screened for VOCs and gross-alpha, -beta, and -gamma radiation. Field-screening results were recorded in the SCLs (Appendix G).

The 2009 sampling locations at AOC C-61-002 are shown in Figure 6.4-1. Table 8.2-1 presents the samples collected and analyses requested at AOC C-61-002. The geodetic coordinates of sampling locations are presented in Table 3.2-1.

8.2.4.2 Soil, Rock, and Sediment Field-Screening Results

During headspace screening for organic vapors at AOC C-61-002, a maximum concentration of 3.1 ppm was detected at a depth of 3.0–4.0 ft bgs. No radiological screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. There were no changes to sampling or other activities because of the field-screening results.

8.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at AOC C-61-002 consist of 30 samples (19 soil and 11 tuff) collected from five locations.

Inorganic Chemicals

Thirty samples (19 soil and 11 tuff) were analyzed for TAL metals and cyanide. Table 8.2-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Plate 4 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in three samples with a maximum concentration of 19,900 mg/kg. The Gehan and quantile tests indicated the site concentrations of aluminum in tuff are statistically different from background (Table H-20 and Figure H-81). Aluminum is retained as a COPC.

Antimony was detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg) in three soil samples and seven tuff samples with a maximum concentration of 1.75 mg/kg. In addition, DLs (1.06 mg/kg to 1.27 mg/kg) were above the BVs in 19 samples. The quantile and slippage tests indicated the site concentrations of antimony in soil are statistically different from background (Table H-21 and Figure H-76). 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 4.61 mg/kg. The Gehan and quantile tests indicated the site concentrations of arsenic in tuff are statistically different from background (Table H-20 and Figure H-81). 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 two soil samples and seven tuff samples with a maximum concentration of 992 mg/kg. The Gehan and quantile tests indicated the site concentrations of barium in soil are not statistically different from background (Table H-21 and Figure H-76). The Gehan and quantile tests indicated the site concentrations of barium in tuff are statistically different from background (Table H-20 and Figure H-82). Barium is retained as a COPC.

Beryllium was detected above the soil and Qbt 2,3,4 BVs (1.83 mg/kg and 1.21 mg/kg) in four soil samples and three tuff samples with a maximum concentration of 2.22 mg/kg. The Gehan and quantile tests indicated the site concentrations of beryllium in soil are statistically different from background (Table H-21 and Figure H-77). The Gehan test indicated the site concentrations of beryllium in tuff are statistically different from background (Table H-20). However, the maximum concentration (1.83 mg/kg) was similar to the maximum soil background concentration (1.8 mg/kg), and the quantile and slippage tests indicated site concentrations of beryllium in tuff are not statistically different from background (Table H-20 and Figure H-82). Beryllium is retained as a COPC.

Cadmium was not detected above soil BV (0.4 mg/kg) but had DLs (0.532 mg/kg to 0.659 mg/kg) above the BV in 15 samples. The quantile and slippage tests indicated the site concentrations of cadmium in soil are not statistically different from background (Table H-21 and Figure H-77). Cadmium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in four soil samples and six tuff samples with a maximum concentration of 13,100 mg/kg. The Gehan and quantile tests indicated the site concentrations of calcium in soil are not statistically different from background (Table H-21 and Figure H-78). The Gehan and quantile tests indicated the site concentrations of calcium in tuff are statistically different from background (Table H-20 and Figure H-83). 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. The Gehan and quantile tests indicated the site concentrations of chromium in tuff are statistically different from background (Table H-20 and Figure H-83). 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 three soil samples and one tuff sample with a maximum concentration of 20.9 mg/kg. The Gehan and quantile tests indicated the site concentrations of cobalt in soil are not statistically different from background (Table H-21 and Figure H-78). The Gehan test indicated the site concentrations of cobalt in tuff are statistically different from background (Table H-20). However, the maximum concentration (5.69 mg/kg) was slightly above the maximum soil background concentration (3.14 mg/kg), and the quantile and slippage tests indicated site concentrations of cobalt in tuff are not statistically different from background (Table H-20 and Figure H-84). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in four samples with a maximum concentration of 14 mg/kg. The Gehan and quantile tests indicated the site concentrations of copper in tuff are statistically different from background (Table H-20 and Figure H-84). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in three samples with a maximum concentration of 25,600 mg/kg. The Gehan and quantile tests indicated the site concentrations of iron in tuff are statistically different from background (Table H-20 and Figure H-85). 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 three soil samples and one tuff sample with a maximum concentration of 27.6 mg/kg. The Gehan and quantile tests indicated the site concentrations of lead in soil are not statistically different from background (Table H-21 and Figure H-79). The Gehan test indicated the site concentrations of lead in tuff are statistically different from background (Table H-20 and Figure H-85). Lead 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 4430 mg/kg. The Gehan and quantile tests indicated the site concentrations of magnesium in tuff are statistically different from background (Table H-20 and Figure H-86). Magnesium is retained as a COPC.

Mercury was detected above the Qbt 2,3,4 BV (0.1 mg/kg) in two samples with a maximum concentration of 0.123 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in two soil samples and three tuff samples with a maximum concentration of 19.8 mg/kg. The Gehan and quantile tests indicated the site concentrations of nickel in soil are statistically different from background (Table H-21 and Figure H-79). The quantile and slippage tests indicated the site concentrations of nickel in tuff are statistically different from background (Table H-20 and Figure H-86). Nickel is retained as a COPC.

Selenium was not detected the soil and Qbt 2,3,4 BVs (1.52 mg/kg and 0.3 mg/kg) but had DLs (1.07 mg/kg to 2.56 mg/kg) above the BVs in 14 samples. Selenium is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in two samples with a maximum concentration of 1.27 mg/kg. The Gehan and quantile tests indicated the site concentrations of thallium in soil are not statistically different from background (Table H-21 and Figure H-80). Thallium is not a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample at a concentration of 26.4 mg/kg. The Gehan and quantile tests indicated the site concentrations of vanadium in tuff are statistically different from background (Table H-20 and Figure H-87). Vanadium is retained as a COPC.

Organic Chemicals

Thirty samples (19 soil and 11 tuff) were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO. Table 8.2-3 summarizes the analytical results for detected organic chemicals. Plate 5 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC C-61-002 include acetone, Aroclor-1254, benzoic acid, and TPH-DRO.

8.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at AOC C-61-002 are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC C-61-002 include aluminum, antimony, arsenic, beryllium, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 19,900 mg/kg. Concentrations decreased with depth at both locations. Concentrations increased to the east at one depth (location 03-608433), but the residential SSL was approximately 4 times the maximum concentration, which was approximately 58,000 mg/kg below the SSL. The vertical extent of aluminum is defined, and further sampling for lateral extent is not warranted.

Antimony was detected above the soil and Qbt 2,3,4 BVs in t3 soil samples and 7 tuff samples with a maximum concentration of 1.75 mg/kg. In addition, the DLs (1.06 mg/kg to 1.27 mg/kg) were above the BVs in 19 samples. Concentrations decreased with depth at 2 locations and the detected concentration was below the DLs of shallower samples at the other location. The residential SSL was approximately 18 times to 62 times the detected concentrations above the BVs. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in one sample at a concentration of 4.61 mg/kg. Concentrations decreased with depth and the concentration was less than the maximum Qbt 2,3,4 background concentration (5 mg/kg). The lateral and vertical extent of arsenic are defined.

Beryllium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and three tuff samples with a maximum concentration of 2.22 mg/kg. Concentrations decreased with depth at all locations and did not change substantially to the west and east (0.1 mg/kg or less). The residential SSL was approximately 70 times the maximum concentration. The vertical extent of beryllium is defined, and further sampling for lateral extent is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and six tuff samples with a maximum concentration of 13,100 mg/kg. Concentrations decreased with depth at all locations but increased to the east. Calcium concentrations were less than the recommended daily allowance for an adult and child (Appendix I). The vertical extent of calcium is defined, and further sampling for lateral 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 decreased with depth and the concentration above the BV was comparable with the maximum Qbt 2,3,4 background concentration (13 mg/kg). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with SSLs for trivalent chromium. The trivalent chromium residential SSL was approximately 8700 times the concentration. The vertical extent of chromium is defined, and further sampling for lateral extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 14 mg/kg. Concentrations decreased with depth and did not change substantially to the east (approximately 3 mg/kg compared with the maximum concentrations between locations 03-608431 and 03-608433 of 11 mg/kg and 14 mg/kg [Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx]). The residential SSL was approximately 220 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 Qbt 2,3,4 BV in three samples with a maximum concentration of 25,600 mg/kg. Concentrations decreased with depth at both locations and increased to the east and south. The residential SSL was approximately 2 times and the industrial SSL was approximately 30 times the maximum concentration. The vertical extent of iron is defined, and further sampling for lateral extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in three soil samples and one tuff sample with a maximum concentration of 27.6 mg/kg. Concentrations decreased with depth at both locations. The lead concentrations to the east and south in soil were less than the maximum soil background concentration (28 mg/kg), and the tuff concentration was slightly above the maximum Qbt 2,3,4 background concentration (15.5 mg/kg). The residential SSL was approximately 14 times to 20 times the concentrations above the BVs. The vertical extent of lead is defined, and further sampling for lateral extent is not warranted.

Magnesium was detected above the Qbt 2,3,4 BV in two tuff samples with a maximum concentration of 4430 mg/kg. The concentration at location 03-608431 was below the maximum background concentration (2820 mg/kg) and decreased with depth at location 03-608433. The concentrations were less than the recommended daily allowance for an adult and child (Appendix I). The vertical extent of magnesium is defined, and further sampling for lateral extent is not warranted.

Mercury was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 0.123 mg/kg. Concentrations decreased with depth and were slightly above the BV to the east (0.023 mg/kg). The residential SSL was approximately 200 times the maximum concentration. The vertical extent of mercury is defined, and further sampling for lateral extent is not warranted.

Nickel was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum concentration of 19.8 mg/kg. Concentrations decreased with depth at both locations. Nickel concentrations to the west and east were less than the maximum soil background concentration (29.6 mg/kg) and approximately 10 mg/kg or less above the maximum Qbt 2,3,4 background concentration (7 mg/kg). The residential SSL was approximately 80 times the maximum concentration. The vertical extent of nickel is defined, and further sampling for lateral extent is not warranted.

Selenium was not detected above the soil and Qbt 2,3,4 BVs but had DLs (1.07 mg/kg to 2.56 mg/kg) above the BVs in 14 samples. Because selenium was not detected above the BVs, and the residential SSL was approximately 155 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 26.4 mg/kg. Concentrations decreased with depth and did not change substantially to the east (1.1 mg/kg based on maximum concentrations of 25.3 mg/kg at location 03-608431(below the soil BV) and 26.4 mg/kg at location 03-608333). The residential SSL was approximately 15 times the maximum concentration. The vertical extent of vanadium is defined, and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC C-61-002 include acetone, Aroclor-1254, benzoic acid, and TPH-DRO.

Acetone was detected in seven samples with a maximum concentration of 0.006 mg/kg. Concentrations decreased with depth and were below the EQLs. The residential SSL was approximately 11,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1254 was detected in one sample at a concentration of 0.0021 mg/kg. The concentration was below the EQL, and the residential SSL was approximately 530 times the concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Benzoic acid was detected in one sample at a concentration of 0.445 mg/kg. The concentration was below the EQL and decreased with depth. The residential SSL was approximately 540,000 times the concentration. Further sampling for extent of benzoic acid is not warranted.

TPH-DRO was detected in 14 samples with a maximum concentration of 1450 mg/kg. Concentrations decreased with depth overall at all locations and were below EQLs at 03-608429, 03-608430, 03-608331, and 03-608432. TPH-DRO concentrations increased to the east. The residential screening guideline for diesel No. 2/crankcase oil was exceeded at location 03-608333 to the east by 450 mg/kg. The concentration at this location was 350 mg/kg below the industrial screening guideline. The vertical extent of TPH-DRO is defined and the lateral extent is not defined.

8.2.5 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 AOC C-61-002.

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.2.

Residential Scenario

The total excess cancer risk for the residential scenario is 8×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.6, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.4.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, construction worker, and residential scenarios at AOC C-61-002.

8.2.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations, 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-61-002.

8.3 SWMU 61-002, Transformer Storage Area—PCB Site

8.3.1 Site Description and Operational History

SWMU 61-002 the former location of an electrical equipment storage area in the western portion of TA-61 on the south side of East Jemez Road, east of the former Radio Repair Shop (former building 61-23) (Figure 8.3-1). From the 1970s to 1992, the 81-ft-by-91-ft fenced area was used as a storage area for capacitors, transformers, drums containing PCB-contaminated oil, and oil-filled vessels. Before 1985, the storage area was unpaved, and containers of PCB-contaminated oil stored on the unpaved surface were known to have leaked (LANL 1990, 007514). In 1986, sampling was conducted in the storage area and in an approximately 600-ft^2 area directly south and downgradient of the fenced storage area that may have been impacted by PCB-contaminated sediment transported off-site. Sampling data confirmed the presence of PCBs in surface soil. The area was subsequently excavated, backfilled, paved with asphalt, and used until 1992 for the storage of oil-filled electrical equipment, some containing PCBs (LANL 1993, 020947). Oil stains were observed on the asphalt within the storage area during a 1992 site inspection (LANL 1993, 020947). The area outside the fenced storage area was used for parking by Los Alamos County landfill employees and for equipment storage by the county. The Laboratory’s Radio Repair Shop (former building 61-23) was demolished in the spring of 2006 to make way for the security perimeter road project.

8.3.2 Relationship to Other SWMUs and AOCs

SWMU 61-002 is not associated with any other SWMUs or AOCs.

8.3.3 Summary of Previous Investigations

Several investigations were previously conducted at SWMU 61-002 related to PCB contamination in surface and shallow-subsurface soil.

In 1986, the storage area was characterized and remediated in accordance with Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761), which contains PCB management regulations under the Toxic Substances Control Act. The Laboratory’s Environment, Safety, and Health Division collected 32 surface soil samples for PCB analysis from the storage area east of the Radio Repair Shop (former building 61-23) and from the area directly south of the storage area. The analytical results showed PCB concentrations ranging from 0.31 mg/kg to 691 mg/kg. The entire equipment storage area and portions of the area south of the site were excavated to a minimum depth of 10 in. and resampled. The analytical results for the confirmation samples showed PCB concentrations ranging from 11.7 mg/kg to 51.3 mg/kg (LANL 1993, 020947). The excavated area was backfilled with clean fill and repaved with asphalt.

In the summer of 1994, an RFI was conducted at SWMU 61-002 to determine if PCBs were present in the stains on the asphalt or in surface soils downgradient from the site. Sampling locations were selected using the stained areas and a minor drainage area as reference points. Eighteen samples were collected from 16 locations and were field-screened for organic chemicals, including PCBs, and were submitted for the analysis of PCBs, VOCs, SVOCs, and TAL metals. Zinc and cadmium were detected above their respective BVs. PCBs were detected in all 5 fill samples, with maximum concentrations of 1.7 mg/kg for mixed Aroclors and 1.6 mg/kg for Aroclor-1260 (LANL 1996, 052930). Aroclor-1254 was detected in 1 asphalt sample. The RFI report (LANL 1996, 052930) recommended the collection of additional samples to identify the extent of PCB contamination at SWMU 61-002.

An ACA investigation and remediation were initiated in the spring of 2005, and a second phase of investigation activities was conducted in the summer of 2006. The ACA was prompted by the construction of a new Laboratory security perimeter road. SWMU 61-002 is located within the proposed construction design footprint and was investigated and remediated before construction activities began and in conjunction with construction activities, as described in the approved ACA work plans. The ACA objectives included (1) removing potentially contaminated soil from SWMU 61-002, and (2) collecting confirmation samples to define the nature and extent of contamination and assess the potential risk at the site.

During the 2005 investigation and remediation of residual PCB contamination associated with SWMU 61-002, petroleum hydrocarbon contamination was discovered in the subsurface of the northwestern portion of the SWMU. The source of the subsurface petroleum hydrocarbon contamination is not known, but it may have been associated with the storage of petroleum products. Two underground product lines and a total of 424 yd^3 of soil was removed in August 2005. The area of subsurface petroleum hydrocarbon contamination was further characterized in 2006.

During the 2006 ACA investigation, a total of 15 samples (2 soil samples and 13 tuff samples) were collected from 8 borehole locations in and around the area of petroleum hydrocarbon contamination discovered during the 2005 ACA. Using a drill rig, characterization and confirmation samples were collected to define the nature and extent of contamination and to determine if, and to what extent, remedial action (e.g., removal of contaminated media) was required for the site to achieve completion. In August 2006, 5 boreholes were installed in and around the area of petroleum hydrocarbon contamination identified during the 2005 ACA investigation and as proposed in the approved 2006 ACA work plan (LANL 2006, 092564; NMED 2006, 092371). During the installation of these 5 boreholes and subsequent field-screening, it was determined that additional boreholes would be required to fully define the lateral and vertical extent of petroleum hydrocarbon–contaminated soil. Based on this information, 3 additional borings were installed, for a total of 8 boreholes. Former building 61-23 was removed in the spring of 2006, which allowed 2 of the boreholes (locations 61-26619 and 61-26986) to be installed within the building footprint. One borehole (location 61-26985) was installed next to the shoulder of East Jemez Road. One borehole (location 61-26620) was installed next to the northwestern corner of the former building footprint, and 3 boreholes (locations 61-26621, 61-26622, and 61-26987) were installed along the northern boundary of SWMU 61-002. One borehole (location 61-26223) was installed east of location 61-26622 to help define the eastern extent of the petroleum hydrocarbon contamination.

Each of the boreholes was advanced to a minimum depth of approximately 25 ft bgs. The vertical extent of contamination was defined by advancing borehole location 61-26621 to a depth of 95 ft bgs at the location anticipated to have the highest petroleum hydrocarbon concentrations based on the 2005 investigation and remediation results. This depth corresponds to the interval 25 ft below the last field-screening detection. To define the lateral extent of soil contamination, it was necessary to “step out” several of the boreholes until field-screening indicated that petroleum hydrocarbon contamination was no longer present. Field-screening for VOCs was conducted in conjunction with sample collection. When sufficient core recovery was obtained, at least one headspace VOC and analytical sample was collected from each core barrel. Two samples were collected from each borehole—one from the sampling interval that exhibited the highest field headspace screening results and one from the bottom of the borehole.

As stated in the approved 2006 ACA work plan (LANL 2006, 092564; NMED 2006, 092371), remediation activities were to be conducted to remove petroleum hydrocarbon–contaminated soil and potentially to remediate the remaining soil in situ. After a review of the field and site characterization data, it was determined excavation was not practical because of the depth to which the contamination extends (approximately 25 ft bgs in some locations) and the proximity of the site to East Jemez Road. In situ remediation was considered because areas of elevated petroleum hydrocarbon concentrations are relatively deep, and the porosity of the weathered tuff is high. As specified in the approved 2006 ACA work plan (LANL 2006, 092564; NMED 2006, 092371), two boreholes (locations 61-26621 and 61-26623) were completed as soil-vapor extraction (SVE) wells in case the results of the risk assessment indicated that in situ remediation was needed. However, analytical data collected in 2006 confirmed that the residual petroleum hydrocarbon contamination is limited to a small subsurface area at concentrations that do not pose an unacceptable risk to site workers or ecological receptors (section 4). In addition, the results of a Tier One Evaluation conducted in accordance with Title 20, Chapter 5, Part 12 of the New Mexico Administrative Code (20.5.12 NMAC) showed residual contamination does not pose a potential future threat to groundwater. Therefore, in situ remediation by SVE was not implemented.

8.3.4 Site Contamination

8.3.4.1 Soil, Rock, and Sediment Sampling

As proposed in the approved investigation work plan, no sampling was conducted at SWMU 61-002 (LANL 2008, 103404.43; NMED 2008, 102721). The site was investigated and remediated, and the results were presented in a remedy completion report (LANL 2007, 100722). The remedy completion report data for SWMU 61-002 were reevaluated based on current approaches (e.g., comparing inorganic chemicals to background using statistics and using SSLs/SALs to determine if additional sampling is warranted) and using standard up-to-date exposure assumptions, including exposure depths for each scenario (NMED 2012, 219971). The results of the reassessment are presented in this supplemental report.

The sampling locations at SWMU 61-002 are shown in Figure 8.3-1. Table 8.3-1 presents the samples collected and analyses requested at SWMU 61-002. The geodetic coordinates of sampling locations are presented in Appendix C of the remedy completion report (LANL 2007, 100722).

8.3.4.2 Soil, Rock, and Sediment Field-Screening Results

During the 2005 investigation, sampled media from each corresponding depth interval were field-screened for VOCs using a PID immediately upon collection. The results ranged from nondetect (≤1 ppm) to 3.1 ppm, which are near or below background PID readings (1 ppm to 3 ppm). Before the samples were removed from the site, they were screened for radioactivity by RP-1 to ensure that U.S. Department of Transportation shipping requirements were met. All radiological screening results showed no detectable activity. Field-screening results were provided in the remedy completion report (LANL 2007, 100722).

In 2006, sampled media from each corresponding depth interval were field-screened for VOCs using a PID. The field-screening results ranged from nondetect (≤1 ppm) to >10,000 ppm, with background PID readings ranging from 1 ppm to 3 ppm. The highest headspace readings were measured in samples collected from boreholes 61-26619, 61-26622, and 61-26623. Field-screening results were provided in the remedy completion report (LANL 2007, 100722).

8.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data collected at SWMU 61-002 consist of 100 samples (77 soil and 23 tuff) collected from 42 locations.

Inorganic Chemicals

One hundred samples (77 soil and 23 tuff) were analyzed for TAL metals. Table 8.3-2 presents the inorganic chemicals above BVs and detected inorganic chemicals with no BVs. Figure 8.3-2 shows the spatial distribution of inorganic chemicals detected or detected above BV.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in four samples with a maximum concentration of 29,500 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Table H-22 and Figure H-88). Aluminum is not a COPC.

Antimony was not detected above the Qbt 2,3,4 BV (0.5 mg/kg) but had DLs (0.55 mg/kg to 0.63 mg/kg) above the BV in eight samples. The DLs were also above the maximum soil background concentration (0.4 mg/kg). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in seven samples with a maximum concentration of 6.46 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Table H-22 and Figure H-88). 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 five soil samples and four tuff samples with a maximum concentration of 676 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Table H-23 and Figure H-93). The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Table H-22 and Figure H-89). Barium is retained as a COPC.

Beryllium was detected above the soil BV (1.83 mg/kg) in four samples with a maximum concentration of 3.2 mg/kg. The Gehan and quantile tests indicated the site concentrations of beryllium in soil are not statistically different from background (Table H-23 and Figure H-93). Beryllium is not a COPC.

Cadmium was detected above soil BV (0.4 mg/kg) in two samples with a maximum concentration of 0.96 mg/kg. One DL (0.53 mg/kg) was above the BV in one soil sample, and one DL (2.9 mg/kg) was above the Qbt 2,3,4 BV (1.63 mg/kg) in one tuff sample. The quantile and slippage tests indicated site concentrations of cadmium in soil are not statistically different from background (Table H-23 and Figure H-94). The maximum DL in tuff was above the maximum Qbt 2,3,4 background concentration (1.5 mg/kg). Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in nine soil with a maximum concentration of 14900 mg/kg. The Gehan and quantile tests indicated the site concentrations of calcium in soil are statistically different from background (Table H-23 and Figure H-94). 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 8.08 mg/kg. The Gehan test indicated site concentrations of chromium in tuff are statistically different from background (Table H-22). However, the maximum concentration (8.08 mg/kg) was below the maximum soil background concentration (13 mg/kg), and the quantile and slippage tests indicated site concentrations of chromium in tuff are not statistically different from background (Table H-22 and Figure H-89). Chromium is not a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in three soil samples with a maximum concentration of 14.1 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Table H-23 and Figure H-95). Cobalt is not 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 four tuff samples with a maximum concentration of 21.5 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Table H-23 and Figure H-95). The Gehan and quantile tests indicated the site concentrations of copper in tuff are statistically different from background (Table H-22 and Figure H-90). 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 16,400 mg/kg. The Gehan test indicated the site concentrations of iron in tuff are statistically different from background (Table H-22). However, the maximum concentration (16,400 mg/kg) was below the maximum soil background concentration (19,500 mg/kg), and the quantile and slippage tests indicated site concentrations of iron in tuff are not statistically different from background (Table H-22 and Figure H-90). 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 six soil samples and six tuff samples with a maximum concentration of 52.5 mg/kg. The Gehan and quantile tests indicated the site concentrations of lead in soil are not statistically different from background (Table H-23 and Figure H-96). The Gehan and quantile tests indicated site concentrations of lead in tuff are statistically different from background (Table H-22 and Figure H-91). Lead 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 2370 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table H-22). However, the maximum concentration (2370 mg/kg) was below the maximum soil background concentration (2820 mg/kg), and the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Table H-22 and Figure H-91). Magnesium is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in four samples with a maximum concentration of 2.2 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg) in five soil samples and one tuff sample with a maximum concentration of 26.2 mg/kg. The Gehan and quantile tests indicated the site concentrations of nickel in soil are not statistically different from background (Table H-23 and Figure H-96). The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Table H-22 and Figure H-92). Nickel is not a COPC.

Selenium was detected above the soil and Qbt 2,3,4 BVs (1.52 mg/kg and 0.3 mg/kg) in 2 soil samples and 10 tuff samples with a maximum concentration of 15.2 mg/kg. Selenium also had DLs (0.31 mg/kg to 1.62 mg/kg) above the Qbt 2,3,4 BV in 11 tuff samples. The quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Table H-23 and Figure H-97). The detected concentrations and DLs were above the Qbt 2,3,4 BV and the maximum background concentration (0.105 mg/kg). Selenium is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in one sample at a concentration of 978 mg/kg. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Table H-23 and Figure H-97). Sodium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in six samples with a maximum concentration of 555 mg/kg. The Gehan and quantile tests indicated the site concentrations of zinc in soil are not statistically different from background (Table H-23). The slippage test indicated site concentrations of zinc in soil are statistically different from background, and the maximum concentration is substantially above background (Table H-23 and Figure H-98). Zinc is retained as a COPC.

Organic Chemicals

One hundred samples (77 soil and 23 tuff) were analyzed for SVOCs, VOCs, and PCBs. Twenty-seven samples (12 soil and 15 tuff) were analyzed for TPH-DRO and TPH-GRO. Table 8.3-3 summarizes the analytical results for detected organic chemicals. Plate 24 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 61-002 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; n-butylbenzene; sec-butylbenzene; butylbenzylphthalate; chlorobenzene; chloroethane; chloromethane; chrysene; 1,2-dibromo-3-chloropropane; 1,2-dibromoethane; 1,2-dichlorobenzene; 1,4-dichlorobenzene; cis/trans-1,2-dichloroethene; di-n-octyl phthalate; ethylbenzene; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; 4-methyl-2-pentanone; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; 1-propylbenzene; pyrene; styrene; tetrachloroethene; toluene; TPH-DRO; TPH-GRO; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylenes (total); 1,2-xylene; and 1,3-xylene+1,4-xylene. All detected organic chemicals are retained as COPCs.

8.3.4.4 Nature and Extent of Contamination

The nature and extent of inorganic and organic COPCs at SWMU 61-002 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 61-002 include antimony, arsenic, barium, cadmium, calcium, copper, lead, mercury, selenium, and zinc.

Antimony was not detected above the Qbt 2,3,4 BV but had DLs (0.55 mg/kg to 0.63 mg/kg) above the BV in eight tuff samples. Because antimony was not detected above the BV and the residential SSL was approximately 50 times to 60 times the DL, further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in seven tuff samples with a maximum concentration of 6.46 mg/kg. Concentrations decreased with depth at locations 61-26621 and 61-26623 and did not change substantially with depth (0.03 mg/kg) at location 61-26622 (all concentrations were below the maximum Qbt 2,3,4 background concentration of 5 mg/kg). Concentrations at locations 61-26619, 61-26620, and 61-26986 were above the residential SSL (3.9 mg/kg), and the industrial SSL was approximately 2.6 times to 3.4 times the concentrations at these locations. However, the concentrations were at 23.0–25.0 ft bgs at each location (arsenic was not detected above background at shallower depths) and were only 0.22 mg/kg to 1.46 mg/kg above the maximum Qbt 2,3,4 background concentration (5 mg/kg) and below the soil BV (8.17 mg/kg). Arsenic was not detected above the maximum Qbt 2,3,4 background concentration at location 61-26621 at 28–30 ft bgs and 93–95 ft bgs, which is approximately 15.0–17.0 ft bgs from locations 61-26619 and 61-26620 and approximately 50 ft from location 61-26986. The vertical extent of arsenic is defined, and further sampling for lateral extent is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in five soil samples and four tuff samples with a maximum concentration of 676 mg/kg. Concentrations decreased with depth at locations 61-24315, 61-24317, 61-24351, 61-26985, and 61-26986 and were below the maximum soil background concentration (410 mg/kg) at location 61-24313. The barium concentrations at location 61-26987 decreased from 157 mg/kg in fill (below the soil BV) at 13.0–15.0 ft bgs to 95 mg/kg at 23.0–25.0 ft bgs

(Appendix G, Upper Sandia All Analysis SWMU & AOC Results.xlsx). The concentration at location 61-26620 was above maximum Qbt 2,3,4 background concentration (51.6 mg/kg) at 23.0–25.0 ft bgs, but barium was not detected above the Qbt 2,3,4 BV at 28.0–30.0 ft bgs and 93.0–95.0 ft bgs in borehole at location 61-26621, approximately 15 ft east/southeast of location 61-26620. The concentration at location 61-24334 (676 mg/kg) was at 3.0–3.5 ft (the deepest sample). The residential SSL was approximately 23 times and the industrial SSL was approximately 330 times this concentration. In addition, the sampling location is east of the SWMU 61-002 boundary was selected to confirm the extent of PCB contamination and cleanup and is not related to site operations. The vertical extent of barium is defined, and further sampling for lateral extent is not warranted.

Cadmium was detected above the soil BV in two samples with a maximum concentration of 0.96 mg/kg. Concentrations decreased with depth at both locations and decreased laterally. The residential SSL was approximately 73 times the maximum concentration. The lateral and vertical extent of cadmium is defined.

Calcium was detected in above soil BV in nine samples with a maximum concentration of 14,900 mg/kg. Concentrations decreased with depth at locations 61-26313, 61-26315, 61-26318, 61-26319, and 61-26346. The concentrations at location 61-26334 increased with depth, but were below the maximum soil background concentration (14,000 mg/kg). Concentrations decreased laterally. The lateral and vertical extent of calcium are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 21.5 mg/kg. Concentrations decreased with depth at four locations and were below the maximum Qbt 2,3,4 background concentration (6.2 mg/kg) at location 61-24328. The residential SSL was approximately 145 times to 610 times the concentrations. The vertical extent of copper is defined, and further sampling for lateral extent is not warranted.

Lead was detected above soil and Qbt 2,3,4 BVs in six soil samples and six tuff samples with a maximum concentration of 52.5 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The residential and industrial SSLs were approximately 7.6 times and 15.2 times the maximum concentration. The lateral and vertical extent of lead are defined.

Mercury was detected above the soil BV in four samples with a maximum concentration of 2.2 mg/kg. Concentrations decreased with depth at locations 61-24315, 61-24347, and 61-24515 and decreased laterally. The maximum concentration at location 61-24321 was at 5.5–6.0 ft bgs (the deepest sample), and mercury was not detected above the soil BV at locations 61-24320 and 61-24322 (approximately 15–20 ft west and east of location 61-24321) at similar depths. The residential SSL and industrial SSL were approximately 10 times and 155 times the maximum concentration. The lateral and vertical extent of mercury are defined.

Selenium was detected above the soil and Qbt 2,3,4 BVs in two soil samples and 10 tuff samples with a maximum concentration of 15.2 mg/kg. Concentrations decreased with depth at locations 61-26620, 61-262623, and 61-26986 and was equal to the maximum soil background concentration (1.7 mg/kg) at location 61-24334. The concentrations at locations 61-26619, 61-26622, and 61-26985 increased with depth, but selenium was not detected above the Qbt 2,3,4 BV at location 61-26621 (10–15 ft northeast and southwest of locations 61-26619 and 61-26622, respectively, and 25–30 ft south of location 61-26985) at 28–30 ft bgs and 93–95 ft bgs. Concentrations decreased laterally. The residential SSL and industrial SSL were approximately 26 times and 370 times the maximum concentration. The lateral extent of selenium is defined, and further sampling for vertical extent is not warranted.

Zinc was detected above soil BV in six samples with a maximum concentration of 555 mg/kg. Concentrations decreased with depth or were below the maximum soil background concentration (75.5 mg/kg). The residential SSL was approximately 40 times to 480 times the concentrations. The vertical extent of zinc is defined, and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 61-002 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; n-butylbenzene; sec-butylbenzene; butylbenzylphthalate; chlorobenzene; chloroethane; chloromethane; chrysene; 1,2-dibromo-3-chloropropane; 1,2-dibromoethane; 1,2-dichlorobenzene; 1,4-dichlorobenzene; cis/trans-1,2-dichloroethene; di-n-octyl phthalate; ethylbenzene; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; 4-methyl-2-pentanone; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; 1-propylbenzene; pyrene; styrene; tetrachloroethene; toluene; TPH-DRO; TPH-GRO; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylenes (total); 1,2-xylene; and 1,3-xylene+1,4-xylene.

Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluorene; and indeno(1,2,3-cd)pyrene were detected in one to three samples. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent are defined.

Fluoranthene, phenanthrene, and pyrene were detected in four to eight samples. Concentrations decreased with depth or did not change substantially with depth (0.02 mg/kg to 0.08 mg/kg at location 61-24319) at all locations, except at location 61-26322 for fluoranthene and pyrene. Fluoranthene and pyrene were detected in the deepest sample (2.5–3.5 ft bgs) but not in the shallower sample. The fluoranthene, phenanthrene, and pyrene concentrations also decreased laterally. The residential SSLs were approximately 1300 times the maximum concentration of each COPC. The lateral and vertical extent are defined.

Acetone was detected in 42 samples with a maximum concentration of 4.5 mg/kg. Concentrations decreased with depth at 12 locations and did not change substantially with depth (0.003 to 0.034 mg/kg) at eight locations. Acetone was detected in only the deeper sample at five locations. The residential SSL was approximately 27,800 times to 2,900,000 times these five detected concentrations and 14,800 times the maximum concentration. The vertical extent of acetone is defined, and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 14 samples with a maximum concentration of 11 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral extent of Aroclor-1254 is defined by decreasing concentrations in the surrounding sampling locations. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in 20 samples with a maximum concentration of 1.3 mg/kg. Concentrations decreased with depth at seven locations and did not change substantially with depth (0.02 mg/kg to 0.08 mg/kg) at five locations. Concentrations also decreased laterally. The lateral and vertical extent of Aroclor-1260 are defined.

Benzene was detected in in eight samples with a maximum concentration of 27 mg/kg. Concentrations decreased with depth and were detected at or below the EQLs in all but two samples. The residential SSL was exceeded by the maximum concentration by approximately 12 mg/kg, but was 100 times or more the other detected concentrations. The industrial SSL was approximately 3 times the maximum concentration and 800 times or more the other detected concentrations. The lateral and vertical extent of benzene are defined.

Benzoic acid was detected in three samples with a maximum concentration of 0.28 mg/kg. Concentrations were below the EQLs and decreased with depth at two locations. The residential SSL was approximately 1,000,000 times the maximum concentration. The vertical extent of benzoic acid is defined, and further sampling for lateral extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 1.3 mg/kg. Concentrations decreased with depth at location 61-24513. The concentration at location 61-24324 was below the EQL for this sample, and bis(2-ethylhexyl)phthalate was not detected in the surface sample. The residential SSL was approximately 265 times the maximum concentration. The vertical extent of bis(2-ethylhexyl)phthalate is defined, and further sampling for lateral extent is not warranted.

Butanone(2-) was detected in 13 samples with a maximum concentration of 0.221 mg/kg. Concentrations decreased with depth at four locations and did not change substantially with depth (0 mg/kg to 0.0046 mg/kg) at three locations. Butanone(2-) was detected only in the deepest samples at locations 61-24353, 61-24354, and 61-26619. The residential SSL was approximately 6,560,000 times to 247,000 times the concentrations at these three locations. Concentrations also decreased laterally. The lateral and vertical extent of 2-butanone are defined.

Butylbenzene(n-) and sec-butylbenzene were detected in one and two samples with maximum concentrations of 0.00054 mg/kg and 9.4 mg/kg, respectively. Concentrations decreased with and decreased laterally. The lateral and vertical extent of butylbenzenes are defined.

Butylbenzylphthalate was detected in three samples with a maximum concentration of 0.66 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL was approximately 4000 times the maximum concentration. The lateral and vertical extent of butylbenzylphthalate are defined.

Chlorobenzene was detected in six samples with a maximum concentration of 0.13 mg/kg. Concentrations decreased with depth at three locations and were below the EQL at location 61-24327. The residential SSL was approximately 2900 times the maximum concentration. The vertical extent of chlorobenzene is defined, and further sampling for lateral extent is not warranted.

Chloroethane, di-n-octyl phthalate, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,4-dichlorobenzene, and 4-methyl-2-pentanone were detected in one sample each. Concentrations decreased with depth at each location and were below EQLs for chloroethane, di-n-octyl phthalate, 1,2-dibromo-3-chloropropane, and 1,2-dibromoethane. The residential SSLs were approximately 450 times to 23000 times the concentrations. The vertical extent of these COPCs is defined, and further sampling for lateral extent is not warranted.

Chloromethane was detected in 10 samples with a maximum concentration of 0.44 mg/kg. Concentrations decreased with depth at locations 61-24310, 61-24313, 61-24317, and 61-24352 and did not change substantially with depth (0 mg/kg to 0.008 mg/kg) at locations 61-24312, 61-24315, and 61-24316. Concentrations at all but location 61-24310 were below the EQLs. Concentrations also decreased laterally. The lateral and vertical extent of chloromethane are defined.

Dichlorobenzene(1,2-) was detected in six samples with a maximum concentration of 0.066 mg/kg. Concentrations decreased with depth at all locations. The residential SSL was 35,000 times the maximum concentration. The vertical extent of 1,2-dichlorobenzene is defined, and further sampling for lateral extent is not warranted.

Dichloroethene(cis/trans 1,2-) and styrene were detected in three and two samples with maximum concentrations of 0.0047 mg/kg and 0.13 mg/kg, respectively. Concentrations decreased with depth and were below the EQLs. The lateral and vertical extent of 1,2-cis/trans-dichloroethene and styrene are defined.

Ethylbenzene and 1-propylbenzene were detected in six samples and seven samples with maximum concentrations of 230 mg/kg and 58.4 mg/kg, respectively. Concentrations decreased with depth at locations 61-24352 and 61-26622 for ethylbenzene and 1-propylbenzene, and at location 61-26985 for 1-propylbenzene (ethylbenzene was not detected at this location). Concentrations for ethylbenzene and 1-propylbenzene increased with depth at location 61-24346 at 5.5–6.0 ft bgs. However, this location is within 10 ft of location 61-26621, which was drilled to 95 ft bgs, and ethylbenzene and 1-propylbenzene were not detected. Ethylbenzene and 1-propylbenzene concentrations decreased laterally. The lateral and vertical extent of ethylbenzene and 1-propylbenzene are defined.

Hexanone(2-) was detected in five samples with a maximum concentration of 0.047 mg/kg. Concentrations decreased with depth at location 61-26621 and did not change substantially with depth (0.023 mg/kg) at location 61-24351. Hexanone(2-) was detected in the deepest samples at locations 61-24353 and 61-24354 and was below the EQL at location 61-24354. Hexanone(2-) was not detected at location 61-26623, which is approximately 15 ft northeast of location 61-24353 and was drilled to 55 ft bgs. The residential SSL was approximately 4500 times the maximum concentration. The lateral and vertical extent of 2-hexanone are defined.

Isopropylbenzene and 4-isopropyltoluene were each detected in five samples with maximum concentrations of 10.9 mg/kg and 3.9 mg/kg, respectively. The 4-isopropyltoluene concentration at location 61-24324 was below the EQL. Isopropylbenzene concentrations decreased with depth at location 61-24352, and 4-isopropyltoluene concentrations decreased with depth at location 61-24333. Isopropylbenzene concentrations increased slightly with depth at location 61-24346 and increased with depth at location 61-26622. Isopropyltoluene(4-) increased with depth at locations 61-24346, 61-24347, and 61-24352. Isopropylbenzene and 4-isopropyltoluene were not detected in the deepest samples at locations 61-26621 (28.0–30.0 ft bgs and 93.0–95.0 ft bgs) and 61-26623 (38.0–40.0 ft bgs and 53.0–55.0 ft bgs). Isopropylbenzene and 4-isopropyltoluene concentrations decreased laterally. The residential SSLs were approximately 225 times and 620 times the maximum concentrations. Further sampling for extent of isopropylbenzene and 4-isopropyltoluene is not warranted.

Methylene chloride was detected in three samples with a maximum concentration of 3.6 mg/kg. Concentrations decreased with depth at location 61-26987 and was detected below the EQL in the deepest sample at location 61-26621 (93.0–95.0 ft bgs). Methylene chloride concentrations at surrounding locations around were less than the maximum concentration detected at location 61-24352 and concentrations decreased laterally. The residential SSL was approximately 110 times the maximum concentration. The lateral extent of methylene chloride is defined, and further sampling for vertical extent is not warranted.

Methylnaphthalene(2-) and naphthalene were detected in nine samples and eight samples with maximum concentrations of 230 mg/kg and 1300 mg/kg, respectively. Concentrations decreased with depth at locations 61-24352, 61-26622, and 61-26623. Concentrations for 2-methylnaphthalene and naphthalene increased with depth at locations 61-24346 and 61-24347 at 5.5–6.0 ft bgs. However, these locations are within 10 ft of location 61-26621, which was drilled to 95 ft bgs, and 2-methylnaphthalene and naphthalene were not detected. Methylnaphthalene(2-) and naphthalene concentrations decreased laterally. The lateral and vertical extent of 2-methylnaphthalene and naphthalene are defined.

Tetrachloroethene was detected in three samples with a maximum concentration of 0.001 mg/kg. Concentrations at locations 61-24314, 61-24324, and 61-24351 were below the EQLs and decreased with depth at location 61-24351. The residential SSL was approximately 7000 times the maximum concentration. The vertical extent of tetrachloroethene is defined, and further sampling for lateral extent is not warranted.

Toluene was detected in 23 samples with a maximum concentration of 380 mg/kg. Concentrations at locations 61-24314, 61-24318, 61-24319, 61-24324, 62-24325, 61-24326, 61-24327, 61-24328, 61-24329, 61-24330, 61-24331, and 61-24333 were below the EQLs. Concentrations decreased with depth at locations 61-24346 and 61-24352 and did not change substantially with depth (0.1 mg/kg) at location 61-26622 at 23.0–25.0 ft bgs. Concentrations increased at location 61-24347 at 5.5–6.0 ft bgs. The residential SSL was approximately 2100 times the concentration at location 61-24347. In addition, toluene was not detected in the deepest boreholes at locations 61-26621 (95 ft bgs) and 61-26623 (55 ft bgs). Toluene concentrations decreased laterally. The lateral and vertical extent of toluene are defined.

Trimethylbenzene(1,2,4-) and 1,3,5-trimethylbenzene were detected in 10 samples and 9 samples, with maximum concentrations of 610 mg/kg and 212 mg/kg, respectively. Concentrations for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene decreased with depth at locations 61-24352 and 61-24622 and 1,2,4-trimethylbenzene concentrations at location 61-24351 and 61-24515 were below the EQLs. Concentrations for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene increased with depth at locations 61-24346 and 61-24347 at 5.5–6.0 ft bgs. However, these locations are within 10 ft of location 61-26621, which was drilled to 95 ft bgs, and 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene were not detected. Trimethylbenzene(1,2,4-) and 1,3,5-trimethylbenzene concentrations decreased laterally. The lateral and vertical extent of 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene are defined.

Xylenes (total), 1,2-xylene, and 1,3-xylene+1,4-xylene were detected in six samples, three samples, and two samples with maximum concentrations of 870 mg/kg, 133 mg/kg, and 276 mg/kg, respectively. Xylenes (total) concentrations decreased with depth at location 61-24352, 1,2-xylene concentrations decreased at locations 61-26622 and 61-26985, and 1,3-xylene+1,4-xylene concentrations decreased with depth at location 61-26622. Concentrations xylenes (total) increased with depth at locations 61-24346 and 61-24347 at 5.5–6.0 ft bgs. However, these locations are within 10 ft of location 61-26621, which was drilled to 95 ft bgs, and xylenes were not detected. Xylenes (total), 1,2-xylene, and 1,3-xylene+1,4-xylene concentrations decreased laterally. The lateral and vertical extent of xylenes (total), 1,2-xylene, and 1,3-xylene+1,4-xylene are defined.

TPH-DRO and TPH-GRO were detected in 14 samples and 20 samples with maximum concentrations of 8500 mg/kg and 16,000 mg/kg, respectively. TPH-DRO concentrations decreased with depth at locations 61-24352, 61-26621, 61-26623, and 61-26987. TPH-GRO concentrations decreased with depth at locations 61-24352, 61-26621, 61-26622, and 61-26623, and concentrations were below the EQLs at locations 61-26620, 61-26985, and 61-26986. TPH-DRO concentrations increased with depth at locations 61-24346, 61-24347, 61-26619, 61-26620, and 61-26622. TPH-GRO concentrations increased with depth at locations, 61-24347, 61-24351, 61-24353, and 61-26619 and did not change with depth at location 61-24346. However, these locations are within 10–25 ft of location 61-26621, which was drilled to 95.0 ft bgs; TPH-DRO was not detected, and but TPH-GRO was detected below the EQL at 95 ft. TPH-DRO and TPH-GRO concentrations decreased laterally. The lateral and vertical extent of TPH-DRO and TPH-GRO are defined.

The results of the sampling at SWMU 61-002 also indicated that migration of contaminants as a free liquid phase is not occurring. Ethylbenzene; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and xylene concentrations exceeded the C_{sat} SSLs at one or two sampling locations. Ethylbenzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene concentrations were above C_{sat} SSLs in the 10.0–10.5 ft bgs sample at location 61-24352 and decreased by approximately an order of magnitude in the sample collected at 17.0–17.5 ft bgs. Ethylbenzene and toluene were not detected above the C_{sat} SSLs at other locations or in other samples. Trimethylbenzene(1,2,4-); 1,3,5-trimethylbenzene; and xylene concentrations were detected also above the C_{sat} SSLs in the samples collected at 17.0–17.5 ft bgs and 23.0–25.0 ft bgs at location 61-26622. The concentrations of these three COPCs decreased with depth at this location. None of the COPCs were detected in the deepest boreholes (locations 61-26623 and 61 26621) at 40.0–55.0 ft bgs and 30.0–95.0 ft bgs, respectively. (The borehole at location 21-26621 was drilled through the middle of the petroleum-contaminated area based on field screening.) Location 61-26621 was drilled south of location 61-24352 and southwest of location 61-26622 (within approximately 10 ft). Location 61-26623 was drilled less than 25 ft east of location 61-26622 and approximately 30 ft east of location 61-24352. Therefore, these COPCs are not migrating vertically to groundwater at SWMU 61-002.

8.3.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.01, which is less than the NMED target HI of 1. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. Potential risk from TPH-GRO is based on constituents. The potential risks for the industrial scenario are below the NMED target levels.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.2, which is below the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO construction worker HQ based on the TPH industrial screening guideline for diesel No. 2/crankcase oil is 0.04. Potential risk from TPH-GRO is based on constituents. The potential risks for the construction worker scenario are below the NMED target levels.

Residential Scenario

The total excess cancer risk for the residential scenario is 5×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is approximately 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971). The TPH-DRO residential HQ based on the TPH residential screening guideline for diesel No. 2/crankcase oil is 0.07. Potential risk from TPH-GRO is based on constituents. The total excess cancer risk for the residential scenario is from PAHs.

Based on the risk-screening assessment results, no potential unacceptable risk exists for the industrial and construction worker scenarios at SWMU 61-002. There is a potential unacceptable cancer risk for the residential scenario, but the residential HI is below the NMED target level.

Although SWMU 61-002 is not regulated as a petroleum storage tank site, a release of petroleum product apparently occurred in the subsurface, and a Tier One Evaluation was performed for information purposes based on New Mexico Petroleum Storage Tank Bureau corrective action guidelines (Title 20 of the NMAC, Chapter 5, Part 12, Section 1213). The Tier One Evaluation is intended to determine whether soil contamination poses a threat to groundwater in the future and is presented in the remedy completion report (LANL 2007, 100722, Appendix E, section E-4.0). The Tier One Evaluation indicated that the residual subsurface petroleum hydrocarbon concentrations did not exceed New Mexico Petroleum Storage Tank Bureau risk-based screening levels for any current or reasonably foreseeable future exposure pathway.

8.3.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), and LOAEL analyses 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 61-002.

9.0 CONCLUSIONS

9.1 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 31 sites investigated previously or during the 2009 Upper Sandia Canyon Aggregate Area investigation. The nature and extent of contamination have not been defined and further sampling is warranted for 11 sites. One site of the 11 sites is proposed for delayed characterization and investigation pending D&D of certain buildings and structures within the aggregate area. Summaries of the nature and extent of contamination and remaining characterization requirements for the sites at TA-03, TA-60, and TA-61 are presented below.

9.1.1 TA-03

The nature and extent of contamination have been defined and/or no further sampling for extent is warranted for the following sites in TA-03:

- SWMU 03-002(c), Former Storage Area
- SWMU 03-009(a), Surface Disposal
- SWMU 03-009(i), Surface Disposal Site
- SWMU 03-012(b), Operational Release
- AOC 03-014(b2), Outfall
- SWMUs 03-014(k,l,m,n), Structures Associated with Former WWTP
- SWMU 03-014(o), Structure Associated with Former WWTP
- SWMU 03-014(u), Structure Associated with Former WWTP
- SWMU 03-015, Outfall
- SWMU 03-021, Outfall
- SWMU 03-029, Landfill
- SWMU 03-045(a), Outfall
- SWMU 03-045(f), Outfall
- SWMU 03-045(g), Storm Drain
- SWMU 03-045(h), Outfall

- AOC 03-047(g), Drum Storage
- AOC 03-051(c), Soil Contamination—Vacuum Pump Leak
- AOC 03-052(b), Storm Drainage
- SWMU 03-052(f), Outfall
- AOC 03-053, Operational Facility
- SWMU 03-056(a), Storage Area
- SWMU 03-056(d), Drum Storage
- AOC 03-056(k), Container Storage Area
- SWMU 03-059, Storage Area—PCB Site

The nature and extent of contamination have not been defined and further sampling is warranted for eight sites in TA-03. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, or radionuclides at the following sites:

- AOC 03-003(d)—Vertical extent of Aroclor-1260
- SWMU 03-013(i)—Lateral and vertical extent of TPH-DRO
- AOC 03-014(c2)—Vertical extent of Aroclor-1254 and Aroclor-1260
- AOC 03-038(d)—Lateral and vertical extent of COPCs
- SWMU 03-045(b)—Lateral extent of COPCs down the drainage because only one location at the outfall was sampled
- SWMU 03-045(c)—Lateral extent of COPCs down the drainage because only one location at the outfall was sampled
- AOC C-03-022—Lateral and vertical extent of TPH-DRO
- SWMU 03-045(e)—Lateral extent of COPCs down the drainage because only one location at the outfall was sampled and the vertical extent of TPH-DRO.

9.1.2 TA-60

The nature and extent of contamination have been defined and/or no further sampling for extent is warranted for the following sites in TA-60:

- SWMU 60-002, Storage Areas
- AOC 60-004(f), Storage Area
- SWMU 60-006(a), Septic System
- SWMU 60-007(b), Release

The nature and extent of contamination have not been defined and further sampling is warranted for one site in TA-60. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, or radionuclides at the following site:

- SWMU 60-007(a)—Vertical extent of TPH-DRO

9.1.3 TA-61

The nature and extent of contamination have been defined and/or no further sampling for extent is warranted for the following site in TA-61:

- SWMU 61-002, Transformer storage area—PCB site

The nature and extent of contamination have not been defined and further sampling is warranted for one site in TA-61. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, or radionuclides at the following site:

- AOC C-61-002—Lateral extent of TPH-DRO

9.2 Summary of Risk-Screening Assessments

Sites were evaluated for potential risk by human health and ecological risk-screening assessments.

- Human health risk-screening assessments were performed for 40 sites. An assessment was not performed for SWMU 60-006(a) because samples were collected at depths greater than 10 ft bgs where no complete pathways to receptors are present. For AOC 03-038(d), samples were collected at the incorrect depths, so the data were not representative of the site and risk-screening assessments were not conducted.

- Ecological risk-screening assessments were performed for 40 sites. An assessment was not performed for SWMU 60-006(a) because samples were collected at depths greater than 5 ft bgs where no complete pathways to receptors are present. For AOC 03-038(d), samples were collected at the incorrect depths, so the data were not representative of the site and a risk screening assessment was not conducted.

9.2.1 Human Health Risk-Screening Assessment

The human health risk-screening assessments are presented in Appendix I, section I-4.0.

The human health risk-screening assessments found no potential unacceptable risks under the construction worker scenario at any of the sites. SWMUs 03-045(g) and 60-002 (East) had construction worker HIs of approximately 1, with associated potential risk from manganese at SWMU 03-045(g) and aluminum and cobalt at SWMU 60-002 (East). However, the risks were overestimated by the SSLs and/or the EPCs. Overall, no potential unacceptable risks to the construction worker exist at the sites evaluated.

SWMU 60-002 (West and East) and AOCs 03-051(c), C-03-022, 60-004(f), and C-61-002 were not evaluated for the industrial scenario because no COPCs were detected in the depth interval of 0.0–1.0-ft bgs. There were no unacceptable risks for any of the sites evaluated under the industrial scenario. The total excess cancer risks for the industrial scenario at SWMUs 03-014(k,l,m,n), 03-045(a), SWMU 03-015 and AOC 03-053, and SWMU 03-052(f) were initially above the 1×10^{-5} target risk level. As described in section I-4.3.2, the risks are overestimated and are not representative of the exposure at the sites. Based on further evaluation of the data, potential cancer risks for the industrial scenario at SWMUs 03-014(k,l,m,n), 03-045(a), and 03-015 and AOC 03-053 are below the NMED target level. For SWMU 03-052(f), the exposure that results in a potential unacceptable risk to a worker is unrealistic. In addition, the PAHs are not related to site operations but result from runoff from paved infrastructure. Therefore, the exposure and risk are not issues for a Laboratory worker at this site.

For the residential scenario, 13 sites had total excess cancer risks above the 1 × 10^{-5} target risk level, and 3 sites had HIs above 1. SWMU 03-045(g) had a total excess cancer risk slightly above the target risk level, which was in part from arsenic. As discussed in section I-4.3.2, the arsenic does not result in an incremental increase in cancer risk above the risk from background, so the cancer risk was overestimated by the EPC and is not representative of the exposure. Without arsenic the cancer risk was less than 1 × 10^{-5}. AOCs 03-047(g) and 03-051(c) had elevated cancer risk from PAHs, which were not site-related but rather resulted from the paved areas in and around the sites. Therefore, the cancer risks at these sites are not an issue. SWMUs 03-014(k,l,m,n) had elevated cancer risk from PAHs. The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detection being the result of residual contamination from site operations. As a result, the cancer risk at the sites is not an issue for any scenario. The remaining sites had total excess cancer risks, HIs, and total doses for the residential scenario below the regulatory target levels.

SWMUs 03-014(k,l,m,n) had potential issues associated with TPH-DRO for all three scenarios. However, as discussed in section I-4.3.2 for SWMUs 03-014(k,l,m,n), no PAHs were detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. The TPH-DRO is at least 20 yr old and is not the result of a recent spill. NMED’s TPH screening guidelines state that site cleanup cannot be based solely on results of TPH sampling and that the TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants. The NMED screening guidelines are based on ingestion and use of groundwater as a potable water supply. However, because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at depths must shallower than the regional aquifer, no potable groundwater issues are related to the TPH detected. Therefore, remediation of TPH-DRO at the sites is not warranted.

SWMU 03-045(e) had TPH-DRO HQs of 2 and 3 for the construction worker and residential scenarios, respectively. As discussed in the uncertainty analysis (section I-4.3.2), the TPH-DRO at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH-DRO constituents have degraded, as evidenced by the detection of only four PAHs at concentrations less than 0.3 mg/kg. All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft bgs). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because individual petroleum-related contaminants were detected at concentrations below the EQLs and the regional aquifer is over 1000 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

Additional sampling is needed at AOC C-03-022 to characterize the constituents of the TPH-DRO detected in the soil and to determine the extent of the TPH-DRO. No VOC or SVOC data are available to determine whether the TPH-DRO constituents are present and pose a potential unacceptable risk.

The remedy completion report data for SWMU 61-002 were reevaluated based on current approaches (e.g., comparing inorganic chemicals to background using statistics and using SSLs/SALs to determine if additional sampling is warranted) and using standard up-to-date exposure assumptions, including exposure depths for each scenario (NMED 2012, 219971). Based on the reassessment, the residential scenario had a total excess cancer risk above the 1 × 10^{-5} target risk level, but the industrial and construction worker scenarios had total excess cancer risks below the target risk level. The HIs were below the target HI of 1 and The TPH-DRO HQs were below 1 for all scenarios.

Complete exposure pathways to receptors are not present at SWMU 60-006(a), where the potential contamination is deeper than 10 ft. Samples were collected at the incorrect depths at AOC 03-038(d), so the data were not representative of the site. Therefore, human health risk-screening assessments were not conducted for these sites.

The total doses at SWMUs 03-014(k,l,m,n,o,u), 03-015, and 03-059 and AOCs 03-014(c2), 03-053, 03-056(k), and 60-004(f) were below the target dose limit of 25 mrem/yr as authorized by DOE Order 458.1 for all three scenarios.

Sites at TA-03, TA-60, and TA-61 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. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 CFR 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

9.2.2 Ecological Risk-Screening Assessment

The ecological risk-screening assessments are presented in Appendix I, section I-5.0. No unacceptable ecological risks existed for any of the sites.

No potential ecological risks were found for any receptor following evaluations based on minimum ESL, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations.

Complete exposure pathways to receptors are not present at SWMU 60-006(a) where the potential contamination is deeper than 5 ft. For AOC 03-038(d), samples were collected at the incorrect depths so data were not representative of the site. Therefore, ecological risk-screening assessments were not conducted for these sites.

10.0 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, construction worker, 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 Upper Sandia Canyon Aggregate Area is industrial.

10.1 Additional Field Characterization Activities

The nature and extent of contamination have not been defined for 10 sites investigated in the Upper Sandia Canyon Aggregate Area (Table 10.1-1). Additional sampling is needed to define the extent of contamination for one or more inorganic and/or organic chemicals at the following sites:

- SWMUs 03-013(i), 03-045(b), 03-045(c), 03-045(e) (outfall only), 60-007(a) and AOCs 03-003(d), 03-014(c2), 03-038(d), C-03-022, and C-61-002

A Phase II work plan has been developed and approved (LANL 2011, 206234; NMED 2011, 206390) based on the conclusions and recommendations presented in the 2010 investigation report (LANL 2010, 110862.24). 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. Upon completion of the proposed Phase II sampling, the data will be used to confirm the extent of contamination has been defined and to complete human health and ecological risk-screening assessments for all remaining sites. The results will be presented in a Phase II investigation report for the Upper Sandia Canyon Aggregate Area.

10.2 Recommendations for Corrective Actions Complete

Thirty-two sites do not pose a potential unacceptable risk or dose under the industrial, construction worker, and/or 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, the Laboratory recommends no further investigation or remediation activities are warranted.

Twenty sites have been found to pose no potential unacceptable risks to human health under the residential scenario and to ecological receptors and are appropriate for corrective actions complete without controls. They include the following:

- SWMU 03-002(c), Former Storage Area
- SWMU 03-009(i), Surface Disposal Site
- SWMU 03-012(b), Operational Release
- AOC 03-014(b2), Outfall
- SWMUs 03-014(k,l,m,n), Structures Associated with Former WWTP
- SWMU 03-014(u), Structure Associated with Former WWTP
- SWMU 03-021, Outfall
- SWMU 03-029, Landfill
- SWMU 03-045(f), Outfall
- SWMU 03-045(g), Storm Drain
- AOC 03-047(g), Drum Storage
- AOC 03-051(c), Soil Contamination–Vacuum Pump Leak
- AOC 03-052(b), Storm Drainage
- SWMU 03-056(a), Storage Area
- SWMU 03-056(d), Drum Storage
- SWMU 60-002, Storage Areas
- SWMU 60-007(b), Release

One site has been found to have no complete exposure pathways to human and ecological receptors under all three scenarios and is appropriate for corrective actions complete without controls. This includes the following:

- SWMU 60-006(a), Septic System

One site has been found to pose no potential unacceptable risks to human health under the industrial, construction worker, and/or residential scenarios and to ecological receptors. The site evaluation will be completed in the Upper Mortandad Canyon Aggregate Area supplemental investigation report:

- SWMU 03-045(h), Outfall

Ten sites have been found to pose no potential unacceptable risks to human health under the industrial and construction worker scenarios and to ecological receptors and are appropriate for corrective actions complete with controls. They include the following:

- SWMU 03-009(a), Surface Disposal
- SWMU 03-014(o), Structure Associated with Former WWTP
- SWMU 03-015, Outfall
- SWMU 03-045(a), Outfall
- SWMU 03-052(f), Outfall
- AOC 03-053, Operational Facility
- AOC 03-056(k), Container Storage Area
- SWMU 03-059, Storage Area—PCB Site
- AOC 60-004(f), Storage Area
- SWMU 61-002, Transformer Storage Area—PCB Site

10.3 Recommendations for Delayed Characterization

SWMU 03-045(e) was recommended for delayed characterization and investigation pending D&D of buildings and structures within the Upper Sandia Canyon Aggregate Area (LANL 2010, 110862.24). However, additional sampling will be conducted to define the extent of contamination at the outfall and in the drainage below the outfall for SWMU 03-045(e). The locations, numbers of samples, and analytical suites will be included in the Phase II investigation work plan.

10.4 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.

11.0 REFERENCES AND MAP DATA SOURCES

11.1 References

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

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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11.2 Map Data Sources

Data sources used in original figures and/or plates created for this report are described below and identified by legend title.

Legend Item/Type	Data Source
LANL Technical Areas	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.
Paved roads	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Paved parking	Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Dirt roads	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Drainages	WQH Drainage Arcs; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; 1:24,000 Scale Data; 03 June 2003.
Inferred USCAA area drainages	Digitized from: relevant maps appearing in the Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1; LANL ERID 103404; LA-UR-08-4798; July 2008
LANL structures	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Los Alamos County structures	Structures; County of Los Alamos, Information Services; as published 29 October 2007.
LANL fence lines	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.
LANL communications lines	Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009.
LANL electric lines	Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL gas lines	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.
LANL sewer lines	Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL steam lines	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.
LANL water lines	Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Legend Item/Type	Data Source
Other LANL drainlines in USCAA area	Digitized from: relevant maps appearing in the Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1; LANL ERID 103404; LA-UR-08-4798; July 2008 Figure 5-14-2; appearing in RFI Work Plan for OU 1114, Addendum 1; LANL ERID 020947; June 1993 Liquid and Compressed Gas Facility Mechanical Bldg. SM-170; LASL engineering drawing ENG-C-31087, last revision 05 March 1965.
Former LANL USCAA area structures	Digitized from: relevant maps appearing in the Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1; LANL ERID 103404; LA-UR-08-4798; July 2008
LANL PRS boundaries	Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0137; 1:2,500 Scale Data; 13 March 2009.
Additional USCAA area LANL PRS boundaries	Digitized from: relevant maps appearing in the Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1; LANL ERID 103404; LA-UR-08-4798; July 2008
USCAA 2009/10 area sampling locations	TPMC field survey data, now found in: Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, 12 April 2010.
LANL historical sampling locations	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, 21 January 2010.
Contours	Hypsography, 2, 10, 20, and 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

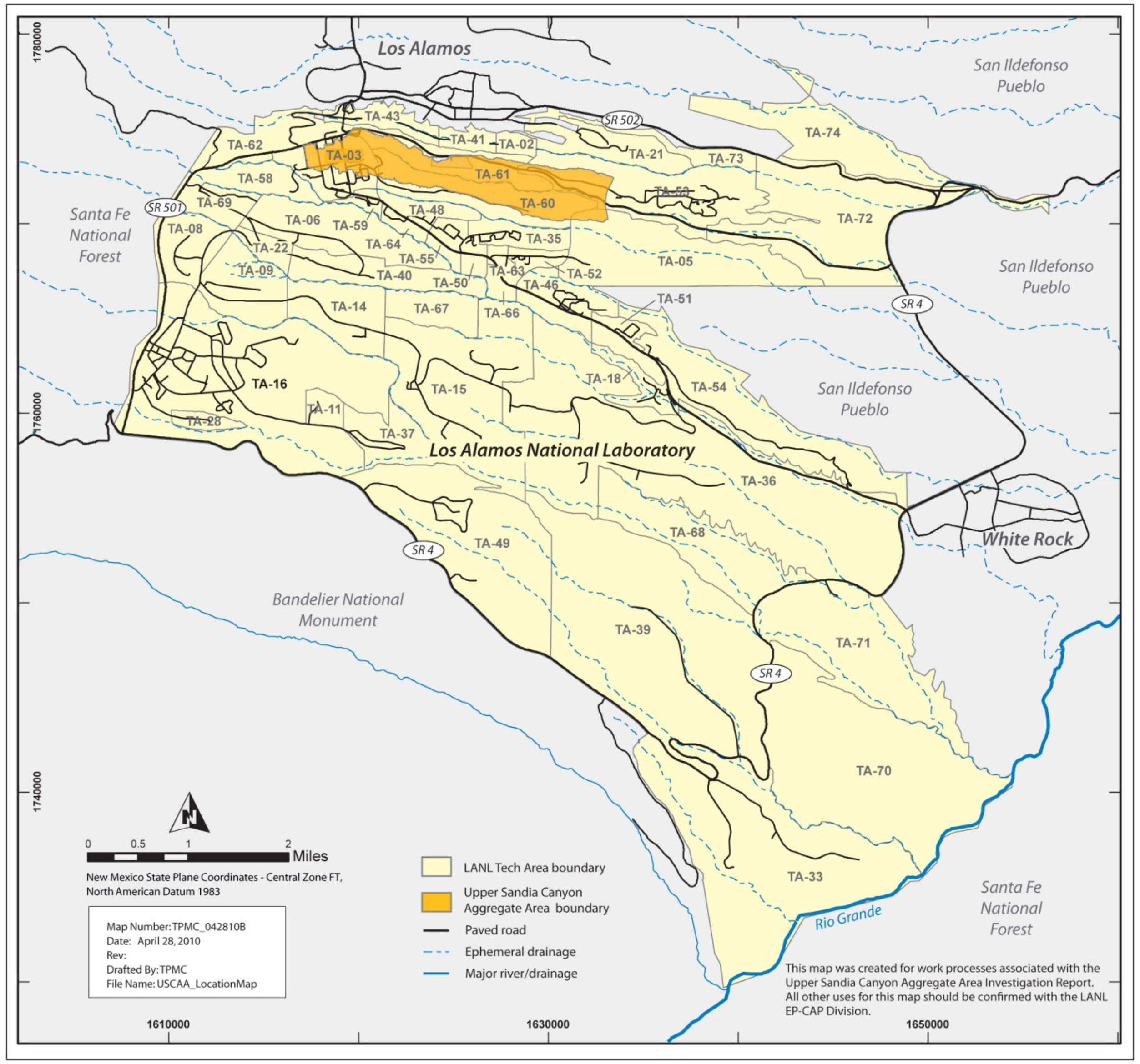


Figure 1.1-1 Location of Upper Sandia Canyon Aggregate Area with respect to Laboratory TAs

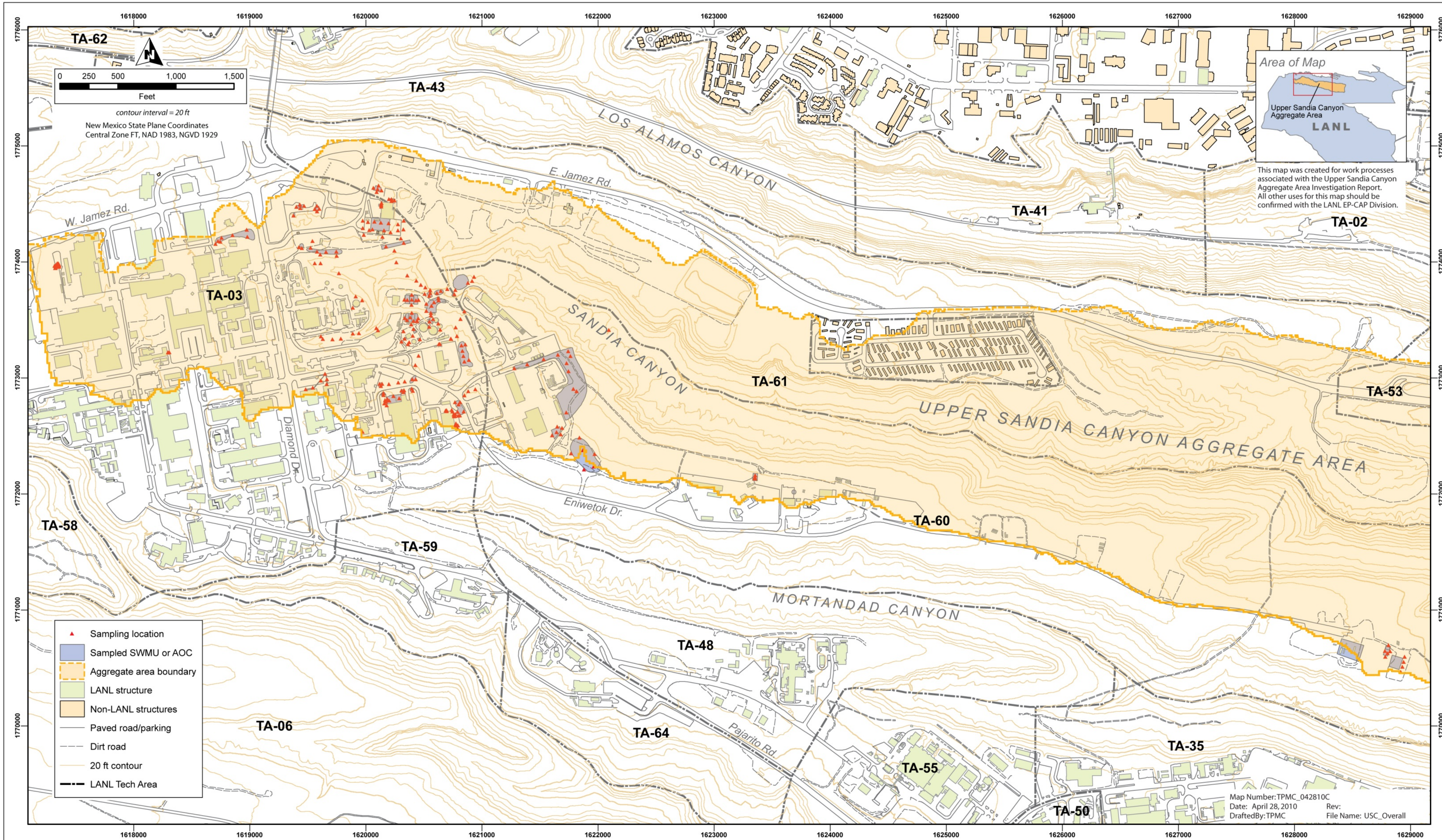


Figure 2.1-1 Location of Upper Sandia Canyon Aggregate Area

Bandelier Tuff	Tshirege Member (Qbt)	Qbt 4	Ash-Flow Units
		Qbt 3	
		Qbt 2	
		Qbt 1v	
		Qbt 1g	
		Tsankawi Pumice Bed	
Cerro Toledo Interval (Qct)		Volcaniclastic Sediments and Ash-Falls	
Bandelier Tuff	Otowi Member (Qbo)	Ash-Flow Units	
		Guaje Pumice Bed (Qbog)	
Puye Formation (Tp)	Fanglomerate	Fanglomerate Facies includes sand, gravel, conglomerate, and tuffaceous sediments	
	Basalt and Andesite	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 (formerly called the “Chaquehui Formation” by Purtymun 1995, 045344)	
	Basalt		
	Coarse Sediments		
	Basalt		
	Coarse Sediments		
	Basalt		
	Coarse Sediments		
	Arkosic clastic sedimentary deposits	Undivided Santa Fe Group (includes Chamita[?] and Tesuque Formations)	

Adapted from (LANL 1999, 064617).

Figure 2.2-1 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau

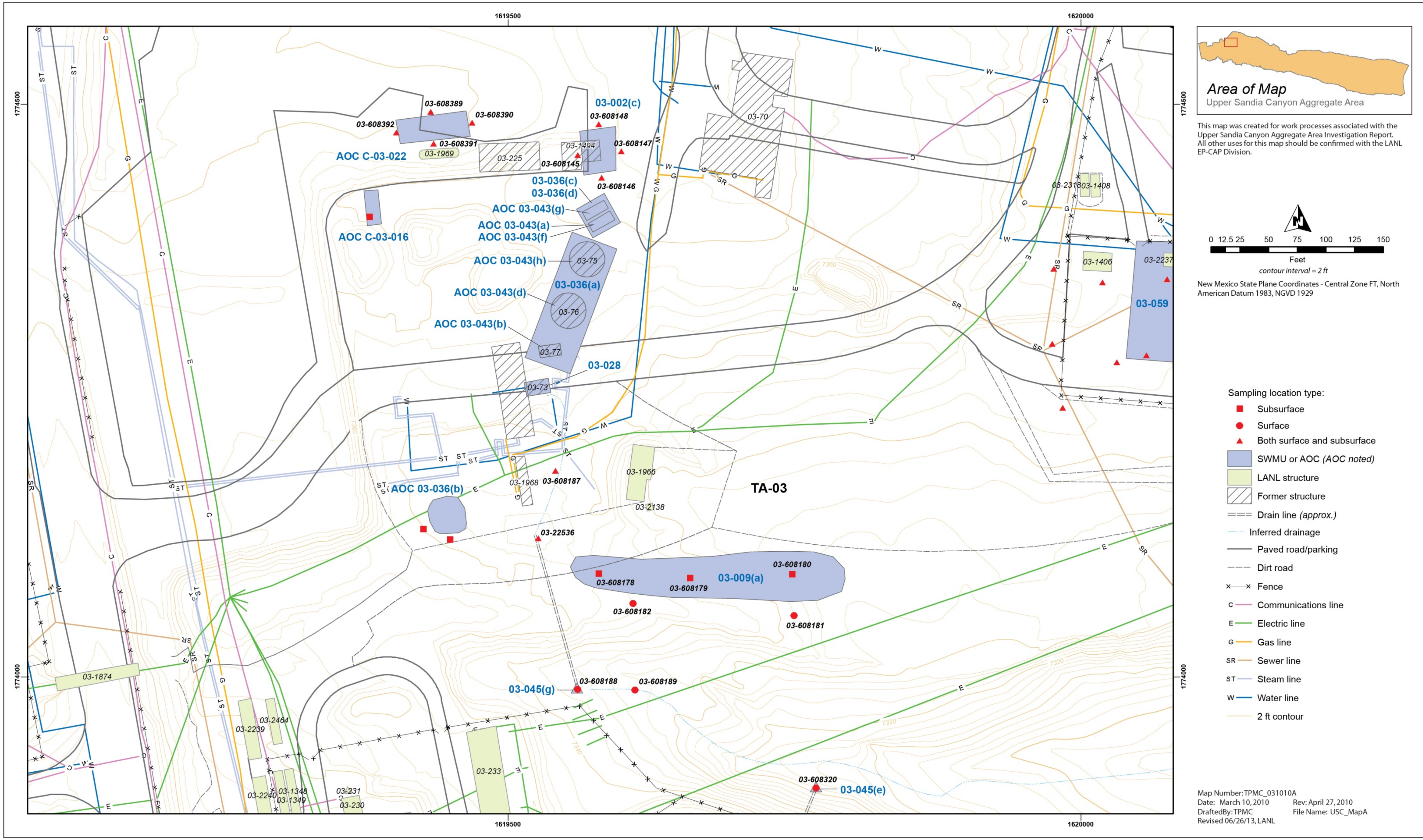


Figure 6.2-1 Site map of SWMUs 03-002(c), 03-009(a), 03-045(e), and 03-045(g) and AOC C-03-022

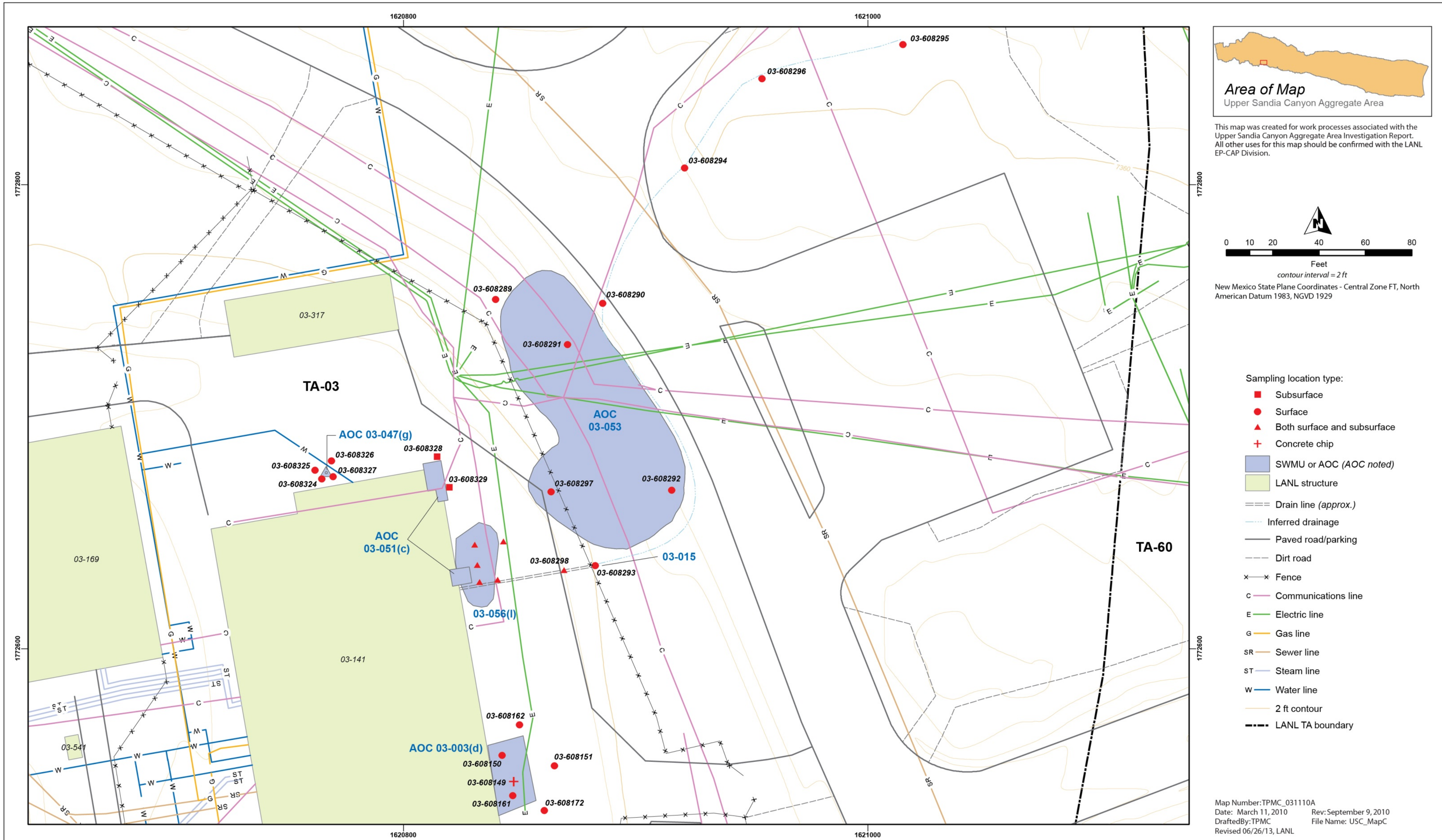


Figure 6.3-1 Site map of SWMU 03-015 and AOCs 03-003(d), 03-047(g), 03-051(c), and 03-053

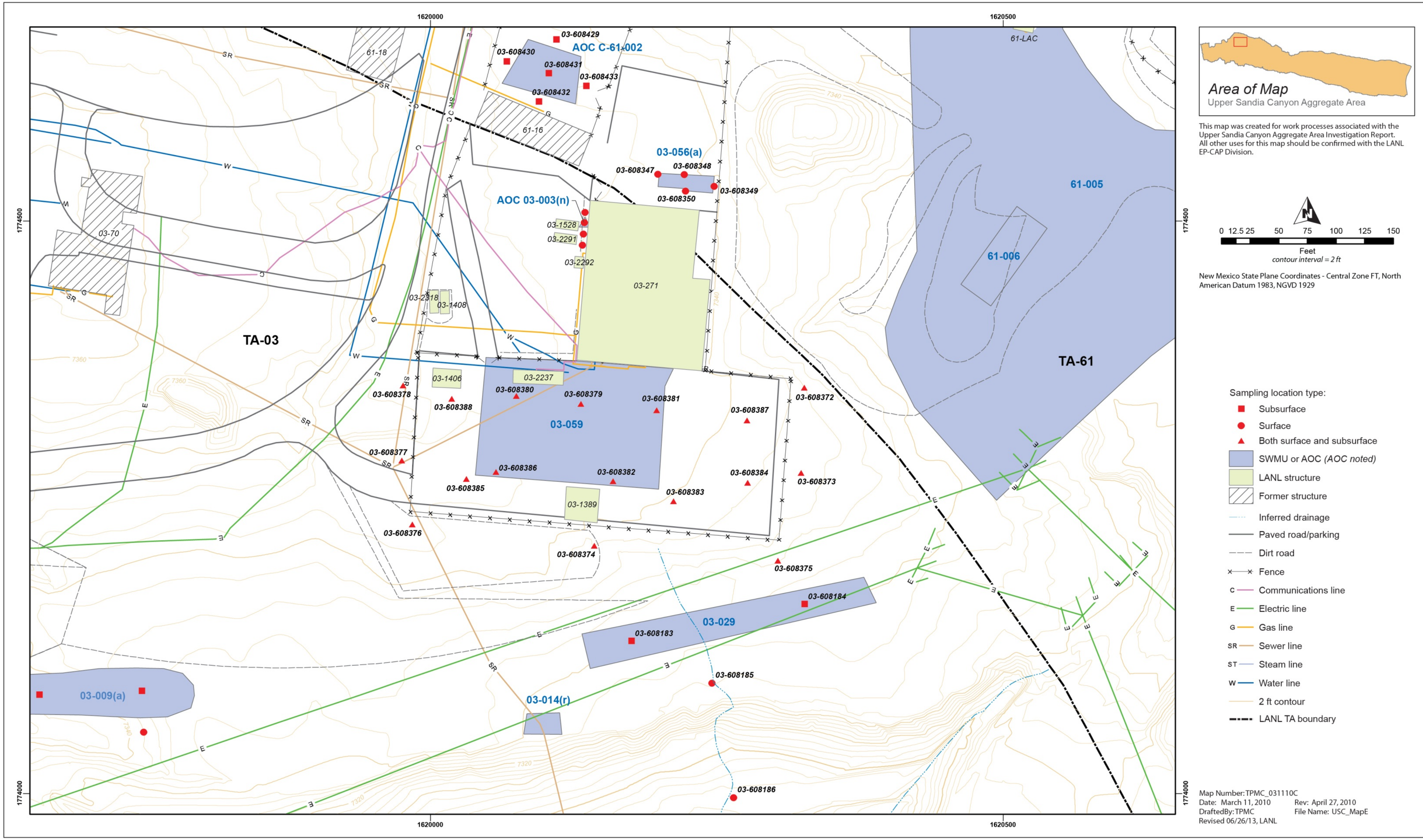


Figure 6.4-1 Site map of SWMUs 03-029, 03-056(a), and 03-059 and AOC C-61-002

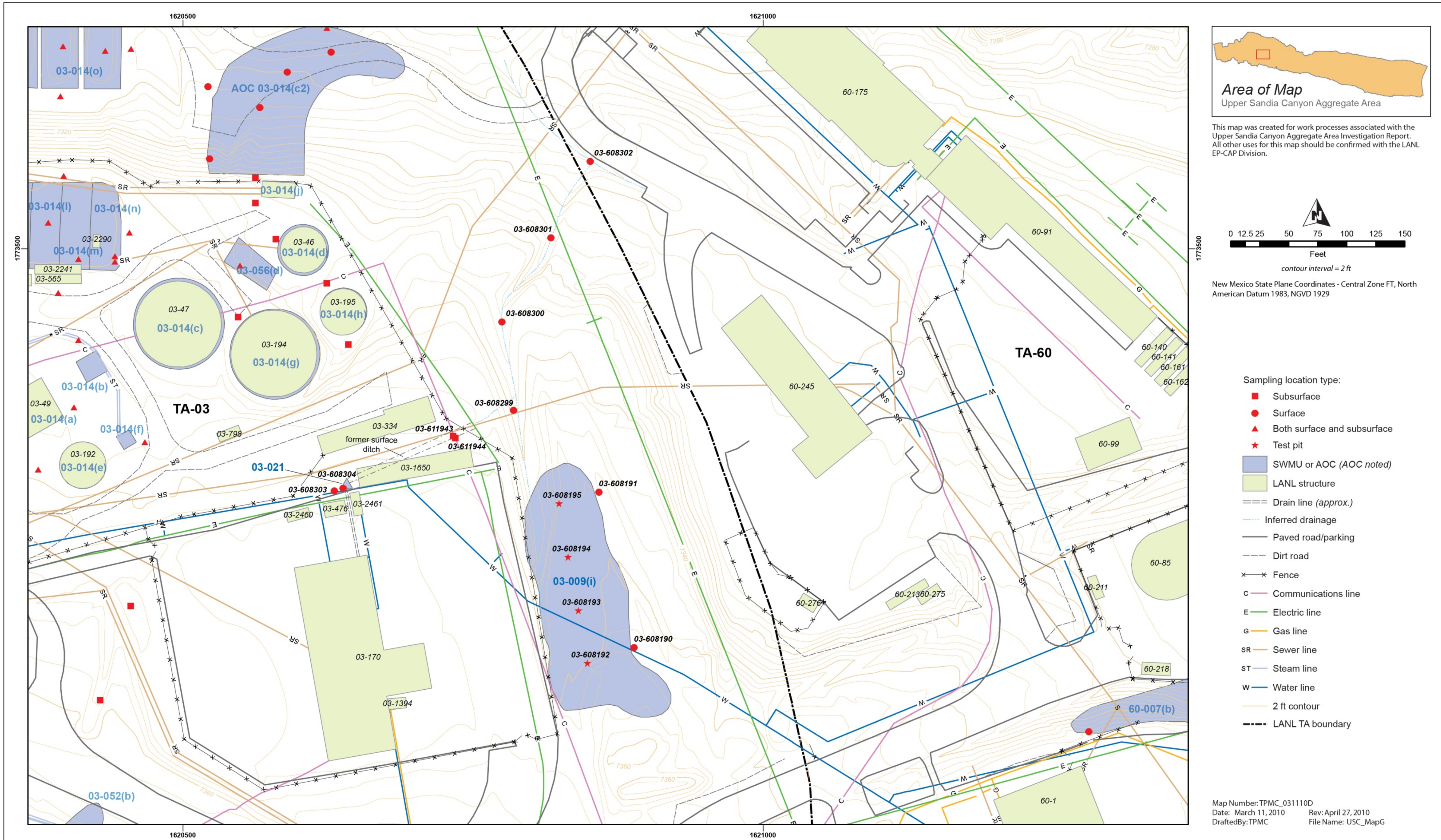


Figure 6.5-1 Site map of SWMUs 03-009(i) and 03-021

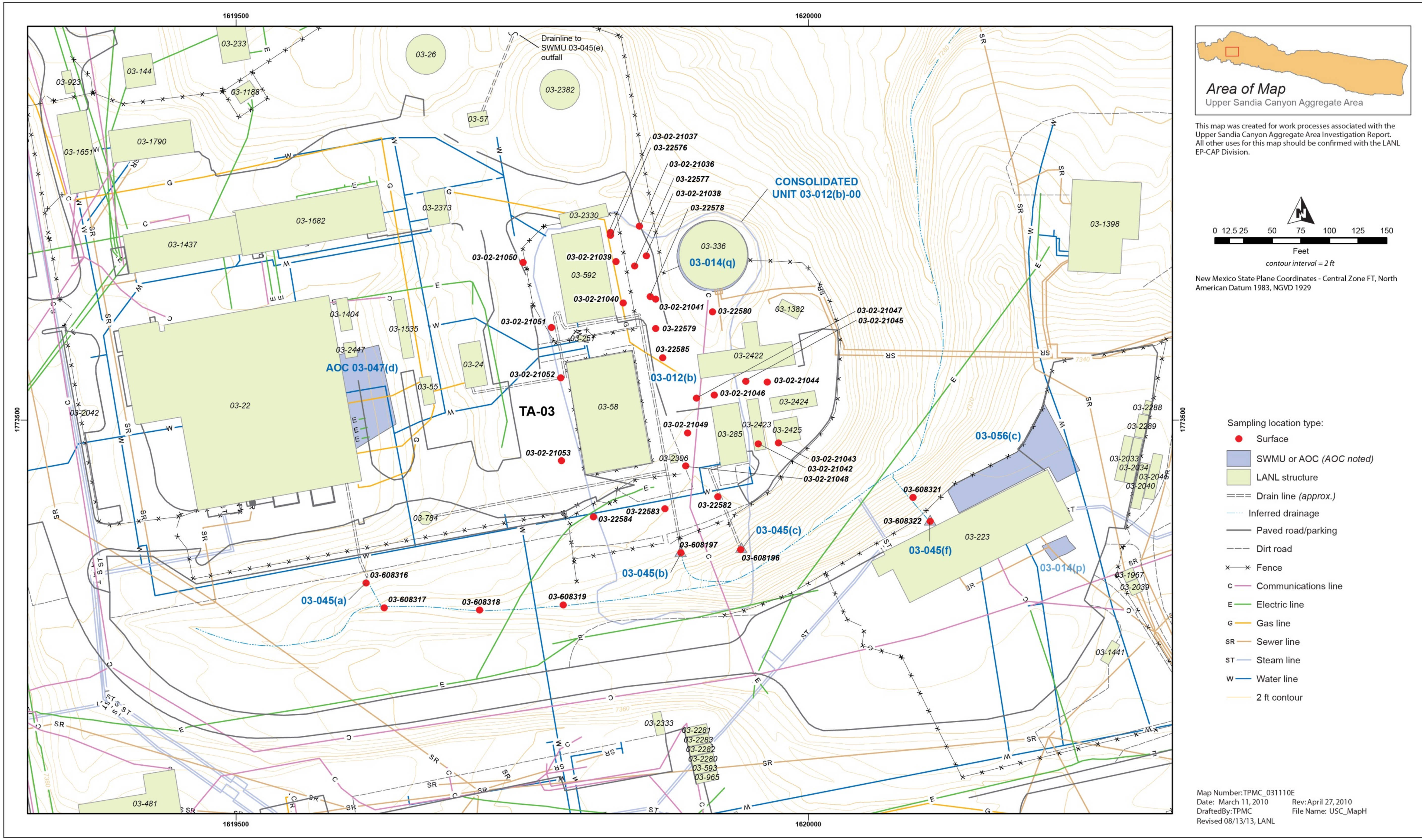


Figure 6.6-1 Site map of SWMUs 03-012(b) and 03-045(a,b,c,f)

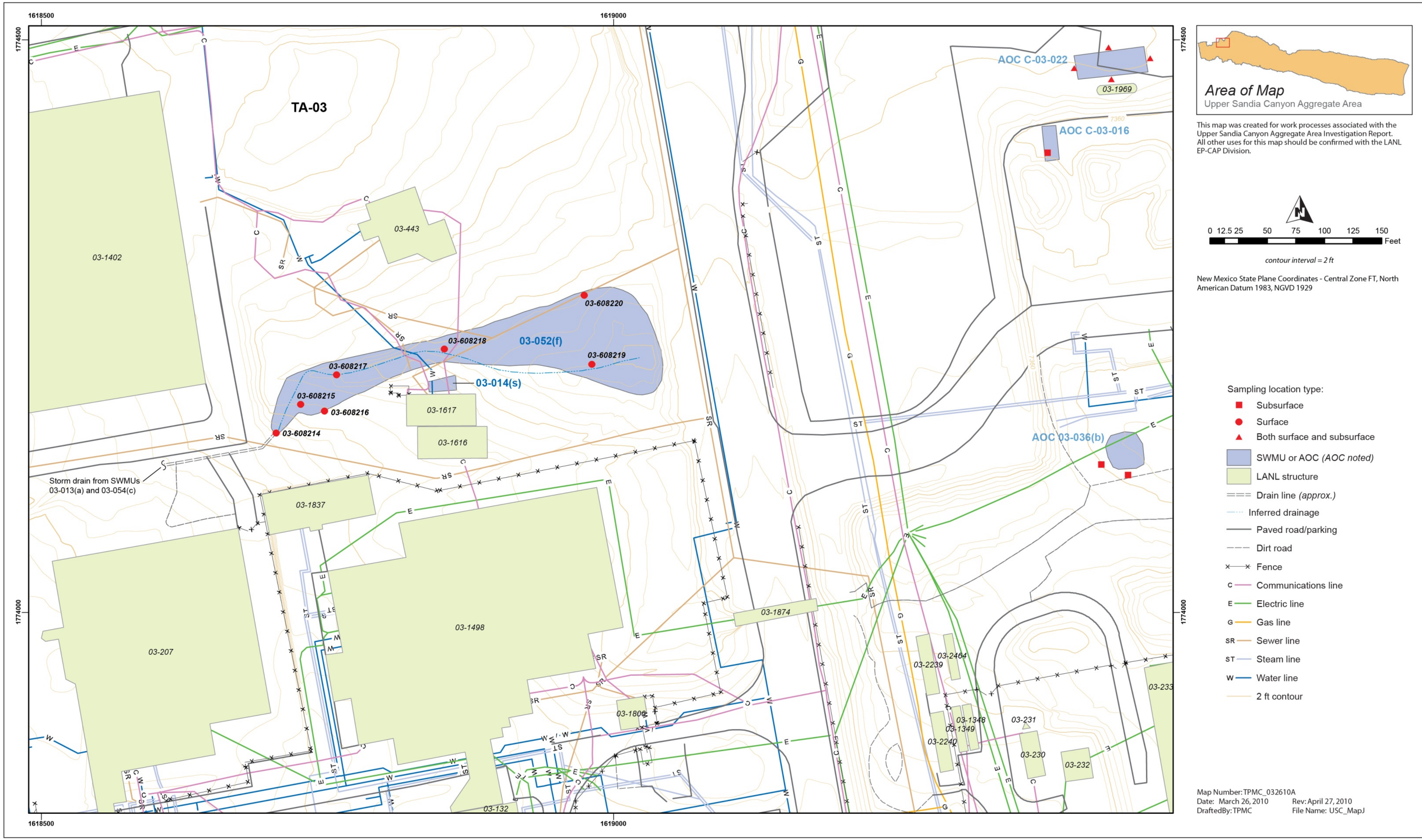


Figure 6.7-1 Site map of SWMUs 03-052(f)

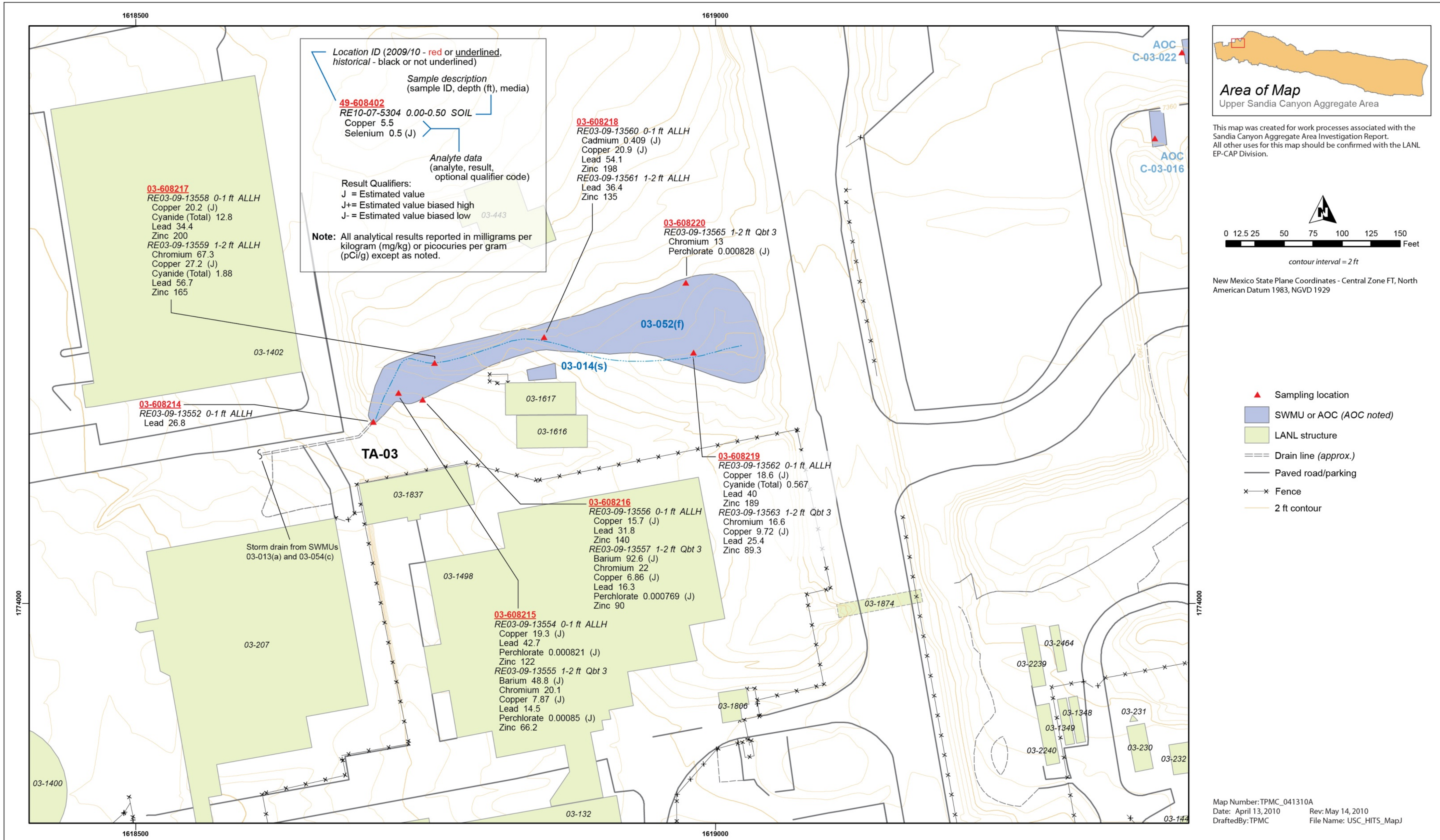


Figure 6.7-2 Inorganic chemical concentrations detected or detected above BVs at SWMU 03-052(f)

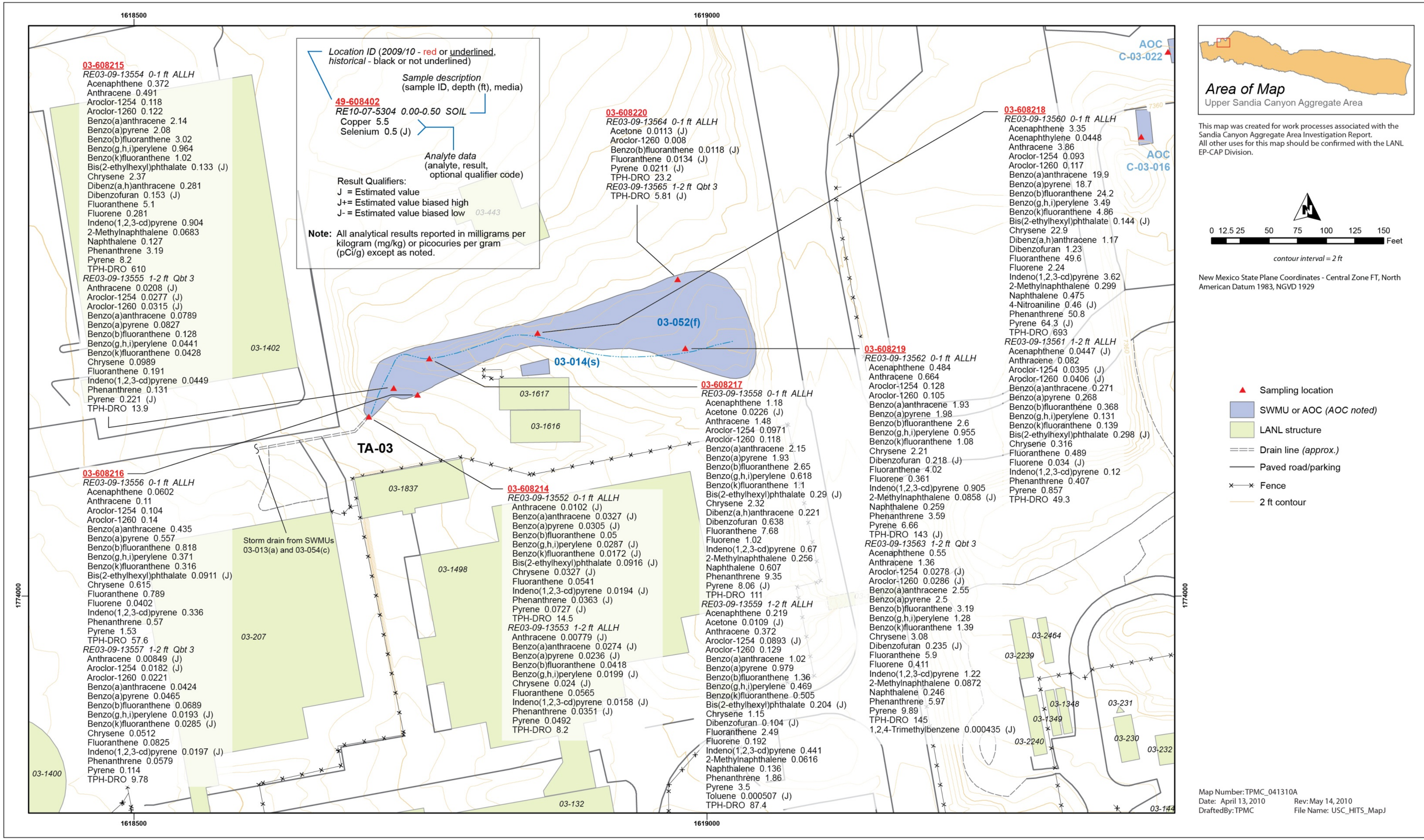


Figure 6.7-3 Organic chemical concentrations detected at SWMU 03-052(f)

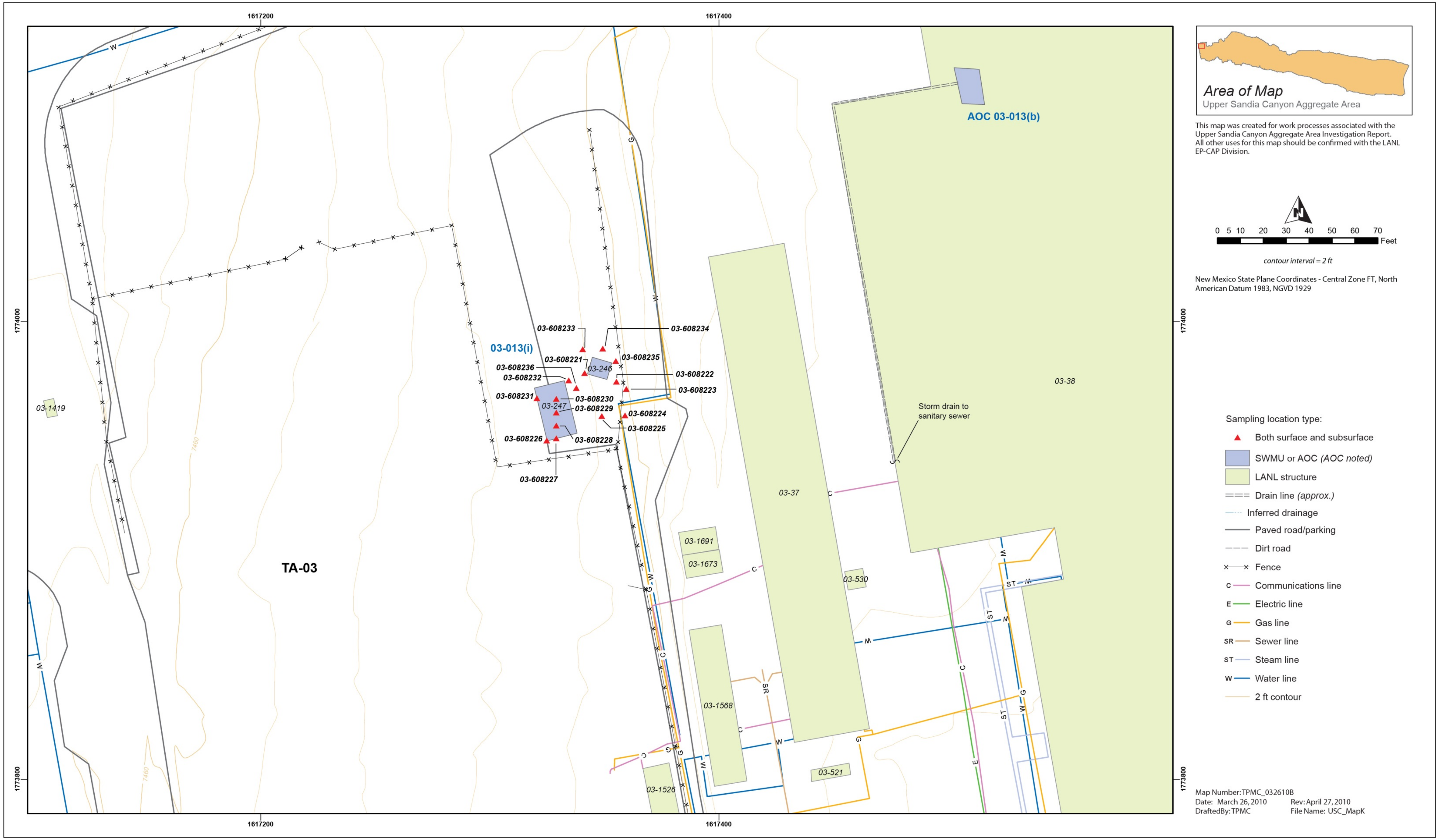


Figure 6.8-1 Site map of SWMU 03-013(i)

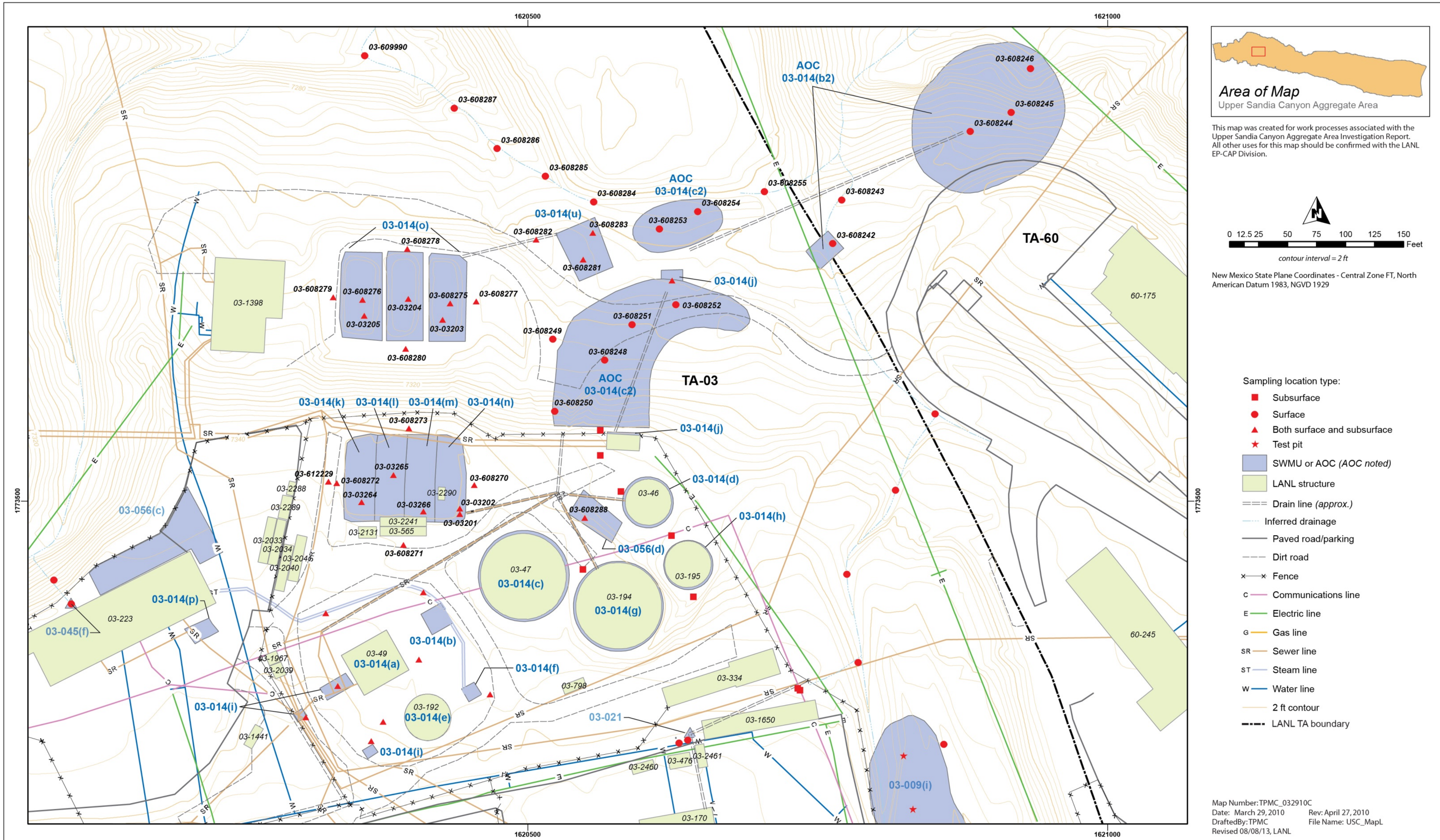


Figure 6.9-1 Site map of SWMUs 03-014 (k–o, u) and 03-056(d) and AOCs 03-014(b2) and 03-014(c2)

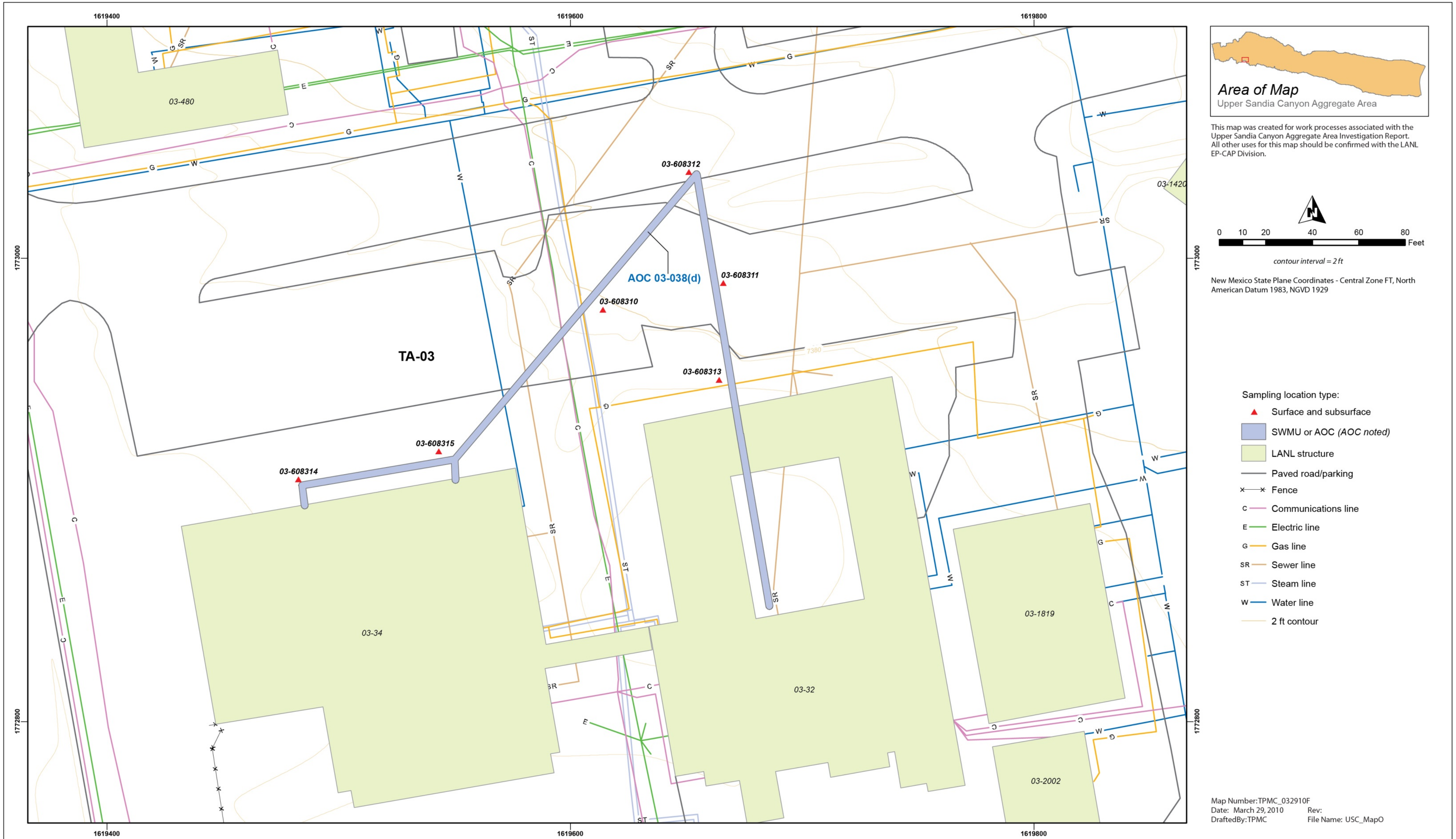


Figure 6.12-1 Site map of AOC 03-038(d)

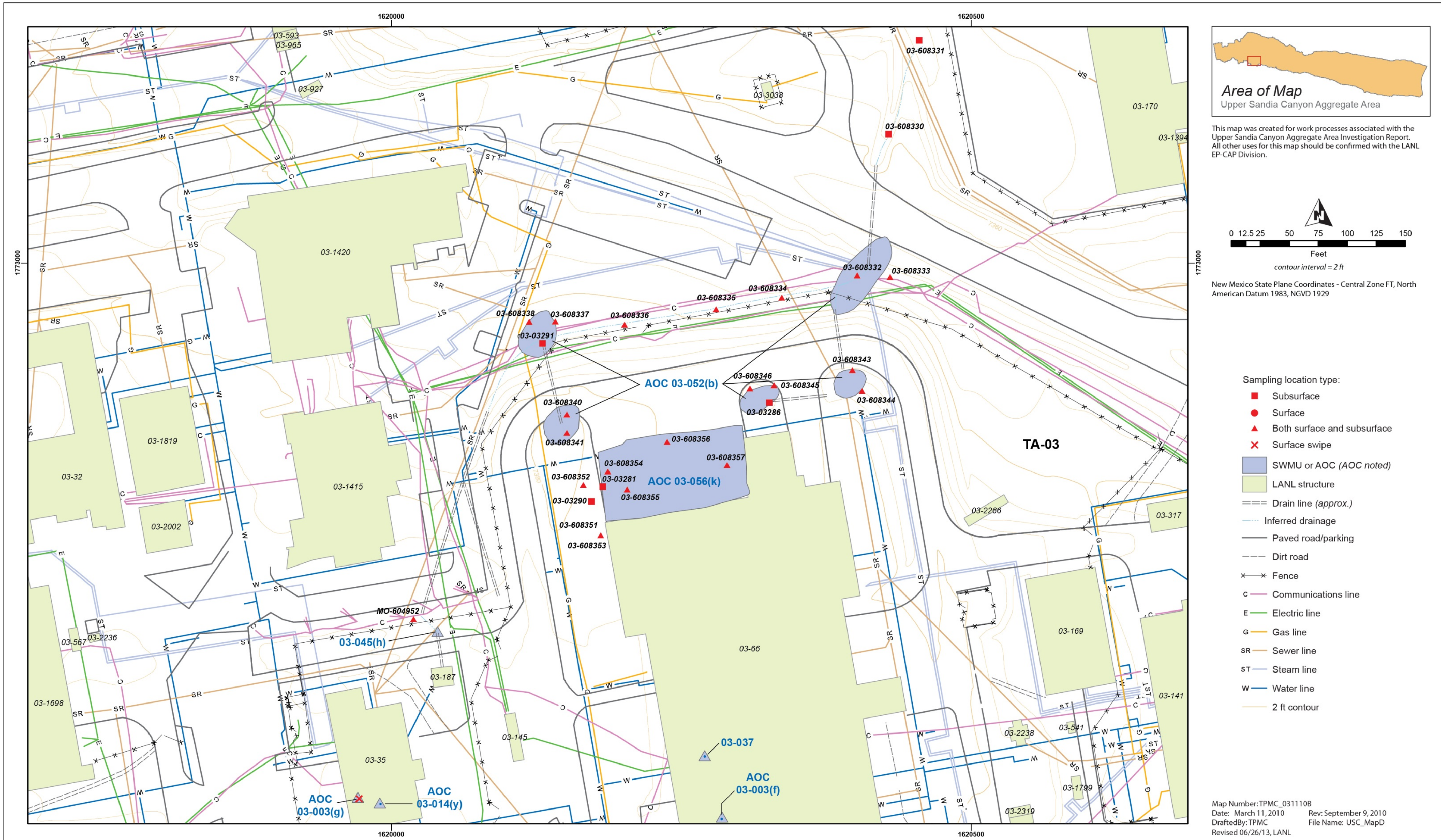


Figure 6.16-1 Site map of SWMU 03-045(h) and AOCs 03-052(b) and 03-056(k)

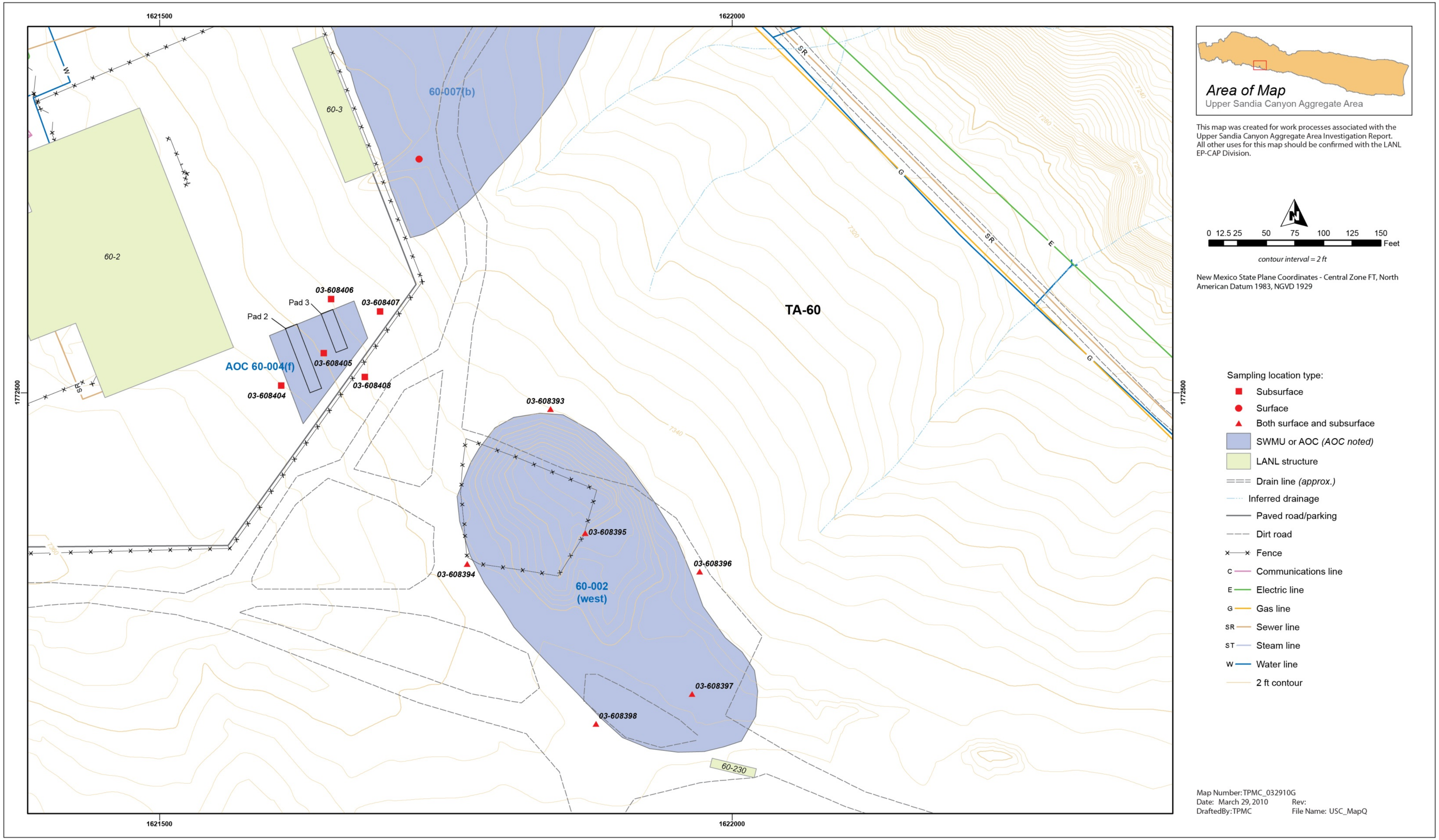


Figure 7.2-1 Site map of SWMU 60-002 (West) and AOC 60-004(f)

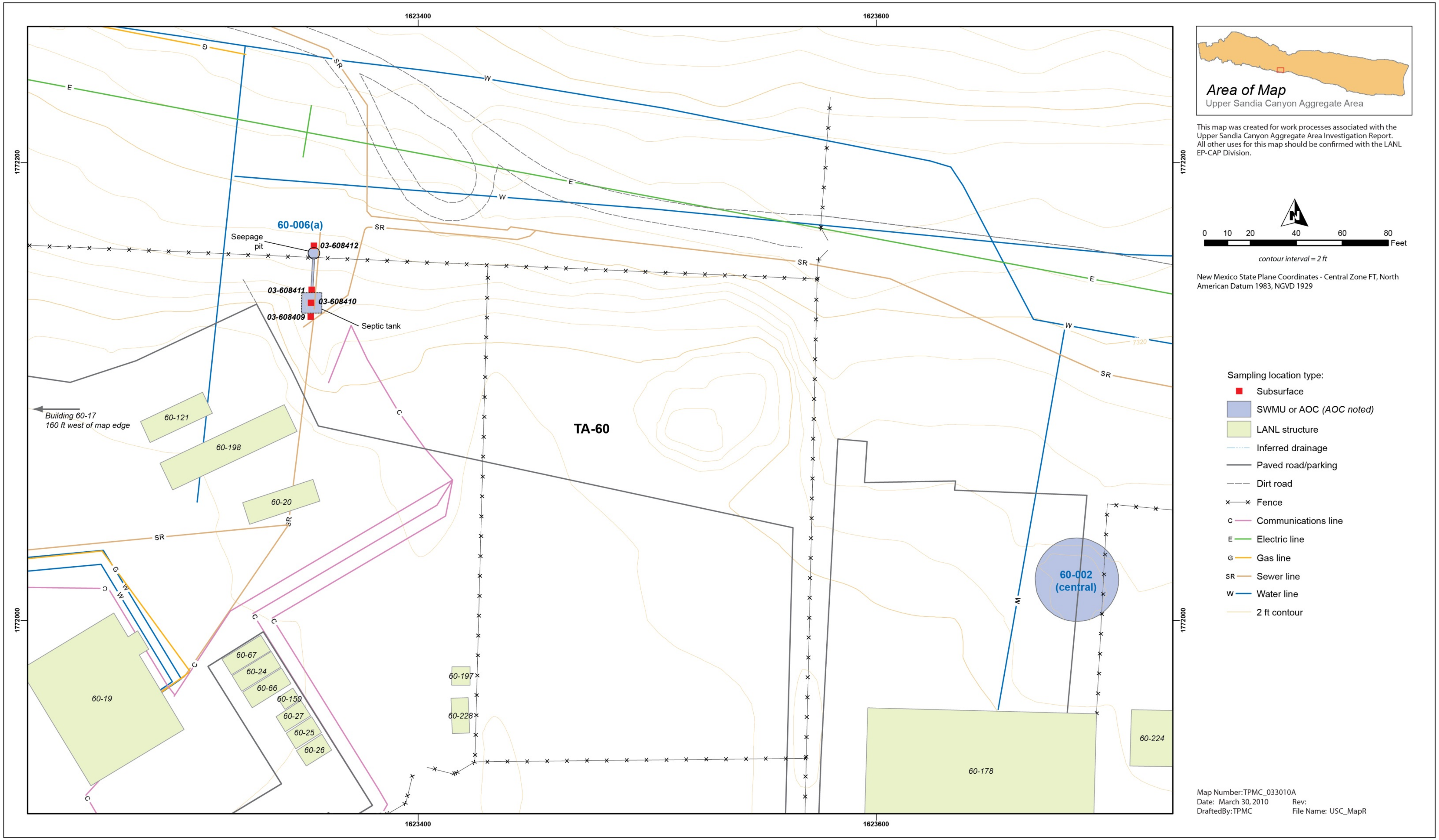


Figure 7.2-2 Site map of SWMUs 60-002 (Central) and 60-006(a)

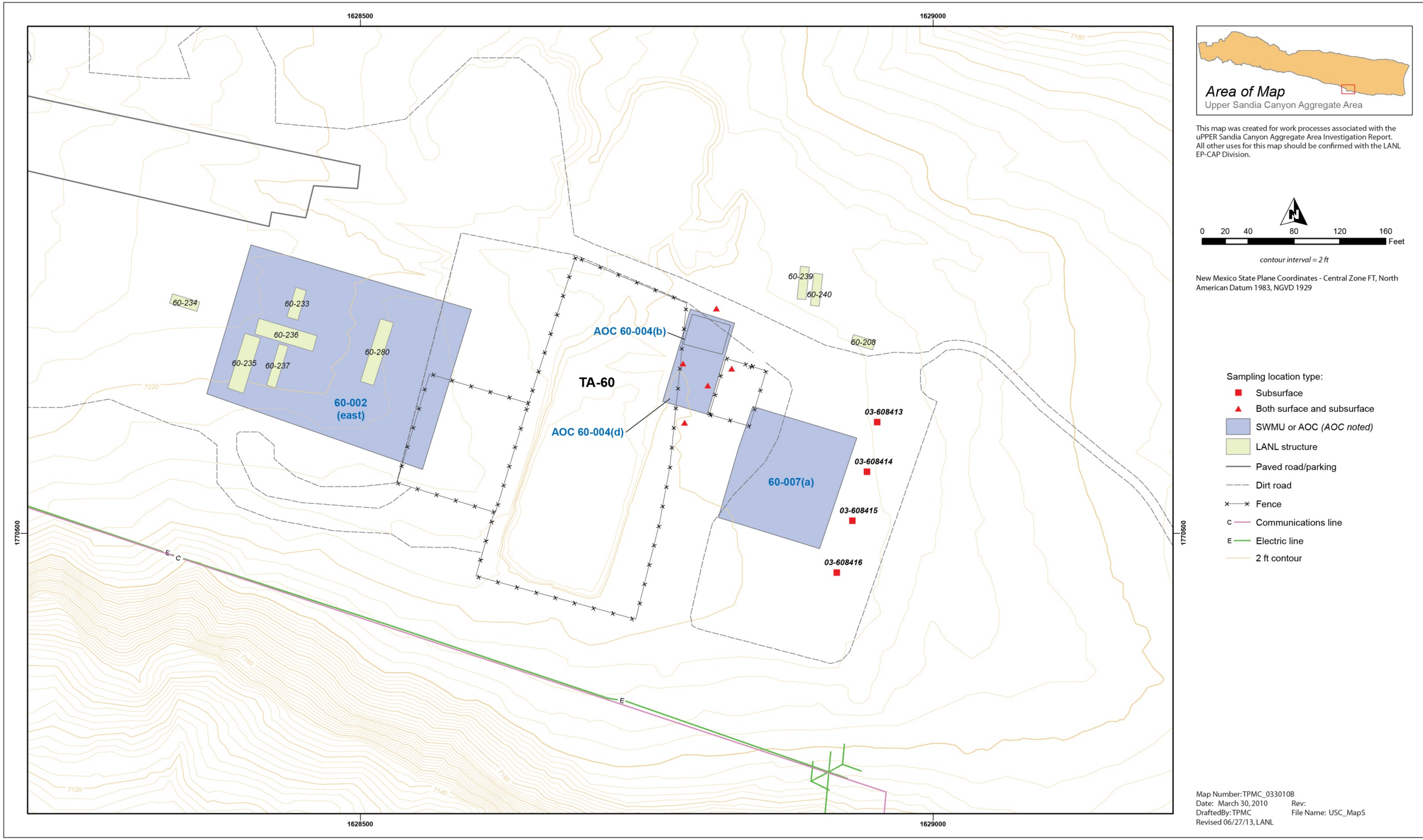


Figure 7.2-3 Site map of SWMUs 60-002 (East) and 60-007(a)

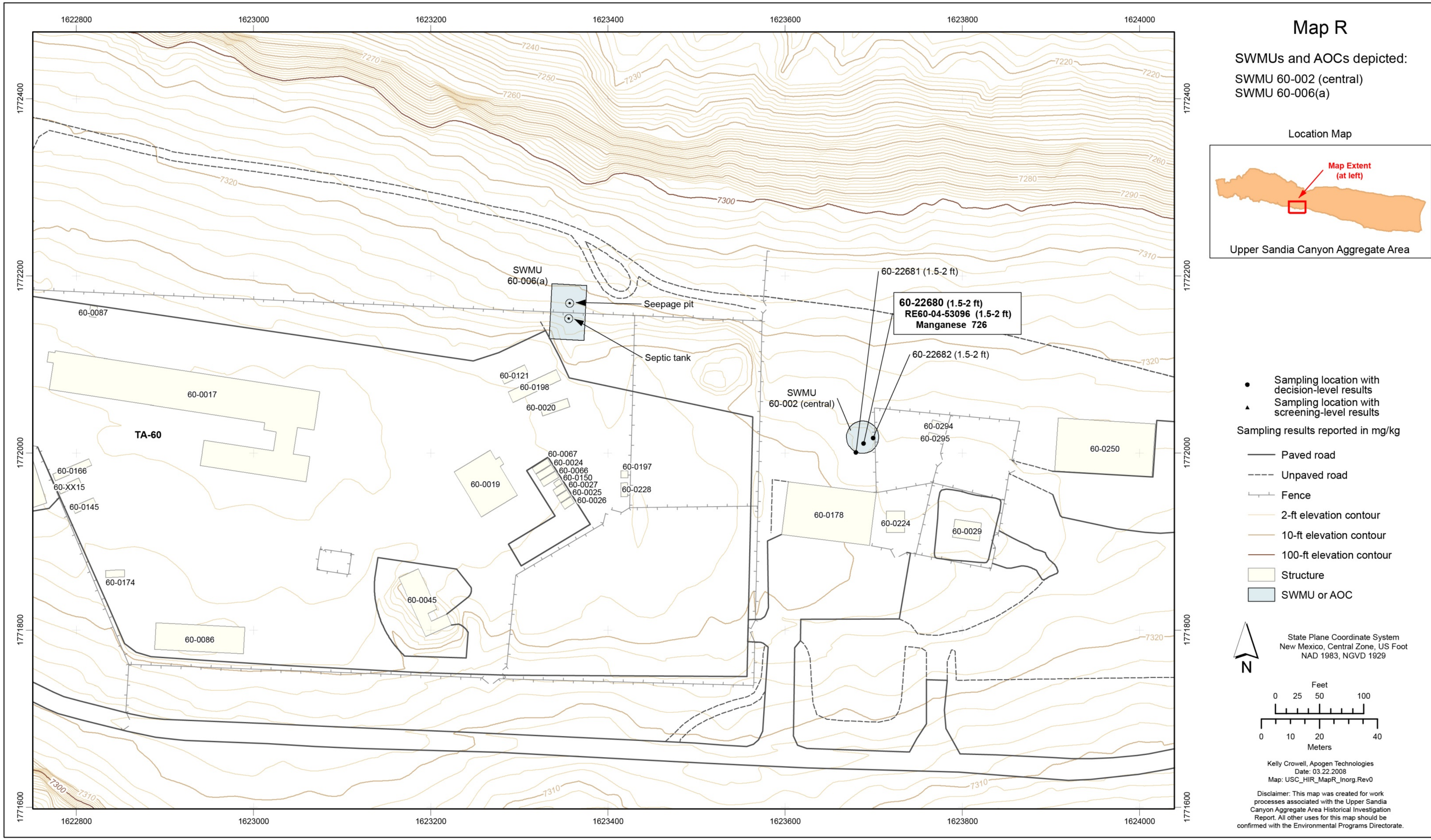


Figure 7.2-4 Inorganic chemical concentrations detected or detected above BVs at SWMU 60-002 (Central)

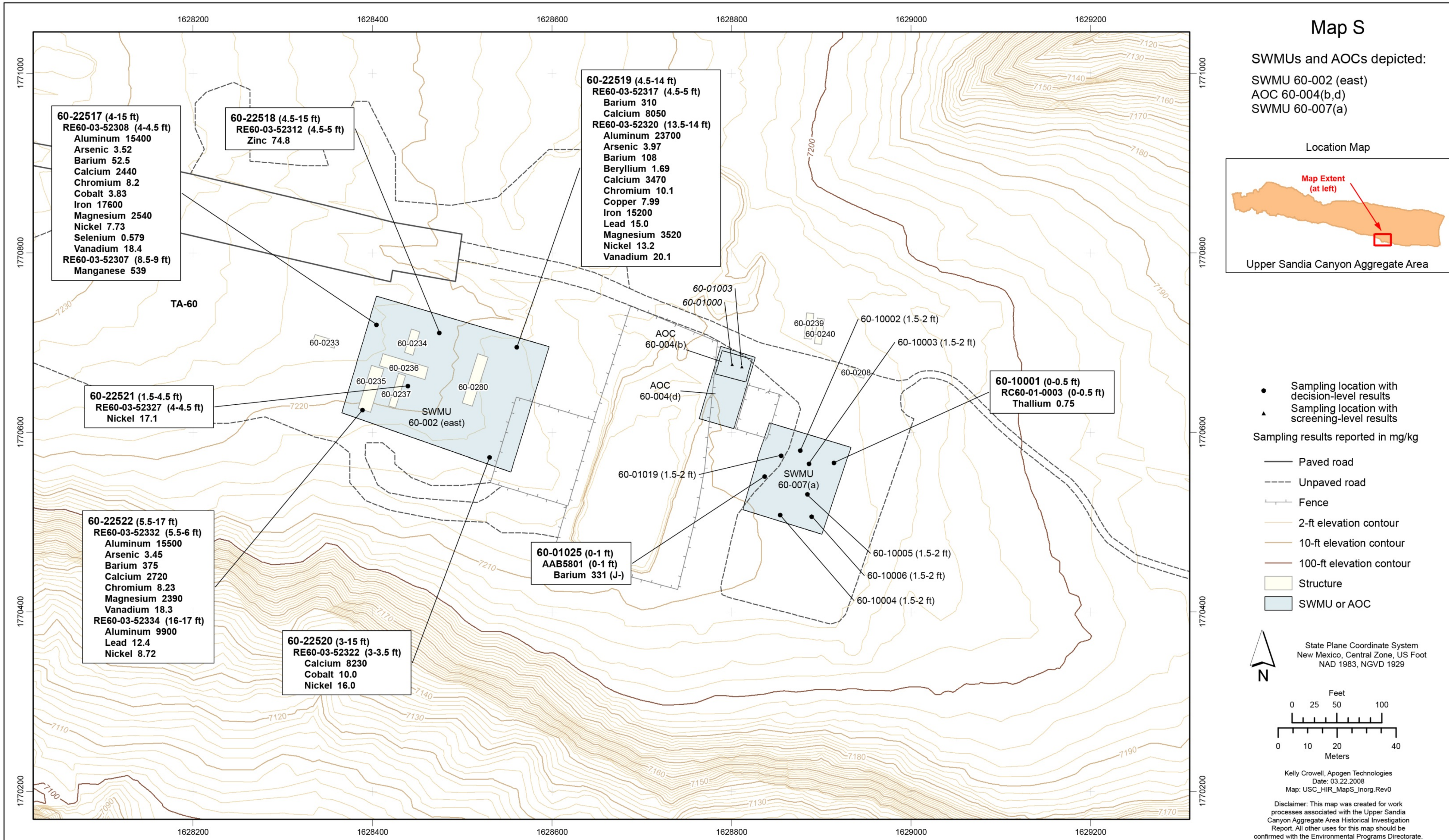


Figure 7.2-5 Inorganic chemical concentrations detected or detected above BVs at SWMU 60-002 (East)

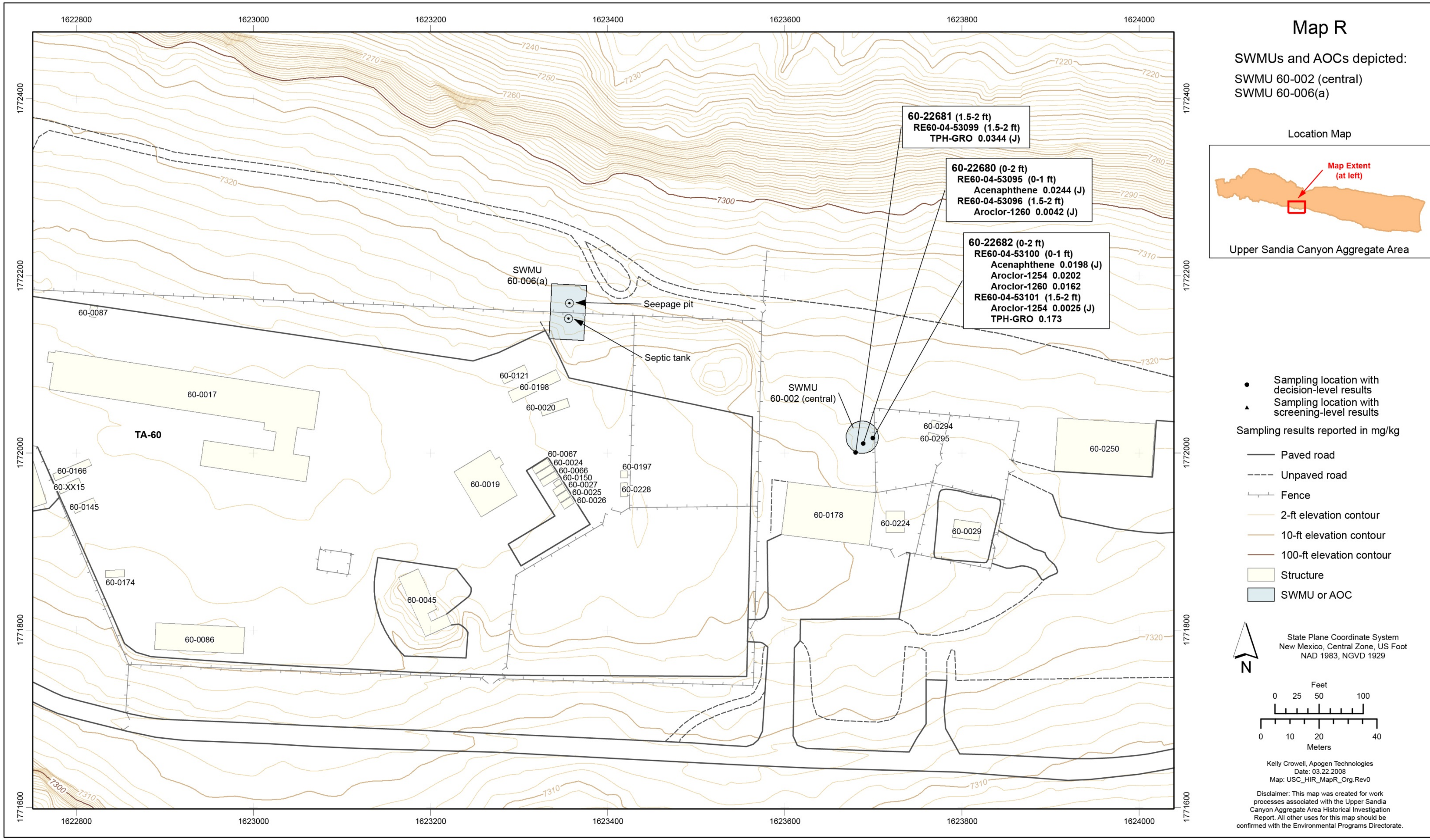


Figure 7.2-6 Organic chemical concentrations detected at SWMU 60-002 (Central)

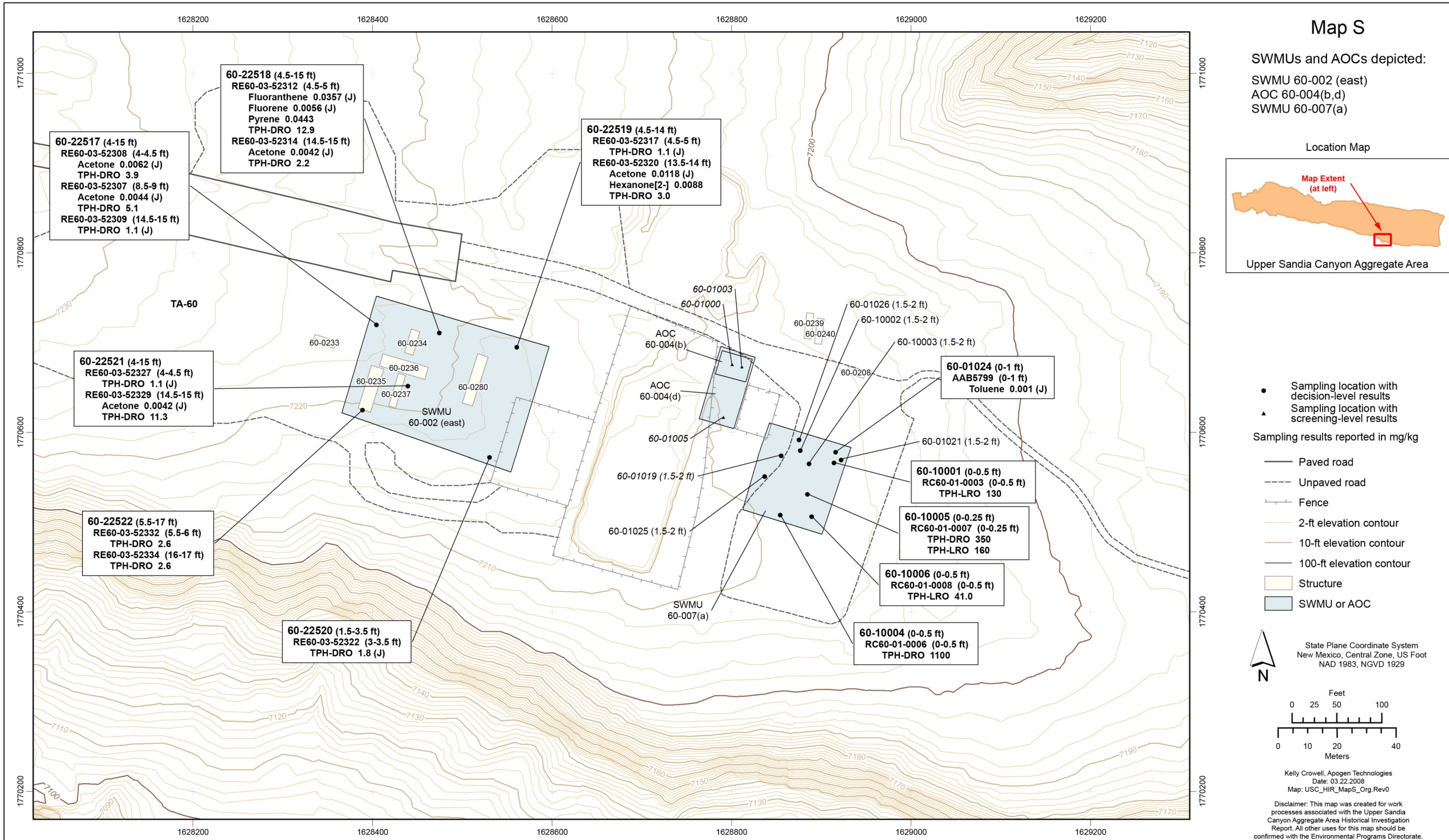


Figure 7.2-7 Organic chemical concentrations detected at SWMU 60-002 (East)

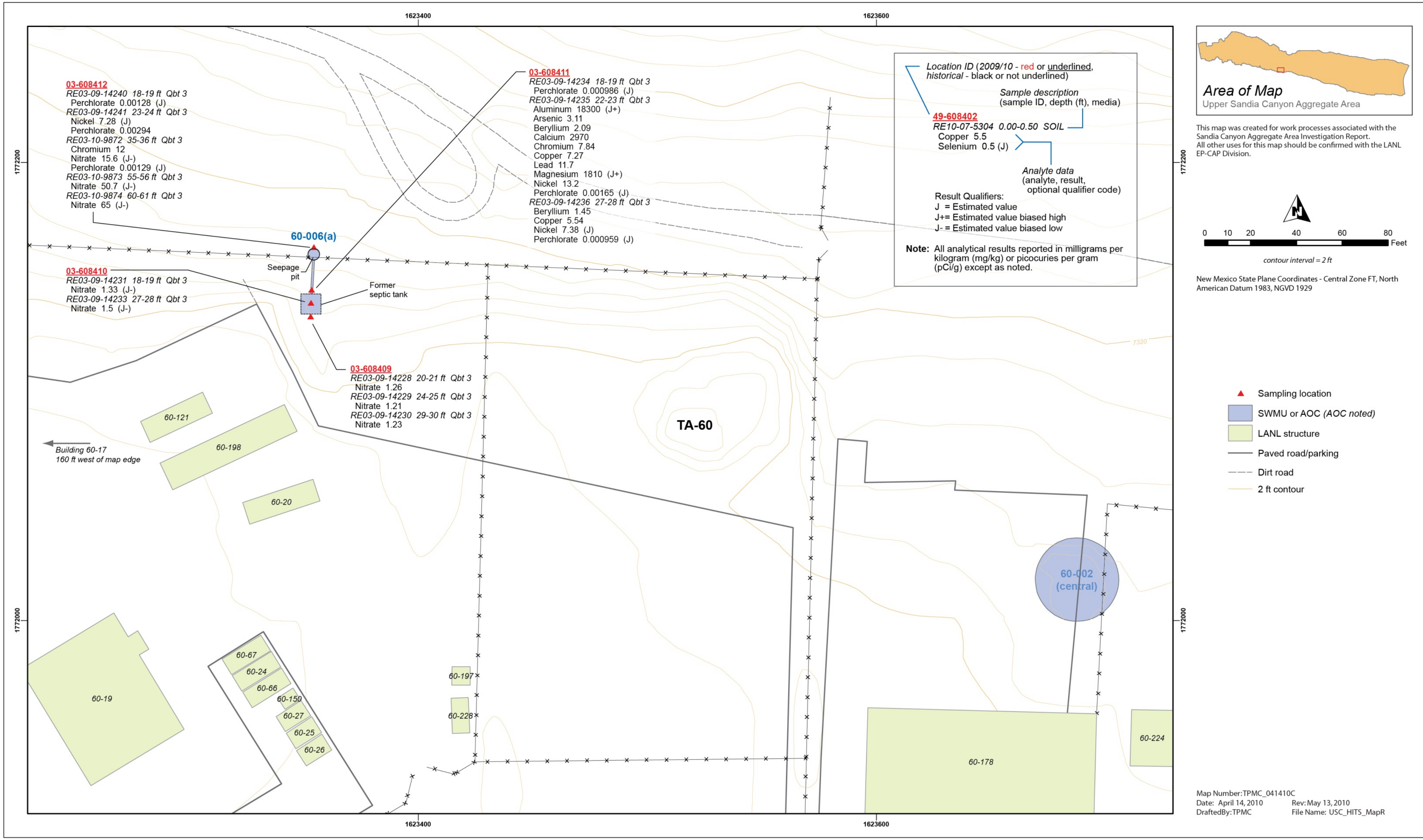


Figure 7.4-1 Inorganic chemical concentrations detected or detected above BVs at SWMU 60-006(a)

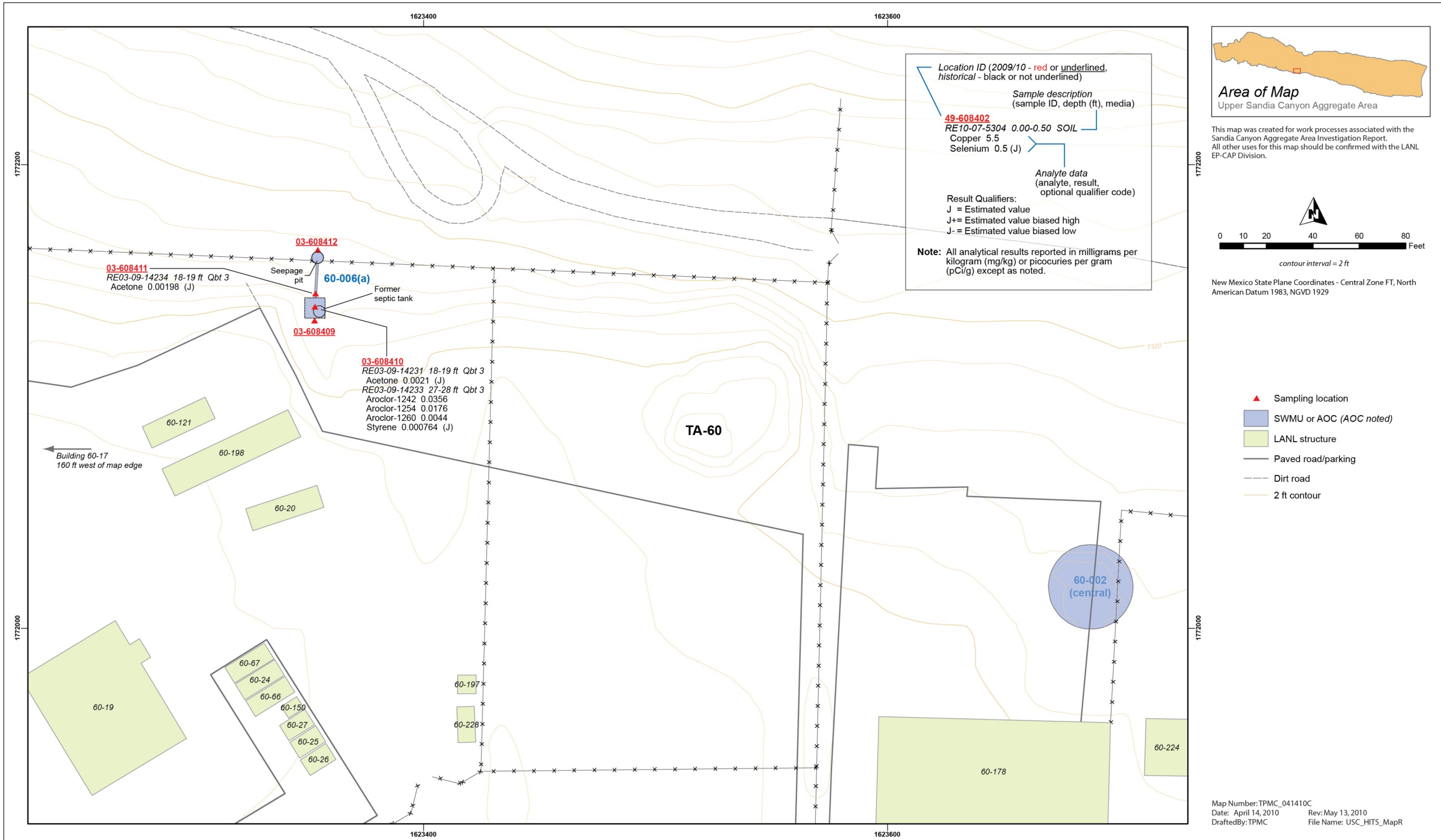


Figure 7.4-2 Organic chemical concentrations detected at SWMU 60-006(a)

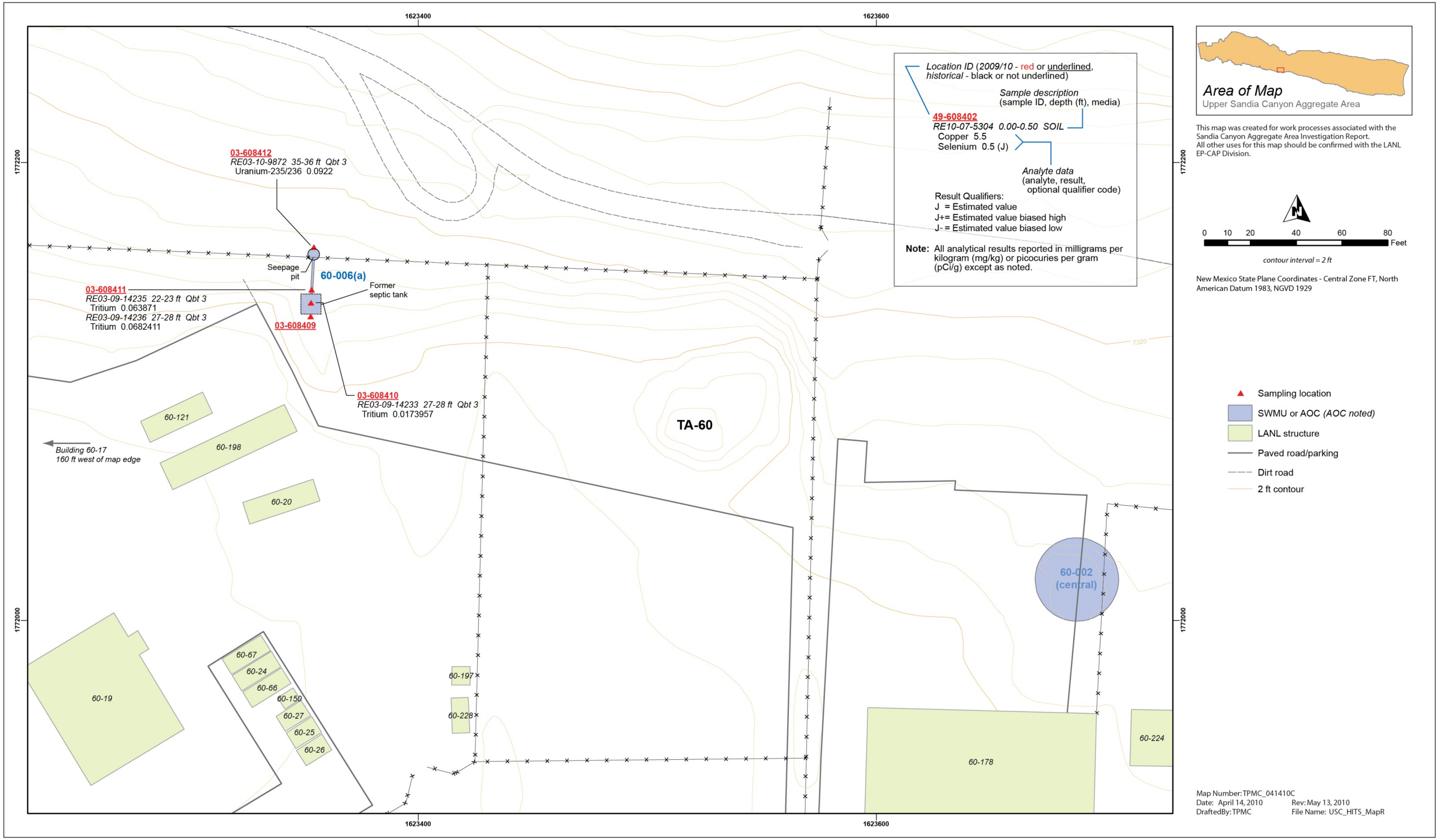


Figure 7.4-3 Radionuclides detected or detected above BVs/FVs at SWMU 60-006(a)

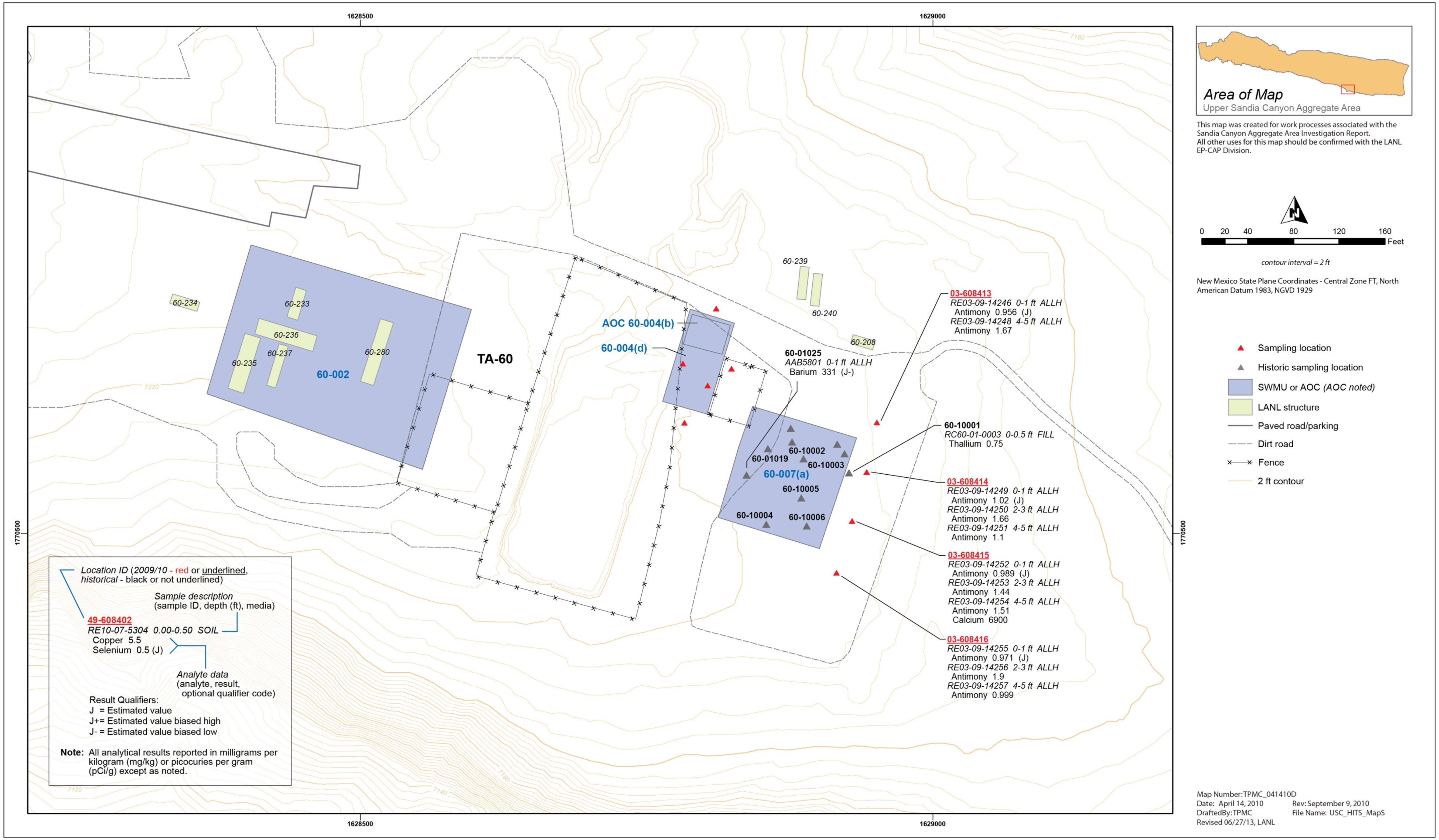


Figure 7.5-1 Inorganic chemical concentrations detected or detected above BVs at SWMU 60-007(a)

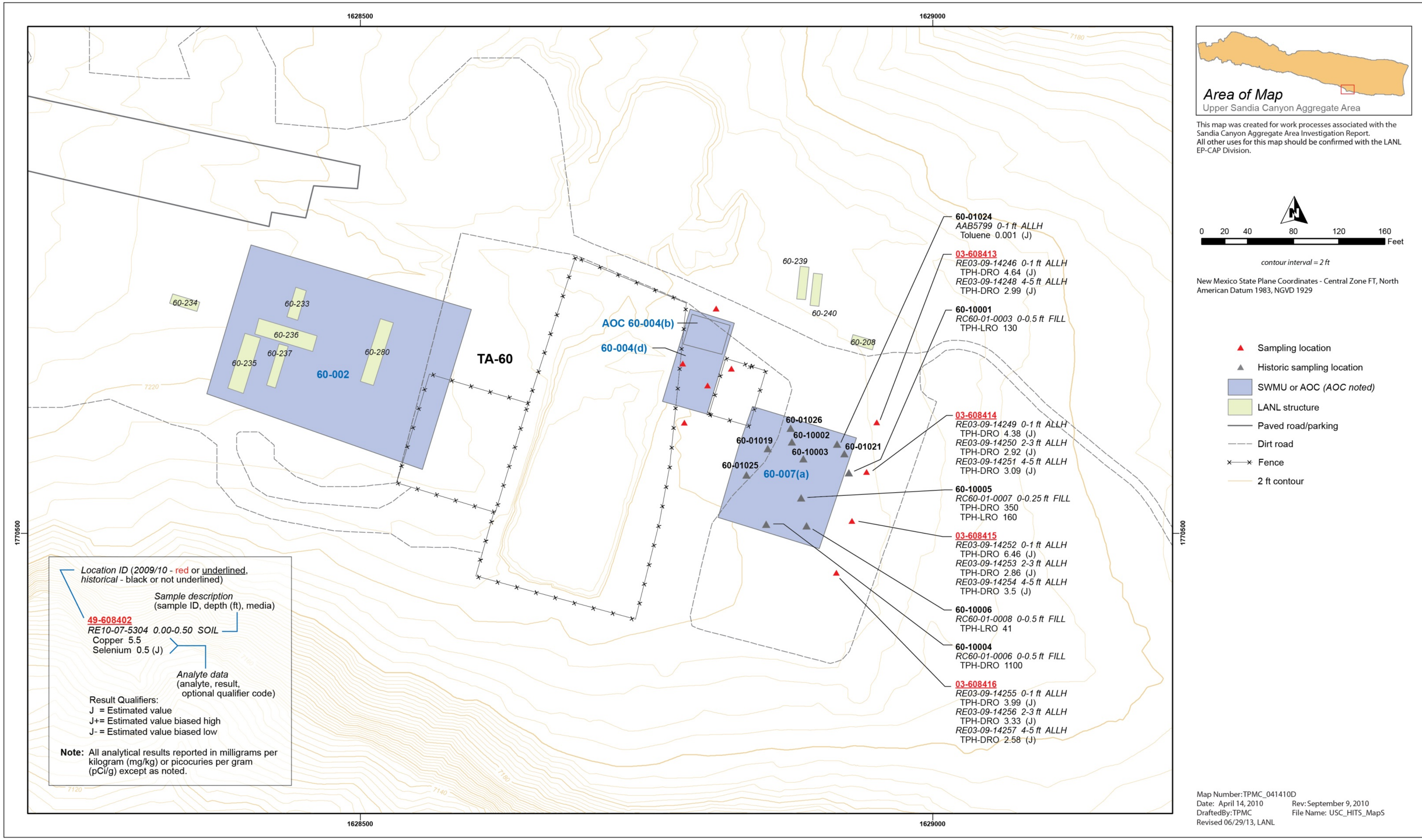


Figure 7.5-2 Organic chemical concentrations detected at SWMU 60-007(a)

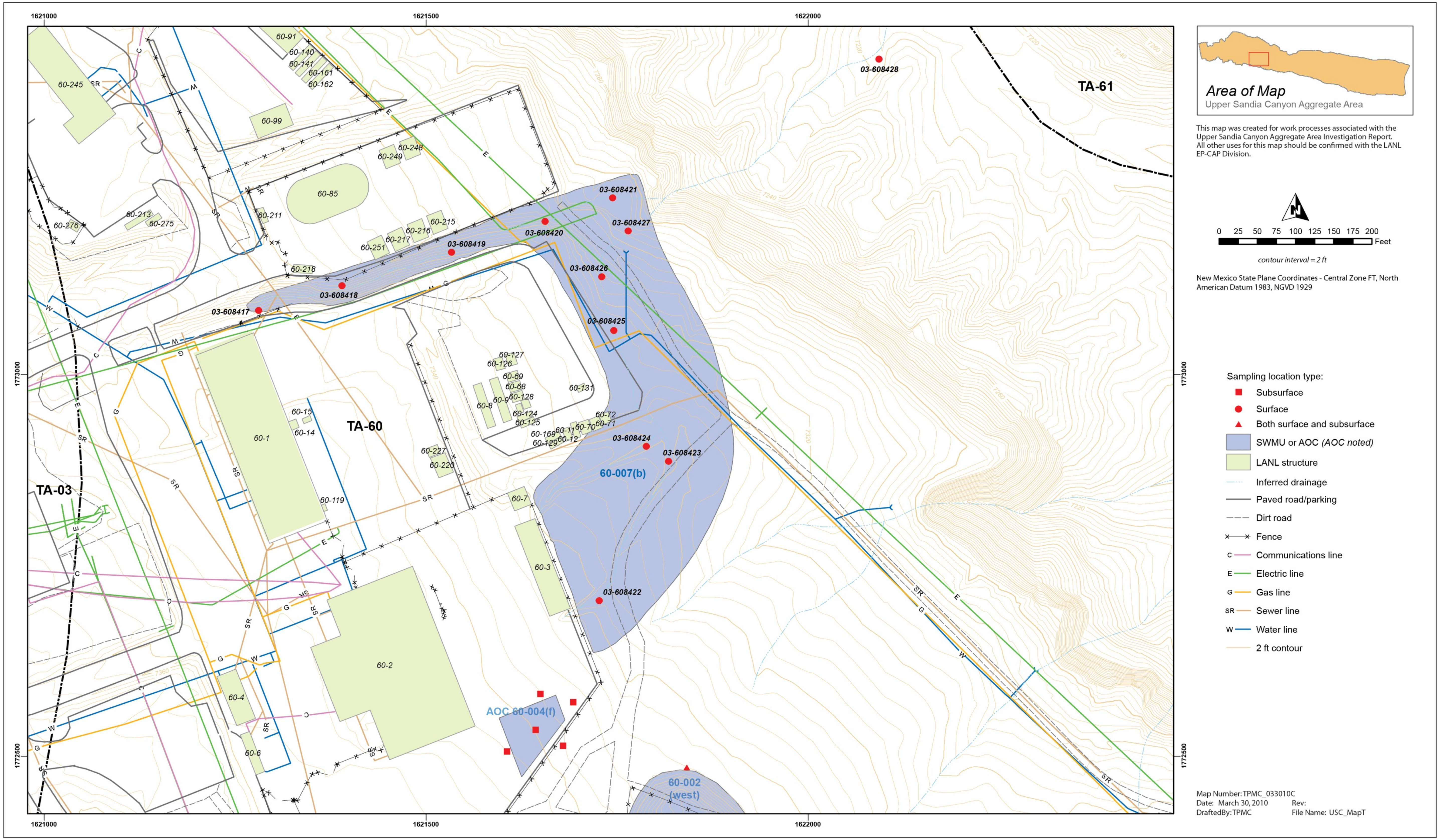


Figure 7.6-1 Site map of SWMU 60-007(b)

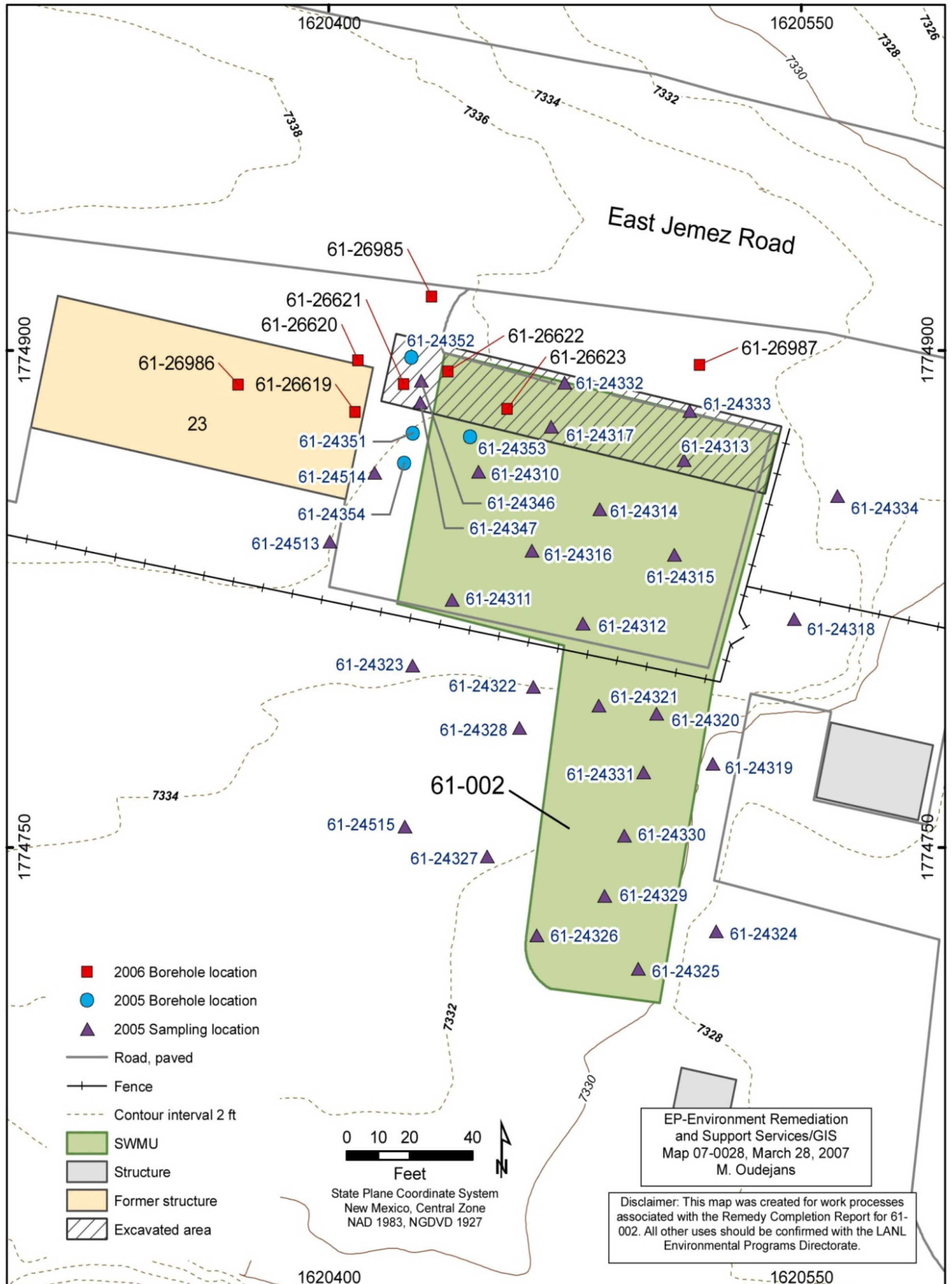


Figure 8.3-1 Site map of SWMU 61-002

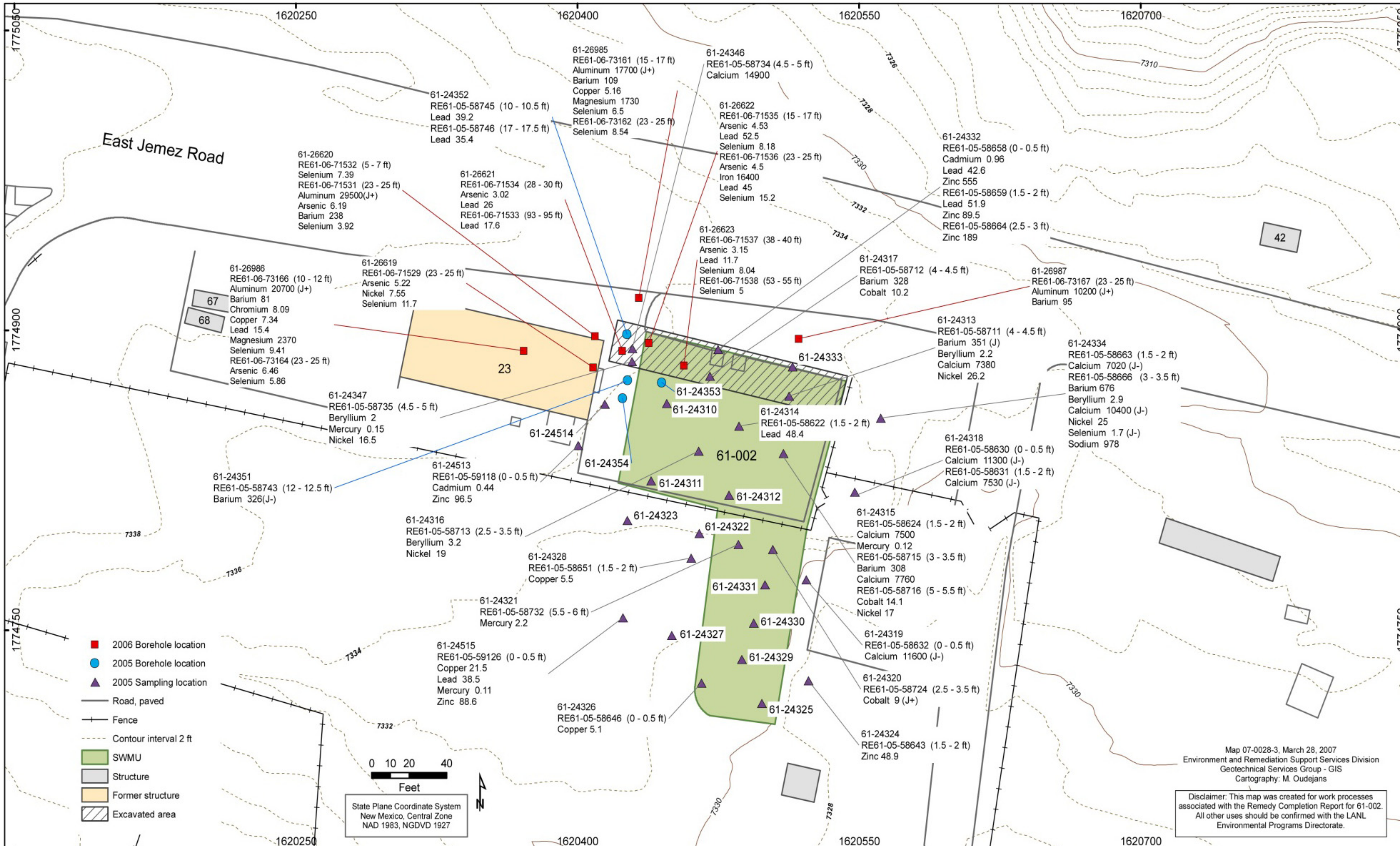


Figure 8.3-2 Inorganic chemical concentrations detected or detected above BVs at SWMU 61-002

Table 1.1-1
Sites Included in 2009 Upper Sandia Canyon Aggregate Area Investigation

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
TA-03				
	SWMU 03-002(c)	Former storage area used to store pesticides and herbicides	Sampled	Supplemental investigation report (section 6.2)
	SWMU 03-003(c)	Equipment storage area—PCB only site—used to temporarily store used dielectric oils/capacitors	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-003(d)	Transformer pad—PCB only site—a concrete pad that formerly housed transformers	Sampled	Supplemental investigation report (section 6.3)
	AOC 03-003(f)	Transformer—PCB only site—an area of potential soil contamination	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-003(g)	Transformer area—PCB only storage site	Swipes only; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-003(o)	Former non-PCB capacitor bank for Scyllac experiment	None; nature and extent per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
Consolidated Unit 03-009(a)-00	SWMU 03-009(a)	Surface disposal (soil fill) located at the canyon rim south of asphalt plant	Sampled	Supplemental investigation report (section 6.4.1)
	SWMU 03-028	Surface impoundment holding pond near asphalt plant	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-029	Landfill near rim of Sandia Canyon south of building 03-0271	Sampled	Supplemental investigation report (section 6.4.2)
	SWMU 03-036(a)	Potential soil contamination associated with aboveground tanks—two former product tanks at asphalt plant	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-036(c)	Potential soil contamination associated with aboveground tank—former tank for cooled asphalt storage	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
Consolidated Unit 03-009(a)-00 (continued)	SWMU 03-036(d)	Potential soil contamination associated with aboveground tank—hot emulsion storage tank	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-043(b)	Aboveground tank, asphalt emulsion storage	None; nature and extent defined per the investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-043(d)	Duplicate of SWMU 03-036(a)	n/a*	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-043(h)	Duplicate of SWMU 03-036(a)	n/a	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-045(g)	Storm drain, closed and locked formerly permitted outfall	Sampled	Supplemental investigation report (section 6.4.3)
	SWMU 03-009(i)	Surface disposal site for construction debris	Sampled	Supplemental investigation report (section 6.5)
Consolidated Unit 03-012(b)-00	SWMU 03-012(b)	Operational release associated with the power plant	Sampled	Supplemental investigation report (section 6.6.1)
	SWMU 03-014(q)	Holding tank, former effluent tank	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-045(b)	Outfall currently NPDES permitted, receives effluent from cooling tower and other discharges from the TA-03 power plant	Sampled	Supplemental investigation report (section 6.6.2)
	SWMU 03-045(c)	Outfall currently NPDES permitted, receives effluent from cooling tower	Sampled	Supplemental investigation report (section 6.6.3)
Consolidated Unit 03-013(a)-00	SWMU 03-013(a)	Storm drain, corrugated metal pipe	None; delayed until after D&D of building 03-1400 and structure 03-1402	Further investigation delayed until D&D of associated structures (LANL 2010, 110862)
	SWMU 03-052(f)	Outfall received wastewater from building 03-0038	Sampled	Supplemental investigation report (section 6.7)
	AOC 03-013(b)	Floor drains in basement of building 03-0038	None; delayed until after D&D of building 03-0038	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-013(i)	Operational release, oil contaminated soil and gravel	Sampled	Supplemental investigation report (section 6.8)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
Consolidated Unit 03-014(a)-99	SWMU 03-014(a)	Structure associated with former WWTP, Imhoff tank	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(b)	Structure associated with former WWTP, the dosing siphon	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-014(b2)	Outfall formerly permitted, received effluent from flow-measurement weir	Sampled	Supplemental investigation report (section 6.9.1)
	SWMU 03-014(c)	Structure associated with former WWTP, trickling filter	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-014(c2)	Outfall, abandoned overflow, received effluent from WWTP	Sampled	Supplemental investigation report (section 6.9.2)
	SWMU 03-014(d)	Structure associated with former WWTP, secondary clarifier	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(e)	Structure associated with former WWTP, Imhoff tank	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(f)	Structure associated with former WWTP, dosing siphon	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(g)	Structure associated with former WWTP, trickling filter	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(h)	Structure associated with former WWTP, secondary clarifier	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
Consolidated Unit 03-014(a)-99 continued	SWMU 03-014(i)	Structure associated with former WWTP, splitter box, a comminutor, and bar screen	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(j)	Structure associated with former WWTP, chlorination system	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(k)	Structure associated with former WWTP, unlined sludge-drying bed	Sampled	Supplemental investigation report (section 6.9.3)
	SWMU 03-014(l)	Structure associated with former WWTP, unlined sludge-drying bed	Sampled	Supplemental investigation report (section 6.9.4)
	SWMU 03-014(m)	Structure associated with former WWTP, unlined sludge-drying bed	Sampled	Supplemental investigation report (section 6.9.5)
	SWMU 03-014(n)	Structure associated with former WWTP, unlined sludge-drying bed	Sampled	Supplemental investigation report (section 6.9.6)
	SWMU 03-014(o)	Structure associated with former WWTP, three lined sludge-drying bed	Sampled	Supplemental investigation report (section 6.9.7)
	SWMU 03-014(p)	Structure associated with former WWTP, active lift station	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-014(u)	Structure associated with former WWTP, former holding tank	Sampled	Supplemental investigation report (section 6.9.8)
	SWMU 03-056(d)	Drum storage, active site on northeast side of Plant 1 trickling filter	Sampled	Supplemental investigation report (section 6.9.9)
	SWMU 03-014(r)	Active lift station associated with former WWTP	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structures (LANL 2010, 110862)
	SWMU 03-014(s)	Active lift station associated with former WWTP	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structures (LANL 2010, 110862)
	AOC 03-014(v)	Drain associated with former WWTP in former garage (building 03-0036)	None; nature and extent defined (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
	AOC 03-014(y)	Drain associated with former WWTP in basement of press building (03-0035)	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
Consolidated Unit 03-015-00	SWMU 03-015	Outfall located between Eniwetok Drive and security fence northeast of building 03-0141	Sampled	Supplemental investigation report (section 6.10.1)
	AOC 03-053	Operational facility, basement area of building 03-0141	Sampled	Supplemental investigation report (section 6.10.2)
	AOC C-03-016	Oil metal bin, cleanout bin	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-021	Outfall located 60 ft north of building 03-0170	Sampled	Supplemental investigation report (section 6.11)
	AOC 03-027	Lift wells, two concrete block-lined lift wells	None; nature and extent defined per investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-036(b)	Former aboveground tanks that contained diesel fuel	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-037	Underground tanks, active concrete tank in basement of Sigma Building	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-038(c)	Waste lines, cast-iron piped rinse solution from copper electroplating	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-038(d)	Waste lines, industrial line associated with liquid waste treatment system	Sampled	Supplemental investigation report (section 6.12)
	AOC 03-043(a)	Aboveground tank stored asphalt emulsion [duplicate of SWMUs 03-036(c) and 03-036(d)]	None; nature and extent defined per investigation work plan (LANL 2008, 103404)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-043(f)	Duplicate of SWMUs 03-036(c) and 03-036(d)	n/a	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-043(g)	Duplicate of SWMUs 03-036(c) and 03-036(d)	n/a	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-045(a)	Outfall from building 03-0022	Sampled	Supplemental investigation report (section 6.13)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
	SWMU 03-045(e)	Outfall from drain in an oil pump house, 03-0057	Sampled; delayed characterization per the investigation work plan (LANL 2008, 103404)	Supplemental investigation report (section 6.14)
	SWMU 03-045(f)	Outfall from sink in utilities control center building 03-0223	Sampled	Supplemental investigation report (section 6.15)
	SWMU 03-045(h)	Outfall located at north perimeter of Sigma Complex	Sampled; also investigated under Upper Mortandad Canyon Aggregate Area (LANL 2009, 107495)	Supplemental investigation report (section 6.16); site evaluation to be completed in Upper Mortandad Canyon Aggregate Area
	AOC 03-047(d)	Storage area for containers for steam plant	None; nature and extent defined in a VCA report (LANL 1996, 053780)	Certificate of completion without controls (NMED 2011, 111821)
	AOC 03-047(g)	Drum storage for three drums	Sampled	Supplemental investigation report (section 6.17)
	AOC 03-051(c)	Soil contamination from vacuum pump leaking	Sampled	Supplemental investigation report (section 6.18)
	AOC 03-052(b)	Storm drainage 20 ft north and west of Sigma Building (03-0066)	Sampled	Supplemental investigation report (section 6.19)
	SWMU 03-054(c)	Outfall, former cooling tower, and pump house	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	SWMU 03-056(a)	Storage area, inactive, used for oil accumulation	Sampled	Supplemental investigation report (section 6.20)
	SWMU 03-056(c)	Transformer storage area—PCB only site north of utilities shop, building 03-0223	None; nature and extent defined in a VCA report (LANL 2001, 071259) and approved by NMED (2002, 073363)	Certificate of completion with controls (NMED 2011, 111821)
	AOC 03-056(h)	Container storage area near buildings 03-0105 and 03-0287	None; delayed characterization per the investigation work plan (LANL 2008, 103404)	Further investigation delayed until D&D of associated structure (LANL 2010, 110862)
	AOC 03-056(k)	Container storage area north side of loading dock at Sigma building 03-0066	Sampled	Supplemental investigation report (section 6.21)
	SWMU 03-056(l)	Storage area outside building 03-0141	Sampled	Certificate of completion without controls (NMED 2011, 111821)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	2009 Investigation	Current Status
Consolidated Unit 03-059-00	AOC 03-003(n)	One-time spill—PCB only site	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	SWMU 03-059	Storage area—PCB only site—former salvage yard	Sampled	Supplemental investigation report (section 6.22)
	AOC C-03-022	Kerosene tanker trailer used to store and distribute kerosene for asphalt plant	Sampled	Supplemental investigation report (section 6.23)
TA-60				
	SWMU 60-002	Storage areas on Sigma Mesa (west, central, east)	Sampled	Supplemental investigation report (section 7.2)
	AOC 60-004(b)	Storage area for 12 containers of diesel sludge	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	AOC 60-004(d)	Storage area for dismantled underground storage tanks and contents	Sampled	Certificate of completion without controls (NMED 2011, 111821)
	AOC 60-004(f)	Storage area bermed and used for new product storage	Sampled	Supplemental investigation report (section 7.3)
	SWMU 60-006(a)	Septic system on Sigma Mesa	Sampled	Supplemental investigation report (section 7.4)
	SWMU 60-007(a)	Release, equipment stored leaked oil	Sampled	Supplemental investigation report (section 7.5)
	SWMU 60-007(b)	Release, storm drainage from motor pool building 03-0001	Sampled	Supplemental investigation report (section 7.6)
TA-61				
	AOC C-61-002	Subsurface contamination, potentially petroleum-based	Sampled	Supplemental investigation report (section 8.2)
	SWMU 61-002	Transformer storage area—PCB only site located east of Radio Repair Shop 61-0023	None; previous ACA (LANL 2007, 100722)	Supplemental investigation report (section 8.3)
	SWMU 61-005	Landfill, County Subtitle D	None; closure under RCRA Subtitle D	Landfill is closed and currently in post-closure care
	SWMU 61-006	Waste oil tank, active, used oil recycling	None; regulated under 40 CFR 279 and 20.4.1.1002 NMAC	Operated under another regulatory program (LANL 2010, 110862)

Note: Shading denotes consolidated unit.
*n/a = Not applicable.

Table 3.2-1
Surveyed Coordinates for Locations Sampled in 2009

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
TA-03			
SWMU 03-002(c)	03-608145	1619560.793	1774455.771
SWMU 03-002(c)	03-608146	1619581.642	1774436.173
SWMU 03-002(c)	03-608147	1619598.739	1774459.107
SWMU 03-002(c)	03-608148	1619579.14	1774482.875
AOC 03-003(d)	03-608149	1620775.689	1772584.634
AOC 03-003(d)	03-608150	1620770.765	1772596.511
AOC 03-003(d)	03-608151	1620793.324	1772591.777
AOC 03-003(d)	03-608161	1620775.243	1772579.053
AOC 03-003(d)	03-608162	1620778.368	1772609.411
AOC 03-003(d)	03-608172	1620788.86	1772572.58
SWMU 03-009(a)	03-608178	1619579.14	1774090.246
SWMU 03-009(a)	03-608179	1619658.784	1774086.493
SWMU 03-009(a)	03-608180	1619748.017	1774089.829
SWMU 03-009(a)	03-608181	1619749.685	1774053.969
SWMU 03-009(a)	03-608182	1619609.163	1774064.393
SWMU 03-009(i)	03-608190	1620888.9	1773156.838
SWMU 03-009(i)	03-608191	1620858.68	1773290.671
SWMU 03-009(i)	03-608192	1620848.606	1773143.167
SWMU 03-009(i)	03-608193	1620840.691	1773188.497
SWMU 03-009(i)	03-608194	1620832.057	1773234.547
SWMU 03-009(i)	03-608195	1620824.142	1773280.598
SWMU 03-013(i)	03-608221	1617341.478	1773977.533
SWMU 03-013(i)	03-608222	1617355.29	1773973.757
SWMU 03-013(i)	03-608223	1617359.662	1773970.578
SWMU 03-013(i)	03-608224	1617359.066	1773959.053
SWMU 03-013(i)	03-608225	1617348.931	1773958.854
SWMU 03-013(i)	03-608226	1617324.887	1773948.123
SWMU 03-013(i)	03-608227	1617329.06	1773949.117
SWMU 03-013(i)	03-608228	1617329.06	1773954.58
SWMU 03-013(i)	03-608229	1617329.06	1773960.265
SWMU 03-013(i)	03-608230	1617329.06	1773966.309
SWMU 03-013(i)	03-608231	1617320.604	1773966.582
SWMU 03-013(i)	03-608232	1617334.519	1773974.403
SWMU 03-013(i)	03-608233	1617337.793	1773971.038
SWMU 03-013(i)	03-608234	1617349.329	1773988.189

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
SWMU 03-013(i)	03-608235	1617355.091	1773982.898
SWMU 03-013(i)	03-608236	1617337.793	1773971.038
AOC 03-014(b2)	03-608242	1620762.899	1773722.387
AOC 03-014(b2)	03-608243	1620770.761	1773760.124
AOC 03-014(b2)	03-608244	1620881.612	1773819.087
AOC 03-014(b2)	03-608245	1620916.99	1773835.597
AOC 03-014(b2)	03-608246	1620933.5	1773873.334
AOC 03-014(c2)	03-608248	1620566.354	1773621.914
AOC 03-014(c2)	03-608249	1620521.542	1773639.996
AOC 03-014(c2)	03-608250	1620523.115	1773577.888
AOC 03-014(c2)	03-608251	1620589.94	1773652.575
AOC 03-014(c2)	03-608252	1620627.676	1773669.871
AOC 03-014(c2)	03-608253	1620613.525	1773735.123
AOC 03-014(c2)	03-608254	1620646.544	1773750.061
AOC 03-014(c2)	03-608255	1620703.936	1773767.357
SWMU 03-014(k)	03-03201	1620441.352	1773489.128
SWMU 03-014(k)	03-03202	1620441.352	1773493.845
SWMU 03-014(k)	03-03264	1620356.44	1773499.35
SWMU 03-014(k)	03-03265	1620383.96	1773522.93
SWMU 03-014(k)	03-03266	1620409.9	1773491.49
SWMU 03-014(k)	03-608270	1620441.352	1773489.128
SWMU 03-014(k)	03-608271	1620392.609	1773462.398
SWMU 03-014(k)	03-608272	1620335.218	1773515.858
SWMU 03-014(k)	03-608273	1620441.352	1773493.845
SWMU 03-014(k)	03-603357	1773516.94	1620430.86
SWMU 03-014(k)	03-612229	1773515.92	1620328.26
SWMU 03-014(o)	03-03204	1620396.73	1773674.66
SWMU 03-014(o)	03-608275	1620396.729	1773674.66
SWMU 03-014(o)	03-608276	1620357.399	1773673.918
SWMU 03-014(o)	03-608277	1620455.353	1773672.434
SWMU 03-014(o)	03-608278	1620395.987	1773717.7
SWMU 03-014(o)	03-608279	1620332.169	1773676.144
SWMU 03-014(o)	03-608280	1620394.503	1773631.62
SWMU 03-014(u)	03-608281	1620547.815	1773708.721
SWMU 03-014(u)	03-608282	1620507.001	1773725.789
SWMU 03-014(u)	03-608283	1620555.978	1773731.725
SWMU 03-014(u)	03-608284	1620556.72	1773758.44
SWMU 03-014(u)	03-608285	1620515.164	1773780.702
SWMU 03-014(u)	03-608286	1620473.608	1773804.449

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
SWMU 03-014(u)	03-608287	1620436.504	1773839.326
SWMU 03-014(u)	03-609990	1620359.328	1773884.593
SWMU 03-015	03-608289	1620767.976	1772792.516
SWMU 03-015	03-608290	1620814.009	1772790.929
SWMU 03-015	03-608291	1620798.929	1772773.071
SWMU 03-015	03-608292	1620843.773	1772710.37
SWMU 03-015	03-608293	1620810.835	1772677.829
SWMU 03-015	03-608294	1620849.328	1772849.265
SWMU 03-015	03-608295	1620943.38	1772902.441
SWMU 03-015	03-608296	1620882.663	1772887.758
SWMU 03-015	03-608297	1620791.786	1772709.577
SWMU 03-015	03-608298	1620797.342	1772675.845
SWMU 03-021	03-611943	na*	na
SWMU 03-021	03-611944	na	na
SWMU 03-021	03-608299	1620784.911	1773361.207
SWMU 03-021	03-608300	1620775.063	1773437.311
SWMU 03-021	03-608301	1620817.144	1773509.834
SWMU 03-021	03-608302	1620851.167	1773575.642
SWMU 03-021	03-608303	1620630.465	1773291.674
SWMU 03-021	03-608304	1620638.075	1773294.057
AOC C-03-022	03-608389	1619432.363	1774493.716
AOC C-03-022	03-608390	1619468.641	1774484.125
AOC C-03-022	03-608391	1619434.865	1774465.778
AOC C-03-022	03-608392	1619402.336	1774475.606
SWMU 03-029	03-608183	1620175.575	1774133.441
SWMU 03-029	03-608184	1620326.776	1774165.5
SWMU 03-029	03-608185	1620245.76	1774096.615
SWMU 03-029	03-608186	1620264.823	1773996.58
AOC 03-038(d)	03-608310	1619614.055	1772977.967
AOC 03-038(d)	03-608311	1619666.01	1772989.409
AOC 03-038(d)	03-608312	1619651.166	1773037.343
AOC 03-038(d)	03-608313	1619664.154	1772947.657
AOC 03-038(d)	03-608314	1619482.623	1772904.674
AOC 03-038(d)	03-608315	1619543.236	1772916.734
SWMU 03-045(a)	03-608316	1619613.591	1773357.571
SWMU 03-045(a)	03-608317	1619629.471	1773336.031
SWMU 03-045(a)	03-608318	1619712.581	1773334.028
SWMU 03-045(a)	03-608319	1619785.678	1773338.534
SWMU 03-045(b)	03-608197	1619888.643	1773383.981

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
SWMU 03-045(c)	03-608196	1619940.813	1773386.727
SWMU 03-045(e)	03-608320	1619768.866	1773903.439
SWMU 03-045(f)	03-608321	1620091.2	1773432.35
SWMU 03-045(f)	03-608322	1620106.196	1773411.651
SWMU 03-045(g)	03-22536	1619526.184	1774121.52
SWMU 03-045(g)	03-608187	1619541.195	1774180.314
SWMU 03-045(g)	03-608188	1619526.184	1774121.52
SWMU 003-045(g)	03-608189	1619610.831	1773988.920
AOC 03-047(g)	03-608324	1620693.097	1772715.219
AOC 03-047(g)	03-608325	1620690.136	1772718.895
AOC 03-047(g)	03-608326	1620697.234	1772722.927
AOC 03-047(g)	03-608327	1620698.008	1772716.112
AOC 03-051(c)	03-608328	1620742.652	1772724.595
AOC 03-051(c)	03-608329	1620748.01	1772711.424
AOC 03-052(b)	03-03286	1620325.6	1772879.5
AOC 03-052(b)	03-03291	1620130.16	1772930.75
AOC 03-052(b)	03-608330	1620428.521	1773111.142
AOC 03-052(b)	03-608331	1620454.912	1773192.19
AOC 03-052(b)	03-608332	1620401.63	1772989.484
AOC 03-052(b)	03-608333	1620429.771	1772988.256
AOC 03-052(b)	03-608334	1620336.429	1772970.338
AOC 03-052(b)	03-608335	1620279.758	1772960.337
AOC 03-052(b)	03-608336	1620201.001	1772947.003
AOC 03-052(b)	03-608337	1620141.413	1772949.919
AOC 03-052(b)	03-608338	1620118.77	1772949.642
AOC 03-052(b)	03-608340	1620151.413	1772869.496
AOC 03-052(b)	03-608341	1620151.413	1772853.661
AOC 03-052(b)	03-608343	1620397.268	1772907.833
AOC 03-052(b)	03-608344	1620405.602	1772889.914
AOC 03-052(b)	03-608345	1620308.927	1772891.998
AOC 03-052(b)	03-608346	1620329.762	1772894.915
SWMU 03-052(f)	03-608214	1618705.028	1774157.067
SWMU 03-052(f)	03-608215	1618726.645	1774182.009
SWMU 03-052(f)	03-608216	1618747.43	1774176.189
SWMU 03-052(f)	03-608217	1618757.822	1774207.782
SWMU 03-052(f)	03-608218	1618852.186	1774230.23
SWMU 03-052(f)	03-608219	1618981.053	1774216.928
SWMU 03-052(f)	03-608220	1618974.401	1774277.204
SWMU 03-056(a)	03-608347	1620198.76	1774541.068

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
SWMU 03-056(a)	03-608348	1620221.79	1774540.886
SWMU 03-056(a)	03-608349	1620247.743	1774530.65
SWMU 03-056(a)	03-608350	1620222.704	1774526.264
SWMU 03-056(d)	03-608288	1620549.058	1773485.984
AOC 03-056(k)	03-03281	1620182.11	1772807.16
AOC 03-056(k)	03-03290	1620172.52	1772794.38
AOC 03-056(k)	03-608351	1620160.442	1772781.044
AOC 03-056(k)	03-608352	1620165.442	1772808.824
AOC 03-056(k)	03-608353	1620180.444	1772765.487
AOC 03-056(k)	03-608354	1620186.555	1772820.492
AOC 03-056(k)	03-608355	1620203.223	1772804.935
AOC 03-056(k)	03-608356	1620237.671	1772846.049
AOC 03-056(k)	03-608357	1620289.342	1772826.048
SWMU 03-059	03-608372	1620326.343	1774354.826
SWMU 03-059	03-608373	1620323.743	1774280.309
SWMU 03-059	03-608374	1620143.082	1774216.623
SWMU 03-059	03-608375	1620303.381	1774203.626
SWMU 03-059	03-608376	1619984.083	1774235.252
SWMU 03-059	03-608377	1619974.985	1774291.14
SWMU 03-059	03-608378	1619976.285	1774356.559
SWMU 03-059	03-608379	1620131.385	1774340.529
SWMU 03-059	03-608380	1620075.064	1774347.461
SWMU 03-059	03-608381	1620197.67	1774334.897
SWMU 03-059	03-608382	1620159.545	1774272.944
SWMU 03-059	03-608383	1620212.401	1774255.614
SWMU 03-059	03-608384	1620276.953	1774271.644
SWMU 03-059	03-608385	1620031.306	1774275.11
SWMU 03-059	03-608386	1620057.175	1774281.024
SWMU 03-059	03-608387	1620276.52	1774326.232
SWMU 03-059	03-608388	1620018.742	1774344.862
TA-60			
SWMU 60-002	03-608393	1621841.361	1772485.915
SWMU 60-002	03-608394	1621768.735	1772350.75
SWMU 60-002	03-608395	1621871.718	1772377.648
SWMU 60-002	03-608396	1621971.819	1772344.025
SWMU 60-002	03-608397	1621965.095	1772237.103
SWMU 60-002	03-608398	1621881.037	1772210.877
AOC 60-004(f)	03-608404	1621606.038	1772506.392
AOC 60-004(f)	03-608405	1621643.486	1772534.478

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
AOC 60-004(f)	03-608406	1621649.869	1772581.926
AOC 60-004(f)	03-608407	1621692.636	1772571.075
AOC 60-004(f)	03-608408	1621679.231	1772513.839
SWMU 60-006(a)	03-608409	1623353.091	1772132.922
SWMU 60-006(a)	03-608410	1623353.222	1772138.828
SWMU 60-006(a)	03-608411	1623353.485	1772144.602
SWMU 60-006(a)	03-608412	1623354.534	1772160.713
SWMU 60-007(a)	03-608413	1628951.121	1770597.344
SWMU 60-007(a)	03-608414	1628942.178	1770553.968
SWMU 60-007(a)	03-608415	1628929.21	1770511.039
SWMU 60-007(a)	03-608416	1628915.794	1770465.874
SWMU 60-007(b)	03-608417	1621280.87	1773084.262
SWMU 60-007(b)	03-608418	1621390.308	1773116.842
SWMU 60-007(b)	03-608419	1621533.575	1773160.315
SWMU 60-007(b)	03-608420	1621656.168	1773200.866
SWMU 60-007(b)	03-608421	1621744.404	1773231.601
SWMU 60-007(b)	03-608422	1621726.773	1772704.438
SWMU 60-007(b)	03-608423	1621817.572	1772886.918
SWMU 60-007(b)	03-608424	1621788.481	1772906.312
SWMU 60-007(b)	03-608425	1621746.167	1773057.937
SWMU 60-007(b)	03-608426	1621730.299	1773128.461
SWMU 60-007(b)	03-608427	1621764.679	1773188.406
SWMU 60-007(b)	03-608428	1622093.301	1773413.4
TA-61			
AOC-C-61-002	03-608429	1620110.168	1774658.649
AOC-C-61-002	03-608430	1620066.633	1774639.43
AOC-C-61-002	03-608431	1620103.368	1774629.094
AOC-C-61-002	03-608432	1620094.737	1774604.378
AOC-C-61-002	03-608433	1620136.061	1774618.109

* na = Not available.

Table 3.2-2
Field-Screening Results for Samples Collected in 2009

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
TA-03						
SWMU 03-002(c)	03-608148	0.0–1.0	RE03-09-13312	0.0	25.6	1860
SWMU 03-002(c)	03-608148	4.5–5.0	RE03-09-13313	0.0	25.6	1860
SWMU 03-002(c)	03-608145	0.0–1.0	RE03-10-4000	2.3	25.6	1860
SWMU 03-002(c)	03-608145	0.0–1.0	RE03-09-13306	2.3	25.6	1860
SWMU 03-002(c)	03-608145	5.0–5.8	RE03-09-13307	0.0	25.6	1860
SWMU 03-002(c)	03-608146	0.0–1.0	RE03-09-13308	0.0	25.6	1860
SWMU 03-002(c)	03-608146	1.5–2.0	RE03-09-13309	0.0	25.6	1860
SWMU 03-002(c)	03-608147	0.0–1.0	RE03-09-13310	0.0	25.6	1860
SWMU 03-002(c)	03-608147	3.5–4.0	RE03-09-13311	0.0	25.6	1860
AOC 03-003(d)	03-608149	0.0–0.0	RE03-09-13314	NC[b]	19	1664
AOC 03-003(d)	03-608150	0.0–1.0	RE03-09-13315	4.1	19	1664
AOC 03-003(d)	03-608150	0.0–1.0	RE03-10-7696	4.1	19	1664
AOC 03-003(d)	03-608150	1.0–2.0	RE03-09-13316	6.7	19	1664
AOC 03-003(d)	03-608161	0.0–1.0	RE03-09-13387	0.5	19	1664
AOC 03-003(d)	03-608161	0.0–1.0	RE03-10-7695	0.5	19	1664
AOC 03-003(d)	03-608161	1.0–2.0	RE03-09-13388	4.6	19	1664
AOC 03-003(d)	03-608172	0.0–1.0	RE03-09-13417	1.0	19	1664
AOC 03-003(d)	03-608172	1.0–2.0	RE03-09-13418	8.4	19	1664
AOC 03-003(d)	03-608151	0.0–1.0	RE03-09-13317	2.6	19	1664
AOC 03-003(d)	03-608151	1.0–2.0	RE03-09-13318	1.6	19	1664
AOC 03-003(d)	03-608162	0.0–1.0	RE03-09-13389	0.4	19	1664
AOC 03-003(d)	03-608162	1.0–2.0	RE03-09-13390	2.7	19	1664
SWMU 03-009(a)	03-608178	11.5–12.0	RE03-09-13426	9.2	24	1662
SWMU 03-009(a)	03-608178	9.0–10	RE03-09-13427	35.6	24	1662
SWMU 03-009(a)	03-608178	14.0–15.0	RE03-09-13428	8.0	24	1662
SWMU 03-009(a)	03-608178	19.0–20.0	RE03-09-13429	2.0	24	1662
SWMU 03-009(a)	03-608179	9.0–10.0	RE03-09-13430	1.1	24	1662
SWMU 03-009(a)	03-608179	9.0–10.0	RE03-10-2002	1.1	24	1662
SWMU 03-009(a)	03-608179	11.0–12.0	RE03-09-13431	0.5	24	1662
SWMU 03-009(a)	03-608179	14.0–15.0	RE03-09-13432	1.5	24	1662
SWMU 03-009(a)	03-608179	19.0–20.0	RE03-09-13433	5.3	24.2	1655
SWMU 03-009(a)	03-608180	9.0–10.0	RE03-09-13434	3.3	<MDA[c]	<MDA
SWMU 03-009(a)	03-608180	14.0–15.0	RE03-09-13436	4.1	<MDA	<MDA
SWMU 03-009(a)	03-608180	19.0–20.0	RE03-09-13437	4.0	<MDA	<MDA
SWMU 03-009(a)	03-608180	19.0–20.0	RE03-10-2001	4.0	<MDA	<MDA
SWMU 03-009(a)	03-608182	0.0–1.0	RE03-09-13440	11.7	25.6	1860

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-009(a)	03-608182	1.0–2.0	RE03-09-13441	0.0	25.6	1860
SWMU 03-009(a)	03-608181	0.0–1.0	RE03-09-13438	0.0	25.6	1860
SWMU 03-009(a)	03-608181	1.0–2.0	RE03-09-13439	5.1	25.6	1860
SWMU 03-009(i)	03-608195	4.0–5.0	RE03-09-13471	0.0	44	1130
SWMU 03-009(i)	03-608195	9.0–10.0	RE03-09-13472	0.0	44	1130
SWMU 03-009(i)	03-608194	4.0–5.0	RE03-09-13469	5.6	44	1130
SWMU 03-009(i)	03-608194	9.0–10.0	RE03-09-13470	9.9	44	1130
SWMU 03-009(i)	03-608193	4.0–5.0	RE03-09-13467	450	67	1447
SWMU 03-009(i)	03-608193	9.0–10.0	RE03-09-13468	0.2	67	1447
SWMU 03-009(i)	03-608192	4.0–5.0	RE03-09-13465	56.5	67	1447
SWMU 03-009(i)	03-608192	4.0–5.0	RE03-10-2003	56.5	67	1447
SWMU 03-009(i)	03-608192	9.0–10.0	RE03-09-13466	5.0	67	1447
SWMU 03-009(i)	03-608190	0.0–1.0	RE03-09-13461	0.0	16	1352
SWMU 03-009(i)	03-608190	1.0–2.0	RE03-09-13462	0.0	16	1352
SWMU 03-009(i)	03-608191	0.0–1.0	RE03-09-13463	0.0	16	1352
SWMU 03-009(i)	03-608191	1.0–2.0	RE03-09-13464	0.0	16	1352
SWMU 03-013(i)	03-608221	0.0–1.0	RE03-09-13566	9.1	52.3	1726
SWMU 03-013(i)	03-608221	4.0–5.0	RE03-09-13567	2.4	52.3	1726
SWMU 03-013(i)	03-608227	0.0–1.0	RE03-09-13578	0.8	52.3	1726
SWMU 03-013(i)	03-608227	4.0–5.0	RE03-09-13579	0.4	52.3	1726
SWMU 03-013(i)	03-608228	0.0–1.0	RE03-09-13580	2.1	52.3	1726
SWMU 03-013(i)	03-608228	4.0–5.0	RE03-09-13581	1.6	52.3	1726
SWMU 03-013(i)	03-608229	0.0–1.0	RE03-09-13582	2.4	52.3	1726
SWMU 03-013(i)	03-608229	4.0–5.0	RE03-09-13583	0.0	52.3	1726
SWMU 03-013(i)	03-608230	0.0–1.0	RE03-09-13584	0.3	52.3	1726
SWMU 03-013(i)	03-608230	4.0–5.0	RE03-09-13586	0.0	52.3	1726
SWMU 03-013(i)	03-608231	0.0–1.0	RE03-09-13585	0.3	52.3	1726
SWMU 03-013(i)	03-608231	4.0–5.0	RE03-09-13587	0.1	52.3	1726
SWMU 03-013(i)	03-608232	0.0–1.0	RE03-09-13588	2.5	11	1723
SWMU 03-013(i)	03-608232	0.0–1.0	RE03-10-5327	2.5	11	1723
SWMU 03-013(i)	03-608232	4.0–5.0	RE03-09-13589	3.6	11	1723
SWMU 03-013(i)	03-608233	0.0–1.0	RE03-09-13590	2.3	11	1723
SWMU 03-013(i)	03-608233	4.0–5.0	RE03-09-13592	3.5	11	1723
SWMU 03-013(i)	03-608234	0.0–1.0	RE03-09-13593	3.8	11	1723
SWMU 03-013(i)	03-608234	0.0–1.0	RE03-10-5328	3.8	11	1723
SWMU 03-013(i)	03-608234	4.0–5.0	RE03-09-13596	4.7	11	1723
SWMU 03-013(i)	03-608235	0.0–1.0	RE03-09-13594	7.4	11	1723
SWMU 03-013(i)	03-608235	4.0–5.0	RE03-09-13597	4.9	11	1723

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-013(i)	03-608236	0.0–1.0	RE03-09-13591	3.2	11	1723
SWMU 03-013(i)	03-608236	4.0–5.0	RE03-09-13595	2.3	11	1723
SWMU 03-013(i)	03-608222	0.0–1.0	RE03-09-13568	43.4	52.3	1726
SWMU 03-013(i)	03-608222	4.0–5.0	RE03-09-13569	4.0	52.3	1726
SWMU 03-013(i)	03-608222	0.0–1.0	RE03-10-5325	43.4	52.3	1726
SWMU 03-013(i)	03-608223	0.0–1.0	RE03-09-13570	7.1	52.3	1726
SWMU 03-013(i)	03-608223	4.0–5.0	RE03-09-13571	4.1	52.3	1726
SWMU 03-013(i)	03-608224	0.0–1.0	RE03-09-13572	NC	52.3	1726
SWMU 03-013(i)	03-608224	4.0–5.0	RE03-09-13573	0.5	52.3	1726
SWMU 03-013(i)	03-608225	0.0–1.0	RE03-09-13574	13.2	52.3	1726
SWMU 03-013(i)	03-608225	0.0–1.0	RE03-10-5326	13.2	52.3	1726
SWMU 03-013(i)	03-608225	4.0–5.0	RE03-09-13575	0.5	52.3	1726
SWMU 03-013(i)	03-608226	0.0–1.0	RE03-09-13576	0.6	52.3	1726
SWMU 03-013(i)	03-608226	4.0–5.0	RE03-09-13577	0.6	52.3	1726
AOC 03-014(b2)	03-608242	0.0–1.0	RE03-09-13618	0.0	26.7	1776
AOC 03-014(b2)	03-608242	0.0–1.0	RE03-10-6084	0.0	26.7	1776
AOC 03-014(b2)	03-608242	1.0–2.0	RE03-09-13619	0.0	26.7	1776
AOC 03-014(b2)	03-608243	0.0–1.0	RE03-09-13620	4.0	26.7	1776
AOC 03-014(b2)	03-608243	1.0–2.0	RE03-09-13621	2.0	26.7	1776
AOC 03-014(b2)	03-608243	1.0–2.0	RE03-10-6085	2.0	26.7	1776
AOC 03-014(b2)	03-608244	0.0–1.0	RE03-09-13622	0.5	26.7	1776
AOC 03-014(b2)	03-608244	1.0–2.0	RE03-09-13623	0.0	26.7	1776
AOC 03-014(b2)	03-608245	0.0–1.0	RE03-09-13624	0.0	26.7	1776
AOC 03-014(b2)	03-608245	1.0–2.0	RE03-09-13625	0.0	26.7	1776
AOC 03-014(b2)	03-608246	0.0–1.0	RE03-09-13626	0.0	26.7	1776
AOC 03-014(b2)	03-608246	1.0–2.0	RE03-09-13627	0.0	26.7	1776
AOC 03-014(c2)	03-608250	0.0–1.0	RE03-09-13635	0.8	<MDA	<MDA
AOC 03-014(c2)	03-608250	1.0–2.0	RE03-09-13636	8.0	<MDA	<MDA
AOC 03-014(c2)	03-608248	0.0–1.0	RE03-09-13631	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608248	1.0–2.0	RE03-09-13632	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608248	1.0–2.0	RE03-10-4796	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608249	0.0–1.0	RE03-09-13633	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608249	1.0–2.0	RE03-09-13634	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608251	0.0–1.0	RE03-09-13637	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608251	1.0–2.0	RE03-09-13638	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608252	0.0–1.0	RE03-09-13639	0.2	<MDA	<MDA
AOC 03-014(c2)	03-608252	1.0–2.0	RE03-09-13640	0.0	<MDA	<MDA
AOC 03-014(c2)	03-608253	0.0–1.0	RE03-09-13641	1.6	<MDA	<MDA

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC 03-014(c2)	03-608253	2.0–3.0	RE03-09-13642	96.5	<MDA	<MDA
AOC 03-014(c2)	03-608254	0.0–1.0	RE03-09-13643	12.3	80	2690
AOC 03-014(c2)	03-608254	0.0–1.0	RE03-10-5458	12.3	80	2690
AOC 03-014(c2)	03-608254	2.0–3.0	RE03-09-13644	0.9	<MDA	<MDA
AOC 03-014(c2)	03-608255	0.0–1.0	RE03-09-13645	0.2	<MDA	<MDA
AOC 03-014(c2)	03-608255	2.0–3.0	RE03-09-13646	1.3	<MDA	<MDA
SWMU 03-014(k)	03-608270	0.0–1.0	RE03-09-13726	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608270	3.0–4.0	RE03-09-13727	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608270	8.0–9.0	RE03-09-13728	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608273	0.0–1.0	RE03-09-13729	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608273	3.0–4.0	RE03-09-13730	0.0	<MDA	<MDA
SWMU 03-014(k)	03-03201	4.0–5.0	RE03-09-13747	0.0	11	1723
SWMU 03-014(k)	03-03201	6.0–7.0	RE03-09-13739	0.0	11	1723
SWMU 03-014(k)	03-03202	4.0–5.0	RE03-09-13746	0.0	11	1723
SWMU 03-014(k)	03-03202	4.0–5.0	RE03-10-5397	0.0	11	1723
SWMU 03-014(k)	03-03202	6.0–7.0	RE03-09-13743	0.0	11	1723
SWMU 03-014(k)	03-03264	4.0–5.0	RE03-09-13740	0.0	11	1723
SWMU 03-014(k)	03-03264	6.0–7.0	RE03-09-13741	0.0	11	1723
SWMU 03-014(k)	03-03265	4.0–5.0	RE03-09-13744	0.0	11	1723
SWMU 03-014(k)	03-03265	6.0–7.0	RE03-09-13745	0.0	11	1723
SWMU 03-014(k)	03-03266	4.0–5.0	RE03-09-13748	0.0	11	1723
SWMU 03-014(k)	03-03266	6.0–7.0	RE03-09-13749	0.0	11	1723
SWMU 03-014(k)	03-608271	0.0–1.0	RE03-09-13736	3.8	11	1723
SWMU 03-014(k)	03-608271	6.0–7.0	RE03-09-13737	0.0	11	1723
SWMU 03-014(k)	03-608271	11.0–12.0	RE03-09-13738	1.0	11	1723
SWMU 03-014(k)	03-608272	0.0–1.0	RE03-09-13732	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608272	3.0–4.0	RE03-09-13733	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608272	8.0–9.0	RE03-09-13734	0.0	<MDA	<MDA
SWMU 03-014(k)	03-608272	8.0–9.0	RE03-10-4964	0.0	<MDA	<MDA
SWMU 03-014(o)	03-03204	5.0–6.0	RE03-09-13755	1.3	67	1447
SWMU 03-014(o)	03-03204	3.0–4.0	RE03-09-13754	0.5	67	1447
SWMU 03-014(o)	03-608276	5.0–6.0	RE03-09-13757	0.6	67	1447
SWMU 03-014(o)	03-608276	3.0–4.0	RE03-09-13756	0.8	67	1447
SWMU 03-014(o)	03-608275	5.0–6.0	RE03-09-13753	0.0	67	1447
SWMU 03-014(o)	03-608275	3.0–4.0	RE03-09-13752	0.3	67	1447
SWMU 03-014(o)	03-608275	3.0–4.0	RE03-10-5525	0.3	67	1447
SWMU 03-014(o)	03-608277	0.0–1.0	RE03-09-13758	2.9	64.9	1943
SWMU 03-014(o)	03-608277	1.0–2.0	RE03-09-13759	3.2	64.9	1943

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-014(o)	03-608277	0.0–1.0	RE03-10-5523	2.9	64.9	1943
SWMU 03-014(o)	03-608277	4.0–5.0	RE03-09-13760	3.2	64.9	1943
SWMU 03-014(o)	03-608277	6.0–7.0	RE03-09-13761	2.8	64.9	1943
SWMU 03-014(o)	03-608280	0.0–1.0	RE03-09-13766	5.0	64.9	1943
SWMU 03-014(o)	03-608280	1.0–2.0	RE03-09-13767	3.2	64.9	1943
SWMU 03-014(o)	03-608280	6.0–7.0	RE03-09-13770	0.0	64.9	1943
SWMU 03-014(o)	03-608280	4.0–5.0	RE03-09-13771	2.0	64.9	1943
SWMU 03-014(o)	03-608279	0.0–1.0	RE03-09-13768	3.2	64.9	1943
SWMU 03-014(o)	03-608279	0.0–1.0	RE03-10-5524	3.2	64.9	1943
SWMU 03-014(o)	03-608279	1.0–2.0	RE03-09-13769	3.1	64.9	1943
SWMU 03-014(o)	03-608279	4.0–5.0	RE03-09-13772	5.0	64.9	1943
SWMU 03-014(o)	03-608279	6.0–7.0	RE03-10-5897	0.0	64.9	1943
SWMU 03-014(o)	03-608278	0.0–1.0	RE03-09-13762	2.7	64.9	1943
SWMU 03-014(o)	03-608278	1.0–2.0	RE03-09-13763	3.2	64.9	1943
SWMU 03-014(o)	03-608278	4.0–5.0	RE03-09-13764	2.1	64.9	1943
SWMU 03-014(o)	03-608278	6.0–7.0	RE03-09-13765	2.8	64.9	1943
SWMU 03-014(u)	03-608281	0.0–1.0	RE03-10-5491	0.0	80	2690
SWMU 03-014(u)	03-608281	1.0–2.0	RE03-09-13779	0.0	80	2690
SWMU 03-014(u)	03-608281	NC	RE03-09-13780	NC	na[d]	na
SWMU 03-014(u)	03-608282	0.0–1.0	RE03-09-13781	0.0	80	2690
SWMU 03-014(u)	03-608282	NC	RE03-09-13782	NC	na	na
SWMU 03-014(u)	03-608282	3.5–4.5	RE03-10-5490	0.0	80	2690
SWMU 03-014(u)	03-608283	0.0–1.0	RE03-09-13783	2.7	64.9	1943
SWMU 03-014(u)	03-608284	0.0–1.0	RE03-09-13799	162	80	2690
SWMU 03-014(u)	03-608284	0.0–1.0	RE03-10-5399	162	80	2690
SWMU 03-014(u)	03-608284	1.0–2.0	RE03-09-13800	13.0	80	2690
SWMU 03-014(u)	03-608285	0.0–1.0	RE03-09-13801	0.0	80	2690
SWMU 03-014(u)	03-608285	1.0–2.0	RE03-09-13802	0.5	80	2690
SWMU 03-014(u)	03-608286	0.0–1.0	RE03-09-13803	8.4	64.9	1943
SWMU 03-014(u)	03-608286	0.0–1.0	RE03-10-5493	8.4	64.9	1943
SWMU 03-014(u)	03-608286	1.0–2.0	RE03-09-13804	6.9	64.9	1943
SWMU 03-014(u)	03-608287	0.0–1.0	RE03-09-13805	35.3	64.9	1943
SWMU 03-014(u)	03-608287	1.0–2.0	RE03-09-13806	7.5	64.9	1943
SWMU 03-014(u)	03-609990	0.0–1.0	RE03-10-5487	0.8	80	2690
SWMU 03-014(u)	03-609990	1.0–2.0	RE03-10-5488	0.0	80	2690
SWMU 03-015	03-608298	2.5–3.5	RE03-09-13880	0.1	21	1884
SWMU 03-015	03-608298	5.5–6.5	RE03-09-13881	0.0	21	1884
SWMU 03-015	03-608295	0.0–1.0	RE03-09-13874	125	16	1352

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-015	03-608295	0.0–1.0	RE03-10-6903	125	16	1352
SWMU 03-015	03-608295	1.0–2.0	RE03-09-13875	7.0	16	1352
SWMU 03-015	03-608293	0.0–1.0	RE03-09-13870	5.5	16	1352
SWMU 03-015	03-608293	1.0–2.0	RE03-09-13871	7.1	16	1352
SWMU 03-015	03-608297	0.0–1.0	RE03-09-13878	5.8	21	1884
SWMU 03-015	03-608297	0.0–1.0	RE03-10-6936	5.8	21	1884
SWMU 03-015	03-608297	1.0–2.0	RE03-09-13879	5.6	21	1884
SWMU 03-015	03-608292	0.0–1.0	RE03-09-13868	1.4	16	1352
SWMU 03-015	03-608292	1.0–2.0	RE03-09-13869	0.0	16	1352
SWMU 03-015	03-608291	0.0–1.0	RE03-09-13866	0.0	16	1352
SWMU 03-015	03-608291	0.0–1.0	RE03-10-6902	0.0	16	1352
SWMU 03-015	03-608291	1.0–2.0	RE03-09-13867	0.0	16	1352
SWMU 03-015	03-608289	0.0–1.0	RE03-09-13862	14.4	16	1352
SWMU 03-015	03-608289	1.0–2.0	RE03-09-13863	44.6	16	1352
SWMU 03-015	03-608290	0.0–1.0	RE03-09-13864	27.2	16	1352
SWMU 03-015	03-608290	1.0–2.0	RE03-09-13865	4.7	16	1352
SWMU 03-015	03-608294	0.0–1.0	RE03-09-13872	90.2	16	1352
SWMU 03-015	03-608294	1.0–2.0	RE03-09-13873	6.1	16	1352
SWMU 03-015	03-608296	0.0–1.0	RE03-09-13876	6.3	16	1352
SWMU 03-015	03-608296	1.0–2.0	RE03-09-13877	9.7	16	1352
SWMU 03-021	03-611943	4.0–5.0	RE03-09-13888	0.0	14	1828
SWMU 03-021	03-611943	5.0–6.0	RE03-09-13889	0.0	14	1828
SWMU 03-021	03-611944	4.0–5.0	RE03-09-13886	0.0	14	1828
SWMU 03-021	03-611944	5.0–6.0	RE03-09-13887	0.0	14	1828
SWMU 03-021	03-608303	0.0–1.0	RE03-10-4952	0.0	14	1987
SWMU 03-021	03-608303	0.0–1.0	RE03-09-13898	0.0	14	1987
SWMU 03-021	03-608303	1.0.2.0	RE03-09-13899	0.0	14	1987
SWMU 03-021	03-608304	0.0–1.0	RE03-09-13900	0.0	14	1987
SWMU 03-021	03-608304	1.0–2.0	RE03-09-13901	0.0	14	1987
SWMU 03-021	03-608299	0.0–1.0	RE03-09-13890	0.0	14	1987
SWMU 03-021	03-608299	1.0–2.0	RE03-09-13891	0.0	14	1987
SWMU 03-021	03-608300	0.0–1.0	RE03-09-13892	0.0	14	1987
SWMU 03-021	03-608300	1.0–2.0	RE03-09-13893	0.0	14	1987
SWMU 03-021	03-608301	0.0–1.0	RE03-09-13894	0.0	14	1987
SWMU 03-021	03-608301	1.0–2.0	RE03-09-13895	0.0	14	1987
SWMU 03-021	03-608302	0.0–1.0	RE03-09-13896	0.0	14	1987
SWMU 03-021	03-608302	1.0–2.0	RE03-09-13897	0.0	14	1987
AOC-C-03-022	03-608389	1.0–2.0	RE03-09-14082	0.0	18	1018

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC-C-03-022	03-608389	4.0–5.0	RE03-09-14083	NC	0	88
AOC-C-03-022	03-608390	1.0–2.0	RE03-10-1985	NC	0	88
AOC-C-03-022	03-608390	1.0–2.0	RE03-09-14084	NC	0	88
AOC-C-03-022	03-608390	4.0–5.0	RE03-09-14085	NC	0	88
AOC-C-03-022	03-608391	1.0–2.0	RE03-09-14086	NC	0	88
AOC-C-03-022	03-608391	4.0–5.0	RE03-09-14087	NC	0	88
AOC-C-03-022	03-608392	1.0–2.0	RE03-09-14088	NC	0	88
AOC-C-03-022	03-608392	4.0–5.0	RE03-09-14089	NC	0	88
SWMU 03-029	03-608183	0.5–1.0	RE03-09-13442	NC	32.3	2190
SWMU 03-029	03-608183	4.0–5.0	RE03-09-13443	NC	32.3	2190
SWMU 03-029	03-608183	9.0–10.0	RE03-09-13444	NC	32.3	2190
SWMU 03-029	03-608184	1.5–2.0	RE03-09-13445	NC	32.3	2190
SWMU 03-029	03-608184	4.0–5.0	RE03-09-13446	NC	32.3	2190
SWMU 03-029	03-608184	9.0–10.0	RE03-09-13447	NC	32.3	2190
SWMU 03-029	03-608185	0.0–1.0	RE03-09-13448	NC	32.3	2190
SWMU 03-029	03-608185	1.0–2.0	RE03-09-13449	NC	32.3	2190
SWMU 03-029	03-608186	0.0–1.0	RE03-09-13450	NC	32.3	2190
SWMU 03-029	03-608186	1.0–2.0	RE03-09-13451	NC	32.3	2190
AOC 03-038(d)	03-608314	0.0–1.0	RE03-09-13922	0.6	51	1038
AOC 03-038(d)	03-608314	0.0–1.0	RE03-10-7034	0.6	51	1038
AOC 03-038(d)	03-608314	1.0–2.0	RE03-09-13923	3.8	51	1038
AOC 03-038(d)	03-608315	0.0–1.0	RE03-09-13924	0.0	51	1038
AOC 03-038(d)	03-608315	1.0–2.0	RE03-09-13925	0.0	51	1038
AOC 03-038(d)	03-608313	0.0–1.0	RE03-09-13920	1.1	24	1567
AOC 03-038(d)	03-608313	0.0–1.0	RE03-10-7033	1.1	24	1567
AOC 03-038(d)	03-608313	1.0–2.0	RE03-09-13921	0.9	24	1567
AOC 03-038(d)	03-608310	0.0–1.0	RE03-09-13914	2.8	24	1567
AOC 03-038(d)	03-608310	1.0–2.0	RE03-09-13915	1.7	24	1567
AOC 03-038(d)	03-608311	0.0–1.0	RE03-09-13916	4.8	24	1567
AOC 03-038(d)	03-608311	1.0–2.0	RE03-09-13917	1.7	24	1567
AOC 03-038(d)	03-608312	0.0–1.0	RE03-09-13918	1.1	24	1567
AOC 03-038(d)	03-608312	1.0–2.0	RE03-09-13919	1.3	24	1567
SWMU 03-45(a)	03-608316	0.0–1.0	RE03-10-4801	0.0	12	1690
SWMU 03-45(a)	03-608316	0.0–1.0	RE03-09-13932	0.0	12	1690
SWMU 03-45(a)	03-608316	1.0–2.0	RE03-09-13933	0.0	12	1690
SWMU 03-45(a)	03-608317	0.0–1.0	RE03-09-13934	0.0	12	1690
SWMU 03-45(a)	03-608317	1.0–2.0	RE03-09-13935	0.0	12	1690
SWMU 03-45(a)	03-608318	0.0–1.0	RE03-09-13936	0.0	12	1690

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-45(a)	03-608318	1.0–2.0	RE03-09-13937	0.0	12	1690
SWMU 03-45(a)	03-608319	0.0–1.0	RE03-09-13938	0.0	12	1690
SWMU 03-45(a)	03-608319	1.0–2.0	RE03-09-13939	0.0	12	1690
SWMU 03-45(b)	03-608197	0.0–1.0	RE03-09-13480	0.0	14	1987
SWMU 03-45(b)	03-608197	1.0–2.0	RE03-09-13481	0.0	14	1987
SWMU 03-45(b)	03-608197	0.0–1.0	RE03-10-4851	0.0	14	1987
SWMU 03-45(c)	03-608196	0.0–1.0	RE03-09-13478	0.0	14	1987
SWMU 03-45(c)	03-608196	1.0–2.0	RE03-09-13479	0.0	14	1987
SWMU 03-45(e)	03-608320	0.0–1.0	RE03-09-13940	222	0	2150
SWMU 03-45(e)	03-608320	1.0–2.0	RE03-09-13941	134	0	2150
SWMU 03-45(f)	03-608322	0.0–1.0	RE03-09-13944	0.0	14	1828
SWMU 03-45(f)	03-608322	1.0–2.0	RE03-09-13945	0.0	14	1828
SWMU 03-45(f)	03-608322	0.0–1.0	RE03-10-4990	0.0	14	1828
SWMU 03-45(f)	03-608321	0.0–1.0	RE03-09-13942	0.0	14	1828
SWMU 03-45(f)	03-608321	1.0–2.0	RE03-09-13943	0.0	14	1828
SWMU 03-045(g)	03-608187	1.0–2.0	RE03-09-13453	2.7	24.2	1655
SWMU 03-045(g)	03-608187	1.0–2.0	RE03-10-2004	2.7	24.2	1655
SWMU 03-045(g)	03-608187	4.0–5.0	RE03-09-13454	5.6	24.2	1655
SWMU 03-045(g)	03-22536	1.0–2.0	RE03-09-13455	4.3	24.2	1655
SWMU 03-045(g)	03-22536	4.0–5.0	RE03-09-13456	3.6	24.2	1655
SWMU 03-045(g)	03-608188	0.0–1.0	RE03-09-13457	32.4	24.2	1655
SWMU 03-045(g)	03-608188	1.0–2.0	RE03-09-13458	30.6	24.2	1655
SWMU 03-045(g)	03-608189	0.0–1.0	RE03-09-13459	109	24.2	1655
SWMU 03-045(g)	03-608189	1.0–2.0	RE03-09-13460	28.8	24.2	1655
AOC 03-047(g)	03-608324	0.0–1.0	RE03-09-13946	39.3	21	1884
AOC 03-047(g)	03-608324	1.0–2.0	RE03-09-13947	0.3	21	1884
AOC 03-047(g)	03-608325	0.0–1.0	RE03-09-13948	141	21	1884
AOC 03-047(g)	03-608325	1.0–2.0	RE03-09-13949	133	21	1884
AOC 03-047(g)	03-608326	0.0–1.0	RE03-09-13950	144	21	1884
AOC 03-047(g)	03-608326	0.0–1.0	RE03-10-3918	144	21	1884
AOC 03-047(g)	03-608326	1.0–2.0	RE03-09-13951	196	21	1884
AOC 03-047(g)	03-608327	0.0–1.0	RE03-09-13952	2.5	21	1884
AOC 03-047(g)	03-608327	1.0–2.0	RE03-09-13953	39.3	21	1884
AOC 03-051(c)	03-608328	2.5–3.5	RE03-09-13954	2.6	21	1884
AOC 03-051(c)	03-608328	2.5–3.5	RE03-10-3919	2.6	21	1884
AOC 03-051(c)	03-608328	4.5–5.5	RE03-09-13955	3.3	21	1884
AOC 03-051(c)	03-608329	2.5–3.5	RE03-09-13956	1.7	21	1884
AOC 03-051(c)	03-608329	4.5–5.5	RE03-09-13957	1.6	21	1884

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC 03-052(b)	03-03286	7.0–8.0	RE03-09-13982	0.2	21	1884
AOC 03-052(b)	03-03286	10.0–11.0	RE03-09-13983	21.8	21	1884
AOC 03-052(b)	03-608344	1.0–2.0	RE03-09-13986	0.6	21	1884
AOC 03-052(b)	03-608344	4.0–5.0	RE03-09-13987	0.5	21	1884
AOC 03-052(b)	03-608346	1.0–2.0	RE03-10-3915	0.5	21	1884
AOC 03-052(b)	03-608346	1.0–2.0	RE03-09-13990	0.5	21	1884
AOC 03-052(b)	03-608346	4.0–5.0	RE03-09-13991	0.8	21	1884
AOC 03-052(b)	03-608345	1.0–2.0	RE03-09-13988	1.1	21	1884
AOC 03-052(b)	03-608345	4.0–5.0	RE03-09-13989	3.1	21	1884
AOC 03-052(b)	03-608336	1.0–2.0	RE03-09-13970	2.0	60	1273
AOC 03-052(b)	03-608336	4.0–5.0	RE03-09-13971	0.0	60	1273
AOC 03-052(b)	03-608335	1.0–2.0	RE03-09-13968	0.0	60	1273
AOC 03-052(b)	03-608335	4.0–5.0	RE03-09-13969	0.0	60	1273
AOC 03-052(b)	03-608334	1.0–2.0	RE03-09-13966	0.0	60	1273
AOC 03-052(b)	03-608334	4.0–5.0	RE03-09-13967	0.0	60	1273
AOC 03-052(b)	03-608330	5.0–6.0	RE03-10-3913	0.0	60	1273
AOC 03-052(b)	03-608330	3.0–4.0	RE03-09-13958	0.0	60	1273
AOC 03-052(b)	03-608330	5.0–6.0	RE03-09-13959	0.0	60	1273
AOC 03-052(b)	03-608331	3.0–4.0	RE03-09-13960	30.4	60	1273
AOC 03-052(b)	03-608331	5.0–6.0	RE03-09-13961	694	60	1273
AOC 03-052(b)	03-03291	1.0–2.0	RE03-09-13976	0.0	16	1352
AOC 03-052(b)	03-03291	4.0–5.0	RE03-09-13977	0.0	16	1352
AOC 03-052(b)	03-03291	7.0–8.0	RE03-10-12247	NC	18	978
AOC 03-052(b)	03-03291	10.0–11.0	RE03-10-12248	NC	18	978
AOC 03-052(b)	03-608341	4.0–5.0	RE03-09-13980	0.8	73.3	1780
AOC 03-052(b)	03-608341	1.0–2.0	RE03-09-13981	1.4	73.3	1780
AOC 03-052(b)	03-608340	1.0–2.0	RE03-09-13978	1.2	73.3	1780
AOC 03-052(b)	03-608340	1.0–2.0	RE03-10-7831	1.2	73.3	1780
AOC 03-052(b)	03-608340	4.0–5.0	RE03-09-13979	1.0	73.3	1780
AOC 03-052(b)	03-608338	1.0–2.0	RE03-09-13974	0.8	16	1352
AOC 03-052(b)	03-608338	4.0–5.0	RE03-09-13975	0.0	16	1352
AOC 03-052(b)	03-608337	1.0–2.0	RE03-09-13972	21.7	16	1352
AOC 03-052(b)	03-608337	4.0–5.0	RE03-09-13973	3.8	16	1352
AOC 03-052(b)	03-608337	4.0–5.0	RE03-10-3915	3.8	16	1352
AOC 03-052(b)	03-608332	1.0–2.0	RE03-10-3914	0.0	60	1273
AOC 03-052(b)	03-608332	1.0–2.0	RE03-09-13962	0.0	60	1273
AOC 03-052(b)	03-608332	4.0–5.0	RE03-09-13963	0.0	60	1273
AOC 03-052(b)	03-608333	1.0–2.0	RE03-09-13964	0.0	60	1273

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC 03-052(b)	03-608333	4.0–5.0	RE03-09-13965	0.0	60	1273
AOC 03-052(b)	03-608343	1.0–2.0	RE03-09-13984	15.7	21	1884
AOC 03-052(b)	03-608343	4.0–5.0	RE03-09-13985	0.7	21	1884
SWMU 03-052(f)	03-608214	0.0–1.0	RE03-09-13552	1.6	0	2150
SWMU 03-052(f)	03-608214	1.0–2.0	RE03-09-13553	0.3	0	2150
SWMU 03-052(f)	03-608215	0.0–1.0	RE03-09-13554	1.5	0	2150
SWMU 03-052(f)	03-608215	1.0–2.0	RE03-09-13555	1.9	0	2150
SWMU 03-052(f)	03-608216	0.0–1.0	RE03-09-13556	21.1	0	2150
SWMU 03-052(f)	03-608216	1.0–2.0	RE03-09-13557	57.9	0	2150
SWMU 03-052(f)	03-608217	0.0–1.0	RE03-09-13558	0.9	0	2150
SWMU 03-052(f)	03-608217	1.0–2.0	RE03-09-13559	4.0	0	2150
SWMU 03-052(f)	03-608218	0.0–1.0	RE03-09-13560	9.0	0	2150
SWMU 03-052(f)	03-608218	1.0–2.0	RE03-09-13561	9.1	0	2150
SWMU 03-052(f)	03-608219	0.0–1.0	RE03-09-13562	41.2	0	2150
SWMU 03-052(f)	03-608219	1.0–2.0	RE03-09-13563	13.4	0	2150
SWMU 03-052(f)	03-608220	0.0–1.0	RE03-10-4682	50.2	0	2150
SWMU 03-052(f)	03-608220	0.0–1.0	RE03-09-13564	50.2	0	2150
SWMU 03-052(f)	03-608220	1.0–2.0	RE03-09-13565	61.4	0	2150
SWMU 03-056(a)	03-608347	0.0–1.0	RE03-09-13992	NC	32.3	2190
SWMU 03-056(a)	03-608347	1.0–2.0	RE03-09-13993	NC	32.3	2190
SWMU 03-056(a)	03-608347	0.0–1.0	RE03-10-3920	NC	32.3	2190
SWMU 03-056(a)	03-608348	0.0–1.0	RE03-09-13994	NC	32.3	2190
SWMU 03-056(a)	03-608348	1.0–2.0	RE03-09-13995	NC	32.3	2190
SWMU 03-056(a)	03-608349	0.0–1.0	RE03-09-13996	NC	32.3	2190
SWMU 03-056(a)	03-608349	1.0–2.0	RE03-09-13997	NC	32.3	2190
SWMU 03-056(a)	03-608350	0.0–1.0	RE03-09-13998	NC	32.3	2190
SWMU 03-056(a)	03-608350	1.0–2.0	RE03-09-13999	NC	32.3	2190
SWMU 03-056(d)	03-608288	0.0–1.0	RE03-09-13811	0.0	60	1273
SWMU 03-056(d)	03-608288	3.0–4.0	RE03-09-13812	0.0	60	1273
AOC 03-056(k)	03-03281	6.0–7.0	RE03-10-3917	0.7	73.3	1780
AOC 03-056(k)	03-03281	3.0–4.0	RE03-09-14011	1.6	73.3	1780
AOC 03-056(k)	03-03281	6.0–7.0	RE03-09-14012	0.7	73.3	1780
AOC 03-056(k)	03-03290	3.0–4.0	RE03-09-14009	0.7	73.3	1780
AOC 03-056(k)	03-03290	3.0–4.0	RE03-10-7368	0.7	73.3	1780
AOC 03-056(k)	03-03290	6.0–7.0	RE03-09-14010	0.8	73.3	1780
AOC 03-056(k)	03-608353	0.0–1.0	RE03-09-14006	0.5	73.3	1780
AOC 03-056(k)	03-608353	3.0–4.0	RE03-09-14007	0.4	73.3	1780
AOC 03-056(k)	03-608353	6.0–7.0	RE03-09-14008	0.2	73.3	1780

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC 03-056(k)	03-608351	0.0–1.0	RE03-09-14000	1.1	73.3	1780
AOC 03-056(k)	03-608351	3.0–4.0	RE03-09-14001	0.6	73.3	1780
AOC 03-056(k)	03-608351	6.0–7.0	RE03-09-14002	1.7	73.3	1780
AOC 03-056(k)	03-608352	0.0–1.0	RE03-09-14003	1.0	73.3	1780
AOC 03-056(k)	03-608352	0.0–1.0	RE03-10-7367	0.2	73.3	1780
AOC 03-056(k)	03-608352	3.0–4.0	RE03-09-14004	0.0	73.3	1780
AOC 03-056(k)	03-608352	6.0–7.0	RE03-09-14005	0.0	73.3	1780
AOC 03-056(k)	03-608354	1.0–2.0	RE03-09-14013	1.0	73.3	1780
AOC 03-056(k)	03-608354	3.0–4.0	RE03-09-14014	0.7	73.3	1780
AOC 03-056(k)	03-608356	3.0–4.0	RE03-10-3916	0.3	73.3	1780
AOC 03-056(k)	03-608356	1.0–2.0	RE03-09-14017	0.0	73.3	1780
AOC 03-056(k)	03-608356	3.0–4.0	RE03-09-14018	0.3	73.3	1780
AOC 03-056(k)	03-608357	1.0–2.0	RE03-09-14019	0.0	73.3	1780
AOC 03-056(k)	03-608357	3.0–4.0	RE03-09-14020	8.9	73.3	1780
AOC 03-056(k)	03-608355	1.0–2.0	RE03-09-14015	0.3	73.3	1780
AOC 03-056(k)	03-608355	3.0–4.0	RE03-09-14016	0.5	73.3	1780
SWMU 03-059	03-608385	0.0–1.0	RE03-09-14074	NC	na	na
SWMU 03-059	03-608385	2.0–3.0	RE03-09-14075	NC	na	na
SWMU 03-059	03-608387	2.0–3.0	RE03-09-14078	NC	na	na
SWMU 03-059	03-608387	0.0–1.0	RE03-09-14079	NC	na	na
SWMU 03-059	03-608372	0.0–1.0	RE03-09-14048	NC	na	na
SWMU 03-059	03-608372	2.0–3.0	RE03-10-2707	NC	na	na
SWMU 03-059	03-608373	0.0–1.0	RE03-09-14050	NC	na	na
SWMU 03-059	03-608373	2.0–3.0	RE03-10-2708	NC	na	na
SWMU 03-059	03-608375	0.0–1.0	RE03-09-14055	NC	na	na
SWMU 03-059	03-608375	2.0–3.0	RE03-10-2709	NC	na	na
SWMU 03-059	03-608374	0.0–1.0	RE03-09-14053	NC	na	na
SWMU 03-059	03-608374	2.0–3.0	RE03-10-2710	NC	na	na
SWMU 03-059	03-608376	0.0–1.0	RE03-09-14056	NC	na	na
SWMU 03-059	03-608376	2.0–3.0	RE03-09-14057	NC	na	na
SWMU 03-059	03-608377	0.0–1.0	RE03-09-14058	NC	na	na
SWMU 03-059	03-608377	2.0–3.0	RE03-10-1983	NC	na	na
SWMU 03-059	03-608377	2.0–3.0	RE03-10-2711	NC	na	na
SWMU 03-059	03-608378	0.0–1.0	RE03-09-14060	NC	na	na
SWMU 03-059	03-608378	2.0–3.0	RE03-10-2712	NC	na	na
SWMU 03-059	03-608379	0.0–1.0	RE03-09-14063	NC	na	na
SWMU 03-059	03-608379	2.0–3.0	RE03-09-14062	NC	na	na
SWMU 03-059	03-608388	0.0–1.0	RE03-09-14080	NC	na	na

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 03-059	03-608388	2.0–3.0	RE03-09-14081	NC	na	na
SWMU 03-059	03-608380	2.0–3.0	RE03-09-14064	NC	na	na
SWMU 03-059	03-608380	0.0–1.0	RE03-09-14065	NC	na	na
SWMU 03-059	03-608386	0.0–1.0	RE03-09-14076	NC	na	na
SWMU 03-059	03-608386	2.0–3.0	RE03-09-14077	NC	na	na
SWMU 03-059	03-608381	0.0–1.0	RE03-09-14066	NC	na	na
SWMU 03-059	03-608381	2.0–3.0	RE03-09-14067	NC	na	na
SWMU 03-059	03-608382	0.0–1.0	RE03-09-14068	NC	na	na
SWMU 03-059	03-608382	2.0–3.0	RE03-09-14069	NC	na	na
SWMU 03-059	03-608383	0.0–1.0	RE03-09-14070	NC	na	na
SWMU 03-059	03-608383	2.0–3.0	RE03-09-14071	NC	na	na
SWMU 03-059	03-608383	0.0–1.0	RE03-10-1984	NC	na	na
SWMU 03-059	03-608384	2.0–3.0	RE03-09-14072	NC	na	na
SWMU 03-059	03-608384	0.0–1.0	RE03-09-14073	NC	na	na
TA-60						
SWMU 60-002	03-608393	1.0–2.0	RE03-09-14094	6.7	32.8	1427
SWMU 60-002	03-608393	1.0–2.0	RE03-10-2730	6.7	32.8	1427
SWMU 60-002	03-608393	4.0–5.0	RE03-09-14095	3.3	32.8	1427
SWMU 60-002	03-608394	1.0–2.0	RE03-09-14096	27.9	32.8	1427
SWMU 60-002	03-608394	4.0–5.0	RE03-09-14097	2.8	32.8	1427
SWMU 60-002	03-608394	4.0–5.0	RE03-10-8299	2.8	32.8	1427
SWMU 60-002	03-608395	1.0–2.0	RE03-09-14098	5.1	32.8	1427
SWMU 60-002	03-608395	4.0–5.0	RE03-09-14099	2.3	32.8	1427
SWMU 60-002	03-608396	1.0–2.0	RE03-09-14100	2.4	32.8	1427
SWMU 60-002	03-608396	4.0–5.0	RE03-09-14101	1.1	32.8	1427
SWMU 60-002	03-608397	1.0–2.0	RE03-09-14102	>1500	32.8	1427
SWMU 60-002	03-608397	4.0–5.0	RE03-09-14103	35.6	32.8	1427
SWMU 60-002	03-608398	1.0–2.0	RE03-09-14104	10.4	32.8	1427
SWMU 60-002	03-608398	4.0–5.0	RE03-09-14105	7.1	32.8	1427
AOC 60-004(f)	03-608404	1.0–2.0	RE03-09-14208	2.8	17	1461
AOC 60-004(f)	03-608404	2.0–3.0	RE03-09-14209	0.0	17	1461
AOC 60-004(f)	03-608404	4.0–5.0	RE03-09-14210	0.0	17	1461
AOC 60-004(f)	03-608404	9.0–10.0	RE03-09-14211	0.5	17	1461
AOC 60-004(f)	03-608405	1.0–2.0	RE03-09-14212	0.7	17	1561
AOC 60-004(f)	03-608405	2.0–3.0	RE03-09-14213	12.3	17	1561
AOC 60-004(f)	03-608405	4.0–5.0	RE03-09-14214	1.3	17	1561
AOC 60-004(f)	03-608405	4.0–5.0	RE03-10-2735	1.3	17	1561
AOC 60-004(f)	03-608405	9.0–10.0	RE03-09-14215	0.0	17	1561

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC 60-004(f)	03-608406	1.0–2.0	RE03-09-14216	21.8	17	1561
AOC 60-004(f)	03-608406	2.0–3.0	RE03-09-14217	0.0	17	1561
AOC 60-004(f)	03-608406	4.0–5.0	RE03-09-14218	0.5	17	1561
AOC 60-004(f)	03-608406	9.0–10.0	RE03-09-14219	0.0	17	1561
AOC 60-004(f)	03-608407	1.0–2.0	RE03-09-14220	1.3	17	1461
AOC 60-004(f)	03-608407	2.0–3.0	RE03-09-14221	0.0	17	1461
AOC 60-004(f)	03-608407	4.0–5.0	RE03-09-14222	0.0	17	1461
AOC 60-004(f)	03-608407	4.0–5.0	RE03-10-2734	0.0	17	1461
AOC 60-004(f)	03-608407	9.0–10.0	RE03-09-14223	0.0	17	1461
AOC 60-004(f)	03-608408	1.0–2.0	RE03-09-14224	2.9	74	1494
AOC 60-004(f)	03-608408	2.0–3.0	RE03-09-14225	46.9	74	1494
AOC 60-004(f)	03-608408	4.0–5.0	RE03-09-14226	NC	74	1494
AOC 60-004(f)	03-608408	9.0–10.0	RE03-09-14227	76.1	74	1494
SWMU 60-006(a)	03-608409	20.0–21.0	RE03-09-14228	0.5	39	26.90
SWMU 60-006(a)	03-608409	24.0–25.0	RE03-09-14229	0.5	39	26.90
SWMU 60-006(a)	03-608409	29.0–30.0	RE03-09-14230	0.4	39	26.90
SWMU 60-006(a)	03-608410	18.0–19.0	RE03-09-14231	0.0	78	1356
SWMU 60-006(a)	03-608410	22.0–23.0	RE03-09-14232	0.3	78	1356
SWMU 60-006(a)	03-608410	27.0–28.0	RE03-09-14233	0.3	78	1356
SWMU 60-006(a)	03-608410	27.0–28.0	RE03-10-2736	0.3	78	1356
SWMU 60-006(a)	03-608411	18.0–19.0	RE03-09-14234	0.0	78	1356
SWMU 60-006(a)	03-608411	22.0–23.0	RE03-09-14235	0.0	78	1356
SWMU 60-006(a)	03-608411	27.0–28.0	RE03-09-14236	0.0	78	1356
SWMU 60-006(a)	03-608412	10.0–11.0	RE03-09-14238	0.5	78	1356
SWMU 60-006(a)	03-608412	14.0–15.0	RE03-09-14239	0.5	78	1356
SWMU 60-006(a)	03-608412	18.0–19.0	RE03-09-14240	0.0	78	1356
SWMU 60-006(a)	03-608412	23.0–24.0	RE03-09-14241	0.0	78	1356
SWMU 60-006(a)	03-608412	35.0–36.0	RE03-10-9872	0.5	78	1356
SWMU 60-006(a)	03-608412	55.0–56.0	RE03-10-9873	0.5	78	1356
SWMU 60-006(a)	03-608412	60.0–61.0	RE03-10-9874	0.1	78	1356
SWMU 60-006(a)	03-608412	60.0–61.0	RE03-10-2737	0.1	78	1356
SWMU 60-007(a)	03-608413	0.0–1.0	RE03-09-14246	4.7	24	1567
SWMU 60-007(a)	03-608413	2.0–3.0	RE03-09-14247	2.8	24	1567
SWMU 60-007(a)	03-608413	4.0–5.0	RE03-09-14248	3.8	24	1567
SWMU 60-007(a)	03-608414	0.0–1.0	RE03-09-14249	1.3	24	1567
SWMU 60-007(a)	03-608414	2.0–3.0	RE03-09-14250	0.6	24	1567
SWMU 60-007(a)	03-608414	4.0–5.0	RE03-09-14251	1.5	24	1567
SWMU 60-007(a)	03-608415	0.0–1.0	RE03-09-14252	NC	24	1567

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
SWMU 60-007(a)	03-608415	2.0–3.0	RE03-09-14253	NC	24	1567
SWMU 60-007(a)	03-608415	4.0–5.0	RE03-09-14254	NC	24	1567
SWMU 60-007(a)	03-608415	4.0–5.0	RE03-10-6969	NC	24	1567
SWMU 60-007(a)	03-608416	0.0–1.0	RE03-09-14255	NC	24	1567
SWMU 60-007(a)	03-608416	2.0–3.0	RE03-09-14256	0.3	24	1567
SWMU 60-007(a)	03-608416	4.0–5.0	RE03-09-14257	0.0	24	1567
SWMU 60-007(b)	03-608417	0.0–1.0	RE03-09-14265	1.7	74	1494
SWMU 60-007(b)	03-608426	0.0–1.0	RE03-09-14283	1.6	74	1494
SWMU 60-007(b)	03-608426	1.0–2.0	RE03-09-14284	0.0	74	1494
SWMU 60-007(b)	03-608427	0.0–1.0	RE03-09-14285	2.6	74	1494
SWMU 60-007(b)	03-608427	1.0–2.0	RE03-09-14286	4.1	74	1494
SWMU 60-007(b)	03-608428	0.0–1.0	RE03-09-14287	6.9	74	1494
SWMU 60-007(b)	03-608428	1.0–2.0	RE03-09-14288	26.6	74	1494
SWMU 60-007(b)	03-608418	0.0–0.5	RE03-09-14267	0.3	74	1494
SWMU 60-007(b)	03-608419	0.0–0.4	RE03-09-14269	0.8	74	1494
SWMU 60-007(b)	03-608420	0.0–0.5	RE03-09-14271	0.9	74	1494
SWMU 60-007(b)	03-608421	0.0–1.0	RE03-09-14273	8.9	74	1494
SWMU 60-007(b)	03-608421	0.0–1.0	RE03-10-2741	8.9	74	1494
SWMU 60-007(b)	03-608421	1.0–2.0	RE03-09-14274	9.8	74	1494
SWMU 60-007(b)	03-608422	0.0–1.0	RE03-09-14275	9.9	74	1494
SWMU 60-007(b)	03-608422	0.0–1.0	RE03-10-2739	9.9	74	1494
SWMU 60-007(b)	03-608422	1.0–2.0	RE03-09-14276	6.5	74	1494
SWMU 60-007(b)	03-608423	0.0–1.0	RE03-09-14277	930	74	1494
SWMU 60-007(b)	03-608423	0.0–1.0	RE03-10-2740	930	74	1494
SWMU 60-007(b)	03-608423	1.0–2.0	RE03-09-14278	107	74	1494
SWMU 60-007(b)	03-608424	0.0–1.0	RE03-09-14279	29.2	32.8	1427
SWMU 60-007(b)	03-608424	1.0–2.0	RE03-09-14280	15.4	32.8	1427
SWMU 60-007(b)	03-608425	0.0–1.0	RE03-09-14281	1.0	74	1494
SWMU 60-007(b)	03-608425	1.0–2.0	RE03-09-14282	4.3	74	1494
TA-61						
AOC-C-61-002	03-608432	3.0–4.0	RE03-09-14318	0.1	<MDA	<MDA
AOC-C-61-002	03-608432	5.0–6.0	RE03-09-14319	1.1	<MDA	<MDA
AOC-C-61-002	03-608432	7.0–8.0	RE03-09-14320	0.3	<MDA	<MDA
AOC-C-61-002	03-608432	9.0–10.0	RE03-09-14321	0.5	<MDA	<MDA
AOC-C-61-002	03-608432	11.0–12.0	RE03-09-14322	1.0	<MDA	<MDA
AOC-C-61-002	03-608432	14.0–15.0	RE03-09-14323	0.7	<MDA	<MDA
AOC-C-61-002	03-608430	3.0–4.0	RE03-09-14306	1.3	12	1690
AOC-C-61-002	03-608430	3.0–4.0	RE03-10-2720	3.1	12	1690

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID (ppm)	Alpha (dpm)[a]	Beta/Gamma (dpm)[a]
AOC-C-61-002	03-608430	5.0–6.0	RE03-09-14307	0.0	12	1690
AOC-C-61-002	03-608430	7.0–8.0	RE03-09-14308	0.1	12	1690
AOC-C-61-002	03-608430	9.0–10.0	RE03-09-14309	0.0	12	1690
AOC-C-61-002	03-608430	11.0–12.0	RE03-09-14310	0.3	12	1690
AOC-C-61-002	03-608430	14.0–15.0	RE03-09-14311	0.3	12	1690
AOC-C-61-002	03-608431	3.0–4.0	RE03-09-14312	0.0	<MDA	<MDA
AOC-C-61-002	03-608431	5.0–6.0	RE03-09-14313	0.0	<MDA	<MDA
AOC-C-61-002	03-608431	7.0–8.0	RE03-09-14314	0.0	<MDA	<MDA
AOC-C-61-002	03-608431	9.0–10.0	RE03-09-14315	0.1	<MDA	<MDA
AOC-C-61-002	03-608431	9.0–10.0	RE03-10-2721	0.1	<MDA	<MDA
AOC-C-61-002	03-608431	11.0–12.0	RE03-09-14316	0.1	<MDA	<MDA
AOC-C-61-002	03-608431	14.0–15.0	RE03-09-14317	1.0	<MDA	<MDA
AOC-C-61-002	03-608433	3.0–4.0	RE03-09-14324	0.0	<MDA	<MDA
AOC-C-61-002	03-608433	5.0–6.0	RE03-09-14325	1.1	<MDA	<MDA
AOC-C-61-002	03-608433	7.0–8.0	RE03-09-14326	1.3	<MDA	<MDA
AOC-C-61-002	03-608433	9.0–10.0	RE03-09-14327	1.1	<MDA	<MDA
AOC-C-61-002	03-608433	9.0–10.0	RE03-10-2722	1.1	<MDA	<MDA
AOC-C-61-002	03-608433	11.0–12.0	RE03-09-14328	0.6	<MDA	<MDA
AOC-C-61-002	03-608433	14.0–15.0	RE03-09-14329	0.0	<MDA	<MDA
AOC-C-61-002	03-608429	3.0–4.0	RE03-09-14300	3.1	12	1690
AOC-C-61-002	03-608429	3.0–4.0	RE03-10-2760	3.1	12	1690
AOC-C-61-002	03-608429	5.0–6.0	RE03-09-14301	1.1	12	1690
AOC-C-61-002	03-608429	7.0–8.0	RE03-09-14302	3.3	12	1690
AOC-C-61-002	03-608429	9.0–10.0	RE03-09-14303	1.7	12	1690
AOC-C-61-002	03-608429	11.0–12.0	RE03-09-14304	1.9	12	1690
AOC-C-61-002	03-608429	14.0–15.0	RE03-09-14305	3.0	12	1690

[a] Result reported represents site background level.

[b] NC= Not collected.

[c] MDA = Minimum detectable activity.

[d] na = Historical reading not available or 2009 readings not available from LANL RCT.

Table 3.2-3
Crosswalk of Proposed and Sampled Locations

SWMU or AOC	Proposed Location	Location ID
TA-03		
SWMU 03-002(c)	2c-1	03-608148
SWMU 03-002(c)	2c-2	03-608145
SWMU 03-002(c)	2c-3	03-608146
SWMU 03-002(c)	2c-4	03-608147
AOC 03-003(d)	3d-1	03-608149
AOC 03-003(d)	3d-2	03-608150
AOC 03-003(d)	3d-3	03-608161
AOC 03-003(d)	3d-4	03-608172
AOC 03-003(d)	3d-5	03-608151
AOC 03-003(d)	3d-6	03-608162
SWMU 03-009(a)	9a-1	03-608178
SWMU 03-009(a)	9a-2	03-608179
SWMU 03-009(a)	9a-3	03-608180
SWMU 03-009(a)	9a-4	03-608182
SWMU 03-009(a)	9a-5	03-608181
SWMU 03-009(i)	9i-1	03-608195
SWMU 03-009(i)	9i-2	03-608194
SWMU 03-009(i)	9i-3	03-608193
SWMU 03-009(i)	9i-4	03-608192
SWMU 03-009(i)	9i-5	03-608190
SWMU 03-009(i)	9i-6	03-608191
SWMU 03-012(b)	12b-1	03-608197
SWMU 03-013(i)	13i-1	03-608221
SWMU 03-013(i)	13i-2	03-608233
SWMU 03-013(i)	13i-3	03-608234
SWMU 03-013(i)	13i-4	03-608235
SWMU 03-013(i)	13i-5	03-608222
SWMU 03-013(i)	13i-6	03-608223
SWMU 03-013(i)	13i-7	03-608224
SWMU 03-013(i)	13i-8	03-608225
SWMU 03-013(i)	13i-9	03-608226
SWMU 03-013(i)	13i-10	03-608227
SWMU 03-013(i)	13i-11	03-608228
SWMU 03-013(i)	13i-12	03-608229
SWMU 03-013(i)	13i-13	03-608230
SWMU 03-013(i)	13i-14	03-608231

Table 3.2-3 (continued)

SWMU or AOC	Proposed Location	Location ID
TA-03		
SWMU 03-013(i)	13i-15	03-608232
SWMU 03-013(i)	13i-16	03-608236
AOC 03-014(b2)	14b2-1	03-608242
AOC 03-014(b2)	14b2-2	03-608243
AOC 03-014(b2)	14b2-3	03-608244
AOC 03-014(b2)	14b2-4	03-608245
AOC 03-014(b2)	14b2-5	03-608246
AOC 03-014(c2)	14c2-1	03-608250
AOC 03-014(c2)	14c2-2	03-608248
AOC 03-014(c2)	14c2-3	03-608249
AOC 03-014(c2)	14c2-4	03-608251
AOC 03-014(c2)	14c2-5	03-608252
AOC 03-014(c2)	14c2-6	03-608253
AOC 03-014(c2)	14c2-7	03-608254
AOC 03-014(c2)	14c2-8	03-608255
SWMU 03-014(k)	14k-1	03-03201
SWMU 03-014(k)	14k-2	03-03202
SWMU 03-014(k)	14k-3	03-03264
SWMU 03-014(k)	14k-4	03-03265
SWMU 03-014(k)	14k-5	03-03266
SWMU 03-014(k)	14k-6	03-608270
SWMU 03-014(k)	14k-7	03-608271
SWMU 03-014(k)	14k-8	03-608272
SWMU 03-014(k)	14k-9	03-608273
SWMU 03-014(o)	14o-1	03-03204
SWMU 03-014(o)	14o-2	03-608276
SWMU 03-014(o)	14o-3	03-608275
SWMU 03-014(o)	14o-4	03-608277
SWMU 03-014(o)	14o-5	03-608280
SWMU 03-014(o)	14o-6	03-608279
SWMU 03-014(o)	14o-7	03-608278
SWMU 03-014(u)	14u-1	03-608281
SWMU 03-014(u)	14u-2	03-608282
SWMU 03-014(u)	14u-3	03-608283
SWMU 03-014(u)	14u-4	03-608284
SWMU 03-014(u)	14u-5	03-608285
SWMU 03-014(u)	14u-6	03-608286

Table 3.2-3 (continued)

SWMU or AOC	Proposed Location	Location ID
SWMU 03-014(u)	14u-7	03-608287
SWMU 03-014(u)	14u-8	03-609990
SWMU 03-015	15-1	03-608298
SWMU 03-015	15-2	03-608293
SWMU 03-015	15-3	03-608297
SWMU 03-015	15-4	03-608292
SWMU 03-015	15-5	03-608291
SWMU 03-015	15-6	03-608289
SWMU 03-015	15-7	03-608290
SWMU 03-015	15-8	03-608294
SWMU 03-015	15-9	03-608296
SWMU 03-015	15-10	03-608295
SWMU 03-021	21-1	03-611943
SWMU 03-021	21-2	03-611944
SWMU 03-021	21-3	03-608303
SWMU 03-021	21-4	03-608304
SWMU 03-021	21-5	03-608299
SWMU 03-021	21-6	03-608300
SWMU 03-021	21-7	03-608301
SWMU 03-021	21-8	03-608302
AOC C-03-022	C22-1	03-608389
AOC C-03-022	C22-2	03-608390
AOC C-03-022	C22-3	03-608391
AOC C-03-022	C22-4	03-608392
SWMU 03-029	29-1	03-608183
SWMU 03-029	29-2	03-608184
SWMU 03-029	29-3	03-608185
SWMU 03-029	29-4	03-608186
AOC 03-038(d)	38d-1	03-608314
AOC 03-038(d)	38d-2	03-608315
AOC 03-038(d)	38d-3	03-608313
AOC 03-038(d)	38d-4	03-608310
AOC 03-038(d)	38d-5	03-608311
AOC 03-038(d)	38d-6	03-608312
SWMU 03-045(a)	45a-1	03-608316
SWMU 03-045(a)	45a-2	03-608317
SWMU 03-045(a)	45a-3	03-608318
SWMU 03-045(a)	45a-4	03-608319

Table 3.2-3 (continued)

SWMU or AOC	Proposed Location	Location ID
SWMU 03-045(c)	45c-1	03-608196
SWMU 03-045(e)	45e-1	03-608320
SWMU 03-045(f)	45f-1	03-608322
SWMU 03-045(f)	45f-2	03-608321
SWMU 03-045(g)	45g-1	03-608187
SWMU 03-045(g)	45g-2	03-22536
SWMU 03-045(g)	45g-3	03-608188
SWMU 03-045(g)	45g-4	03-608189
AOC 03-047(g)	47g-1	03-608324
AOC 03-047(g)	47g-2	03-608325
AOC 03-047(g)	47g-3	03-608326
AOC 03-047(g)	47g-4	03-608327
AOC 03-051(c)	51c-1	03-608328
AOC 03-051(c)	51c-2	03-608329
AOC 03-052(b)	52b-1	03-03286
AOC 03-052(b)	52b-2	03-03291
AOC 03-052(b)	52b-3	03-608341
AOC 03-052(b)	52b-4	03-608340
AOC 03-052(b)	52b-5	03-608338
AOC 03-052(b)	52b-6	03-608337
AOC 03-052(b)	52b-7	03-608332
AOC 03-052(b)	52b-8	03-608333
AOC 03-052(b)	52b-9	03-608343
AOC 03-052(b)	52b-10	03-608344
AOC 03-052(b)	52b-11	03-608346
AOC 03-052(b)	52b-12	03-608345
AOC 03-052(b)	52b-13	03-608336
AOC 03-052(b)	52b-14	03-608335
AOC 03-052(b)	52b-15	03-608334
AOC 03-052(b)	52b-16	03-608330
AOC 03-052(b)	52b-17	03-608331
SWMU 03-052(f)	52f-1	03-608214
SWMU 03-052(f)	52f-2	03-608215
SWMU 03-052(f)	52f-3	03-608216
SWMU 03-052(f)	52f-4	03-608217
SWMU 03-052(f)	52f-5	03-608218
SWMU 03-052(f)	52f-6	03-608219
SWMU 03-052(f)	52f-7	03-608220

Table 3.2-3 (continued)

SWMU or AOC	Proposed Location	Location ID
SWMU 03-056(a)	56a-1	03-608347
SWMU 03-056(a)	56a-2	03-608348
SWMU 03-056(a)	56a-3	03-608349
SWMU 03-056(a)	56a-4	03-608350
SWMU 03-056(d)	56d-1	03-608288
AOC 03-056(k)	56k-1	03-03281
AOC 03-056(k)	56k-2	03-03290
AOC 03-056(k)	56k-3	03-608353
AOC 03-056(k)	56k-4	03-608351
AOC 03-056(k)	56k-5	03-608352
AOC 03-056(k)	56k-6	03-608354
AOC 03-056(k)	56k-7	03-608356
AOC 03-056(k)	56k-8	03-608357
AOC 03-056(k)	56k-9	03-608355
SWMU 03-059	59-1	03-608385
SWMU 03-059	59-2	03-608388
SWMU 03-059	59-3	03-608380
SWMU 03-059	59-4	03-608386
SWMU 03-059	59-5	03-608379
SWMU 03-059	59-6	03-608381
SWMU 03-059	59-7	03-608382
SWMU 03-059	59-8	03-608383
SWMU 03-059	59-9	03-608384
SWMU 03-059	59-10	03-608387
SWMU 03-059	59-11	03-608372
SWMU 03-059	59-12	03-608373
SWMU 03-059	59-13	03-608375
SWMU 03-059	59-14	03-608374
SWMU 03-059	59-15	03-608376
SWMU 03-059	59-16	03-608377
SWMU 03-059	59-17	03-608378
TA-60		
SWMU 60-002	60-2-1	03-608393
SWMU 60-002	60-2-2	03-608394
SWMU 60-002	60-2-3	03-608395
SWMU 60-002	60-2-4	03-608396
SWMU 60-002	60-2-5	03-608397
SWMU 60-002	60-2-6	03-608398

Table 3.2-3 (continued)

SWMU or AOC	Proposed Location	Location ID
AOC 60-004(f)	4f-1	03-608404
AOC 60-004(f)	4f-2	03-608405
AOC 60-004(f)	4f-3	03-608406
AOC 60-004(f)	4f-4	03-608407
AOC 60-004(f)	4f-5	03-608408
SWMU 60-006(a)	6a-1	03-608409
SWMU 60-006(a)	6a-2	03-608410
SWMU 60-006(a)	6a-3	03-608411
SWMU 60-006(a)	6a-4	03-608412
SWMU 60-007(a)	7a-1	03-608413
SWMU 60-007(a)	7a-2	03-608414
SWMU 60-007(a)	7a-3	03-608415
SWMU 60-007(a)	7a-4	03-608416
SWMU 60-007(b)	7b-1	03-608417
SWMU 60-007(b)	7b-12	03-608428
SWMU 60-007(b)	7b-2	03-608418
SWMU 60-007(b)	7b-3	03-608419
SWMU 60-007(b)	7b-4	03-608420
SWMU 60-007(b)	7b-5	03-608421
SWMU 60-007(b)	7b-6	03-608422
SWMU 60-007(b)	7b-7	03-608423
SWMU 60-007(b)	7b-8	03-608424
SWMU 60-007(b)	7b-9	03-608425
SWMU 60-007(b)	7b-10	03-608426
SWMU 60-007(b)	7b-11	03-608427
SWMU 60-007(b)	7b-12	03-608428
TA-61		
AOC C-61-002	c2-1	03-608432
AOC C-61-002	c2-2	03-608430
AOC C-61-002	c2-3	03-608431
AOC C-61-002	c2-4	03-608433
AOC C-61-002	c2-5	03-608429

Table 6.2-1
Samples Collected and Analyses Requested at SWMU 03-002(c)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	Pesticides	SVOCs	VOCs	Cyanide (Total)
RE03-09-13306	03-608145	0.0–1.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13307	03-608145	5.0–5.8	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13308	03-608146	0.0–1.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13309	03-608146	1.5–2.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13310	03-608147	0.0–1.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13311	03-608147	3.5–4.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13312	03-608148	0.0–1.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278
RE03-09-13313	03-608148	4.5–5.0	Soil	10-278	10-278	10-278	10-278	10-278	10-278

Table 6.2-2
Inorganic Chemicals above BVs at SWMU 03-002(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Chromium	Lead	Sodium	Thallium
Soil BV[a]				**0.83**	**1.83**	**0.4**	**19.3**	**22.3**	**915**	**0.73**
Residential SSL[b]				**3.13E+01**	**1.56E+02**	**7.03E+01**	**1.17E+05[c]**	**4.00E+02**	**na[d]**	**7.82E-01**
Industrial SSL[b]				**4.54E+02**	**2.26E+03**	**8.97E+02**	**1.70E+06[c]**	**8.00E+02**	**na**	**1.14E+01**
Construction Worker SSL[b]				**1.24E+02**	**1.44E+02**	**2.77E+02**	**4.65E+05[c]**	**8.00E+02**	**na**	**3.10E+00**
RE03-09-13306	03-608145	0.0–1.0	Soil	—[e]	—	0.533 (U)	—	—	—	—
RE03-09-13307	03-608145	5.0–5.8	Soil	1.18 (U)	—	0.591 (U)	20.8	—	—	—
RE03-09-13308	03-608146	0.0–1.0	Soil	1.22 (U)	—	0.608 (U)	—	—	2620	—
RE03-09-13309	03-608146	1.5–2.0	Soil	1.3 (U)	—	0.649 (U)	—	—	2730	—
RE03-09-13310	03-608147	0.0–1.0	Soil	1.1 (U)	—	0.549 (U)	36.2	—	970	—
RE03-09-13311	03-608147	3.5–4.0	Soil	1.3 (U)	—	0.652 (U)	29.7	—	1650	—
RE03-09-13312	03-608148	0.0–1.0	Soil	1.23 (U)	—	0.613 (U)	—	—	—	—
RE03-09-13313	03-608148	4.5–5.0	Soil	1.22 (U)	1.96	0.609 (U)	—	37.7	—	0.931

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] SSL for trivalent chromium.

[d] na = Not available.

[e] — = Not detected or not detected above BV.

Table 6.2-3
Organic Chemicals Detected at SWMU 03-002(c)

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chlordane[gamma-]	Chrysene	DDT[4,4'-]	Fluoranthene	Phenanthrene	Pyrene
Residential SSL[a]				**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.62E+01**	**1.48E+02**	**1.72E+01**	**2.29E+03**	**1.83E+03**	**1.72E+03**
Industrial SSL[a]				**2.34E+01**	**2.34E+00**	**2.34E+01**	**7.19E+01**	**2.34E+03**	**7.81E+01**	**2.44E+04**	**2.05E+04**	**1.83E+04**
Construction Worker SSL[a]				**2.13E+02**	**2.13E+01**	**2.13E+02**	**1.35E+02**	**2.06E+04**	**1.42E+02**	**8.91E+03**	**7.15E+03**	**6.68E+03**
RE03-09-13306	03-608145	0.0–1.0	Soil	0.0199 (J)	0.0153 (J)	0.0152 (J)	—[b]	0.0121 (J)	0.00308 (J)	0.0266 (J)	0.0264 (J)	0.0298 (J)
RE03-09-13310	03-608147	0.0–1.0	Soil	—	—	—	0.000983 (J)	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] — = Not detected.

Table 6.3-1
Samples Collected and Analyses Requested at AOC 03-003(d)

Sample ID	Location ID	Depth (ft)	Media	PCBs
RE03-09-13314	03-608149	0.0–0.0	Concrete	10-782
RE03-09-13315	03-608150	0.0–1.0	Soil	10-782
RE03-09-13316	03-608150	1.0–2.0	Soil	10-782
RE03-09-13317	03-608151	0.0–1.0	Soil	10-782
RE03-09-13318	03-608151	1.0–2.0	Soil	10-782
RE03-09-13387	03-608161	0.0–1.0	Soil	10-782
RE03-09-13388	03-608161	1.0–2.0	Soil	10-782
RE03-09-13389	03-608162	0.0–1.0	Soil	10-782
RE03-09-13390	03-608162	1.0–2.0	Soil	10-782
RE03-09-13417	03-608172	0.0–1.0	Soil	10-782
RE03-09-13418	03-608172	1.0–2.0	Soil	10-782

Table 6.3-2
Organic Chemicals Detected at AOC 03-003(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260
Residential SSL[a]				**1.12E+00**	**2.22E+00**
Industrial SSL[a]				**8.26E+00**	**8.26E+00**
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**
RE03-09-13314	03-608149	0.0–0.0	Concrete	—[b]	0.0048
RE03-09-13315	03-608150	0.0–1.0	Soil	0.19	0.489
RE03-09-13316	03-608150	1.0–2.0	Soil	—	0.0315
RE03-09-13317	03-608151	0.0–1.0	Soil	—	0.0168 (J)
RE03-09-13318	03-608151	1.0–2.0	Soil	—	0.0071
RE03-09-13387	03-608161	0.0–1.0	Soil	—	0.408
RE03-09-13388	03-608161	1.0–2.0	Soil	—	0.965
RE03-09-13389	03-608162	0.0–1.0	Soil	—	0.0246
RE03-09-13390	03-608162	1.0–2.0	Soil	—	0.0081
RE03-09-13417	03-608172	0.0–1.0	Soil	—	0.0276
RE03-09-13418	03-608172	1.0–2.0	Soil	—	0.0136 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] — = Not detected.

Table 6.4-1
Samples Collected and Analyses Requested at SWMU 03-009(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-03-52417	03-22537	4.5–5.0	Qbt4	1885S	—*	1885S	1885S	1885S	1885S	—
RE03-03-52419	03-22537	19.5–20.0	Qbt4	1892S	—	1892S	1892S	1892S	1892S	—
RE03-03-52422	03-22538	14.5–15.0	Fill	1886S	—	1886S	1886S	1886S	1886S	—
RE03-03-52423	03-22538	19.5–20.0	Qbt4	1892S	—	1892S	1892S	1892S	1892S	—
RE03-03-52427	03-22539	4.0–5.0	Qbt4	1886S	—	1886S	1886S	1886S	1886S	—
RE03-03-52429	03-22539	19.5–20.0	Qbt4	1886S	—	1886S	1886S	1886S	1886S	—
RE03-09-13427	03-608178	9.0–10.0	Soil	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13426	03-608178	11.5–12.0	Qbt3	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13428	03-608178	14.0–15.0	Qbt3	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13429	03-608178	19.0–20.0	Qbt3	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13430	03-608179	9.0–10.0	Soil	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13431	03-608179	11.2–12.0	Qbt3	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13432	03-608179	14.0–15.0	Qbt3	10-296	10-295	10-295	10-295	—	10-295	10-296
RE03-09-13433	03-608179	19.0–20.0	Qbt3	10-307	10-307	10-307	10-307	—	10-307	10-307
RE03-09-13434	03-608180	9.0–10.0	Soil	10-323	10-323	10-323	10-323	—	10-323	10-323
RE03-09-13436	03-608180	14.0–15.0	Qbt3	10-323	10-323	10-323	10-323	—	10-323	10-323
RE03-09-13437	03-608180	19.0–20.0	Qbt3	10-323	10-323	10-323	10-323	—	10-323	10-323
RE03-09-13438	03-608181	0.0–1.0	Soil	10-276	10-276	10-276	10-276	—	10-276	10-276
RE03-09-13439	03-608181	1.0–2.0	Soil	10-276	10-276	10-276	10-276	—	10-276	10-276
RE03-09-13440	03-608182	0.0–1.0	Soil	10-276	10-276	10-276	10-276	—	10-276	10-276
RE03-09-13441	03-608182	1.0–2.0	Soil	10-276	10-276	10-276	10-276	—	10-276	10-276

*— = Analyses not requested.

Table 6.4-2
Inorganic Chemicals above BVs at SWMU 03-009(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Lead	Manganese	Selenium	Sodium
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**2200**	**7.14**	**11.2**	**482**	**0.3**	**2770**
Soil BV[a]				**0.83**	**0.4**	**6120**	**19.3**	**22.3**	**671**	**1.52**	**915**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**4.00E+02**	**1.86E+03**	**3.91E+02**	**na**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**na**	**1.70E+06[d]**	**8.00E+02**	**2.67E+04**	**5.68E+03**	**na**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**8.00E+02**	**4.40E+02**	**1.55E+03**	**na**
RE03-03-52423	03-22538	19.5–20.0	Qbt4	—[e]	—	—	—	—	—	0.48 (J+)	—
RE03-03-52427	03-22539	4.0–5.0	Qbt4	—	—	—	—	—	—	0.43 (J+)	—
RE03-09-13427	03-608178	9.0–10.0	Soil	1.17 (U)	0.584 (U)	—	—	—	—	—	—
RE03-09-13426	03-608178	11.5–12.0	Qbt3	1.15 (U)	—	—	21.5	12.4	—	1.19 (UJ)	—
RE03-09-13428	03-608178	14.0–15.0	Qbt3	1.19 (U)	—	—	20.9	—	—	1.19 (UJ)	—
RE03-09-13429	03-608178	19.0–20.0	Qbt3	1.11 (U)	—	—	37.5	58.2	530	1.11 (UJ)	—
RE03-09-13430	03-608179	9.0–10.0	Soil	1.01 (U)	0.503 (U)	—	—	—	—	—	—
RE03-09-13431	03-608179	11.2–12.0	Qbt3	1.16 (U)	—	—	14.1	—	—	1.16 (UJ)	—
RE03-09-13432	03-608179	14.0–15.0	Qbt3	1.08 (U)	—	—	21.5	—	—	1.08 (UJ)	—
RE03-09-13433	03-608179	19.0–20.0	Qbt3	1.06 (U)	—	—	65.8	—	—	1.07 (U)	—
RE03-09-13434	03-608180	9.0–10.0	Soil	1.78 (U)	—	13,400 (J)	—	—	—	—	1160
RE03-09-13436	03-608180	14.0–15.0	Qbt3	0.742 (U)	—	—	—	—	—	1.08 (U)	—
RE03-09-13437	03-608180	19.0–20.0	Qbt3	0.887 (U)	—	—	—	—	—	1.06 (U)	—
RE03-09-13438	03-608181	0.0–1.0	Soil	1.05 (U)	0.523 (U)	—	—	—	—	—	—
RE03-09-13439	03-608181	1.0–2.0	Soil	1.08 (U)	0.541 (U)	—	—	—	—	—	—
RE03-09-13440	03-608182	0.0–1.0	Soil	1.04 (U)	0.519 (U)	—	—	—	—	—	—
RE03-09-13441	03-608182	1.0–2.0	Soil	1.06 (U)	0.532 (U)	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 209971).

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 6.4-3
Organic Chemicals Detected at SWMU 03-009(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	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	Butylbenzene[sec-]	Chrysene	Ethylbenzene	Fluoranthene	Fluorene
Residential SSL[a]				**3.44E+03**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**3.47E+02**	**3.90E+03[c,d]**	**1.48E+02**	**6.84E+01**	**2.29E+03**	**2.29E+03**
Industrial SSL[a]				**3.67E+04**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**1.37E+03**	**5.10E+04[c,d]**	**2.34E+03**	**3.78E+02**	**2.44E+04**	**2.44E+04**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**4.76E+03**	**1.55E+04[c,e]**	**2.06E+04**	**1.83E+03**	**8.91E+03**	**8.91E+03**
RE03-03-52422	03-22538	14.5–15.0	Fill	—[f]	—	NA[g]	NA	—	—	—	—	—	—	—	—	—	—	—
RE03-03-52427	03-22539	4.0–5.0	Qbt4	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
RE03-03-52429	03-22539	19.5–20.0	Qbt4	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13427	03-608178	9.0–10.0	Soil	0.108	0.293	0.0396	0.0382 (J)	0.857	0.944	1.62	0.469	—	0.148 (J)	0.000825 (J)	0.894	0.000756 (J)	1.83	—
RE03-09-13426	03-608178	11.5–12.0	Qbt3	0.0133 (J)	0.0553	—	—	0.13	0.13	0.232	0.076	—	—	—	0.129	—	0.346	0.0234 (J)
RE03-09-13428	03-608178	14.0–15.0	Qbt3	—	0.0227 (J)	—	—	0.0648	0.0597	0.107	0.0332 (J)	—	—	—	0.0557	—	0.159	—
RE03-09-13429	03-608178	19.0–20.0	Qbt3	—	0.0457	—	—	0.0878	0.07	0.123	0.0316 (J)	—	—	—	0.0782	—	0.248	0.0187 (J)
RE03-09-13430	03-608179	9.0–10.0	Soil	—	0.0104 (J)	—	—	0.0243 (J)	—	0.0345 (J)	—	—	—	—	0.022 (J)	—	0.045	—
RE03-09-13434	03-608180	9.0–10.0	Soil	—	—	—	—	0.0295 (J)	0.0309 (J)	0.0468	0.015 (J)	0.0148 (J)	—	—	0.0329 (J)	—	0.045	—
RE03-09-13436	03-608180	14.0–15.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13438	03-608181	0.0–1.0	Soil	0.0119 (J)	—	—	0.0069 (J)	—	—	0.0168 (J)	—	—	—	—	—	—	0.0195 (J)	—
RE03-09-13439	03-608181	1.0–2.0	Soil	—	—	—	—	—	0.0187 (J)	0.0308 (J)	0.0168 (J)	—	—	0.00033 (J)	—	—	0.0386	—
RE03-09-13440	03-608182	0.0–1.0	Soil	—	0.0219 (J)	—	—	0.0557	0.0511	0.0854	0.0299 (J)	—	—	—	0.0505	—	0.138	0.0117 (J)
RE03-09-13441	03-608182	1.0–2.0	Soil	0.0272 (J)	0.0639	—	0.0016 (J)	0.179	0.166	0.27	0.0996	—	—	—	0.16	—	0.437	0.0329 (J)

Table 6.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Tetrachloroethene	TPH-DRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Residential SSL[a]				**1.48E+00**	**2.43E+03**	**2.43E+03[h]**	**4.09E+02**	**2.30E+02[d]**	**4.30E+01**	**1.83E+03**	**3.40E+03[d]**	**1.72E+03**	**7.02E+00**	**1.00E+03[i]**	**6.20E+01[d]**	**7.80E+02[d]**	**8.98E+02**	**8.14E+02[j]**
Industrial SSL[a]				**2.34E+01**	**1.45E+04**	**1.45E+04[h]**	**4.70E+03**	**2.20E+03[d]**	**2.41E+02**	**2.05E+04**	**2.10E+04[d]**	**1.83E+04**	**3.66E+01**	**1.80E+03[i]**	**2.60E+02[d]**	**1.00E+04[d]**	**4.41E+03**	**3.98E+03[j]**
Construction Worker SSL[a]				**2.13E+02**	**2.81E+03**	**2.81E+03[h]**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**2.01E+04[e]**	**6.68E+03**	**2.12E+02**	**na[k]**	**6.88E+02[e]**	**3.10E+03[e]**	**8.23E+02**	**7.43E+02[j]**
RE03-03-52422	03-22538	14.5–15.0	Fill	—	—	—	0.031	—	—	—	—	—	0.00057 (J)	—	—	—	NA	NA
RE03-03-52427	03-22539	4.0–5.0	Qbt4	—	—	—	0.023	—	—	—	—	—	—	—	—	—	NA	NA
RE03-03-52429	03-22539	19.5–20.0	Qbt4	—	—	—	0.024	—	—	—	—	—	—	—	—	—	NA	NA
RE03-09-13427	03-608178	9.0–10.0	Soil	0.408	0.000412 (J)	0.00183	—	0.915	0.24	0.941	0.000744 (J)	1.86	—	226 (J+)	0.00206	0.00111 (J)	0.00071 (J)	0.000687 (J)
RE03-09-13426	03-608178	11.5–12.0	Qbt3	0.0688	—	—	—	0.0374 (J)	0.0164 (J)	0.203	—	0.332	—	27.5 (J+)	—	—	—	—
RE03-09-13428	03-608178	14.0–15.0	Qbt3	0.0279 (J)	—	—	—	0.0138 (J)	—	0.0895	—	0.154	—	23.6 (J+)	—	—	—	—
RE03-09-13429	03-608178	19.0–20.0	Qbt3	0.0263 (J)	—	—	—	—	—	0.156	—	0.208	—	—	—	—	—	—
RE03-09-13430	03-608179	9.0–10.0	Soil	—	—	—	—	—	—	0.045	—	0.0557	—	—	—	—	—	—
RE03-09-13434	03-608180	9.0–10.0	Soil	0.0169 (J)	—	—	0.00238 (J)	—	—	0.0242 (J)	—	0.0669	—	6.96 (J)	—	—	—	—
RE03-09-13436	03-608180	14.0–15.0	Qbt3	—	—	—	—	—	—	—	—	—	—	3.24 (J)	—	—	—	—
RE03-09-13438	03-608181	0.0–1.0	Soil	—	—	—	—	—	—	—	—	0.0173 (J)	—	23.7	—	—	—	—
RE03-09-13439	03-608181	1.0–2.0	Soil	—	—	0.000373 (J)	—	—	—	0.0279 (J)	—	0.0432	—	83.5 (J+)	0.000741 (J)	0.000575 (J)	—	—
RE03-09-13440	03-608182	0.0–1.0	Soil	0.0249 (J)	—	—	—	—	—	0.0913	—	0.126	—	3.91 (J)	—	—	—	—
RE03-09-13441	03-608182	1.0–2.0	Soil	0.0928	—	—	—	—	—	0.279	—	0.373	—	7.39	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Butylbenzene[n-] used as a surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] Isopropylbenzene used as a surrogate based on structural similarity.

[i] Screening guidelines for diesel No.2 from NMED (2012, 219971).

[j] Xylenes used as a surrogate based on structural similarity.

[k] na = Not available.

Table 6.4-4
Samples Collected and Analyses Requested at SWMU 03-029

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13442	03-608183	0.5–1.0	Soil	10-227	10-227	10-227	10-227	10-227	10-227
RE03-09-13443	03-608183	4.0–5.0	Qbt3	10-227	10-227	10-227	10-227	10-227	—*
RE03-09-13444	03-608183	9.0–10.0	Qbt3	10-227	10-227	10-227	10-227	10-227	10-227
RE03-09-13445	03-608184	1.5–2.0	Soil	10-236	10-236	10-236	10-236	10-236	10-236
RE03-09-13446	03-608184	4.0–5.0	Qbt3	10-236	10-236	10-236	10-236	10-236	10-236
RE03-09-13447	03-608184	9.0–10.0	Qbt3	10-236	10-236	10-236	10-236	10-236	10-236
RE03-09-13448	03-608185	0.0–1.0	Soil	10-248	10-248	10-248	10-248	10-248	10-248
RE03-09-13449	03-608185	1.0–2.0	Soil	10-248	10-248	10-248	10-248	10-248	10-248
RE03-09-13450	03-608186	0.0–1.0	Qbt3	10-248	10-248	10-248	10-248	10-248	10-248
RE03-09-13451	03-608186	1.0–2.0	Qbt3	10-248	10-248	10-248	10-248	10-248	10-248

*— = Analyses not requested.

Table 6.4-5
Inorganic Chemicals above BVs at SWMU 03-029

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Calcium	Chromium	Copper	Iron	Selenium
Qbt 2,3,4 BV[a]				**0.5**	**2.79**	**1.63**	**2200**	**7.14**	**4.66**	**14,500**	**0.3**
Soil BV[a]				**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**14.7**	**21,500**	**1.52**
Residential SSL[b]				**3.13E+01**	**3.90E+00**	**7.03E+01**	**na**[c]	**1.17E+05**[d]	**3.13E+03**	**5.48E+04**	**3.91E+02**
Industrial SSL[b]				**4.54E+02**	**1.77E+01**	**8.97E+02**	**na**	**1.70E+06**[d]	**4.54E+04**	**7.95E+05**	**5.68E+03**
Construction Worker SSL[b]				**1.24E+02**	**5.30E+01**	**2.77E+02**	**na**	**4.65E+05**[d]	**1.24E+04**	**2.17E+05**	**1.55E+03**
RE03-09-13442	03-608183	0.6–1	Soil	1.07 (U)	—[e]	0.536 (U)	—	—	—	—	—
RE03-09-13443	03-608183	4–5	Qbt3	1.11 (U)	—	—	—	14	—	—	1.11 (U)
RE03-09-13444	03-608183	9–10	Qbt3	1.09 (U)	—	—	—	19.6	—	—	1.09 (U)
RE03-09-13445	03-608184	1.5–2	Soil	1.11 (U)	—	0.556 (U)	—	—	—	34,900	—
RE03-09-13446	03-608184	4–5	Qbt3	1.08 (U)	—	—	—	8.5	—	—	1.08 (U)
RE03-09-13447	03-608184	9–10	Qbt3	1.08 (U)	—	—	—	15.8	—	—	1.07 (U)
RE03-09-13448	03-608185	0–1	Soil	1.08 (U)	8.7	0.54 (U)	12,200	—	18.9	—	—
RE03-09-13449	03-608185	1–2	Soil	1.06 (U)	—	0.53 (U)	—	—	40.5	—	—
RE03-09-13450	03-608186	0–1	Qbt3	1.1 (U)	—	—	—	11.2	—	—	1.12 (U)
RE03-09-13451	03-608186	1–2	Qbt3	1.06 (U)	—	—	—	22	—	—	1.09 (U)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 6.4-6
Organic Chemicals Detected at SWMU 03-029

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.48E+02**	**2.29E+03**	**1.83E+03**	**1.72E+03**	**1.00E+03[b]**
Industrial SSL[a]				**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**2.34E+03**	**2.44E+04**	**2.05E+04**	**1.83E+04**	**1.80E+03[b]**
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**2.06E+04**	**8.91E+03**	**7.15E+03**	**6.68E+03**	**na[c]**
RE03-09-13442	03-608183	0.6–1	Soil	0.0246	0.0155	0.0225 (J)	0.0184 (J)	0.0286 (J)	0.0185 (J)	0.032 (J)	0.0126 (J)	0.0327 (J)	5 (J)
RE03-09-13445	03-608184	1.5–2	Soil	—[d]	0.0134	—	—	—	—	—	—	—	4.8 (J)
RE03-09-13446	03-608184	4–5	Qbt3	0.0023 (J)	—	—	—	—	—	—	—	—	2.86 (J)
RE03-09-13447	03-608184	9–10	Qbt3	—	—	—	—	—	—	—	—	—	2.94 (J)
RE03-09-13448	03-608185	0–1	Soil	0.0203	0.0117	—	—	—	—	—	—	—	2.86 (J)
RE03-09-13449	03-608185	1–2	Soil	0.0296	0.0261	—	—	—	—	—	—	—	—
RE03-09-13450	03-608186	0–1	Qbt3	0.0065	0.0051	—	—	—	—	—	—	—	—
RE03-09-13451	03-608186	1–2	Qbt3	0.0015 (J)	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[c] na = Not available.

[d] — = Not detected.

Table 6.4-7
Samples Collected and Analyses Requested at SWMU 03-045(g)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-03-52407	03-22535	0.0–0.5	Sed	1886S	—*	1886S	1886S	1886S	1886S	—
RE03-03-52408	03-22535	1.5–2.0	Sed	1886S	—	1886S	1886S	1886S	1886S	—
RE03-03-52412	03-22536	0.0–0.5	Sed	1886S	—	1886S	1886S	1886S	1886S	—
RE03-09-13455	03-22536	1.0–2.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-03-52413	03-22536	1.5–2.0	Sed	1886S	—	1886S	1886S	1886S	1886S	—
RE03-09-13456	03-22536	4.0–5.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13453	03-608187	1.0–2.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13454	03-608187	4.0–5.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13457	03-608188	0.0–1.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13458	03-608188	1.0–2.0	Qbt3	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13459	03-608189	0.0–1.0	Soil	10-307	10-307	10-307	10-307	10-307	10-307	10-307
RE03-09-13460	03-608189	1.0–2.0	Qbt3	10-307	10-307	10-307	10-307	10-307	10-307	10-307

*— = Analyses not requested.

Table 6.4-8
Inorganic Chemicals above BVs at SWMU 03-045(g)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Sodium	Thallium	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**3500**	**0.3**	**2770**	**1.1**	**17**	**63.5**
Sediment BV[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13,800**	**19.7**	**2370**	**543**	**9.38**	**2690**	**0.3**	**1470**	**0.73**	**19.7**	**60.2**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**3460**	**1.52**	**915**	**0.73**	**39.6**	**48.8**
Residential SSL[b]				**3.13E+01**	**3.90E+00**	**1.56E+04**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**1.86E+03**	**1.56E+03**	**na**	**3.91E+02**	**na**	**7.82E-01**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**1.77E+01**	**2.23E+05**	**8.097E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**2.67E+04**	**2.25E+04**	**na**	**5.68E+03**	**na**	**1.14E+01**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**5.30E+01**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**4.40E+02**	**6.19E+03**	**na**	**1.55E+03**	**na**	**3.10E+00**	**1.55E+03**	**9.29E+04**
RE03-03-52407	03-22535	0.0–0.5	Sed	—[g]	4.2	262	—	23,400	27.5 (J-)	7.9	29.4	19,700	—	6310	582 (J)	17.5	2850	—	2190	—	32	61.1
RE03-03-52408	03-22535	1.5–2.0	Sed	—	—	128	0.63	13,700	14.4 (J-)	—	24.5	—	—	2700	—	11	—	—	—	—	21.6	65.1
RE03-03-52412	03-22536	0.0–0.5	Sed	—	—	241	0.93	22,100	27.7 (J-)	7.7	39.2	19,900	27.3	5200	—	19.3	2870	—	1510	—	31.3	141
RE03-09-13455	03-22536	1.0–2.0	Soil	1.06 (U)	—	—	—	16,400	58.7	—	22.1	—	—	—	—	—	—	—	—	—	—	61.9
RE03-03-52413	03-22536	1.5–2.0	Sed	—	—	—	—	66,000	10.9 (J-)	—	—	—	—	3340	654 (J)	11.9	—	—	—	—	—	—
RE03-09-13456	03-22536	4.0–5.0	Soil	1.09 (U)	—	—	0.547 (U)	—	20	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13453	03-608187	1.0–2.0	Soil	1.01 (U)	—	—	0.503 (U)	13,000	38.4	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13454	03-608187	4.0–5.0	Soil	1.04 (U)	—	—	0.522 (U)	6530	43.3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13457	03-608188	0.0–1.0	Soil	1.07 (U)	—	—	0.537 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.04 (U)	—	—
RE03-09-13458	03-608188	1.0–2.0	Qbt3	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.997 (U)	—	—	—	—
RE03-09-13459	03-608189	0.0–1.0	Soil	1.08 (U)	—	—	0.542 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13460	03-608189	1.0–2.0	Qbt3	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.983 (U)	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.4-9
Organic Chemicals Detected at SWMU 03-045(g)

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	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzene[n-]	Chrysene
Residential SSL[a]				**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03**[b]	**1.48E+01**	**2.40E+05**[c]	**3.47E+02**	**3.90E+03**[c]	**1.48E+02**
Industrial SSL[a]				**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04**[b]	**2.34E+02**	**2.50E+06**[c]	**1.37E+03**	**5.10E+04**[c]	**2.34E+03**
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03**[b]	**2.06E+03**	**9.52E+05**[d]	**4.76E+03**	**1.55E+04**[d]	**2.06E+04**
RE03-03-52407	03-22535	0.0–0.5	Sed	NA[e]	NA	0.16 (J)	0.22 (J)	0.19 (J)	0.2 (J)	0.2 (J)	—[f]	0.73	—	0.21 (J)
RE03-03-52408	03-22535	1.5–2.0	Sed	NA	NA	—	—	—	—	—	—	0.28 (J)	—	—
RE03-03-52412	03-22536	0.0–0.5	Sed	NA	NA	0.12 (J)	0.14 (J)	0.15 (J)	—	0.12 (J)	—	0.77	—	0.15 (J)
RE03-09-13455	03-22536	1.0–2.0	Soil	—	—	0.0197 (J)	0.0226 (J)	0.0317 (J)	—	0.0115 (J)	—	—	—	0.0189 (J)
RE03-03-52413	03-22536	1.5–2.0	Sed	NA	NA	0.16 (J)	0.16 (J)	0.15 (J)	0.11 (J)	0.14 (J)	—	0.32 (J)	0.0018 (J)	0.18 (J)
RE03-09-13456	03-22536	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13453	03-608187	1.0–2.0	Soil	—	—	0.0272 (J)	0.03 (J)	0.0404	0.0304 (J)	0.0158 (J)	—	—	—	0.0238 (J)
RE03-09-13454	03-608187	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13457	03-608188	0.0–1.0	Soil	0.0052	0.0153	—	0.0177 (J)	0.0226 (J)	—	—	—	—	—	0.0148 (J)
RE03-09-13458	03-608188	1.0–2.0	Qbt3	—	—	—	—	—	—	—	0.174 (J)	—	—	—
RE03-09-13459	03-608189	0.0–1.0	Soil	0.002 (J)	0.0026 (J)	—	—	—	—	—	—	—	—	—
RE03-09-13460	03-608189	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—

Table 6.4-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	TPH-DRO	TPH-GRO	Trichloroethene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]
Residential SSL[a]				**2.29E+03**	**1.48E+00**	**2.43E+03[g]**	**4.09E+02**	**1.83E+03**	**1.72E+03**	**1.00E+03[h]**	**na[i]**	**4.57E+01**	**6.20E+01[c]**	**7.80E+02[c]**
Industrial SSL[a]				**2.44E+04**	**2.34E+01**	**1.45E+04[g]**	**4.70E+03**	**2.05E+04**	**1.83E+04**	**1.80E+03[h]**	**na**	**2.53E+02**	**2.60E+02[c]**	**1.00E+04[c]**
Construction Worker SSL[a]				**8.91E+03**	**2.13E+02**	**2.81E+04[g]**	**1.12E+03**	**7.15E+03**	**6.68E+03**	**na**	**na**	**4.60E+03**	**6.88E+02[e]**	**3.10E+03[e]**
RE03-03-52407	03-22535	0.0–0.5	Sed	0.37 (J)	0.18 (J)	—	0.013	0.14 (J)	0.38 (J)	—	—	—	—	—
RE03-03-52408	03-22535	1.5–2.0	Sed	0.12 (J)	—	—	0.011	—	0.11 (J)	—	—	—	—	—
RE03-03-52412	03-22536	0.0–0.5	Sed	0.33 (J)	0.12 (J)	—	0.018	0.12 (J)	0.28 (J)	—	—	—	—	—
RE03-09-13455	03-22536	1.0–2.0	Soil	0.0474	0.122	—	—	0.0148 (J)	0.0356	6.9 (J)	—	—	—	—
RE03-03-52413	03-22536	1.5–2.0	Sed	0.42	0.12 (J)	0.014	0.013	0.2 (J)	0.34 (J)	—	0.95	0.0019 (J)	0.0029 (J)	0.0011 (J)
RE03-09-13456	03-22536	4.0–5.0	Soil	—	—	—	—	—	—	—	0.0165 (J)	—	—	—
RE03-09-13453	03-608187	1.0–2.0	Soil	0.0571	0.122	—	—	0.0183 (J)	0.0435	18.5 (J)	0.016 (J)	—	—	—
RE03-09-13454	03-608187	4.0–5.0	Soil	—	—	—	—	—	—	—	0.0336 (J)	—	—	—
RE03-09-13457	03-608188	0.0–1.0	Soil	0.0383	0.119	—	—	0.0157 (J)	0.0305 (J)	48.5	0.309	—	—	—
RE03-09-13458	03-608188	1.0–2.0	Qbt3	—	—	—	—	—	—	3.66 (J)	0.184	—	—	—
RE03-09-13459	03-608189	0.0–1.0	Soil	—	—	—	—	—	—	13.1	0.195	—	—	—
RE03-09-13460	03-608189	1.0–2.0	Qbt3	—	—	—	—	—	—	—	0.377	—	0.000329 (J)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] NA = Not analyzed.

[f] — = Not detected.

[g] Isopropylbenzene used as a surrogate based on structural similarity.

[h] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[i] na = Not available.

Table 6.5-1
Samples Collected and Analyses Requested at SWMU 03-009(i)

Sample ID	Location ID	Depth (ft)	Media	TAL Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13461	03-608190	0.0–1.0	Soil	10-603	10-603	10-603	10-603	10-603	10-603
RE03-09-13462	03-608190	1.0–2.0	Soil	10-603	10-603	10-603	10-603	10-603	10-603
RE03-09-13463	03-608191	0.0–1.0	Soil	10-603	10-603	10-603	10-603	10-603	10-603
RE03-09-13464	03-608191	1.0–2.0	Qbt3	10-603	10-603	10-603	10-603	10-603	10-603
RE03-09-13465	03-608192	4.0–5.0	Qbt3	10-886	10-886	10-886	10-886	10-886	10-886
RE03-09-13466	03-608192	9.0–10.0	Qbt3	10-886	10-886	10-886	10-886	10-886	10-886
RE03-09-13467	03-608193	4.0–5.0	Qbt3	10-886	10-886	10-886	10-886	10-886	10-886
RE03-09-13468	03-608193	9.0–10.0	Qbt3	10-886	10-886	10-886	10-886	10-886	10-886
RE03-09-13469	03-608194	4.0–5.0	Qbt3	10-901	10-901	10-901	10-901	10-901	10-901
RE03-09-13470	03-608194	9.0–10.0	Qbt3	10-901	10-901	10-901	10-901	10-901	10-901
RE03-09-13471	03-608195	4.0–5.0	Qbt3	10-901	10-901	10-901	10-901	10-901	10-901
RE03-09-13472	03-608195	9.0–10.0	Qbt3	10-901	10-901	10-901	10-901	10-901	10-901

Table 6.5-2
Inorganic Chemicals above BVs at SWMU 03-009(i)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Nickel	Selenium	Vanadium
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**482**	**6.58**	**0.3**	**17**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**15.4**	**1.52**	**39.6**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+04**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**4.69E+01**	**5.48E+04**	**4.00E+02**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**3.91E+02**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**1.77E+01**	**2.23E+05**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**6.81E+02**	**7.95E+05**	**8.00E+02**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**5.68E+03**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**4.35E+03**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**1.88E+02**	**2.17E+05**	**8.00E+02**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**1.55E+03**
RE03-09-13461	03-608190	0.0–1.0	Soil	—[g]	2.44	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13462	03-608190	1.0–2.0	Soil	—	1.33 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13463	03-608191	0.0–1.0	Soil	—	2.07 (U)	—	—	9350	—	—	—	—	—	—	—	—	—	—
RE03-09-13464	03-608191	1.0–2.0	Qbt3	—	1.9 (U)	—	74.4	3460	14	6.06	10.2	0.631	18,500	—	565	9.55 (J+)	1 (UJ)	24.6
RE03-09-13465	03-608192	4.0–5.0	Qbt3	—	1.04 (U)	—	—	—	—	—	—	—	—	—	—	—	1.07 (U)	—
RE03-09-13466	03-608192	9.0–10.0	Qbt3	—	1.07 (U)	4.34	—	—	—	—	—	—	19,300	—	—	—	1.07 (U)	—
RE03-09-13467	03-608193	4.0–5.0	Qbt3	—	1.01 (U)	—	—	—	—	—	—	—	—	—	—	—	1 (U)	—
RE03-09-13468	03-608193	9.0–10.0	Qbt3	—	1.1 (U)	—	—	—	—	—	—	—	—	17	—	—	1.09 (U)	—
RE03-09-13469	03-608194	4.0–5.0	Qbt3	8110 (J+)	1.65	—	136	2310	7.68	4.67	5.88	—	—	12.8	—	7.04	1.05 (U)	22.4
RE03-09-13470	03-608194	9.0–10.0	Qbt3	—	0.794 (J)	—	—	—	—	—	—	—	—	—	—	—	1.01 (U)	—
RE03-09-13471	03-608195	4.0–5.0	Qbt3	—	0.589 (J)	—	—	—	—	—	—	—	—	—	—	—	1.03 (U)	—
RE03-09-13472	03-608195	9.0–10.0	Qbt3	—	0.661 (J)	—	—	—	—	—	—	—	—	—	—	—	1.06 (U)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.5-3
Organic Chemicals Detected at SWMU 03-009(i)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1254	Aroclor-1260	Fluoranthene	Hexanone[2-]	Methylene Chloride	Pyrene	TPH-DRO
Residential SSL[a]				**1.72E+04**	**1.12E+00**	**2.22E+00**	**2.29E+03**	**2.10E+02**[b]	**4.09E+02**	**1.72E+03**	**1.00E+03**[c]
Industrial SSL[a]				**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.44E+04**	**1.40E+03**[b]	**4.70E+03**	**1.83E+04**	**1.80E+03**[c]
Construction Worker SSL[a]				**6.68E+04**	**4.36E+00**	**7.58E+01**	**8.91E+03**	**1.54E+03**[d]	**1.12E+03**	**6.68E+03**	**na**[e]
RE03-09-13461	03-608190	0.0–1.0	Soil	0.0364 (J)	0.0297	0.0589	0.0526 (J)	—[f]	—	0.0536 (J)	28.6 (J)
RE03-09-13462	03-608190	1.0–2.0	Soil	0.0367 (J)	—	0.0434	0.0468 (J)	—	—	—	11.3
RE03-09-13463	03-608191	0.0–1.0	Soil	—	—	—	—	—	—	—	36.4 (J)
RE03-09-13464	03-608191	1.0–2.0	Qbt3	—	—	—	—	—	—	—	11.7
RE03-09-13466	03-608192	9.0–10.0	Qbt3	—	—	—	—	—	—	—	3.94 (J)
RE03-09-13467	03-608193	4.0–5.0	Qbt3	—	—	—	—	—	—	—	5.44 (J)
RE03-09-13468	03-608193	9.0–10.0	Qbt3	—	—	—	—	—	—	—	4.51 (J)
RE03-09-13469	03-608194	4.0–5.0	Qbt3	—	—	—	0.0161 (J)	—	0.00234 (J)	0.0151 (J)	—
RE03-09-13470	03-608194	9.0–10.0	Qbt3	—	—	—	—	—	0.00219 (J)	—	2.86 (J)
RE03-09-13471	03-608195	4.0–5.0	Qbt3	—	—	—	—	0.00228 (J)	0.00233 (J)	—	—
RE03-09-13472	03-608195	9.0–10.0	Qbt3	—	—	—	—	—	0.00224 (J)	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] na = Not available.

[f] — = Not detected.

Table 6.6-1
Samples Collected and Analyses Requested at SWMU 03-012(b)

Sample ID	Location ID	Depth (ft)	Media	Hexavalent Chromium	Metals	PCBs
RE03-02-49270	03-02-21036	0–0.5	Fill	1199S	1199S	—*
RE03-02-49284	03-02-21036	0.5–1	Fill	1199S	1199S	—
RE03-02-49271	03-02-21037	0–0.5	Fill	1199S	1199S	—
RE03-02-49285	03-02-21037	0.5–1	Fill	1199S	1199S	—
RE03-02-49272	03-02-21038	0–0.5	Fill	1199S	1199S	—
RE03-02-49286	03-02-21038	0.5–1	Fill	1199S	1199S	—
RE03-02-49273	03-02-21039	0–0.5	Fill	1199S	1199S	—
RE03-02-49287	03-02-21039	0.5–1	Fill	1199S	1199S	—
RE03-02-49274	03-02-21040	0–0.5	Fill	1199S	1199S	—
RE03-02-49288	03-02-21040	0.5–1	Fill	1199S	1199S	—
RE03-02-49275	03-02-21041	0–0.5	Fill	1199S	1199S	—
RE03-02-49289	03-02-21041	0.5–1	Fill	1199S	1199S	—
RE03-02-49276	03-02-21042	0–0.5	Fill	1199S	1199S	—
RE03-02-49290	03-02-21042	0.5–1	Fill	1199S	1199S	—
RE03-02-49277	03-02-21043	0–0.5	Fill	1199S	1199S	—
RE03-02-49291	03-02-21043	0.5–1	Fill	1199S	1199S	—
RE03-02-49278	03-02-21044	0–0.5	Fill	1199S	1199S	—
RE03-02-49292	03-02-21044	0.5–1	Fill	1199S	1199S	—
RE03-02-49279	03-02-21045	0–0.5	Fill	1199S	1199S	—
RE03-02-49293	03-02-21045	0.5–1	Fill	1199S	1199S	—
RE03-02-49280	03-02-21046	0–0.5	Fill	1199S	1199S	—
RE03-02-49294	03-02-21046	0.5–1	Fill	1199S	1199S	—
RE03-02-49281	03-02-21047	0–0.5	Fill	1199S	1199S	—
RE03-02-49295	03-02-21047	0.5–1	Fill	1199S	1199S	—
RE03-02-49282	03-02-21048	0–0.5	Fill	1199S	1199S	—
RE03-02-49296	03-02-21048	0.5–1	Fill	1199S	1199S	—
RE03-02-49283	03-02-21049	0–0.5	Fill	1199S	1199S	—
RE03-02-49297	03-02-21049	0.5–1	Fill	1199S	1199S	—
RE03-02-49298	03-02-21050	0.5–1	Fill	1199S	1199S	—
RE03-02-49299	03-02-21051	0.5–1	Fill	1199S	1199S	—
RE03-02-49300	03-02-21052	0.5–1	Fill	1199S	1199S	—
RE03-02-49301	03-02-21053	0.5–1	Fill	1199S	1199S	—

Table 6.6-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexavalent Chromium	Metals	PCBs
RE03-04-52775	03-22576	0–0.5	Soil	1954S	1954S	1953S
RE03-04-52785	03-22576	3.5–4	Soil	1954S	1954S	—
RE03-04-52776	03-22577	0–0.5	Soil	1954S	1954S	—
RE03-04-52786	03-22577	3–3.5	Soil	1954S	1954S	—
RE03-04-52777	03-22578	0–0.5	Soil	1954S	1954S	1953S
RE03-04-52787	03-22578	3.5–4	Soil	1954S	1954S	—
RE03-04-52778	03-22579	0–0.5	Soil	1954S	1954S	—
RE03-04-52788	03-22579	3.5–4	Soil	1954S	1954S	—
RE03-04-52779	03-22580	0–0.5	Soil	1961S	1961S	1960S
RE03-04-52789	03-22580	3.5–4	Soil	1961S	1961S	—
RE03-04-52781	03-22582	0.83–1.33	Soil	1959S	1959S	1958S
RE03-04-52791	03-22582	1.83–2.83	Soil	1959S	1959S	—
RE03-04-52782	03-22583	0–0.5	Soil	1959S	1959S	—
RE03-04-52792	03-22583	3.5–4	Soil	1959S	1959S	—
RE03-04-52783	03-22584	0–0.5	Soil	1959S	1959S	1958S
RE03-04-52793	03-22584	3.5–4	Soil	1959S	1959S	—
RE03-04-52784	03-22585	0–0.5	Soil	1959S	1959S	—
RE03-04-52794	03-22585	3.5–4	Soil	1959S	1959S	—

*— = Analyses not requested.

Table 6.6-2
Inorganic Chemicals above BVs at SWMU 03-012(b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Chromium Hexavalent Ion	Copper	Mercury	Silver	Thallium	Zinc
Soil BV[a]				**0.83**	**0.4**	**19.3**	**na[b]**	**14.7**	**0.1**	**1**	**0.73**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**1.17E+05[d]**	**2.97E+00**	**3.13E+03**	**2.35E+01**	**3.91E+02**	**7.82E-01**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**1.70E+06[d]**	**6.31E+01**	**4.54E+04**	**3.41E+02**	**5.68E+03**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**4.65E+05[d]**	**6.56E+01**	**1.24E+04**	**9.29E+01**	**1.55E+03**	**3.10E+00**	**9.29E+04**
RE03-02-49270	03-02-21036	0–0.5	Fill	—[e]	0.687855	156.64	R[f]	26.1067	0.102157	6.44722	—	97.9569
RE03-02-49272	03-02-21038	0–0.5	Fill	—	—	42.8736	R	20.5747	—	1.49425	—	49.8851
RE03-02-49273	03-02-21039	0–0.5	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49287	03-02-21039	0.5–1	Fill	5.57377 (U)	2.78689 (U)	—	R	—	—	2.78689 (U)	2.78689 (U)	—
RE03-02-49275	03-02-21041	0–0.5	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49289	03-02-21041	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49277	03-02-21043	0–0.5	Fill	—	—	—	R	—	—	—	—	62
RE03-02-49291	03-02-21043	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49278	03-02-21044	0–0.5	Fill	—	—	21.34	R	—	—	1.27792	—	145.161
RE03-02-49292	03-02-21044	0.5–1	Fill	—	—	—	R	—	—	—	—	73.6963
RE03-02-49279	03-02-21045	0–0.5	Fill	—	—	—	R	—	—	—	—	130.17
RE03-02-49293	03-02-21045	0.5–1	Fill	—	—	22.1761	R	—	—	—	—	78.7634
RE03-02-49280	03-02-21046	0–0.5	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49294	03-02-21046	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49281	03-02-21047	0–0.5	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49296	03-02-21048	0.5–1	Fill	—	—	19.3705	R	—	—	—	—	57.2639
RE03-02-49283	03-02-21049	0–0.5	Fill	—	—	45.8333	R	—	—	1.63194	—	52.3148
RE03-02-49297	03-02-21049	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49298	03-02-21050	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49300	03-02-21052	0.5–1	Fill	—	—	—	R	—	—	—	—	—
RE03-02-49301	03-02-21053	0.5–1	Fill	—	0.469939	—	R	—	—	—	—	67.7301
RE03-04-52775	03-22576	0–0.5	Soil	NA[g]	0.524 (U)	—	—	—	—	—	—	—
RE03-04-52785	03-22576	3.5–4	Soil	NA	0.547 (U)	—	—	—	—	—	—	—
RE03-04-52776	03-22577	0–0.5	Soil	NA	—	31	0.241	—	—	1.18	—	54.5
RE03-04-52786	03-22577	3–3.5	Soil	NA	0.539 (U)	—	—	—	—	—	—	—
RE03-04-52777	03-22578	0–0.5	Soil	NA	0.56 (U)	25	—	—	—	1.88	—	—
RE03-04-52778	03-22579	0–0.5	Soil	NA	—	28	—	—	—	1.04	—	54.6
RE03-04-52788	03-22579	3.5–4	Soil	NA	0.501 (U)	—	0.102 (J)	—	—	—	—	—

Table 6.6-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Chromium Hexavalent Ion	Copper	Mercury	Silver	Thallium	Zinc
Soil BV[a]				**0.83**	**0.4**	**19.3**	**na[b]**	**14.7**	**0.1**	**1**	**0.73**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**2.97E+00[d]**	**2.97E+00**	**3.13E+03**	**2.35E+01[e]**	**3.91E+02**	**7.82E+01**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**6.31E+01[d]**	**6.31E+01**	**4.54E+04**	**3.41E+02[e]**	**5.68E+03**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**6.56E+01[d]**	**6.56E+01**	**1.24E+04**	**9.29E+01[e]**	**1.55E+03**	**3.10E+00**	**9.29E+04**
RE03-04-52779	03-22580	0–0.5	Soil	NA	—	—	0.0952 (J)	—	—	1.99	—	—
RE03-04-52791	03-22582	1.83–2.83	Soil	NA	0.545 (U)	—	—	—	—	—	—	—
RE03-04-52782	03-22583	0–0.5	Soil	NA	0.514 (U)	—	—	—	—	—	—	—
RE03-04-52792	03-22583	3.5–4	Soil	NA	0.532 (U)	—	—	—	—	—	—	—
RE03-04-52783	03-22584	0–0.5	Soil	NA	—	—	0.157	—	—	—	—	—
RE03-04-52793	03-22584	3.5–4	Soil	NA	0.491 (U)	—	—	—	—	—	—	—
RE03-04-52784	03-22585	0–0.5	Soil	NA	—	32.5	—	—	—	2.08	—	54.2
RE03-04-52794	03-22585	3.5–4	Soil	NA	—	—	0.21	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

[f] R = Data were rejected (see Appendix F).

[g] NA = Not analyzed.

Table 6.6-3
Organic Chemicals Detected at SWMU 03-012(b)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260
Residential SSL[a]				**1.12E+00**	**2.22E+00**
Industrial SSL[a]				**8.26E+00**	**8.26E+00**
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**
RE03-04-52777	03-22578	0–0.5	Soil	0.0085 (J)	0.0321 (J)
RE03-04-52779	03-22580	0–0.5	Soil	0.0213 (J)	0.0711 (J)
RE03-04-52781	03-22582	0.83–1.33	Soil	—[b]	0.259
RE03-04-52783	03-22584	0–0.5	Soil	0.336	0.925

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] — = Not detected.

Table 6.6-4
Samples Collected and Analyses Requested at SWMU 03-045(b)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13480	03-608197	0–1	Soil	10-355	10-354	10-354	10-354	10-354	10-355
RE03-09-13481	03-608197	1–2	Soil	10-355	10-354	10-354	10-354	10-354	10-355

Table 6.6-5
Inorganic Chemicals above BVs at SWMU 03-045(b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Mercury	Silver	Zinc
Soil BV[a]				**0.83**	**0.4**	**0.1**	**1**	**48.8**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**2.35E+01**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**3.41E+02**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**9.29E+01**	**1.55E+03**	**9.29E+04**
RE03-09-13480	03-608197	0–1	Soil	1.06 (U)	0.528 (U)	0.159	1.17	53.4
RE03-09-13481	03-608197	1–2	Soil	1.07 (U)	0.536 (U)	—[c]	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] — = Not detected or not detected above BV.

Table 6.6-6
Organic Chemicals Detected at SWMU 03-045(b)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+02**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**1.83E+03**	**1.72E+03**	**1.00E+03[c]**
Industrial SSL[a]				**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.05E+04**	**1.83E+04**	**1.80E+03[c]**
Construction Worker SSL[a]				**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**7.15E+03**	**6.68E+03**	**na[d]**
RE03-09-13480	03-608197	0–1	Soil	0.00901 (J)	0.0803	0.117	0.0562	0.111	0.03 (J)	0.0493	0.102	0.0297 (J)	—[e]	0.0362	0.0845	8.88
RE03-09-13481	03-608197	1–2	Soil	—	0.021	0.0905	—	0.0492	0.015 (J)	—	0.0389	0.0141 (J)	0.00225 (J)	—	0.0324 (J)	4.03 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Pyrene used as surrogate based on structural similarity.
[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).
[d] na = Not available.
[e] — = Not detected.

Table 6.6-7
Samples Collected and Analyses Requested at SWMU 03-045(c)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13478	03-608196	0–1	Soil	10-355	10-354	10-354	10-354	10-354	10-355
RE03-09-13479	03-608196	1–2	Soil	10-355	10-354	10-354	10-354	10-354	10-355

Table 6.6-8
Inorganic Chemicals above BVs at SWMU 03-045(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Calcium	Magnesium	Sodium	Zinc
Soil BV[a]				**0.83**	**6120**	**4610**	**915**	**48.8**
Residential SSL[b]				**3.13E+01**	**na[c]**	**na**	**na**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**na**	**na**	**na**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**na**	**na**	**na**	**9.29E+04**
RE03-09-13478	03-608196	0–1	Soil	1.14 (U)	22,800 (J+)	5240 (J+)	1450	—[d]
RE03-09-13479	03-608196	1–2	Soil	1.12 (U)	8460 (J+)	—	—	50.3

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] na = Not available.
[d] — = Not detected or not detected above BV.

Table 6.6-9
Organic Chemicals Detected at SWMU 03-045(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**3.44E+03**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+02**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**2.30E+02[c]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03[d]**
Industrial SSL[a]				**3.67E+04**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03[d]**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na[f]**
RE03-09-13478	03-608196	0–1	Soil	—[g]	—	0.235	0.862	—	—	0.0451	—	0.0233 (J)	0.548	0.0624	0.111	0.00241 (J)	0.00868 (J)	0.025 (J)	0.447	0.534	53.8
RE03-09-13479	03-608196	1–2	Soil	0.0542	0.139	0.812	3.19	0.287	0.242	0.451	0.12	0.232	0.0468	—	—	0.00256 (J)	—	—	0.0615	0.0475	2.98 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971) unless otherwise noted.
[b] Pyrene used as surrogate based on structural similarity.
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[d] Screening guidelines for diesel No. 2 from NMED (21012, 219971).
[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).
[f] na = Not available.
[g] — = Not detected.

Table 6.7-1
Samples Collected and Analyses Requested at SWMU 03-052(f)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13552	03-608214	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13553	03-608214	1.0–2.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13554	03-608215	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13555	03-608215	1.0–2.0	Qbt3	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13556	03-608216	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13557	03-608216	1.0–2.0	Qbt3	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13558	03-608217	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13559	03-608217	1.0–2.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13560	03-608218	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13561	03-608218	1.0–2.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13562	03-608219	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13563	03-608219	1.0–2.0	Qbt3	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13564	03-608220	0.0–1.0	Soil	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310
RE03-09-13565	03-608220	1.0–2.0	Qbt3	10-311	10-311	10-311	10-310	10-309	10-310	10-309	10-309	10-309	10-310

Table 6.7-2
Inorganic Chemicals above BVs at SWMU 03-052(f)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**46**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**na[b]**	**0.3**	**63.5**
Soil BV[a]				**0.83**	**295**	**0.4**	**19.3**	**14.7**	**0.5**	**22.3**	**na**	**1.52**	**48.8**
Residential SSL[c]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**4.00E+02**	**5.48E+01**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**8.00E+02**	**7.95E+02**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**8.00E+02**	**2.17E+02**	**1.55E+03**	**9.29E+04**
RE03-09-13552	03-608214	0.0–1.0	Soil	1.11 (U)	—[e]	—	—	—	—	26.8	—	—	—
RE03-09-13553	03-608214	1.0–2.0	Soil	1.11 (U)	—	0.554 (U)	—	—	—	—	—	—	—
RE03-09-13554	03-608215	0.0–1.0	Soil	1.15 (U)	—	—	—	19.3 (J)	—	42.7	0.000821 (J)	—	122
RE03-09-13555	03-608215	1.0–2.0	Qbt3	1.13 (U)	48.8 (J)	—	20.1	7.87 (J)	—	14.5	0.00085 (J)	1.14 (U)	66.2
RE03-09-13556	03-608216	0.0–1.0	Soil	1.12 (U)	—	—	—	15.7 (J)	—	31.8	—	—	140
RE03-09-13557	03-608216	1.0–2.0	Qbt3	1.09 (U)	92.6 (J)	—	22	6.86 (J)	—	16.3	0.000769 (J)	1.08 (U)	90
RE03-09-13558	03-608217	0.0–1.0	Soil	1.33 (U)	—	—	—	20.2 (J)	12.8	34.4	—	—	200
RE03-09-13559	03-608217	1.0–2.0	Soil	1.44 (U)	—	0.72 (U)	67.3	27.2 (J)	1.88	56.7	—	—	165
RE03-09-13560	03-608218	0.0–1.0	Soil	—	—	0.409 (J)	—	20.9 (J)	—	54.1	—	—	198
RE03-09-13561	03-608218	1.0–2.0	Soil	1.29 (U)	—	—	—	—	—	36.4	—	—	135
RE03-09-13562	03-608219	0.0–1.0	Soil	1.28 (U)	—	—	—	18.6 (J)	0.567	40	—	—	189
RE03-09-13563	03-608219	1.0–2.0	Qbt3	1.3 (U)	—	—	16.6	9.72 (J)	—	25.4	—	1.24 (U)	89.3
RE03-09-13564	03-608220	0.0–1.0	Soil	1.13 (U)	—	0.566 (U)	—	—	—	—	—	—	—
RE03-09-13565	03-608220	1.0–2.0	Qbt3	1.04 (U)	—	—	13	—	—	—	0.000828 (J)	1.05 (U)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 6.7-3
Organic Chemicals Detected at SWMU 03-052(f)

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	Bis(2-ethylhexyl)phthalate	Chrysene
Residential SSL[a]				**3.44E+03**	**1.72E+03[b]**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**3.47E+02**	**1.48E+02**
Industrial SSL[a]				**3.67E+04**	**1.83E+04[b]**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**1.37E+03**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+03[b]**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**4.76E+03**	**2.06E+04**
RE03-09-13552	03-608214	0.0–1.0	Soil	—[c]	—	—	0.0102 (J)	—	—	0.0327 (J)	0.0305 (J)	0.05	0.0287 (J)	0.0172 (J)	0.0916 (J)	0.0327 (J)
RE03-09-13553	03-608214	1.0–2.0	Soil	—	—	—	0.00779 (J)	—	—	0.0274 (J)	0.0236 (J)	0.0418	0.0199 (J)	—	—	0.024 (J)
RE03-09-13554	03-608215	0.0–1.0	Soil	0.372	—	—	0.491	0.118	0.122	2.14	2.08	3.02	0.964	1.02	0.133 (J)	2.37
RE03-09-13555	03-608215	1.0–2.0	Qbt3	—	—	—	0.0208 (J)	0.0277 (J)	0.0315 (J)	0.0789	0.0827	0.128	0.0441	0.0428	—	0.0989
RE03-09-13556	03-608216	0.0–1.0	Soil	0.0602	—	—	0.11	0.104	0.14	0.435	0.557	0.818	0.371	0.316	0.0911 (J)	0.615
RE03-09-13557	03-608216	1.0–2.0	Qbt3	—	—	—	0.00849 (J)	0.0182 (J)	0.0221	0.0424	0.0465	0.0689	0.0193 (J)	0.0285 (J)	—	0.0512
RE03-09-13558	03-608217	0.0–1.0	Soil	1.18	—	0.0226 (J)	1.48	0.0971	0.118	2.15	1.93	2.65	0.618	1.1	0.29 (J)	2.32
RE03-09-13559	03-608217	1.0–2.0	Soil	0.219	—	0.0109 (J)	0.372	0.0893 (J)	0.129	1.02	0.979	1.36	0.469	0.505	0.204 (J)	1.15
RE03-09-13560	03-608218	0.0–1.0	Soil	3.35	0.0448	—	3.86	0.093	0.117	19.9	18.7	24.2	3.49	4.86	0.144 (J)	22.9
RE03-09-13561	03-608218	1.0–2.0	Soil	0.0447 (J)	—	—	0.082	0.0395 (J)	0.0406 (J)	0.271	0.268	0.368	0.131	0.139	0.298 (J)	0.316
RE03-09-13562	03-608219	0.0–1.0	Soil	0.484	—	—	0.664	0.128	0.105	1.93	1.98	2.6	0.955	1.08	—	2.21
RE03-09-13563	03-608219	1.0–2.0	Qbt3	0.55	—	—	1.36	0.0278 (J)	0.0286 (J)	2.55	2.5	3.19	1.28	1.39	—	3.08
RE03-09-13564	03-608220	0.0–1.0	Soil	—	—	0.0113 (J)	—	—	0.008	—	—	0.0118 (J)	—	—	—	—
RE03-09-13565	03-608220	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Nitroaniline[4-]	Phenanthrene	Pyrene	Toluene	TPH-DRO	Trimethylbenzene[1,2,4-]
Residential SSL[a]				**1.48E-01**	**7.80E+01[d]**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.30E+02[d]**	**4.30E+01**	**2.40E+02[d]**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03[e]**	**6.20E+01[d]**
Industrial SSL[a]				**2.34E+00**	**1.00E+03[d]**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**2.20E+03[d]**	**2.41E+02**	**8.60E+02[d]**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03[e]**	**2.60E+02[d]**
Construction Worker SSL[a]				**2.13E+01**	**2.82E+02[f]**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.24E+03[f]**	**1.58E+02**	**8.52E+03[f]**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na[g]**	**6.88E+02[f]**
RE03-09-13552	03-608214	0.0–1.0	Soil	—	—	0.0541	—	0.0194 (J)	—	—	—	0.0363 (J)	0.0727 (J)	—	14.5	—
RE03-09-13553	03-608214	1.0–2.0	Soil	—	—	0.0565	—	0.0158 (J)	—	—	—	0.0351 (J)	0.0492	—	8.2	—
RE03-09-13554	03-608215	0.0–1.0	Soil	0.281	0.153 (J)	5.1	0.281	0.904	0.0683	0.127	—	3.19	8.2	—	610	—
RE03-09-13555	03-608215	1.0–2.0	Qbt3	—	—	0.191	—	0.0449	—	—	—	0.131	0.221 (J)	—	13.9	—
RE03-09-13556	03-608216	0.0–1.0	Soil	—	—	0.789	0.0402	0.336	—	—	—	0.57	1.53	—	57.6	—
RE03-09-13557	03-608216	1.0–2.0	Qbt3	—	—	0.0825	—	0.0197 (J)	—	—	—	0.0579	0.114	—	9.78	—
RE03-09-13558	03-608217	0.0–1.0	Soil	0.221	0.638	7.68	1.02	0.67	0.256	0.607	—	9.35	8.06 (J)	—	111	—
RE03-09-13559	03-608217	1.0–2.0	Soil	—	0.104 (J)	2.49	0.192	0.441	0.0616	0.136	—	1.86	3.5	0.000507 (J)	87.4	—
RE03-09-13560	03-608218	0.0–1.0	Soil	1.17	1.23	49.6	2.24	3.62	0.299	0.475	0.46 (J)	50.8	64.3 (J)	—	693	—
RE03-09-13561	03-608218	1.0–2.0	Soil	—	—	0.489	0.034 (J)	0.12	—	—	—	0.407	0.857	—	49.3	—
RE03-09-13562	03-608219	0.0–1.0	Soil	—	0.218 (J)	4.02	0.361	0.905	0.0858 (J)	0.259	—	3.59	6.66	—	143 (J)	—
RE03-09-13563	03-608219	1.0–2.0	Qbt3	—	0.235 (J)	5.9	0.411	1.22	0.0872	0.246	—	5.97	9.89	—	145	0.000435 (J)
RE03-09-13564	03-608220	0.0–1.0	Soil	—	—	0.0134 (J)	—	—	—	—	—	—	0.0211 (J)	—	23.2	—
RE03-09-13565	03-608220	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	5.81 (J)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] na = Not available.

Table 6.8-1
Samples Collected and Analyses Requested at SWMU 03-013(i)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-05-59527	03-24444	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—*	—
RE03-05-59528	03-24444	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59529	03-24445	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—	—
RE03-05-59530	03-24445	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59531	03-24446	0.0–0.5	Fill	3195S	3194S	3194S	3194S	3194S	—	—
RE03-05-59532	03-24446	1.5–1.5	Fill	3195S	3194S	3194S	3194S	3194S	3194S	—
RE03-05-59533	03-24447	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—	—
RE03-05-59534	03-24447	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59535	03-24448	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—	—
RE03-05-59536	03-24448	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59537	03-24449	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—	—
RE03-05-59538	03-24449	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59539	03-24450	0.0–0.5	Fill	3193S	3192S	3192S	3192S	3192S	—	—
RE03-05-59540	03-24450	1.5–1.5	Fill	3193S	3192S	3192S	3192S	3192S	3192S	—
RE03-05-59541	03-24451	0.0–0.5	Fill	3195S	3194S	3194S	3194S	3194S	—	—
RE03-05-59542	03-24451	1.5–1.5	Fill	3195S	3194S	3194S	3194S	3194S	3194S	—
RE03-09-13566	03-608221	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13567	03-608221	4.0–5.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13568	03-608222	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13569	03-608222	4.0–5.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13570	03-608223	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13571	03-608223	4.0–5.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13572	03-608224	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13573	03-608224	4.0–5.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13574	03-608225	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13575	03-608225	4.0–5.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-09-13576	03-608226	0.0–1.0	Soil	10-435	10-435	10-435	10-435	—	10-435	10-435
RE03-09-13577	03-608226	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13578	03-608227	0.0–1.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13579	03-608227	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13580	03-608228	0.0–1.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13581	03-608228	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13582	03-608229	0.0–1.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13583	03-608229	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13584	03-608230	0.0–1.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13586	03-608230	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13585	03-608231	0.0–1.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13587	03-608231	4.0–5.0	Soil	10-436	10-436	10-436	10-436	—	10-436	10-436
RE03-09-13588	03-608232	0.0–1.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13589	03-608232	4.0–5.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13590	03-608233	0.0–1.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13592	03-608233	4.0–5.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13593	03-608234	0.0–1.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13595	03-608234	4.0–5.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13594	03-608235	0.0–1.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13597	03-608235	4.0–5.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13591	03-608236	0.0–1.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461
RE03-09-13596	03-608236	4.0–5.0	Soil	10-461	10-460	10-460	10-460	—	10-460	10-461

*— = Analyses not requested.

Table 6.8-2
Inorganic Chemicals above BVs at SWMU 03-013(i)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Selenium	Zinc
Soil BV[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**1.52**	**48.8**
Residential SSL[b]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**3.13E+03**	**4.00E+02**	**na**	**1.56E+03**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**8.00E+02**	**na**	**2.25E+04**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**8.00E+02**	**na**	**6.19E+03**	**1.55E+03**	**9.29E+04**
RE03-05-59527	03-24444	0.0–0.5	Fill	—[e]	—	0.505 (J)	—	—	—	38.1	—	—	1.7 (U)	52.8
RE03-05-59528	03-24444	1.5–1.5	Fill	—	—	—	—	—	—	—	—	—	1.75 (U)	—
RE03-05-59529	03-24445	0.0–0.5	Fill	—	—	0.797	—	—	—	—	—	—	1.68 (U)	—
RE03-05-59530	03-24445	1.5–1.5	Fill	—	—	3.53	—	—	—	—	—	—	1.81 (U)	55.9
RE03-05-59531	03-24446	0.0–0.5	Fill	NA[f]	—	—	—	—	—	—	—	—	1.76 (U)	—
RE03-05-59532	03-24446	1.5–1.5	Fill	NA	—	0.57 (U)	—	—	—	—	—	—	1.71 (U)	—
RE03-05-59533	03-24447	0.0–0.5	Fill	1.71 (J-)	—	5.58	—	—	21.8 (J)	238	—	16.3	1.76 (U)	482
RE03-05-59534	03-24447	1.5–1.5	Fill	1.55 (J-)	—	2.79	—	—	—	140	—	—	1.68 (U)	196
RE03-05-59535	03-24448	0.0–0.5	Fill	0.961 (J-)	—	1.18	—	—	—	137	—	—	1.66 (U)	113
RE03-05-59536	03-24448	1.5–1.5	Fill	—	—	—	—	—	—	37.6	—	—	1.72 (U)	56.5
RE03-05-59537	03-24449	0.0–0.5	Fill	—	—	0.406 (J)	—	—	—	45.8	—	—	1.79 (U)	61.7
RE03-05-59538	03-24449	1.5–1.5	Fill	—	—	0.656 (U)	—	—	—	—	—	—	1.97 (U)	—
RE03-05-59539	03-24450	0.0–0.5	Fill	—	302 (J+)	0.623	—	—	—	37.1	—	—	—	59.1
RE03-05-59540	03-24450	1.5–1.5	Fill	—	—	—	—	—	—	—	—	—	1.89 (U)	—
RE03-05-59541	03-24451	0.0–0.5	Fill	NA	—	0.568 (U)	—	—	—	—	—	—	1.7 (U)	—
RE03-05-59542	03-24451	1.5–1.5	Fill	NA	—	—	—	—	—	—	—	—	1.7 (U)	—
RE03-09-13566	03-608221	0.0–1.0	Soil	1.41	—	1.36	—	—	—	46.5 (J)	—	NA	—	59.2
RE03-09-13567	03-608221	4.0–5.0	Soil	1.11 (U)	—	0.555 (U)	—	—	—	—	—	NA	—	—
RE03-09-13568	03-608222	0.0–1.0	Soil	1.28	—	—	7810 (J+)	—	—	—	—	NA	—	50.8
RE03-09-13569	03-608222	4.0–5.0	Soil	1.08 (U)	—	0.54 (U)	—	—	—	—	—	NA	—	—
RE03-09-13570	03-608223	0.0–1.0	Soil	1.56	—	0.73	—	—	—	53.5 (J)	—	NA	—	73.6
RE03-09-13571	03-608223	4.0–5.0	Soil	1.13 (U)	—	0.565 (U)	—	—	—	—	—	NA	—	—
RE03-09-13572	03-608224	0.0–1.0	Soil	4.6	—	0.405 (J)	—	—	—	115 (J)	—	NA	—	89
RE03-09-13573	03-608224	4.0–5.0	Soil	1.13 (U)	373	0.567 (U)	—	—	—	—	—	NA	—	—
RE03-09-13574	03-608225	0.0–1.0	Soil	2.67	—	—	—	—	—	37.3 (J)	—	NA	—	53.2
RE03-09-13575	03-608225	4.0–5.0	Soil	1.12 (U)	—	0.56 (U)	—	21.6	—	—	—	NA	—	—
RE03-09-13576	03-608226	0.0–1.0	Soil	5.71	—	0.68	—	—	18.5	213 (J)	—	NA	—	212
RE03-09-13577	03-608226	4.0–5.0	Soil	1.19 (U)	—	0.595 (U)	—	—	—	—	—	—	—	—
RE03-09-13578	03-608227	0.0–1.0	Soil	0.914 (J)	—	—	10500	—	—	22.9	—	—	—	57.4
RE03-09-13579	03-608227	4.0–5.0	Soil	1.18 (U)	—	0.591 (U)	—	—	—	—	—	—	—	—
RE03-09-13580	03-608228	0.0–1.0	Soil	1.14 (U)	—	0.572 (U)	14200	—	15.1	—	4700	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Selenium	Zinc
Soil BV[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**1.52**	**48.8**
Residential SSL[b]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**3.13E+03**	**4.00E+02**	**na**	**1.56E+03**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**8.00E+02**	**na**	**2.25E+04**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**8.00E+02**	**na**	**6.19E+03**	**1.55E+03**	**9.29E+04**
RE03-09-13581	03-608228	4.0–5.0	Soil	1.13 (U)	—	0.563 (U)	—	—	—	—	—	—	—	—
RE03-09-13582	03-608229	0.0–1.0	Soil	1.08 (U)	—	0.538 (U)	9420	—	—	—	—	—	—	—
RE03-09-13583	03-608229	4.0–5.0	Soil	1.15 (U)	—	0.575 (U)	—	—	—	—	—	—	—	—
RE03-09-13584	03-608230	0.0–1.0	Soil	1.08 (U)	—	0.539 (U)	10,700	—	—	—	—	—	—	—
RE03-09-13586	03-608230	4.0–5.0	Soil	1.2 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-13585	03-608231	0.0–1.0	Soil	—	—	—	9560	20.6	—	—	—	—	—	55.4
RE03-09-13587	03-608231	4.0–5.0	Soil	1.25 (U)	—	0.625 (U)	—	—	—	—	—	—	—	—
RE03-09-13588	03-608232	0.0–1.0	Soil	4.31	—	2.71	6590	—	—	191	—	—	—	75
RE03-09-13589	03-608232	4.0–5.0	Soil	1.17 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-13590	03-608233	0.0–1.0	Soil	2.24	—	0.967	—	—	—	49.2	—	—	—	51.8
RE03-09-13592	03-608233	4.0–5.0	Soil	1.16 (U)	—	0.581 (U)	—	—	—	28.3	—	—	—	—
RE03-09-13593	03-608234	0.0–1.0	Soil	—	—	0.503 (J)	—	—	—	24.1	—	—	—	—
RE03-09-13595	03-608234	4.0–5.0	Soil	1.18 (U)	—	0.592 (U)	—	—	—	—	—	—	—	—
RE03-09-13594	03-608235	0.0–1.0	Soil	1.02 (J)	—	—	—	—	—	57.5	—	—	—	94
RE03-09-13597	03-608235	4.0–5.0	Soil	1.1 (U)	—	0.551 (U)	—	—	—	—	—	—	—	—
RE03-09-13591	03-608236	0.0–1.0	Soil	—	—	—	—	—	—	50.7	—	—	—	66.2
RE03-09-13596	03-608236	4.0–5.0	Soil	1.14 (U)	—	0.57 (U)	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.8-3
Organic Chemicals Detected at SWMU 03-013(i)

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	Benzo(k) fluoranthene
Residential SSL[a]				**3.44E+03**	**1.72E+03[b]**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**
Industrial SSL[a]				**3.67E+04**	**1.83E+04[b]**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+03[b]**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**
RE03-05-59527	03-24444	0.0–0.5	Fill	—[c]	—	NA[d]	—	—	2.81	2.26	—	—	—	—	—
RE03-05-59528	03-24444	1.5–1.5	Fill	—	—	0.0168	—	—	—	—	—	—	—	—	—
RE03-05-59529	03-24445	0.0–0.5	Fill	—	—	NA	—	—	—	—	—	—	—	—	—
RE03-05-59530	03-24445	1.5–1.5	Fill	—	—	0.376	—	—	—	—	—	—	—	—	—
RE03-05-59531	03-24446	0.0–0.5	Fill	—	—	NA	—	—	0.0184 (J)	—	—	—	—	—	—
RE03-05-59532	03-24446	1.5–1.5	Fill	—	—	0.0091	—	—	—	—	—	—	—	—	—
RE03-05-59533	03-24447	0.0–0.5	Fill	0.0923	0.0421	NA	0.095	—	0.193	0.0665	—	—	—	—	—
RE03-05-59534	03-24447	1.5–1.5	Fill	—	—	0.0296	—	—	0.0274 (J)	0.0154 (J)	—	—	—	—	—
RE03-05-59535	03-24448	0.0–0.5	Fill	—	0.0186 (J)	NA	—	—	0.0483 (J-)	0.021 (J-)	—	—	—	—	—
RE03-05-59536	03-24448	1.5–1.5	Fill	—	—	—	—	—	0.0054 (J-)	0.0039 (J-)	—	—	—	—	—
RE03-05-59537	03-24449	0.0–0.5	Fill	—	—	NA	—	—	0.0537 (J-)	0.0193 (J-)	—	—	—	—	—
RE03-05-59538	03-24449	1.5–1.5	Fill	—	—	—	—	—	0.0018 (J)	—	—	—	—	—	—
RE03-05-59539	03-24450	0.0–0.5	Fill	—	—	NA	0.0266 (J)	—	0.0261	0.0082	—	—	—	—	—
RE03-05-59540	03-24450	1.5–1.5	Fill	—	—	—	—	—	0.0209 (J-)	0.0071 (J-)	—	—	—	—	—
RE03-05-59541	03-24451	0.0–0.5	Fill	—	—	NA	—	—	0.0025 (J)	0.0013 (J)	—	—	—	—	—
RE03-05-59542	03-24451	1.5–1.5	Fill	—	—	—	—	—	0.0024 (J)	0.0014 (J)	—	—	—	—	—
RE03-09-13566	03-608221	0.0–1.0	Soil	—	—	—	0.00797 (J)	—	0.0096 (J)	0.008 (J)	0.0326 (J)	0.0318 (J)	0.0436	—	0.0178 (J)
RE03-09-13567	03-608221	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13568	03-608222	0.0–1.0	Soil	—	—	—	0.0119 (J)	—	—	—	0.0538	—	—	—	—
RE03-09-13570	03-608223	0.0–1.0	Soil	—	—	—	—	—	0.0542	0.0258	0.0238 (J)	0.0203 (J)	0.0336 (J)	0.0177 (J)	0.0141 (J)
RE03-09-13571	03-608223	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13572	03-608224	0.0–1.0	Soil	0.125	—	—	0.162	—	0.267	0.05	0.243	0.28	0.388	0.142	0.157
RE03-09-13573	03-608224	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13574	03-608225	0.0–1.0	Soil	—	—	—	—	—	0.0152	0.0099	0.0215 (J)	0.0212 (J)	—	—	—
RE03-09-13575	03-608225	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13576	03-608226	0.0–1.0	Soil	0.0155 (J)	—	—	0.0274 (J)	—	0.0811	0.0252	0.107	0.119	0.169	0.125	0.0619
RE03-09-13578	03-608227	0.0–1.0	Soil	—	—	—	—	0.0297	0.0494	0.0202	0.0211 (J)	0.0157 (J)	—	0.0134 (J)	—
RE03-09-13580	03-608228	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13581	03-608228	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13582	03-608229	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13584	03-608230	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13586	03-608230	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

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	Benzo(k) fluoranthene
Residential SSL[a]				**3.44E+03**	**1.72E+03[b]**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**
Industrial SSL[a]				**3.67E+04**	**1.83E+04[b]**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+03[b]**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**
RE03-09-13585	03-608231	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13588	03-608232	0.0–1.0	Soil	—	—	—	—	—	0.0289	0.0177 (J)	—	—	—	—	—
RE03-09-13589	03-608232	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13590	03-608233	0.0–1.0	Soil	0.0523	—	—	0.0782	—	0.0566	0.0377	0.303	0.392	0.506	0.287	0.212
RE03-09-13592	03-608233	4.0–5.0	Soil	—	—	—	—	—	0.0063	0.0044	0.0311 (J)	0.0362 (J)	0.0413	0.0302 (J)	0.0165 (J)
RE03-09-13593	03-608234	0.0–1.0	Soil	0.0188 (J)	—	—	0.0262 (J)	—	0.0129	0.0148	0.118	0.153	0.193	0.0982	0.0765
RE03-09-13595	03-608234	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13594	03-608235	0.0–1.0	Soil	0.016 (J)	—	—	0.0211 (J)	—	0.0126 (J)	0.0109 (J)	0.098	0.131	0.175	0.0915	—
RE03-09-13597	03-608235	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13591	03-608236	0.0–1.0	Soil	—	—	—	—	—	0.0347	0.018	0.0183 (J)	0.0194 (J)	0.0254 (J)	0.0134 (J)	—
RE03-09-13596	03-608236	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis (2-ethylhexyl) phthalate	Butanone[2-]	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Isopropyltoluene[4-]
Residential SSL[a]				**2.40E+05[e]**	**3.47E+02**	**3.71E+04**	**1.48E+02**	**1.48E-01**	**7.80E+01[e]**	**6.84E+01**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[f]**
Industrial SSL[a]				**2.50E+06[e]**	**1.37E+03**	**3.75E+05**	**2.34E+03**	**2.34E+00**	**1.00E+03[e]**	**3.78E+02**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[f]**
Construction Worker SSL[a]				**9.52E+05[g]**	**4.76E+03**	**8.43E+04**	**2.06E+04**	**2.13E+01**	**2.82E+02[g]**	**1.83E+03**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[f]**
RE03-05-59527	03-24444	0.0–0.5	Fill	—	—	NA	—	—	—	NA	—	—	—	NA
RE03-05-59528	03-24444	1.5–1.5	Fill	—	—	—	—	—	—	—	—	—	—	—
RE03-05-59529	03-24445	0.0–0.5	Fill	0.689 (J)	—	NA	—	—	—	NA	—	—	—	NA
RE03-05-59530	03-24445	1.5–1.5	Fill	—	—	0.0174	—	—	—	—	—	—	—	—
RE03-05-59531	03-24446	0.0–0.5	Fill	—	—	NA	—	—	—	NA	—	—	—	NA
RE03-05-59532	03-24446	1.5–1.5	Fill	—	—	—	—	—	—	—	—	—	—	—
RE03-05-59533	03-24447	0.0–0.5	Fill	0.666 (J)	—	NA	—	—	—	NA	1.32	0.0947	—	NA
RE03-05-59534	03-24447	1.5–1.5	Fill	—	1.13 (J)	—	—	—	—	—	0.0795	—	—	0.0017
RE03-05-59535	03-24448	0.0–0.5	Fill	—	—	NA	—	—	—	NA	0.535	0.017 (J)	—	NA
RE03-05-59536	03-24448	1.5–1.5	Fill	0.609 (J)	—	—	—	—	—	—	—	—	—	0.0012 (J)
RE03-05-59537	03-24449	0.0–0.5	Fill	—	—	NA	—	—	—	NA	—	—	—	NA
RE03-05-59538	03-24449	1.5–1.5	Fill	—	1.39 (J)	—	—	—	—	—	—	—	—	—
RE03-05-59539	03-24450	0.0–0.5	Fill	—	—	NA	—	—	—	NA	0.161	0.013 (J)	—	NA
RE03-05-59540	03-24450	1.5–1.5	Fill	—	—	—	—	—	—	—	—	—	—	—
RE03-05-59541	03-24451	0.0–0.5	Fill	—	—	NA	—	—	—	NA	—	—	—	NA
RE03-05-59542	03-24451	1.5–1.5	Fill	—	1.19 (J)	—	—	—	—	—	—	—	—	—
RE03-09-13566	03-608221	0.0–1.0	Soil	—	—	—	0.0309 (J)	—	—	—	0.0692	—	—	—
RE03-09-13567	03-608221	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13568	03-608222	0.0–1.0	Soil	—	—	—	0.0515	—	—	—	0.0861	—	0.0422	—
RE03-09-13570	03-608223	0.0–1.0	Soil	—	—	—	0.0339 (J)	—	—	—	0.0684	—	0.0557	—
RE03-09-13571	03-608223	4.0–5.0	Soil	0.214 (J)	—	—	—	—	—	—	—	—	—	—
RE03-09-13572	03-608224	0.0–1.0	Soil	—	0.146 (J)	—	0.289	0.0525	0.0797 (J)	—	0.634	0.121	0.139	—
RE03-09-13573	03-608224	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13574	03-608225	0.0–1.0	Soil	—	—	—	0.0233 (J)	—	—	—	0.0464	—	—	—
RE03-09-13575	03-608225	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13576	03-608226	0.0–1.0	Soil	—	—	—	0.123	—	—	—	0.216	0.014 (J)	0.133	—
RE03-09-13578	03-608227	0.0–1.0	Soil	—	—	—	0.0147 (J)	—	—	—	0.0285 (J)	—	0.0125 (J)	—
RE03-09-13580	03-608228	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13581	03-608228	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13582	03-608229	0.0–1.0	Soil	—	0.113 (J)	—	—	—	—	—	—	—	—	—
RE03-09-13584	03-608230	0.0–1.0	Soil	—	—	—	—	—	—	0.000366 (J)	—	—	—	—
RE03-09-13586	03-608230	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13585	03-608231	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13588	03-608232	0.0–1.0	Soil	—	—	—	—	—	—	—	0.0225 (J)	—	—	—
RE03-09-13589	03-608232	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis (2-ethylhexyl) phthalate	Butanone[2-]	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Isopropyltoluene[4-]
Residential SSL[a]				**2.40E+05[e]**	**3.47E+02**	**3.71E+04**	**1.48E+02**	**1.48E-01**	**7.80E+01[e]**	**6.84E+01**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[f]**
Industrial SSL[a]				**2.50E+06[e]**	**1.37E+03**	**3.75E+05**	**2.34E+03**	**2.34E+00**	**1.00E+03[e]**	**3.78E+02**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[f]**
Construction Worker SSL[a]				**9.52E+05[g]**	**4.76E+03**	**8.43E+04**	**2.06E+04**	**2.13E+01**	**2.82E+02[g]**	**1.83E+03**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[f]**
RE03-09-13590	03-608233	0.0–1.0	Soil	—	0.111 (J)	—	0.351	0.0668	—	—	0.543	—	0.245 (J)	—
RE03-09-13592	03-608233	4.0–5.0	Soil	—	—	—	0.0357 (J)	—	—	—	0.06	—	0.0249 (J)	—
RE03-09-13593	03-608234	0.0–1.0	Soil	—	—	—	0.143	0.0279 (J)	—	—	0.242	—	0.0924 (J)	—
RE03-09-13595	03-608234	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13594	03-608235	0.0–1.0	Soil	—	—	—	0.12	—	—	—	0.201	—	0.0843 (J)	—
RE03-09-13597	03-608235	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13591	03-608236	0.0–1.0	Soil	—	—	—	0.0189 (J)	—	—	—	0.0288 (J)	—	0.0117 (J)	—
RE03-09-13596	03-608236	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+ Xylene[1,4-]
Residential SSL[a]				**4.09E+02**	**2.30E+02**[e]	**4.30E+01**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03**[h]	**na**[i]	**6.20E+01**[e]	**8.98E+02**	**8.14E+02**[j]
Industrial SSL[a]				**4.70E+03**	**2.20E+03**[e]	**2.41E+02**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03**[h]	**na**	**2.60E+02**[e]	**4.41E+04**	**3.98E+03**[j]
Construction Worker SSL[a]				**1.12E+03**	**1.24E+03**[g]	**1.58E+02**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na**	**na**	**6.88E+02**[g]	**8.23E+02**	**7.43E+02**[j]
RE03-05-59527	03-24444	0.0–0.5	Fill	NA	—	—	—	—	NA	231	0.0156 (J)	NA	NA	NA
RE03-05-59528	03-24444	1.5–1.5	Fill	—	—	—	—	—	—	134	0.0127 (J-)	—	—	—
RE03-05-59529	03-24445	0.0–0.5	Fill	NA	—	—	—	—	NA	2730	0.35 (J-)	NA	NA	NA
RE03-05-59530	03-24445	1.5–1.5	Fill	—	—	—	—	—	—	3340	0.132 (J-)	—	—	—
RE03-05-59531	03-24446	0.0–0.5	Fill	NA	—	—	—	—	NA	398	0.0292 (J)	NA	NA	NA
RE03-05-59532	03-24446	1.5–1.5	Fill	—	—	—	—	—	—	88	—	—	—	—
RE03-05-59533	03-24447	0.0–0.5	Fill	NA	0.0275 (J)	—	1.09	1.36	NA	5370	—	NA	NA	NA
RE03-05-59534	03-24447	1.5–1.5	Fill	—	—	—	—	—	—	595	0.308	—	—	—
RE03-05-59535	03-24448	0.0–0.5	Fill	NA	0.0141 (J)	—	0.468	0.477	NA	208	—	NA	NA	NA
RE03-05-59536	03-24448	1.5–1.5	Fill	—	—	—	—	—	—	270	0.338	—	—	—
RE03-05-59537	03-24449	0.0–0.5	Fill	NA	—	—	0.0393 (J)	—	NA	604	0.0192 (J)	NA	NA	NA
RE03-05-59538	03-24449	1.5–1.5	Fill	—	—	—	—	—	—	9.3 (J)	—	—	—	—
RE03-05-59539	03-24450	0.0–0.5	Fill	NA	—	—	0.108	0.2	NA	92	—	NA	NA	NA
RE03-05-59540	03-24450	1.5–1.5	Fill	—	—	—	—	—	—	161	0.013 (J-)	—	—	—
RE03-05-59541	03-24451	0.0–0.5	Fill	NA	—	—	—	—	NA	99.9	—	NA	NA	NA
RE03-05-59542	03-24451	1.5–1.5	Fill	—	—	—	—	—	—	230	0.0292 (J)	—	—	—
RE03-09-13566	03-608221	0.0–1.0	Soil	—	—	—	0.0409	0.0565	0.00075 (J)	80.7 (J)	NA	—	—	—
RE03-09-13567	03-608221	4.0–5.0	Soil	—	—	—	—	—	—	5.28 (J)	NA	—	—	—
RE03-09-13568	03-608222	0.0–1.0	Soil	—	—	—	0.0483	0.0806	0.000693 (J)	479	NA	—	—	—
RE03-09-13570	03-608223	0.0–1.0	Soil	—	—	—	0.0364 (J)	0.0548	—	37.1	NA	—	—	—
RE03-09-13571	03-608223	4.0–5.0	Soil	—	—	—	—	—	—	—	NA	0.00035 (J)	—	0.000429 (J)
RE03-09-13572	03-608224	0.0–1.0	Soil	—	0.0783	0.192	0.658	0.585	—	48.1	NA	—	—	—
RE03-09-13573	03-608224	4.0–5.0	Soil	—	—	—	—	—	—	4.02 (J)	NA	—	—	—
RE03-09-13574	03-608225	0.0–1.0	Soil	—	—	—	0.0265 (J)	0.0447	0.00205	17.4	NA	—	—	—
RE03-09-13575	03-608225	4.0–5.0	Soil	—	—	—	—	—	0.000706 (J)	5.62 (J)	NA	—	—	—
RE03-09-13576	03-608226	0.0–1.0	Soil	—	—	—	0.129	0.191	0.00302	37.1	NA	—	—	—
RE03-09-13578	03-608227	0.0–1.0	Soil	—	—	—	0.0178 (J)	0.027 (J)	0.000611 (J)	23.4	NA	—	—	—
RE03-09-13580	03-608228	0.0–1.0	Soil	—	—	—	—	—	—	4.33 (J)	NA	—	—	—
RE03-09-13581	03-608228	4.0–5.0	Soil	0.00237 (J)	—	—	—	—	—	—	NA	—	—	—
RE03-09-13582	03-608229	0.0–1.0	Soil	—	—	—	—	—	0.00125	3.53 (J)	NA	—	—	—
RE03-09-13584	03-608230	0.0–1.0	Soil	—	—	—	—	—	0.0104	4.02 (J)	NA	—	0.000548 (J)	0.00111 (J)
RE03-09-13586	03-608230	4.0–5.0	Soil	—	—	—	—	—	—	6.41 (J)	NA	—	—	—
RE03-09-13585	03-608231	0.0–1.0	Soil	—	—	—	—	—	0.000457 (J)	28.6 (J)	NA	—	—	—
RE03-09-13588	03-608232	0.0–1.0	Soil	0.00254 (J)	—	—	0.0149 (J)	0.0267 (J)	0.000949 (J)	300 (J)	NA	—	—	—
RE03-09-13589	03-608232	4.0–5.0	Soil	0.00291 (J)	—	—	—	—	—	6.06 (J)	NA	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+ Xylene[1,4-]
Residential SSL[a]				**4.09E+02**	**2.30E+02[e]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03[h]**	**na[i]**	**6.20E+01[e]**	**8.98E+02**	**8.14E+02[j]**
Industrial SSL[a]				**4.70E+03**	**2.20E+03[e]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03[h]**	**na**	**2.60E+02[e]**	**4.41E+04**	**3.98E+03[j]**
Construction Worker SSL[a]				**1.12E+03**	**1.24E+03[g]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na**	**na**	**6.88E+02[g]**	**8.23E+02**	**7.43E+02[j]**
RE03-09-13590	03-608233	0.0–1.0	Soil	0.00272 (J)	0.0105 (J)	—	0.403	0.664	—	48.2 (J)	NA	—	—	—
RE03-09-13592	03-608233	4.0–5.0	Soil	0.00236 (J)	—	—	0.0365 (J)	0.0567	—	2.92 (J)	NA	—	—	—
RE03-09-13593	03-608234	0.0–1.0	Soil	0.00264 (J)	—	—	0.152	0.297	—	9.25 (J)	NA	—	—	—
RE03-09-13595	03-608234	4.0–5.0	Soil	0.00271 (J)	—	—	—	—	—	—	NA	—	—	—
RE03-09-13594	03-608235	0.0–1.0	Soil	0.00227 (J)	—	—	0.126	0.203	—	105 (J)	NA	—	—	—
RE03-09-13597	03-608235	4.0–5.0	Soil	0.00275 (J)	—	—	—	—	—	190 (J)	NA	—	—	—
RE03-09-13591	03-608236	0.0–1.0	Soil	0.00252 (J)	—	—	0.0168 (J)	0.0343 (J)	0.000498 (J)	65.1 (J)	NA	—	—	—
RE03-09-13596	03-608236	4.0–5.0	Soil	0.00278 (J)	—	—	—	—	—	—	NA	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Isopropylbenzene used as a surrogate based on structural similarity.

[g] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[h] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[i] na = Not available.

[j] Xylenes used as a surrogate based on structural similarity.

Table 6.9-1
Samples Collected and Analyses Requested at AOC 03-014(b2)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13618	03-608242	0.0–1.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13619	03-608242	1.0–2.0	Qbt3	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13620	03-608243	0.0–1.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13621	03-608243	1.0–2.0	Qbt3	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13622	03-608244	0.0–1.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13623	03-608244	1.0–2.0	Qbt3	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13624	03-608245	0.0–1.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13625	03-608245	1.0–2.0	Qbt3	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13626	03-608246	0.0–1.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544
RE03-09-13627	03-608246	1.0–2.0	Soil	10-545	10-545	10-545	10-544	10-544	10-543	10-544	10-543	10-543	10-543	10-544

Table 6.9-2
Inorganic Chemicals above BVs at AOC 03-014(b2)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Chromium	Cyanide (Total)	Lead	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**2.79**	**1.63**	**7.14**	**0.5**	**11.2**	**na**[b]	**0.3**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**0.4**	**19.3**	**0.5**	**22.3**	**na**	**1.52**	**48.8**
Residential SSL[c]				**3.13E+01**	**3.90E+00**	**7.03E+01**	**1.17E+05**[d]	**4.69E+01**	**4.00E+02**	**5.48E+01**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**1.77E+01**	**8.97E+02**	**1.70E+06**[d]	**6.81E+02**	**8.00E+02**	**7.95E+02**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**5.30E+01**	**2.77E+02**	**4.65E+05**[d]	**1.86E+02**	**8.00E+02**	**2.17E+02**	**1.55E+03**	**9.29E+04**
RE03-09-13618	03-608242	0.0–1.0	Soil	1.15 (U)	—[e]	0.575 (U)	—	—	—	—	—	—
RE03-09-13619	03-608242	1.0–2.0	Qbt3	1.15 (U)	3.61	—	14.9 (J)	—	—	—	1.13 (U)	—
RE03-09-13620	03-608243	0.0–1.0	Soil	1.06 (U)	—	0.528 (U)	—	—	37.3	—	—	—
RE03-09-13621	03-608243	1.0–2.0	Qbt3	1.04 (U)	—	—	—	—	15.9	—	0.999 (U)	—
RE03-09-13622	03-608244	0.0–1.0	Soil	1.06 (U)	—	0.528 (U)	—	—	—	0.0009 (J)	—	—
RE03-09-13623	03-608244	1.0–2.0	Qbt3	1.02 (U)	—	—	—	—	—	0.00173 (J)	1.03 (U)	—
RE03-09-13624	03-608245	0.0–1.0	Soil	1.29 (U)	—	0.644 (U)	—	1.54	—	—	—	82.4
RE03-09-13625	03-608245	1.0–2.0	Qbt3	1.16 (U)	—	—	—	—	—	—	1.19 (U)	—
RE03-09-13626	03-608246	0.0–1.0	Soil	1.18 (U)	—	0.592 (U)	—	1.17	—	—	—	52.7
RE03-09-13627	03-608246	1.0–2.0	Soil	1.08 (U)	—	0.538 (U)	—	1.61	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SSLs from NMED (2012, 219971).
[d] SSL for trivalent chromium.
[e] — = Not detected or not detected above BV.

Table 6.9-3
Organic Chemicals Detected at AOC 03-014(b2)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-ethylhexyl) phthalate	Chrysene	Fluoranthene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**6.66E+04**	**1.12E+00**	**2.22E+00**	**1.48E-01**	**1.48E+00**	**1.48E+01**	**3.47E+02**	**1.48E+01**	**2.29E+03**	**1.83E+03**	**1.72E+03**	**1.00E+03[b]**
Industrial SSL[a]				**8.68E+05**	**8.26E+00**	**8.26E+00**	**2.34E+00**	**2.34E+01**	**2.34E+02**	**1.37E+03**	**2.34E+03**	**2.44E+04**	**2.05E+04**	**1.83E+04**	**1.80E+03[b]**
Construction Worker SSL[a]				**2.21E+05**	**4.36E+00**	**7.58E+01**	**2.13E+01**	**2.13E+02**	**2.06E+03**	**4.76E+03**	**2.06E+04**	**8.91E+03**	**7.15E+03**	**6.68E+03**	**na[c]**
RE03-09-13618	03-608242	0.0–1.0	Soil	0.00433 (J)	—[d]	—	—	—	—	—	—	—	—	—	3.91 (J)
RE03-09-13619	03-608242	1.0–2.0	Qbt3	0.0144 (J)	—	—	—	—	—	—	—	—	—	—	6.09 (J)
RE03-09-13620	03-608243	0.0–1.0	Soil	0.00952 (J)	0.0149 (J)	0.0184	0.0191 (J)	0.0224 (J)	0.0155 (J)	—	0.0188 (J)	0.037	0.0186 (J)	0.0329 (J)	32.1
RE03-09-13621	03-608243	1.0–2.0	Qbt3	—	0.0026 (J)	0.0033 (J)	—	—	—	0.1 (J)	—	—	—	—	7.52
RE03-09-13622	03-608244	0.0–1.0	Soil	—	0.021	0.0177	—	—	—	—	—	—	—	—	17.2
RE03-09-13623	03-608244	1.0–2.0	Qbt3	—	0.0693	0.0514	—	—	—	—	—	—	—	—	4.69 (J)
RE03-09-13624	03-608245	0.0–1.0	Soil	—	0.0195 (J)	0.0214 (J)	0.0151 (J)	—	—	—	0.0159 (J)	0.02 (J)	0.014 (J)	0.0326 (J)	31.6 (J)
RE03-09-13625	03-608245	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	3.02 (J)
RE03-09-13626	03-608246	0.0–1.0	Soil	—	—	—	—	—	—	—	—	—	—	—	5.55 (J)
RE03-09-13627	03-608246	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	2.94 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 2019971).

[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[c] na = Not available.

[d] — = Not detected.

Table 6.9-4
Samples Collected and Analyses Requested at AOC 03-014(c2)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13631	03-608248	0.0–1.0	Soil	10-465	10-465	10-465	10-464	10-464	10-463	10-464	10-463	10-463	10-463	10-464
RE03-09-13632	03-608248	1.0–2.0	Qbt3	10-465	10-465	10-465	10-464	10-464	10-463	10-464	10-463	10-463	10-463	10-464
RE03-09-13633	03-608249	0.0–1.0	Soil	10-465	10-465	10-465	10-464	10-464	10-463	10-464	10-463	10-463	10-463	10-464
RE03-09-13634	03-608249	1.0–2.0	Soil	10-465	10-465	10-465	10-464	10-464	10-463	10-464	10-463	10-463	10-463	10-464
RE03-09-13635	03-608250	0.0–1.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13636	03-608250	1.0–2.0	Qbt3	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13637	03-608251	0.0–1.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13638	03-608251	1.0–2.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13639	03-608252	0.0–1.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13640	03-608252	1.0–2.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13641	03-608253	0.0–1.0	Soil	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13642	03-608253	2.0–3.0	Qbt3	10-468	10-468	10-468	10-467	10-467	10-466	10-467	10-466	10-466	10-466	10-467
RE03-09-13643	03-608254	0.0–1.0	Soil	10-486	10-486	10-486	10-485	10-485	10-484	10-485	10-484	10-484	10-484	10-485
RE03-09-13644	03-608254	2.0–3.0	Qbt3	10-486	10-486	10-486	10-485	10-485	10-484	10-485	10-484	10-484	10-484	10-485
RE03-09-13645	03-608255	0.0–1.0	Soil	10-486	10-486	10-486	10-485	10-485	10-484	10-485	10-484	10-484	10-484	10-485
RE03-09-13646	03-608255	2.0–3.0	Soil	10-486	10-486	10-486	10-485	10-485	10-484	10-485	10-484	10-484	10-484	10-485

Table 6.9-5
Inorganic Chemicals above BVs at AOC 03-014(c2)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**na**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**4.00E+02**	**2.35E+01**	**1.56E+03**	**1.25E+05**	**5.48E+01**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**8.00E+02**	**3.41E+02**	**2.25E+04**	**1.82E+06**	**7.95E+02**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**8.00E+02**	**9.29E+01**	**6.19E+03**	**4.96E+05**	**2.17E+02**	**1.55E+03**	**1.55E+03**	**9.29E+04**
RE03-09-13631	03-608248	0.0–1.0	Soil	1.11 (U)	0.538 (J)	—[e]	—	21.2	4.59	—	0.564	—	—	—	—	4.99	—
RE03-09-13632	03-608248	1.0–2.0	Qbt3	1.05 (U)	—	—	10.8	10.6	3.87	—	0.174	—	—	—	1.03 (U)	1.85	—
RE03-09-13633	03-608249	0.0–1.0	Soil	1.08 (U)	0.541 (U)	—	—	—	—	—	0.156	—	—	—	—	—	—
RE03-09-13634	03-608249	1.0–2.0	Soil	1.11 (U)	—	—	—	—	—	30.5	0.364	—	1.24	—	—	1.82	49.8
RE03-09-13635	03-608250	0.0–1.0	Soil	1.08 (U)	—	—	—	16.3	1.55	—	0.345 (J+)	—	—	—	—	5.95	60.1
RE03-09-13636	03-608250	1.0–2.0	Qbt3	1.02 (U)	—	—	—	5.45	—	—	—	—	—	0.000678 (J)	1.01 (U)	1.67	—
RE03-09-13637	03-608251	0.0–1.0	Soil	1.1 (U)	0.87	7210 (J+)	34.4	32.3	5.56	—	0.847 (J+)	—	2.08	—	—	10.9	89.4
RE03-09-13638	03-608251	1.0–2.0	Soil	1.07 (U)	1.09	—	—	23.4	0.669	—	0.534 (J+)	18.6	2.75	—	—	7.27	88.9
RE03-09-13639	03-608252	0.0–1.0	Soil	1.05 (U)	—	—	—	—	—	—	0.142 (J+)	—	—	—	—	2.11	—
RE03-09-13640	03-608252	1.0–2.0	Soil	1.06 (U)	—	—	20.3	—	—	—	0.175 (J+)	—	1.2	—	—	6.94	—
RE03-09-13641	03-608253	0.0–1.0	Soil	1.03 (U)	0.437 (J)	—	—	—	0.513	—	0.768 (J+)	—	—	—	—	7.5	—
RE03-09-13642	03-608253	2.0–3.0	Qbt3	1.04 (U)	—	—	17.8	24.1	0.892	—	0.722 (J+)	7.04	—	0.000989 (J)	1.01 (U)	7.34	—
RE03-09-13643	03-608254	0.0–1.0	Soil	1.04 (U)	—	—	21.4	22.5	30.2	—	0.116 (J)	—	—	0.000557 (J)	—	10.8	—
RE03-09-13644	03-608254	2.0–3.0	Qbt3	0.999 (U)	—	—	—	—	0.802	—	—	—	—	—	1 (U)	—	—
RE03-09-13645	03-608255	0.0–1.0	Soil	1.04 (U)	0.52 (U)	—	—	—	—	27.2	—	—	—	—	—	—	—
RE03-09-13646	03-608255	2.0–3.0	Soil	1.05 (U)	0.526 (U)	7270 (J+)	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 6.9-6
Organic Chemicals Detected at AOC 03-014(c2)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene
Residential SSL[a]				**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**6.21E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**
Industrial SSL[a]				**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**
Construction Worker SSL[a]				**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**
RE03-09-13631	03-608248	0.0–1.0	Soil	—[c]	—	—	1.65	1.22	—	—	0.0184 (J)	0.0137 (J)	—
RE03-09-13632	03-608248	1.0–2.0	Qbt3	—	—	—	0.243	0.193	—	—	—	—	—
RE03-09-13633	03-608249	0.0–1.0	Soil	—	—	—	0.998	0.953	—	—	—	—	—
RE03-09-13634	03-608249	1.0–2.0	Soil	—	—	—	6.78	6.03	—	—	—	—	—
RE03-09-13635	03-608250	0.0–1.0	Soil	—	0.0353 (J)	—	0.205	0.247	0.146	0.173	0.227	0.112	0.0889
RE03-09-13636	03-608250	1.0–2.0	Qbt3	—	—	—	0.0309	0.0358	—	—	—	—	—
RE03-09-13637	03-608251	0.0–1.0	Soil	—	—	—	0.0817	0.0648	0.0318 (J)	0.0365 (J)	0.0624	0.0126 (J)	0.0257 (J)
RE03-09-13638	03-608251	1.0–2.0	Soil	—	—	—	0.171	0.121	—	—	—	—	—
RE03-09-13639	03-608252	0.0–1.0	Soil	—	—	—	0.172	0.151	—	—	—	—	—
RE03-09-13640	03-608252	1.0–2.0	Soil	0.00248 (J)	—	—	0.205	0.204	—	—	—	—	—
RE03-09-13641	03-608253	0.0–1.0	Soil	0.00196 (J)	—	—	0.362	0.336	0.0305 (J)	0.0398	0.0554	0.0235 (J)	0.0203 (J)
RE03-09-13642	03-608253	2.0–3.0	Qbt3	0.0511 (J)	—	—	0.184	0.173	—	—	—	—	—
RE03-09-13643	03-608254	0.0–1.0	Soil	—	—	—	0.0857	0.0643	—	—	0.0109 (J)	—	—
RE03-09-13644	03-608254	2.0–3.0	Qbt3	—	—	0.0141	0.0127	0.0063	—	—	—	—	—
RE03-09-13645	03-608255	0.0–1.0	Soil	—	0.0101 (J)	—	—	—	—	0.0337 (J)	0.0334 (J)	0.0177 (J)	—
RE03-09-13646	03-608255	2.0–3.0	Soil	—	—	—	—	—	0.0118 (J)	—	—	—	—

Table 6.9-6 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzene[tert-]	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene	TPH-DRO
Residential SSL[a]				**3.90+03[d,e]**	**1.48E+02**	**2.29E+03**	**1.48E+00**	**2.43E+03[f]**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03[h]**
Industrial SSL[a]				**5.10E+04[d,e]**	**2.34E+03**	**2.44E+04**	**2.34E+01**	**1.45E+04[f]**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03[h]**
Construction Worker SSL[a]				**1.55E+04[d,g]**	**2.06E+04**	**8.91E+03**	**2.13E+02**	**2.81E+03[f]**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na[i]**
RE03-09-13631	03-608248	0.0–1.0	Soil	—	0.0159 (J)	0.0292 (J)	0.123	—	—	0.0238 (J)	—	20.4
RE03-09-13632	03-608248	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	8.73
RE03-09-13633	03-608249	0.0–1.0	Soil	—	—	—	—	—	—	—	—	20.2 (J)
RE03-09-13634	03-608249	1.0–2.0	Soil	—	—	0.0174 (J)	—	—	—	0.0144 (J)	—	57.6
RE03-09-13635	03-608250	0.0–1.0	Soil	—	0.167	0.316	0.0944	—	0.17	0.373	—	44.9 (J)
RE03-09-13636	03-608250	1.0–2.0	Qbt3	—	—	—	—	—	—	0.0117 (J)	—	8.26
RE03-09-13637	03-608251	0.0–1.0	Soil	—	0.0421	0.0545	0.0231 (J)	—	0.0161 (J)	0.0696	—	69.1 (J)
RE03-09-13638	03-608251	1.0–2.0	Soil	—	—	—	—	—	—	—	—	11.1
RE03-09-13639	03-608252	0.0–1.0	Soil	—	—	—	—	—	—	—	—	11.9 (J)
RE03-09-13640	03-608252	1.0–2.0	Soil	—	—	—	—	—	—	—	—	6.38 (J)
RE03-09-13641	03-608253	0.0–1.0	Soil	—	0.0398	0.0522	0.0203 (J)	—	0.0243 (J)	0.0787	—	12.8
RE03-09-13642	03-608253	2.0–3.0	Qbt3	0.000685 (J)	—	—	—	0.0333	—	—	0.00156	38.3
RE03-09-13643	03-608254	0.0–1.0	Soil	—	0.0132 (J)	0.0331 (J)	—	—	0.015 (J)	0.0272 (J)	—	25.7 (J)
RE03-09-13644	03-608254	2.0–3.0	Qbt3	—	—	—	—	—	—	—	—	3.27 (J)
RE03-09-13645	03-608255	0.0–1.0	Soil	—	0.0311 (J)	0.0723	0.121	—	0.0455	0.0653	—	33.6 (J)
RE03-09-13646	03-608255	2.0–3.0	Soil	—	—	0.0113 (J)	—	—	—	0.0117 (J)	—	6.42 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971) unless otherwise noted.
[b] Pyrene used as surrogate based on structural similarity.
[c] — = Not detected.
[d] Butylbenzene[n-] used as surrogate based on structural similarity.
[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[f] Isopropylbenzene used as a surrogate based on structural similarity.
[g] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).
[h] Screening guidelines for diesel No. 2 from NMED (2012, 219971).
[i] na = Not available.

Table 6.9-7
Radionuclides Detected or Detected above BVs/FVs at AOC 03-014(c2)

Sample ID	Location ID	Depth (ft)	Media	Americium-241
Qbt 2,3,4 BV[a]				**na[b]**
Soil BV[a]				**0.013**
Residential SAL[c]				**82**
Industrial SAL[c]				**990**
Construction Worker SAL[c]				**140**
RE03-09-13644	03-608254	2.0–3.0	Qbt3	0.0498
RE03-09-13646	03-608255	2.0–3.0	Soil	0.0349

Note: All activities are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs for radionuclides from LANL (2012, 228852).

Table 6.9-8
Samples Collected and Analyses Requested at SWMUs 03-014 (k,l,m,n)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Tritium	Herbicides	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	Pesticides	Strontium 90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
0103-97-0020	03-03201	0.0–1.58	Fill	—*	3435R	3433R	3435R	3435R	3434R	—	—	—	3433R	3435R	3433R	3433R	3433R	—
0103-97-0021	03-03201	1.58–2.58	Qbt4	—	3435R	3433R	3435R	3435R	3434R	—	—	—	3433R	3435R	3433R	3433R	3433R	—
0103-97-0022	03-03201	2.58–3.58	Qbt4	—	3435R	3433R	3435R	3435R	3434R	—	—	—	3433R	3435R	3433R	3433R	3433R	—
RE03-09-13747	03-03201	4.0–5.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13739	03-03201	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-10-17135	03-03201	10.0–11.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-10-17136	03-03201	14.0–15.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
0103-97-0023	03-03202	0.0–0.33	Fill	—	—	3433R	—	—	3434R	—	—	—	3433R	—	3433R	3433R	3433R	—
RE03-09-13746	03-03202	4.0–5.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13743	03-03202	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
0103-97-0011	03-03264	0.0–1.0	Fill	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0012	03-03264	1.33–2.33	Qbt4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0013	03-03264	2.33–3.33	Qbt4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	3375R	—
RE03-09-13740	03-03264	4.0–5.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13741	03-03264	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
0103-97-0014	03-03265	0.0–1.17	Fill	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0015	03-03265	1.67–2.67	Qbt 4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0016	03-03265	2.67–3.67	Qbt 4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	3375R	—
RE03-09-13744	03-03265	4.0–5.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13745	03-03265	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-10-17130	03-03265	10.0–11.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-10-17131	03-03265	14.0–15.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
0103-97-0017	03-03266	0.0–0.17	Fill	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0018	03-03266	0.75–1.75	Qbt4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	—	—
0103-97-0019	03-03266	1.75–2.75	Qbt4	—	3377R	3375R	3377R	3377R	3376R	—	3375R	—	3375R	3377R	3375R	—	3375R	—
RE03-09-13748	03-03266	4.0–5.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13749	03-03266	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
0103-97-0343	03-603357	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	3721R	—	—
0103-97-0345	03-603357	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	—	—	—	3721R	—	—
0103-97-0347	03-603357	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	—	—	—	3721R	—	—
RE03-10-17132	03-603357	4.0–5.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-10-17133	03-603357	6.0–7.0	Qbt3	10-3256	10-3256	—	10-3256	10-3256	10-3256	10-3256	10-3256	10-3256	—	—	10-3256	10-3256	10-3256	10-3256
RE03-10-17134	03-603357	10.0–11.0	Qbt3	10-3256	10-3256	—	10-3256	10-3256	10-3256	10-3256	10-3256	10-3256	—	—	10-3256	10-3256	10-3256	10-3256
0103-97-0363	03-03386	0.0–0.5	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—

Table 6.9-8 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Tritium	Herbicides	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	Pesticides	Strontium 90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
0103-97-0362	03-03386	0.5–1.0	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
0103-97-0361	03-03386	0.67–1.0	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
0103-97-0367	03-03387	0.0–0.5	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
0103-97-0366	03-03387	0.5–1.0	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
0103-97-0365	03-03387	1.0–1.5	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
0103-97-0364	03-03387	1.5–2.0	Fill	—	—	—	—	—	—	—	4002R	—	—	—	4002R	—	—	—
RE03-09-13726	03-608270	0.0–1.0	Qbt3	—	10-390	—	10-390	10-390	10-390	10-390	10-390	10-390	—	—	10-390	10-390	10-390	10-390
RE03-09-13727	03-608270	3.0–4.0	Qbt3	—	10-390	—	10-390	10-390	10-390	10-390	10-390	10-390	—	—	10-390	10-390	10-390	10-390
RE03-09-13728	03-608270	8.0–9.0	Qbt3	—	10-390	—	10-390	10-390	10-390	10-390	10-390	10-390	—	—	10-390	10-390	10-390	10-390
RE03-09-13736	03-608271	0.0–1.0	Soil	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13737	03-608271	6.0–7.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-09-13738	03-608271	11.0–12.0	Qbt3	10-459	10-459	—	10-459	10-459	10-458	10-458	10-457	10-458	—	—	10-457	10-457	10-457	10-458
RE03-10-17137	03-608271	14.0–15.0	Qbt3	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	—	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-09-13732	03-608272	0.0–1.0	Soil	10-408	10-408	—	10-408	10-408	10-408	10-408	10-407	10-408	—	—	10-407	10-407	10-407	10-408
RE03-09-13733	03-608272	3.0–4.0	Qbt3	10-408	10-408	—	10-408	10-408	10-408	10-408	10-407	10-408	—	—	10-407	10-407	10-407	10-408
RE03-09-13734	03-608272	8.0–9.0	Qbt3	10-408	10-408	—	10-408	10-408	10-408	10-408	10-407	10-408	—	—	10-407	10-407	10-407	10-408
RE03-09-13729	03-608273	0.0–1.0	Soil	—	10-390	—	10-390	10-390	10-390	10-390	10-390	10-390	—	—	10-390	10-390	10-390	10-390
RE03-09-13730	03-608273	3.0–4.0	Qbt3	—	10-390	—	10-390	10-390	10-390	10-390	10-390	10-390	—	—	10-390	10-390	10-390	10-390
RE03-10-17127	03-612229	0.0–1.0	Soil	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-10-17128	03-612229	3.0–4.0	Soil	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246
RE03-10-17129	03-612229	8.0–9.0	Soil	10-3247	10-3247	—	10-3247	10-3247	10-3246	10-3246	10-3245	10-3246	—	—	10-3245	10-3245	10-3245	10-3246

*— = Analyses not requested.

Table 6.9-9
Inorganic Chemicals above BVs at SWMUs 03-014 (k,l,m,n)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Residential SSL[c]				**3.13E+01**	**3.90E+00**	**1.56E+04**	**7.03E+01**	**na**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**5.48E+04**	**4.00E+02**	**1.86E+03**	**2.35E+01**	**1.56E+03**	**1.25E+05**	**5.48E+01**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**1.77E+01**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**7.95E+05**	**8.00E+02**	**2.67E+04**	**3.41E+02**	**2.25E+04**	**1.82E+06**	**7.95E+02**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**5.30E+01**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**2.17E+05**	**8.00E+02**	**4.40E+02**	**9.29E+01**	**6.19E+03**	**4.96E+05**	**2.17E+02**	**1.55E+03**	**1.55E+03**	**9.29E+04**
0103-97-0020	03-03201	0.0–1.58	Fill	—[e]	—	—	—	—	—	25.1	NA[f]	—	—	—	0.55 (J-)	—	NA	NA	—	3.1	71.3
0103-97-0021	03-03201	1.58–2.58	Qbt4	0.75 (UJ)	—	—	—	—	—	11.6	NA	—	—	—	0.14 (J-)	—	NA	NA	0.6 (U)	1.1 (J)	—
0103-97-0022	03-03201	2.58–3.58	Qbt4	0.76 (UJ)	—	—	—	—	8.8	5.6 (J)	NA	—	—	—	—	8.7 (J)	NA	NA	0.61 (U)	—	—
RE03-09-13747	03-03201	4.0–5.0	Qbt3	1.09 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.7 (J-)	—	1.12 (U)	—	—
RE03-09-13739	03-03201	6.0–7.0	Qbt3	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.54 (J-)	—	1.12 (U)	—	—
RE03-10-17135	03-03201	10.0–11.0	Qbt3	1.19 (U)	—	—	—	—	10.2	13.8	—	—	—	—	—	—	—	—	1.18 (U)	1.75	—
RE03-10-17136	03-03201	14.0–15.0	Qbt3	1.29 (U)	—	—	—	—	8.97	6.11	1.26	—	15.8	—	—	—	2.09	—	1.3 (U)	—	—
0103-97-0023	03-03202	0.0–0.33	Fill	8.3 (J-)	—	345	15.5	6430	51.9	231	NA	—	217	—	0.46 (J-)	30.7	NA	NA	—	1.4 (J)	638
RE03-09-13746	03-03202	4.0–5.0	Qbt3	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.29 (J-)	—	1.07 (U)	—	—
RE03-09-13743	03-03202	6.0–7.0	Qbt3	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.23 (J-)	—	1.1 (U)	—	—
0103-97-0011	03-03264	0.0–1.0	Fill	4.7 (U)	—	—	0.47 (U)	—	—	—	NA	—	—	—	0.16	—	NA	NA	—	2.7	—
0103-97-0012	03-03264	1.33–2.33	Qbt4	5.4 (U)	—	—	—	—	19.3	—	NA	—	—	—	—	8.6	NA	NA	—	—	154
0103-97-0013	03-03264	2.33–3.33	Qbt4	5 (U)	—	—	—	—	24	6.9	NA	—	—	—	—	11.9	NA	NA	—	—	164
RE03-09-13740	03-03264	4.0–5.0	Qbt3	1.13 (U)	—	—	—	—	16.8	13.2	—	—	—	—	—	—	1.3 (J-)	0.000595 (J)	1.15 (U)	5.55	—
RE03-09-13741	03-03264	6.0–7.0	Qbt3	1.18 (U)	—	—	—	—	—	4.85	—	—	—	—	—	—	—	—	1.12 (U)	—	122
0103-97-0014	03-03265	0.0–1.17	Fill	5 (U)	—	—	0.5 (U)	—	—	30	NA	—	—	—	5 (U)	—	—	—	0.5 (U)	—	—
0103-97-0015	03-03265	1.67–2.67	Qbt4	5.2 (U)	—	—	—	—	9.7	4.7	NA	—	—	—	5.2 (U)	—	—	—	—	—	9.7
0103-97-0016	03-03265	2.67–3.67	Qbt4	5 (U)	—	—	—	—	11.4	—	NA	—	—	—	5 (U)	—	—	—	—	—	11.4
RE03-09-13744	03-03265	4.0–5.0	Qbt3	1.06 (U)	—	—	—	—	—	5.46	1.9	—	—	—	—	—	—	—	1.08 (U)	1.37	—
RE03-09-13745	03-03265	6.0–7.0	Qbt3	1.05 (U)	—	—	—	—	9.45	6.95	2.13	—	—	—	—	—	1.22 (J-)	—	1.1 (U)	2.53	—
RE03-10-17130	03-03265	10.0–11.0	Qbt3	6.08 (U)	—	—	—	—	—	—	0.699	—	—	—	—	—	—	—	1.2 (U)	—	—
RE03-10-17131	03-03265	14.0–15.0	Qbt3	1.04 (U)	—	—	—	—	—	—	0.507	—	—	—	—	—	—	—	1.03 (U)	—	—
0103-97-0017	03-03266	0.0–0.17	Fill	4.6 (U)	—	—	0.49	—	38.9	44.8	NA	—	29.1	—	0.92	—	NA	NA	—	18.3	76.9
0103-97-0018	03-03266	0.75–1.75	Qbt4	5.3 (U)	—	—	—	—	13.1	8.4	NA	—	—	—	—	8.4	NA	NA	—	—	—
0103-97-0019	03-03266	1.75–2.75	Qbt4	5.8 (U)	—	—	—	—	17.6	—	NA	—	—	—	—	11.1	NA	NA	—	—	—
RE03-09-13748	03-03266	4.0–5.0	Qbt3	1.23 (U)	—	—	—	—	—	—	0.578	—	—	—	—	—	—	—	1.18 (U)	—	—
RE03-09-13749	03-03266	6.0–7.0	Qbt3	1.17 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.23 (U)	—	—
RE03-10-17132	03-603357	4.0–5.0	Qbt3	5.74 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.18 (U)	—	—

Table 6.9-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Residential SSL[c]				**3.13E+01**	**3.90E+00**	**1.56E+04**	**7.03E+01**	**na**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**5.48E+04**	**4.00E+02**	**1.86E+03**	**2.35E+01**	**1.56E+03**	**1.25E+05**	**5.48E+01**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**1.77E+01**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**7.95E+05**	**8.00E+02**	**2.67E+04**	**3.41E+02**	**2.25E+04**	**1.82E+06**	**7.95E+02**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**5.30E+01**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**2.17E+05**	**8.00E+02**	**4.40E+02**	**9.29E+01**	**6.19E+03**	**4.96E+05**	**2.17E+02**	**1.55E+03**	**1.55E+03**	**9.29E+04**
RE03-10-17133	03-603357	6.0–7.0	Qbt3	6.05 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.18 (UJ)	—	—
RE03-10-17134	03-603357	10.0–11.0	Qbt3	6.94 (U)	3.83	—	—	—	—	—	—	—	—	509 (J)	—	—	—	—	1.38 (UJ)	—	65.7
RE03-09-13726	03-608270	0.0–1.0	Qbt3	—	—	—	—	—	—	—	—	—	125	—	—	—	—	—	1.07 (U)	—	65.5
RE03-09-13727	03-608270	3.0–4.0	Qbt3	1.14 (U)	—	—	—	4570 (J+)	—	—	—	—	27.1	—	—	—	—	—	1.09 (U)	—	—
RE03-09-13728	03-608270	8.0–9.0	Qbt3	1.15 (U)	—	—	—	—	—	—	—	15,200	—	—	—	—	—	—	1.16 (U)	—	—
RE03-09-13736	03-608271	0.0–1.0	Soil	1.12 (U)	—	—	0.562 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13737	03-608271	6.0–7.0	Qbt3	1.13 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.15 (U)	—	—
RE03-09-13738	03-608271	11.0–12.0	Qbt3	1.09 (U)	—	—	—	—	7.83	10.1	—	—	16.3	—	—	—	—	—	1.11 (U)	—	—
RE03-10-17137	03-608271	14.0–15.0	Qbt3	1.12 (U)	—	—	—	—	—	—	—	—	—	—	—	—	2.06	—	1.14 (U)	—	—
RE03-09-13732	03-608272	0.0–1.0	Soil	1.1 (U)	—	—	—	—	—	—	4.67	—	—	—	0.176	—	—	—	—	—	66.7
RE03-09-13733	03-608272	3.0–4.0	Qbt3	1.01 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04 (U)	—	—
RE03-09-13734	03-608272	8.0–9.0	Qbt3	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
RE03-09-13729	03-608273	0.0–1.0	Soil	—	—	—	1.02	—	—	—	9.48	—	—	—	0.913	—	—	—	—	6.19	80
RE03-09-13730	03-608273	3.0–4.0	Qbt3	1.05 (U)	—	52.4	—	—	—	—	—	—	12.9	—	—	—	—	0.000748 (J)	1.06 (U)	—	—
RE03-10-17127	03-612229	0.0–1.0	Soil	1.07 (U)	—	—	0.533 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	63.2
RE03-10-17128	03-612229	3.0–4.0	Soil	1.02 (U)	—	—	0.51 (U)	—	—	—	—	—	63.2	—	—	—	—	0.00355	—	1.01	85.9
RE03-10-17129	03-612229	8.0–9.0	Soil	1.01 (U)	—	—	0.503 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.9-10
Organic Chemicals Detected at SWMUs 03-014 (k,l,m,n)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl) phthalate	Butylbenzylphthalate	Carbazole	Carbon Disulfide	Chrysene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**3.47E+02**	**2.60E+03[c]**	**na[d]**	**1.53E+03**	**1.48E+02**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**1.37E+03**	**9.10E+03[c]**	**na**	**8.33E+03**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**4.76E+03**	**4.76E+04[e]**	**na**	**1.58E+03**	**2.06E+04**
0103-97-0020	03-03201	0.0–1.58	Fill	—[f]	NA[g]	—	—	—	—	—	—	—	—	3.1	—	NA	—	—
0103-97-0021	03-03201	1.58–2.58	Qbt4	—	0.042(J+)	—	—	—	—	—	—	—	—	0.5	—	NA	—	—
0103-97-0022	03-03201	2.58–3.58	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE03-09-13747	03-03201	4.0–5.0	Qbt3	—	—	—	—	0.0141	0.0133	—	—	—	—	—	—	NA	—	—
RE03-09-13739	03-03201	6.0–7.0	Qbt3	—	—	—	—	0.0084	0.0072	—	—	—	—	—	—	NA	—	—
RE03-10-17135	03-03201	10.0–11.0	Qbt3	—	—	—	—	0.0132	0.0069	—	—	—	—	—	—	—	—	—
RE03-10-17136	03-03201	14.0–15.0	Qbt3	—	—	—	—	0.0178	0.0117	—	—	—	—	—	—	—	—	—
0103-97-0023	03-03202	0.0–0.33	Fill	—	—	—	—	—	—	—	—	—	—	44	30	NA	—	—
RE03-09-13746	03-03202	4.0–5.0	Qbt3	—	—	—	—	0.0056	0.0058	—	—	—	—	—	—	NA	—	—
RE03-09-13743	03-03202	6.0–7.0	Qbt3	—	—	—	—	0.0063	0.0057	—	—	—	—	—	—	NA	—	—
RE03-09-13740	03-03264	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE03-09-13741	03-03264	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
0103-97-0014	03-03265	0.0–1.17	Fill	—	NA	—	—	0.078	—	—	—	—	—	—	—	NA	NA	—
0103-97-0016	03-03265	2.67–3.67	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE03-09-13744	03-03265	4.0–5.0	Qbt3	—	0.00613 (J)	—	—	0.0098	0.0126	—	—	—	—	—	—	NA	—	—
RE03-09-13745	03-03265	6.0–7.0	Qbt3	—	—	—	—	0.006	0.0116	—	—	—	—	—	—	NA	—	—
RE03-10-17130	03-03265	10.0–11.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-10-17131	03-03265	14.0–15.0	Qbt3	—	—	—	—	0.0024 (J)	0.0019 (J)	—	—	—	—	—	—	—	—	—
0103-97-0017	03-03266	0.0–0.17	Fill	2.3 (J)	NA	3.9	—	6.5	—	11	8.3	15	5.6	—	—	3.2 (J)	NA	9.3
RE03-09-13748	03-03266	4.0–5.0	Qbt3	—	—	—	—	0.01	0.0159	—	—	—	—	—	—	NA	0.00978	—
RE03-09-13749	03-03266	6.0–7.0	Qbt3	—	0.00213 (J)	—	—	0.0033 (J)	0.0049	—	—	—	—	—	—	NA	0.00637	—
0103-97-0363	03-03386	0.0–0.5	Fill	—	NA	—	—	—	0.096	—	—	—	—	—	—	NA	NA	—
0103-97-0362	03-03386	0.5–1.0	Fill	—	NA	—	—	—	0.041	—	—	—	—	—	—	NA	NA	—
0103-97-0367	03-03387	0.0–0.5	Fill	—	NA	—	—	—	0.089	—	—	—	—	—	—	NA	NA	—
0103-97-0343	03-603357	0.0–0.5	Soil	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0345	03-603357	0.0–0.5	Fill	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0347	03-603357	0.0–0.5	Fill	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE03-10-17132	03-603357	4.0–5.0	Qbt3	—	—	—	—	0.0025 (J)	0.0017 (J)	—	—	—	—	—	—	—	—	—
RE03-10-17133	03-603357	6.0–7.0	Qbt3	—	—	—	—	0.0021 (J)	0.0015 (J)	—	—	—	—	—	—	—	—	—
RE03-10-17134	03-603357	10.0–11.0	Qbt3	—	—	—	—	0.0037 (J)	0.0025 (J)	—	—	—	—	—	—	—	—	—
RE03-09-13726	03-608270	0.0–1.0	Qbt3	—	—	—	—	0.0041	0.0044	—	—	—	—	—	—	NA	—	—

Table 6.9-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl) phthalate	Butylbenzylphthalate	Carbazole	Carbon Disulfide	Chrysene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**3.47E+02**	**2.60E+03[c]**	**na[d]**	**1.53E+03**	**1.48E+02**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**1.37E+03**	**9.10E+03[c]**	**na**	**8.33E+03**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**4.76E+03**	**4.76E+04[e]**	**na**	**1.58E+03**	**2.06E+04**
RE03-09-13736	03-608271	0.0–1.0	Soil	—	—	—	—	0.0214	0.0505	—	—	0.0154 (J)	—	—	—	NA	0.00281 (J)	—
RE03-09-13738	03-608271	11.0–12.0	Qbt3	—	—	—	—	—	0.002 (J)	—	—	—	—	—	—	NA	—	—
RE03-09-13732	03-608272	0.0–1.0	Soil	—	—	—	—	0.119	0.206	0.0152 (J)	0.013 (J)	0.0274 (J)	—	—	—	NA	—	0.0172 (J)
RE03-09-13733	03-608272	3.0–4.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE03-09-13734	03-608272	8.0–9.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE03-09-13729	03-608273	0.0–1.0	Soil	0.0176 (J)	—	0.00827 (J)	—	0.0207	0.036	—	0.012 (J)	0.0227 (J)	0.0107 (J)	—	—	NA	—	0.0122 (J)
RE03-09-13730	03-608273	3.0–4.0	Qbt3	—	—	—	—	—	0.0037	—	—	—	—	—	—	NA	—	—
RE03-10-17127	03-612229	0.0–1.0	Soil	—	—	0.00827 (J)	—	0.0428	0.0427	0.0188 (J)	0.0157 (J)	0.0259 (J)	0.0126 (J)	—	—	NA	—	0.0182 (J)
RE03-10-17128	03-612229	3.0–4.0	Soil	—	—	0.0105 (J)	—	0.989	0.182	0.0274 (J)	0.0293 (J)	0.0495	—	—	—	NA	—	0.029(J)
RE03-10-17129	03-612229	8.0–9.0	Soil	0.041	—	0.0735	0.0141	0.0189	0.0066	0.0729	0.0853	0.112	0.0567	—	—	NA	—	0.0818

Table 6.9-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzene[1,4-]	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO	TPH-LRO	Toluene
Residential SSL[a]				**1.48E-01**	**7.80E+01**[c]	**3.17E+01**	**2.29E+03**	**2.29E+03**	**2.10E+02**[c]	**1.48E+00**	**2.43E+03**[h]	**2.30E+02**[c]	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03**[i]	**na**	**5.27E+03**
Industrial SSL[a]				**2.34E+00**	**1.00E+03**[c]	**1.77E+02**	**2.44E+04**	**2.44E+04**	**1.40E+03**[c]	**2.34E+01**	**1.45E+04**[h]	**2.20E+03**[c]	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03**[i]	**na**	**5.77E+04**
Construction Worker SSL[a]				**2.13E+01**	**2.82E+02**[e]	**8.31E+02**	**8.91E+03**	**8.91E+03**	**1.54E+03**[e]	**2.13E+02**	**2.81E+03**[h]	**1.24E+03**[e]	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na**	**na**	**1.34E+04**
0103-97-0020	03-03201	0.0–1.58	Fill	—	—	—	—	—	—	—	—	—	—	—	—	3000	NA	—
0103-97-0021	03-03201	1.58–2.58	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	460	NA	—
0103-97-0022	03-03201	2.58–3.58	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	200	NA	—
RE03-09-13747	03-03201	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—
RE03-09-13739	03-03201	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—
RE03-10-17135	03-03201	10.0–11.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	12.6 (J)	NA	—
RE03-10-17136	03-03201	14.0–15.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	12.9 (J)	NA	—
0103-97-0023	03-03202	0.0–0.33	Fill	—	—	—	—	—	—	—	—	—	—	—	—	31,000	NA	—
RE03-09-13746	03-03202	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	7.67 (J)	NA	—
RE03-09-13743	03-03202	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	6.57 (J)	NA	—
RE03-09-13740	03-03264	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	3.22 (J)	NA	—
RE03-09-13741	03-03264	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	3.02 (J)	NA	—
0103-97-0014	03-03265	0.0–1.17	FILL	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	NA	NA
0103-97-0016	03-03265	2.67–3.67	QBT4	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)	NA	NA	0.004 (J)
RE03-09-13744	03-03265	4.0–5.0	Qbt3	—	—	—	—	—	0.02 (J)	—	0.0061	—	—	—	—	7.45 (J)	NA	—
RE03-09-13745	03-03265	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	786 (J)	NA	—
RE03-10-17130	03-03265	10.0–11.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	1870 (J)	NA	—
RE03-10-17131	03-03265	14.0–15.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	22.6	NA	—
0103-97-0017	03-03266	0.0–0.17	Fill	1.1 (J)	1.2 (J)	1.4 (J)	24	2 (J)	NA	4.6	NA	—	0.94 (J)	22	32	NA	NA	NA
RE03-09-13748	03-03266	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	4.12 (J)	NA	—
RE03-09-13749	03-03266	6.0–7.0	Qbt3	—	—	—	—	—	—	—	0.000762 (J)	—	—	—	—	—	NA	—
0103-97-0363	03-03386	0.0–0.5	Fill	—	—	—	—	—	NA	—	NA	—	—	—	—	NA	NA	NA
0103-97-0362	03-03386	0.5–1.0	Fill	—	—	—	—	—	NA	—	NA	—	—	—	—	NA	NA	NA
0103-97-0367	03-03387	0.0–0.5	Fill	—	—	—	—	—	NA	—	NA	—	—	—	—	NA	NA	NA
0103-97-0343	03-603357	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	—	450	—
0103-97-0345	03-603357	0.0–0.5	Fill	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	—	290	—
0103-97-0347	03-603357	0.0–0.5	Fill	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	130	490	—
RE03-10-17132	03-603357	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	6.6 (J)	NA	—
RE03-10-17133	03-603357	6.0–7.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	28.7 (J)	NA	—
RE03-10-17134	03-603357	10.0–11.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—
RE03-09-13726	03-608270	0.0–1.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—

Table 6.9-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzene[1,4-]	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO	TPH-LRO	Toluene
Residential SSL[a]				**1.48E-01**	**7.80E+01**[c]	**3.17E+01**	**2.29E+03**	**2.29E+03**	**2.10E+02**[c]	**1.48E+00**	**2.43E+03**[h]	**2.30E+02**[c]	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03**[i]	**na**	**5.27E+03**
Industrial SSL[a]				**2.34E+00**	**1.00E+03**[c]	**1.77E+02**	**2.44E+04**	**2.44E+04**	**1.40E+03**[c]	**2.34E+01**	**1.45E+04**[h]	**2.20E+03**[c]	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03**[i]	**na**	**5.77E+04**
Construction Worker SSL[a]				**2.13E+01**	**2.82E+02**[e]	**8.31E+02**	**8.91E+03**	**8.91E+03**	**1.54E+03**[e]	**2.13E+02**	**2.81E+03**[h]	**1.24E+03**[e]	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na**	**na**	**1.34E+04**
RE03-09-13736	03-608271	0.0–1.0	Soil	—	—	—	0.0151 (J)	—	—	—	—	—	—	—	0.0144 (J)	3.58 (J)	NA	—
RE03-09-13738	03-608271	11.0–12.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—
RE03-09-13732	03-608272	0.0–1.0	Soil	—	—	—	0.028 (J)	—	—	—	—	—	—	0.0116 (J)	0.03 (J)	79.8 (J)	NA	—
RE03-09-13733	03-608272	3.0–4.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	3.04 (J)	NA	—
RE03-09-13734	03-608272	8.0–9.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	4.79 (J)	NA	—
RE03-09-13729	03-608273	0.0–1.0	Soil	—	—	—	0.024 (J)	—	—	—	—	—	—	—	0.026 (J)	12.2 (J)	NA	—
RE03-09-13730	03-608273	3.0–4.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—
RE03-10-17127	03-612229	0.0–1.0	Soil	—	—	—	0.0437	—	—	0.0319 (J)	—	—	—	0.0313 (J)	0.0359	11.9 (J)	NA	—
RE03-10-17128	03-612229	3.0–4.0	Soil	—	—	—	0.0512	—	—	—	0.00122	—	—	0.0441	0.0513	81.7 (J)	NA	—
RE03-10-17129	03-612229	8.0–9.0	Soil	—	—	—	0.177	0.0446	—	0.0696	—	0.0268 (J)	0.0825	0.202	0.154	11.6 (J)	NA	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] na = Not available.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] Isopropylbenzene used as a surrogate based on structural similarity.

[i] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

Table 6.9-11
Radionuclides Detected or Detected above BVs/FVs at SWMUs 03-014(k,l,m,n)

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**
Soil BV[a]				**na**	**2.59**	**0.2**	**2.29**
Residential SAL[c]				**850**	**270**	**39**	**150**
Industrial SAL[c]				**200000**	**3000**	**150**	**750**
Construction Worker SAL[c]				**62000**	**770**	**100**	**410**
0103-97-0016	03-03265	2.67-3.67	Qbt4	0.04	—[d]	—	—
RE03-10-17130	03-03265	10.0–11.0	Qbt3	0.073768	—	—	—
RE03-09-13727	03-608270	3.0–4.0	Qbt3	0.100773	—	—	—
RE03-09-13728	03-608270	8.0–9.0	Qbt3	0.213256	—	—	—
RE03-10-17137	03-608271	14.0–15.0	Qbt3	0.129203	—	—	—
RE03-09-13733	03-608272	3.0–4.0	Qbt3	0.0129915	—	—	—
RE03-09-13734	03-608272	8.0–9.0	Qbt3	0.0163383	—	—	—
RE03-09-13729	03-608273	0.0–1.0	Soil	0.0567635	4.72	0.237	2.94
RE03-09-13730	03-608273	3.0–4.0	Qbt3	0.0343154	—	—	—
RE03-10-17128	03-612229	3.0–4.0	Soil	0.0113988	—	—	—
RE03-10-17129	03-612229	8.0–9.0	Soil	0.0222303	—	—	—

Note: All activities are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs for radionuclides from LANL (2012, 228852).
[d] — = Not detected or detected above BV/FV.

Table 6.9-12
Samples Collected and Analyses Requested at SWMU 03-014(o)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Tritium	Herbicides	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	Pesticides	Strontium 90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
0103-97-0024	03-03203	0.0–0.5	Fill	—*	—	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0025	03-03203	1.5–2.5	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0026	03-03203	2.5–3.5	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	3444R	—
0103-97-0027	03-03204	0.0–0.83	Fill	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0028	03-03204	1.75–2.75	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0029	03-03204	2.75–3.75	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	3444R	—
RE03-09-13754	03-03204	3.0–4.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-09-13755	03-03204	5.0–6.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
0103-97-0030	03-03205	0.0–0.75	Fill	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0031	03-03205	1.25–2.25	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	—	—
0103-97-0032	03-03205	2.25–3.25	Qbt4	—	3446R	3444R	3446R	3446R	3445R	—	3444R	—	3444R	3446R	3444R	—	3444R	—
RE03-09-13752	03-608275	3.0–4.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-10-5525	03-608275	3.0–4.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-09-13753	03-608275	5.0–6.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-09-13756	03-608276	3.0–4.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-09-13757	03-608276	5.0–6.0	Qbt3	—	—	—	—	—	10-887	—	10-887	—	—	—	—	—	—	10-887
RE03-09-13758	03-608277	0.0–1.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13759	03-608277	1.0–2.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13760	03-608277	4.0–5.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13761	03-608277	6.0–7.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13762	03-608278	0.0–1.0	Soil	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13763	03-608278	1.0–2.0	Soil	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13764	03-608278	4.0–5.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13765	03-608278	6.0–7.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13768	03-608279	0.0–1.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13769	03-608279	1.0–2.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13772	03-608279	4.0–5.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-10-5897	03-608279	6.0–7.0	Qbt3	10-546	10-546	—	10-546	—	10-546	10-546	10-546	10-546	—	10-546	10-546	10-546	10-546	10-546
RE03-10-17138	03-608279	10.0–11.0	Qbt3	10-3328	10-3328	—	10-3328	10-3328	10-3328	10-3328	10-3328	10-3328	—	—	10-3328	10-3328	10-3328	10-3328
RE03-10-17139	03-608279	14.0–15.0	Qbt3	10-3328	10-3328	—	10-3328	10-3328	10-3328	10-3328	10-3328	10-3328	—	—	10-3328	10-3328	10-3328	10-3328
RE03-09-13766	03-608280	0.0–1.0	Soil	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13767	03-608280	1.0–2.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13771	03-608280	4.0–5.0	Qbt3	10-518	10-518	—	10-518	—	10-517	10-517	10-516	10-517	—	10-518	10-516	10-516	10-516	10-517
RE03-09-13770	03-608280	6.0–7.0	Qbt3	10-546	10-546	—	10-546	—	10-546	10-546	10-546	10-546	—	10-546	10-546	10-546	10-546	10-546

*— = Analyses not requested.

Table 6.9-13
Inorganic Chemicals above BVs at SWMU 03-014(o)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na[b]**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**0.4**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**9.38**	**na**	**0.3**	**1**	**60.2**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**4.00E+02**	**2.35E+01**	**1.56E+03**	**1.25E+05**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**8.00E+02**	**3.41E+02**	**2.25E+04**	**1.82E+06**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**8.00E+02**	**9.29E+01**	**6.19E+03**	**4.96E+05**	**1.55E+03**	**1.55E+03**	**9.29E+04**
0103-97-0024	03-03203	0.0–0.5	Fill	4.31 (U)	0.627	40.6 (J+)	46.8	NA[e]	—[f]	1.5	—	NA	—	19.7	53.7
0103-97-0025	03-03203	1.5–2.5	Qbt4	3.82 (U)	—	12.8 (J+)	5.04	NA	—	—	6.7	NA	—	1.34	—
0103-97-0026	03-03203	2.5–3.5	Qbt4	4.79 (U)	—	9.88 (J+)	—	NA	—	—	—	NA	—	—	—
0103-97-0027	03-03204	0.0–0.83	Fill	5.38 (U)	0.538 (U)	—	18.5	NA	—	0.22	—	NA	—	6.48	—
0103-97-0028	03-03204	1.75–2.75	Qbt4	4.86 (U)	—	—	—	NA	—	—	—	NA	—	—	—
0103-97-0029	03-03204	2.75–3.75	Qbt4	5.09 (U)	—	12 (J+)	—	NA	—	—	—	NA	—	—	—
RE03-09-13754	03-03204	3.0–4.0	Qbt3	1.1 (U)	—	—	—	—	—	—	—	NA	1.08 (U)	—	—
RE03-09-13755	03-03204	5.0–6.0	Qbt3	1.1 (U)	—	—	—	—	—	—	—	NA	1.08 (U)	—	—
0103-97-0030	03-03205	0.0–0.75	Fill	4.96 (U)	2.5	136 (J+)	122	NA	45.1	3.8	—	NA	—	71.3	131
0103-97-0031	03-03205	1.25–2.25	Qbt4	4.94 (U)	—	25 (J+)	—	NA	—	—	11.4	NA	—	1.13	—
0103-97-0032	03-03205	2.25–3.25	Qbt4	4.62 (U)	—	19.2 (J+)	—	NA	—	—	10.1	NA	—	—	—
RE03-09-13752	03-608275	3.0–4.0	Qbt3	1.06 (U)	—	—	—	—	—	—	—	NA	1.07 (U)	—	—
RE03-09-13753	03-608275	5.0–6.0	Qbt3	1.07 (U)	—	—	—	—	—	—	—	NA	1.09 (U)	—	—
RE03-09-13756	03-608276	3.0–4.0	Qbt3	1.06 (U)	—	—	6.47	—	—	—	—	NA	1.06 (U)	—	—
RE03-09-13757	03-608276	5.0–6.0	Qbt3	1.08 (U)	—	—	—	—	—	—	—	NA	1.08 (U)	—	—
RE03-09-13758	03-608277	0.0–1.0	Qbt3	—	—	—	5.72	—	—	—	—	—	1.06 (U)	1.55	—
RE03-09-13759	03-608277	1.0–2.0	Qbt3	1.05 (U)	—	—	—	—	—	—	—	—	1.06 (U)	—	—
RE03-09-13760	03-608277	4.0–5.0	Qbt3	1.01 (U)	—	—	—	—	—	—	—	—	1.01 (U)	—	—
RE03-09-13761	03-608277	6.0–7.0	Qbt3	1.04 (U)	—	9.94	—	—	—	—	—	—	1.03 (U)	—	—
RE03-09-13762	03-608278	0.0–1.0	Soil	1.06 (U)	0.532 (U)	—	—	—	—	—	—	—	—	1.77	—
RE03-09-13763	03-608278	1.0–2.0	Soil	1.03 (U)	0.513 (U)	—	—	—	—	—	—	—	—	1.49	—
RE03-09-13764	03-608278	4.0–5.0	Qbt3	1 (U)	—	7.56	6.92	—	—	0.151	—	—	1.01 (U)	2.6	—
RE03-09-13765	03-608278	6.0–7.0	Qbt3	1 (U)	—	7.84	5.36	—	—	—	—	—	1.02 (U)	2.05	—
RE03-09-13768	03-608279	0.0–1.0	Qbt3	1.04 (U)	—	15.3	13.1	—	—	—	—	—	1.05 (U)	1.73	—
RE03-09-13769	03-608279	1.0–2.0	Qbt3	1.04 (U)	—	—	5.24	—	—	—	—	—	1.02 (U)	—	—
RE03-09-13772	03-608279	4.0–5.0	Qbt3	1.07 (U)	—	—	—	—	16.9	—	—	—	1.06 (U)	—	—
RE03-10-5897	03-608279	6.0–7.0	Qbt3	1.05 (U)	—	17.6 (J+)	4.77 (J)	—	12.1	—	—	—	1.06 (U)	—	—
RE03-10-17138	03-608279	10.0–11.0	Qbt3	1.06 (U)	—	—	—	—	11.5	—	—	—	1.07 (U)	—	—
RE03-10-17139	03-608279	14.0–15.0	Qbt3	1.05 (U)	—	—	—	—	—	—	—	1.24	1.09 (U)	—	—

Table 6.9-13 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na[b]**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**0.4**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**9.38**	**na**	**0.3**	**1**	**60.2**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**4.00E+02**	**2.35E+01**	**1.56E+03**	**1.25E+05**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**8.00E+02**	**3.41E+02**	**2.25E+04**	**1.82E+06**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**8.00E+02**	**9.29E+01**	**6.19E+03**	**4.96E+05**	**1.55E+03**	**1.55E+03**	**9.29E+04**
RE03-09-13766	03-608280	0.0–1.0	Soil	1.14 (U)	—	—	—	2.7	—	0.13	—	3.71	—	3.02	49
RE03-09-13767	03-608280	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	1.09 (U)	—	—
RE03-09-13771	03-608280	4.0–5.0	Qbt3	1.08 (U)	—	—	—	—	—	—	—	—	1.09 (U)	—	—
RE03-09-13770	03-608280	6.0–7.0	Qbt3	1.1 (U)	—	8.78 (J+)	—	—	—	—	—	—	1.08 (U)	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] NA = Not analyzed.

[f] — = Not detected or not detected above BV.

Table 6.9-14
Organic Chemicals Detected at SWMU 03-014(o)

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	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate
Residential SSL[a]				**3.44E+03**	**1.72E+03[b]**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**2.40E+05[c]**	**3.47E+02**
Industrial SSL[a]				**3.67E+04**	**1.83E+04[b]**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.50E+06[c]**	**1.37E+03**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+03[b]**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**9.52E+05[d]**	**4.76E+03**
0103-97-0024	03-03203	0.0–0.5	Fill	—[e]	—	NA[f]	—	—	—	—	0.16 (J)	0.22 (J)	0.39	0.16 (J)	0.12 (J)	—	—
0103-97-0027	03-03204	0.0–0.83	Fill	—	—	NA	—	—	—	—	—	—	—	—	—	—	—
0103-97-0030	03-03205	0.0–0.75	Fill	—	0.036 (J)	NA	0.057 (J)	—	—	1.22	0.48	0.65	1.2	0.29 (J)	0.46	0.12 (J)	—
0103-97-0032	03-03205	2.25–3.25	Qbt4	—	—	0.002 (J)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13752	03-608275	3.0–4.0	Qbt3	NA	NA	NA	NA	—	0.0333	0.0395	NA	NA	NA	NA	NA	NA	NA
RE03-09-13756	03-608276	3.0–4.0	Qbt3	NA	NA	NA	NA	0.0188	0.0162	0.0044	NA	NA	NA	NA	NA	NA	NA
RE03-09-13757	03-608276	5.0–6.0	Qbt3	NA	NA	NA	NA	—	0.0024 (J)	0.0025 (J)	NA	NA	NA	NA	NA	NA	NA
RE03-09-13758	03-608277	0.0–1.0	Qbt3	—	—	—	—	—	0.0119	0.0216	—	—	—	—	—	—	—
RE03-09-13759	03-608277	1.0–2.0	Qbt3	—	—	—	—	—	0.016	0.0304	—	—	—	—	—	—	—
RE03-09-13760	03-608277	4.0–5.0	Qbt3	—	—	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—
RE03-09-13761	03-608277	6.0–7.0	Qbt3	0.1	—	—	—	—	0.0033 (J)	0.0041	—	—	—	—	—	—	—
RE03-09-13762	03-608278	0.0–1.0	Soil	—	—	—	—	—	0.0353	0.0684	—	—	—	—	—	—	—
RE03-09-13763	03-608278	1.0–2.0	Soil	—	—	—	—	—	0.0356	0.0753	—	—	—	—	—	—	—
RE03-09-13764	03-608278	4.0–5.0	Qbt3	—	—	—	—	—	0.551	0.638	—	—	—	—	—	—	—
RE03-09-13765	03-608278	6.0–7.0	Qbt3	—	—	0.0023 (J)	—	—	0.048	0.0883	—	—	—	—	—	—	—
RE03-09-13768	03-608279	0.0–1.0	Qbt3	—	—	—	—	—	0.0289	0.0536	—	—	—	—	—	—	—
RE03-09-13769	03-608279	1.0–2.0	Qbt3	—	—	—	—	0.0918	0.0465	0.0304	—	—	—	—	—	—	—
RE03-09-13772	03-608279	4.0–5.0	Qbt3	—	—	—	—	—	0.0035 (J)	0.004	—	—	—	—	—	—	—
RE03-10-5897	03-608279	6.0–7.0	Qbt3	—	—	0.00257 (J)	—	—	0.0474	0.0535	—	—	—	—	—	—	0.0877 (J)
RE03-09-13766	03-608280	0.0–1.0	Soil	—	—	—	—	—	0.0229	0.0349	—	—	0.0152 (J)	—	—	—	—
RE03-09-13767	03-608280	1.0–2.0	Qbt3	—	—	—	—	—	0.0075	0.0105	—	—	—	—	—	—	—
RE03-09-13771	03-608280	4.0–5.0	Qbt3	—	—	—	—	—	0.0053	0.0069	—	—	—	—	—	—	0.0746 (J)
RE03-09-13770	03-608280	6.0–7.0	Qbt3	—	—	—	—	—	—	0.0016 (J)	—	—	—	—	—	—	—

Table 6.9-14 (continued)

Sample ID	Location ID	Depth (ft)	Media	Carbazole	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	MCPA	MCPP	Methylene Chloride	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**na[g]**	**1.48E+02**	**1.48E-01**	**2.29E+03**	**2.10E+02[c]**	**1.48E+00**	**2.43E+03[h]**	**na**	**na**	**4.09E+02**	**1.83E+03**	**1.72E+03**	**1.00E+03[i]**
Industrial SSL[a]				**na**	**2.34E+03**	**2.34E+00**	**2.44E+04**	**1.40E+03[c]**	**2.34E+01**	**1.45E+04[h]**	**na**	**na**	**4.70E+03**	**2.05E+04**	**1.83E+04**	**1.80E+03[i]**
Construction Worker SSL[a]				**na**	**2.06E+04**	**2.13E+01**	**8.91E+03**	**1.54E+03[d]**	**2.13E+02**	**2.81E+03[h]**	**na**	**na**	**1.12E+03**	**7.15E+03**	**6.68E+03**	**na**
0103-97-0024	03-03203	0.0–0.5	Fill	—	0.25 (J)	—	0.26 (J)	NA	0.16 (J)	NA	—	—	NA	0.036 (J)	0.23 (J)	NA
0103-97-0027	03-03204	0.0–0.83	Fill	—	—	—	—	NA	—	NA	—	0.993	NA	—	—	NA
0103-97-0030	03-03205	0.0–0.75	Fill	0.037 (J)	0.69	0.084 (J)	0.81	NA	0.31 (J)	NA	0.956	—	NA	0.29 (J)	0.74	NA
0103-97-0032	03-03205	2.25–3.25	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	NA
RE03-09-13752	03-608275	3.0–4.0	Qbt3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE03-09-13756	03-608276	3.0–4.0	Qbt3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE03-09-13757	03-608276	5.0–6.0	Qbt3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE03-09-13758	03-608277	0.0–1.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.0027 (J)	—	—	—
RE03-09-13759	03-608277	1.0–2.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00339 (J)	—	—	—
RE03-09-13760	03-608277	4.0–5.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.0026 (J)	—	—	—
RE03-09-13761	03-608277	6.0–7.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00315 (J)	—	—	—
RE03-09-13762	03-608278	0.0–1.0	Soil	NA	—	—	—	—	—	—	NA	NA	0.00334 (J)	—	—	3.42 (J)
RE03-09-13763	03-608278	1.0–2.0	Soil	NA	—	—	—	—	—	—	NA	NA	0.00251 (J)	—	—	2.8 (J)
RE03-09-13764	03-608278	4.0–5.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00282 (J)	—	—	7.79
RE03-09-13765	03-608278	6.0–7.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	—	—	—	3.7 (J)
RE03-09-13768	03-608279	0.0–1.0	Qbt3	NA	—	—	—	—	—	0.00037 (J)	NA	NA	0.00349 (J)	—	—	3.39 (J)
RE03-09-13769	03-608279	1.0–2.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00311 (J)	—	—	—
RE03-09-13772	03-608279	4.0–5.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00342 (J)	—	—	—
RE03-10-5897	03-608279	6.0–7.0	Qbt3	NA	—	—	—	0.00392 (J)	—	—	NA	NA	—	—	—	2.98 (J)
RE03-09-13766	03-608280	0.0–1.0	Soil	NA	—	—	0.014 (J)	—	—	—	NA	NA	0.00309 (J)	—	—	3.4 (J)
RE03-09-13767	03-608280	1.0–2.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00324 (J)	—	—	—
RE03-09-13771	03-608280	4.0–5.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	0.00323 (J)	—	—	—
RE03-09-13770	03-608280	6.0–7.0	Qbt3	NA	—	—	—	—	—	—	NA	NA	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] — = Not detected.

[f] NA = Not analyzed.

[g] na = Not available.

[h] Isopropylbenzene used as a surrogate based on structural similarity.

[i] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

Table 6.9-15
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-014(o)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Strontium-90	Tritium	Uranium-234
Qbt 2,3,4 BV[a]				**na[b]**	**na**	**na**	**1.98**
Soil BV[a]				**0.054**	**1.31**	**na**	**2.59**
Residential SAL[c]				**79**	**15**	**850**	**270**
Industrial SAL[c]				**1200**	**3500**	**200000**	**3000**
Construction Worker SAL[c]				**120**	**1600**	**62000**	**770**
0103-97-0024	03-03203	0.0–0.5	Fill	0.088	—[d]	NA[e]	—
0103-97-0027	03-03204	0.0–0.83	Fill	—	—	0.286	—
0103-97-0028	03-03204	1.75–2.75	Qbt4	—	3.2	—	—
0103-97-0030	03-03205	0.0–0.75	Fill	0.131	8.01	2.906	2.68
0103-97-0031	03-03205	1.25–2.25	Qbt4	0.186	—	—	—
RE03-09-13759	03-608277	1.0–2.0	Qbt3	—	—	0.0160747	NA
RE03-09-13761	03-608277	6.0–7.0	Qbt3	—	—	0.0078086	NA
RE03-09-13763	03-608278	1.0–2.0	Soil	—	—	0.00748423	NA
RE03-09-13764	03-608278	4.0–5.0	Qbt3	—	—	0.00579541	NA
RE03-09-13771	03-608280	4.0–5.0	Qbt3	—	—	0.0199685	NA

Note: All activities are in pCi/g.

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

[b] na = Not available.

[c] SALs for radionuclides from LANL (2012, 228852).

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

[e] NA = Not analyzed.

Table 6.9-16
Samples Collected and Analyses Requested at SWMU 03-014(u)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	Strontium-90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-10-5491	03-608281	0.0–1.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—*	10-487	10-487	10-487	10-488
RE03-09-13779	03-608281	1.0–2.0	Qbt3	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13781	03-608282	0.0–1.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-10-5490	03-608282	3.5–4.5	Qbt3	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13783	03-608283	0.0–1.0	Soil	10-518	10-518	—	10-517	10-517	10-516	10-517	10-518	10-516	10-516	10-516	10-517
RE03-09-13799	03-608284	0.0–1.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13800	03-608284	1.0–2.0	Qbt3	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13801	03-608285	0.0–1.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13802	03-608285	1.0–2.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-09-13803	03-608286	0.0–1.0	Soil	10-518	10-518	—	10-517	10-517	10-516	10-517	10-518	10-516	10-516	10-516	10-517
RE03-09-13804	03-608286	1.0–2.0	Qbt3	10-518	10-518	—	10-517	10-517	10-516	10-517	10-518	10-516	10-516	10-516	10-517
RE03-09-13805	03-608287	0.0–1.0	Soil	10-518	10-518	—	10-517	10-517	10-516	10-517	10-518	10-516	10-516	10-516	10-517
RE03-09-13806	03-608287	1.0–2.0	Qbt3	10-518	10-518	—	10-517	10-517	10-516	10-517	10-518	10-516	10-516	10-516	10-517
RE03-10-5487	03-609990	0.0–1.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488
RE03-10-5488	03-609990	1.0–2.0	Soil	10-489	10-489	10-489	10-488	10-488	10-487	10-488	—	10-487	10-487	10-487	10-488

*— = Analysis not requested

Table 6.9-17
Inorganic Chemicals above BVs at SWMU 03-014(u)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Manganese	Mercury	Nitrate	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**482**	**0.1**	**na[b]**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**0.4**	**19.3**	**14.7**	**0.5**	**22.3**	**671**	**0.1**	**na**	**1.52**	**1**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**1.17E+05[d]**	**3.13E+03**	**4.69E+01**	**4.00E+02**	**1.86E+03**	**2.35E+01**	**1.25E+05**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**1.70E+06[d]**	**4.54E+04**	**6.81E+02**	**8.00E+02**	**2.67E+04**	**3.41E+02**	**1.82E+06**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**4.65E+05[d]**	**1.24E+04**	**1.86E+02**	**8.00E+02**	**4.40E+02**	**9.29E+01**	**4.96E+05**	**1.55E+03**	**1.55E+03**	**9.29E+04**
RE03-10-5491	03-608281	0.0–1.0	Soil	1.09 (U)	1.66	168	224	—[e]	116	—	1.99 (J)	4.11	—	66.7	110
RE03-09-13779	03-608281	1.0–2.0	Qbt3	1.04 (U)	—	22.7	34.5	27.7	17.5	—	0.272 (J)	—	1.04 (U)	9.12	73.9
RE03-09-13781	03-608282	0.0–1.0	Soil	1.06 (U)	0.529 (U)	—	—	—	—	—	—	—	—	—	—
RE03-10-5490	03-608282	3.5–4.5	Qbt3	1.03 (U)	—	—	—	—	—	—	—	—	1.04 (U)	—	—
RE03-09-13783	03-608283	0.0–1.0	Soil	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13799	03-608284	0.0–1.0	Soil	1.08 (U)	—	—	—	—	—	—	0.145 (J)	—	—	2.02	—
RE03-09-13800	03-608284	1.0–2.0	Qbt3	0.994 (U)	—	—	—	1.1	18.7	—	—	—	0.992 (U)	—	—
RE03-09-13801	03-608285	0.0–1.0	Soil	1.09 (U)	—	—	—	—	—	—	—	—	—	—	52.9
RE03-09-13802	03-608285	1.0–2.0	Soil	1.12 (U)	0.561 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-13803	03-608286	0.0–1.0	Soil	1.21 (U)	—	—	—	—	—	—	0.2	—	—	2.15	91.6
RE03-09-13804	03-608286	1.0–2.0	Qbt3	1.08 (U)	—	—	—	—	—	500	—	—	1.08 (U)	—	—
RE03-09-13805	03-608287	0.0–1.0	Soil	1.12 (U)	0.561 (U)	—	—	—	—	—	—	—	—	—	61.7
RE03-09-13806	03-608287	1.0–2.0	Qbt3	1.13 (U)	—	7.52	—	—	19.2	—	—	—	1.14 (U)	—	—
RE03-10-5487	03-609990	0.0–1.0	Soil	1.13 (U)	0.565 (U)	—	—	—	—	—	—	—	—	—	—
RE03-10-5488	03-609990	1.0–2.0	Soil	1.13 (U)	0.563 (U)	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971).

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 6.9-18
Organic Chemicals Detected at SWMU 03-014(u)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**3.44E+03**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**3.47E+02**	**1.48E+02**	**1.48E-01**	**4.89E+04**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**1.83E+03**	**1.72E+03**	**1.00E+03[c]**
Industrial SSL[a]				**3.67E+04**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**1.37E+03**	**2.34E+03**	**2.34E+00**	**5.47E+05**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.05E+04**	**1.83E+04**	**1.80E+03[c]**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**4.76E+03**	**2.06E+04**	**2.13E+01**	**1.91E+05**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**7.15E+03**	**6.68E+03**	**na[d]**
RE03-10-5491	03-608281	0.0–1.0	Soil	—[e]	0.01 (J)	0.581	0.417	0.0774	0.114	0.257	0.0968	0.341 (J)	0.121	0.0276 (J)	—	0.159	0.0882	—	0.0728	0.179	270 (J)
RE03-09-13779	03-608281	1.0–2.0	Qbt3	—	—	0.0633	0.0492	0.0225 (J)	0.0264 (J)	0.0626	0.0266 (J)	0.0754 (J)	0.0246 (J)	—	—	0.0307 (J)	0.0207 (J)	—	0.0108 (J)	0.0297 (J)	34.4 (J)
RE03-09-13781	03-608282	0.0–1.0	Soil	—	—	0.038	0.0665	—	—	—	—	—	—	—	—	—	—	—	—	—	6.23 (J)
RE03-10-5490	03-608282	3.5–4.5	Qbt3	—	—	0.317	0.272	—	—	—	—	—	—	—	—	—	—	—	—	—	4.44 (J)
RE03-09-13783	03-608283	0.0–1.0	Soil	—	—	0.0106	0.0156	—	0.016 (J)	0.0244 (J)	—	—	0.0141 (J)	—	—	0.016 (J)	—	0.00344 (J)	—	0.0207 (J)	4.25 (J)
RE03-09-13799	03-608284	0.0–1.0	Soil	0.0377	—	0.226	0.152	0.0191 (J)	0.0183 (J)	0.0307 (J)	0.0129 (J)	—	0.0189 (J)	—	—	0.0366	0.0118 (J)	—	0.0221 (J)	0.04	125 (J)
RE03-09-13800	03-608284	1.0–2.0	Qbt3	—	—	0.0614	0.0464	0.0177 (J)	0.0146 (J)	0.0247 (J)	—	—	0.0146 (J)	—	—	0.0326 (J)	—	—	0.0237 (J)	0.03 (J)	10.6 (J)
RE03-09-13801	03-608285	0.0–1.0	Soil	—	0.00842 (J)	0.17	0.134	0.0324 (J)	0.0364 (J)	0.0657	0.0261 (J)	—	0.0357 (J)	—	—	0.0739	0.0209 (J)	—	0.0403	0.0664	14 (J)
RE03-09-13802	03-608285	1.0–2.0	Soil	—	—	0.122	0.0997	0.013 (J)	0.0114 (J)	0.0202 (J)	—	—	0.0123 (J)	—	—	0.0246 (J)	—	—	0.0123 (J)	0.0198 (J)	9.03 (J)
RE03-09-13803	03-608286	0.0–1.0	Soil	—	—	0.279	0.262	—	0.0361 (J)	0.0822	0.0268 (J)	—	0.0453	—	—	0.0739	0.0226 (J)	—	0.0297 (J)	0.0746	28.7
RE03-09-13804	03-608286	1.0–2.0	Qbt3	—	—	0.0484	0.0438	—	—	—	—	—	—	—	—	—	—	0.0035 (J)	—	—	12.2
RE03-09-13805	03-608287	0.0–1.0	Soil	—	—	0.0733	0.0558	—	0.0348 (J)	0.0873	0.0388	—	0.0639	—	0.0916 (J)	0.0721	0.0318 (J)	0.00241 (J)	0.0267 (J)	0.053	27
RE03-09-13806	03-608287	1.0–2.0	Qbt3	—	—	0.0092	0.0076	—	—	0.0213 (J)	—	—	—	—	—	0.0169 (J)	—	0.00331 (J)	—	0.0118 (J)	7.27 (J)
RE03-10-5487	03-609990	0.0–1.0	Soil	—	—	0.012	0.0108	—	—	—	—	—	—	—	—	—	—	—	—	—	2.75 (J)
RE03-10-5488	03-609990	1.0–2.0	Soil	—	—	0.0019 (J)	0.0019 (J)	—	—	—	—	—	—	—	—	0.0132 (J)	—	—	—	0.013 (J)	7.27 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene used as surrogate based on structural similarity.

[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[d] na = Not available.

[e] — = Not detected.

Table 6.9-19
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-014(u)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238
Soil BV[a]				**0.023**
Residential SAL[b]				**84**
Industrial SAL[b]				**1300**
Construction Worker SAL[b]				**130**
RE03-10-5491	03-608281	0.0–1.0	Soil	0.0285

Note: All activities are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] SALs for radionuclides from LANL (2012, 228852).

Table 6.9-20
Samples Collected and Analyses Requested at SWMU 03-056(d)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13811	03-608288	0.0–1.0	Soil	10-575	10-575	10-575	10-575	10-575	10-575
RE03-09-13812	03-608288	3.0–4.0	Soil	10-575	10-575	10-575	10-575	10-575	10-575

Table 6.9-21
Inorganic Chemicals above BVs at SWMU 03-056(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Mercury	Silver	Zinc
Soil BV[a]				**0.83**	**0.4**	**19.3**	**14.7**	**0.5**	**0.1**	**1**	**48.8**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**1.17E+05[c]**	**3.13E+03**	**4.69E+01**	**2.35E+01**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**1.70E+06[c]**	**4.54E+04**	**6.81E+02**	**3.41E+02**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**4.65E+05[c]**	**1.24E+04**	**1.86E+02**	**9.29E+01**	**1.55E+03**	**9.29E+04**
RE03-09-13811	03-608288	0.0–1.0	Soil	1.07 (U)	0.533 (U)	—[d]	—	—	—	—	—
RE03-09-13812	03-608288	3.0–4.0	Soil	1.07 (U)	—	22.6 (J+)	21.8 (J)	0.554	0.161 (J+)	12	52.3

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] SSL for trivalent chromium.
[d] — = Not detected or not detected above BV.

Table 6.9-22
Organic Chemicals Detected at SWMU 03-056(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	TPH-DRO
Residential SSL[a]				**1.12E+00**	**2.22E+00**	**1.00E+03**[b]
Industrial SSL[a]				**8.26E+00**	**8.26E+00**	**1.80E+03**[b]
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**	**na**[c]
RE03-09-13811	03-608288	0.0–1.0	Soil	—[d]	0.0014 (J)	—
RE03-09-13812	03-608288	3.0–4.0	Soil	0.0539	0.0769	3.19 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).
[c] na = Not available.
[d] — = Not detected.

Table 6.10-1
Samples Collected and Analyses Requested at SWMU 03-015 and AOC 03-053

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs
AAB5813	03-02004	0.0–1.5	Sed	—*	20229	—	—	20215	—	—	—	—	—
RE03-09-13862	03-608289	0.0–1.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13863	03-608289	1.0–2.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13864	03-608290	0.0–1.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13865	03-608290	1.0–2.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13866	03-608291	0.0–1.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13867	03-608291	1.0–2.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13868	03-608292	0.0–1.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13869	03-608292	1.0–2.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13870	03-608293	0.0–1.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13871	03-608293	1.0–2.0	Soil	10-606	—	10-606	10-606	10-605	10-604	10-605	10-604	10-604	10-604
RE03-09-13878	03-608297	0.0–1.0	Soil	10-756	—	10-756	10-756	10-756	10-755	10-756	10-755	10-755	10-755
RE03-09-13879	03-608297	1.0–2.0	Soil	10-756	—	10-756	10-756	10-756	10-755	10-756	10-755	10-755	10-755
RE03-09-13880	03-608298	2.5–3.5	Soil	10-756	—	10-756	10-756	10-756	10-755	10-756	10-755	10-755	10-755
RE03-09-13881	03-608298	5.5–6.5	Soil	10-756	—	10-756	10-756	10-756	10-755	10-756	10-755	10-755	10-755

*— = Analyses not requested.

Table 6.10-2
Inorganic Chemicals above BVs at SWMU 03-015 and AOC 03-053

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Sediment BV[a]				**0.83**	**127**	**0.4**	**10.5**	**4.73**	**11.2**	**19.7**	**543**	**0.1**	**9.38**	**na[b]**	**0.3**	**1**	**1470**	**19.7**	**60.2**
Soil BV[a]				**0.83**	**295**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Residential SSL[c]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**4.00E+02**	**1.86E+03**	**2.35E+01**	**1.56E+03**	**5.48E+01**	**3.91E+02**	**3.91E+02**	**na**	**3.91E+02**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**8.00E+02**	**2.67E+04**	**3.41E+02**	**2.25E+04**	**7.95E+02**	**5.68E+03**	**5.68E+03**	**na**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**8.00E+02**	**4.40E+02**	**9.29E+01**	**6.19E+03**	**2.17E+02**	**1.55E+03**	**1.55E+03**	**na**	**1.55E+03**	**9.29E+04**
AAB5813	03-02004	0.0–1.5	Sed	—[g]	181 (J-)	—	—	NA[h]	NA	29.3 (J-)	NA	NA	—	NA	0.61 (UJ)	—	NA	NA	NA
RE03-09-13862	03-608289	0.0–1.0	Soil	1.1 (UJ)	—	0.551 (U)	—	—	—	—	—	—	28.7	—	—	—	—	—	—
RE03-09-13863	03-608289	1.0–2.0	Soil	1.08 (UJ)	—	0.542 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13864	03-608290	0.0–1.0	Soil	1.03 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	1350	—	—
RE03-09-13865	03-608290	1.0–2.0	Soil	1.09 (UJ)	—	0.544 (U)	19.4	—	—	—	—	—	—	—	—	—	3260	—	—
RE03-09-13866	03-608291	0.0–1.0	Soil	1.13 (UJ)	—	—	—	—	—	—	—	—	—	0.00119 (J)	—	—	—	—	—
RE03-09-13867	03-608291	1.0–2.0	Soil	1.09 (UJ)	—	—	—	26.6 (J)	—	36	1220	—	—	—	—	—	—	—	—
RE03-09-13868	03-608292	0.0–1.0	Soil	1.03 (UJ)	—	—	—	—	—	23	—	—	—	—	—	—	—	—	—
RE03-09-13869	03-608292	1.0–2.0	Soil	1.19 (UJ)	—	0.597 (U)	45.2	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13870	03-608293	0.0–1.0	Soil	4.32 (J-)	—	0.57	—	—	18.8	35.5	—	0.211 (J+)	—	0.000709 (J)	—	1.36	—	—	129
RE03-09-13871	03-608293	1.0–2.0	Soil	—	—	—	—	—	—	—	—	0.168 (J+)	—	—	—	—	—	—	57.3
RE03-09-13878	03-608297	0.0–1.0	Soil	7.39	—	—	—	—	17	32.8	—	—	—	—	—	—	—	—	95.6
RE03-09-13879	03-608297	1.0–2.0	Soil	4.25	—	0.619 (U)	42	—	—	197	—	—	—	—	—	—	—	—	78.4
RE03-09-13880	03-608298	2.5–3.5	Soil	1.31 (U)	—	0.654 (U)	—	—	—	—	—	—	—	—	—	—	—	—	63.1
RE03-09-13881	03-608298	5.5–6.5	Soil	1.19 (U)	—	0.594 (U)	—	—	—	—	1320	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971) unless otherwise noted.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

[h] NA = Not analyzed.

Table 6.10-3
Organic Chemicals Detected at SWMU 03-015 and AOC 03-053

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	Benzo(k)fluoranthene	Chrysene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**1.48E+02**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.31E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**2.06E+04**
RE03-09-13862	03-608289	0.0–1.0	Soil	—[c]	—	0.00998 (J)	—	—	0.0468	0.0381 (J)	0.179	0.0293 (J)	—	0.066
RE03-09-13863	03-608289	1.0–2.0	Soil	—	—	—	—	—	—	—	0.106	—	—	—
RE03-09-13865	03-608290	1.0–2.0	Soil	—	—	—	0.0392	0.0255	—	—	—	—	—	—
RE03-09-13866	03-608291	0.0–1.0	Soil	0.0618	—	0.108	—	0.0174	0.193	0.169	0.352	0.114	—	0.208
RE03-09-13867	03-608291	1.0–2.0	Soil	—	—	0.0113 (J)	—	0.0068	0.0347 (J)	0.0215 (J)	0.141	0.0184 (J)	—	0.0318 (J)
RE03-09-13868	03-608292	0.0–1.0	Soil	0.0298 (J)	—	0.0568	—	—	0.156	0.143	0.335	0.107	—	0.187
RE03-09-13870	03-608293	0.0–1.0	Soil	0.539	—	0.892	1.28	0.487	2.61	2.36	4.79	1.58	—	2.85
RE03-09-13871	03-608293	1.0–2.0	Soil	0.0249 (J)	—	0.0402	0.225	0.103	0.0844	0.0789	0.229	0.0667	—	0.0907
RE03-09-13878	03-608297	0.0–1.0	Soil	0.0802	—	0.178	—	0.0513	0.441	0.382	0.698	—	—	0.456
RE03-09-13879	03-608297	1.0–2.0	Soil	0.0201 (J)	—	0.0411 (J)	0.0187	0.0154	0.174	0.171	0.238	0.0777	0.11	0.185
RE03-09-13880	03-608298	2.5–3.5	Soil	—	0.00479 (J)	—	—	—	—	—	—	—	—	—
RE03-09-13881	03-608298	5.5–6.5	Soil	—	0.00842 (J)	—	—	—	—	—	—	—	—	—

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.30E+02[d]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03[e]**
Industrial SSL[a]				**2.44E+04**	**2.44E+04**	**2.34E+01**	**2.20E+03[d]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03[e]**
Construction Worker SSL[a]				**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.24E+03[f]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na[g]**
RE03-09-13862	03-608289	0.0–1.0	Soil	0.115	—	—	—	—	0.065	0.0938	3.39 (J)
RE03-09-13863	03-608289	1.0–2.0	Soil	0.0127 (J)	—	—	—	—	—	0.0132 (J)	3.21 (J)
RE03-09-13865	03-608290	1.0–2.0	Soil	—	—	—	—	—	—	—	—
RE03-09-13866	03-608291	0.0–1.0	Soil	0.513	0.0566	0.0843	0.0132 (J)	0.0308 (J)	0.411	0.415	9.32
RE03-09-13867	03-608291	1.0–2.0	Soil	0.0756	—	—	—	—	0.0493	0.0669	5.06 (J)
RE03-09-13868	03-608292	0.0–1.0	Soil	0.408	0.0262 (J)	0.0715	—	—	0.247	0.339	6.05 (J)
RE03-09-13870	03-608293	0.0–1.0	Soil	6.75	0.508	1.22	0.111 (J)	0.344 (J)	4.55	5.56	89.8
RE03-09-13871	03-608293	1.0–2.0	Soil	0.23	0.0222 (J)	0.0354 (J)	—	0.0174 (J)	0.187	0.2	8.58
RE03-09-13878	03-608297	0.0–1.0	Soil	0.982	0.0779	0.196	0.0182 (J)	0.036 (J)	0.654	0.88	47 (J)
RE03-09-13879	03-608297	1.0–2.0	Soil	0.374	0.0175 (J)	0.113	—	0.0144 (J)	0.204	0.37	10.3
RE03-09-13880	03-608298	2.5–3.5	Soil	—	—	—	—	—	—	—	—
RE03-09-13881	03-608298	5.5–6.5	Soil	—	—	—	—	—	—	—	3.7 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] na = Not available.

Table 6.10-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-015 and AOC 03-053

Sample ID	Location ID	Depth (ft)	Media	Uranium-238
Soil BV[a]				**2.29**
Residential SAL[b]				**150**
Industrial SAL[b]				**750**
Construction Worker SAL[b]				**410**
RE03-09-13870	03-608293	0.0–1.0	Soil	2.36

Note: All activities are in pCi/g.

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

[b] SALs for radionuclides from LANL (2012, 228852).

Table 6.11-1
Samples Collected and Analyses Requested at SWMU 03-021

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	VOCs	Cyanide (Total)
0103-97-0241	03-03326	0.0–1.0	Soil	3429R	—*	3428R	—	—
0103-97-0242	03-03327	2.0–3.0	Soil	3429R	—	3428R	—	—
0103-97-0243	03-03327	3.0–4.0	Soil	3429R	—	3428R	—	—
0103-97-0244	03-03328	3.0–4.0	Soil	3429R	—	3428R	3427R	—
0103-97-0245	03-03328	4.0–5.0	Soil	3429R	—	3428R	—	—
0103-97-0246	03-03329	2.0–3.0	Soil	3429R	—	3428R	—	—
0103-97-0247	03-03329	3.0–4.0	Soil	3429R	—	3428R	—	—
0103-97-0248	03-03330	2.75–3.75	Soil	3429R	—	3428R	—	—
0103-97-0251	03-03330	3.75–4.25	Soil	3429R	—	3428R	—	—
0103-97-0249	03-03331	3.0–4.0	Soil	3429R	—	3428R	—	—
0103-97-0250	03-03331	4.0–5.0	Qbt3	3429R	—	3428R	—	—
RE03-09-13890	03-608299	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13891	03-608299	1.0–2.0	Qbt3	10-357	10-356	10-356	10-356	10-357
RE03-09-13892	03-608300	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13893	03-608300	1.0–2.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13894	03-608301	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13895	03-608301	1.0–2.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13896	03-608302	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13897	03-608302	1.0–2.0	Qbt3	10-357	10-356	10-356	10-356	10-357
RE03-09-13898	03-608303	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13899	03-608303	1.0–2.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13900	03-608304	0.0–1.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13901	03-608304	1.0–2.0	Soil	10-357	10-356	10-356	10-356	10-357
RE03-09-13888	03-611943	4.0–5.0	Qbt3	10-389	10-389	—	—	10-389
RE03-09-13889	03-611943	5.0–6.0	Qbt3	10-389	10-389	—	—	10-389
RE03-09-13886	03-611944	4.0–5.0	Qbt3	10-389	10-389	—	—	10-389
RE03-09-13887	03-611944	5.0–6.0	Qbt3	10-389	10-389	—	—	10-389

*— = Analyses not requested.

Table 6.11-2
Inorganic Chemicals above BVs at SWMU 03-021

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Selenium	Thallium	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**46**	**1.63**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**482**	**6.58**	**0.3**	**1.1**	**63.5**
Soil BV[a]				**0.83**	**295**	**0.4**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**671**	**15.4**	**1.52**	**0.73**	**48.8**
Residential SSL[b]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**1.17E+05[c]**	**2.30E+01[d]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**7.82E-01**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**1.70E+06[c]**	**3.00E+02[d]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**4.65E+05[c]**	**3.46E+01[e]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**3.10E+00**	**9.29E+04**
0103-97-0241	03-03326	0.0–1.0	Soil	—[f]	—	—	—	—	22.9	—	24.7	—	24.5	—	2.1 (J)	53
0103-97-0242	03-03327	2.0–3.0	Soil	—	—	—	28.1	—	—	—	84.7	—	—	—	2 (J)	—
0103-97-0243	03-03327	3.0–4.0	Soil	0.95 (U)	—	—	101	—	—	33,200	33.7	—	—	—	1.3 (J)	—
0103-97-0244	03-03328	3.0–4.0	Soil	—	—	—	—	—	—	—	29.7	—	—	—	—	—
0103-97-0245	03-03328	4.0–5.0	Soil	0.86 (U)	—	—	—	—	—	—	—	—	—	—	—	—
0103-97-0246	03-03329	2.0–3.0	Soil	—	—	—	—	—	—	—	31.4	—	—	—	—	52.5
0103-97-0247	03-03329	3.0–4.0	Soil	—	—	—	56.6	11.2	—	—	358	—	—	—	—	193
0103-97-0248	03-03330	2.75–3.75	Soil	—	—	—	—	—	—	—	103	—	—	—	—	—
0103-97-0251	03-03330	3.75–4.25	Soil	—	—	—	—	—	—	—	67.1	—	—	—	—	49.3
0103-97-0249	03-03331	3.0–4.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	49.3
0103-97-0250	03-03331	4.0–5.0	Qbt3	0.79 (U)	63.1	—	13.5	—	—	—	41.6	—	12.5	0.63 (U)	—	74.9
RE03-09-13891	03-608299	1.0–2.0	Qbt3	—	—	—	—	—	—	—	—	—	—	1.11 (UJ)	—	—
RE03-09-13893	03-608300	1.0–2.0	Soil	1.17 (U)	—	0.587 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-13894	03-608301	0.0–1.0	Soil	0.932 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13895	03-608301	1.0–2.0	Soil	1.13 (U)	—	—	—	—	—	—	—	746 (J-)	—	—	—	59.9
RE03-09-13896	03-608302	0.0–1.0	Soil	1.15 (U)	—	—	—	—	—	—	—	—	—	—	—	52.8
RE03-09-13897	03-608302	1.0–2.0	Qbt3	1.14 (U)	—	—	—	—	—	—	—	—	—	1.14 (UJ)	—	—
RE03-09-13898	03-608303	0.0–1.0	Soil	1.24	—	—	—	—	—	—	53.8	—	—	—	—	51.9
RE03-09-13899	03-608303	1.0–2.0	Soil	0.991 (J)	—	—	—	—	—	—	39.3	—	—	—	—	51.5
RE03-09-13901	03-608304	1.0–2.0	Soil	0.914 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13888	03-611943	4.0–5.0	Qbt3	1.03 (U)	—	—	25.7	—	—	—	—	—	—	1.07 (U)	—	—
RE03-09-13889	03-611943	5.0–6.0	Qbt3	1.03 (U)	—	—	—	—	—	—	—	—	—	1.07 (U)	—	—
RE03-09-13886	03-611944	4.0–5.0	Qbt3	1.08 (U)	—	—	—	—	—	—	36.8	—	—	1.14 (U)	—	—
RE03-09-13887	03-611944	5.0–6.0	Qbt3	1.13 (U)	—	—	—	—	—	—	33.6	—	—	1.09 (U)	—	64

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] SSL for trivalent chromium.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[f] — = Not detected or not detected above BV.

Table 6.11-3
Organic Chemicals Detected at SWMU 03-021

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Phenanthrene	Pyrene
Residential SSL[a]				**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.48E+01**	**1.48E+02**	**2.29E+03**	**1.83E+03**	**1.72E+03**
Industrial SSL[a]				**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**2.34E+02**	**2.34E+03**	**2.44E+04**	**2.05E+04**	**1.83E+04**
Construction Worker SSL[a]				**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**2.06E+03**	**2.06E+04**	**8.91E+03**	**7.15E+03**	**6.68E+03**
RE03-09-13890	03-608299	0.0–1.0	Soil	—[b]	—	0.0035 (J)	0.0057	—	—	—	—	—	0.0142 (J)	—	0.0149 (J)
RE03-09-13895	03-608301	1.0–2.0	Soil	0.0144	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13898	03-608303	0.0–1.0	Soil	—	0.0154 (J)	0.0256	0.0178 (J)	0.044	0.0276 (J)	0.0431	0.0183 (J)	0.0421	0.13	0.0806	0.125 (J)
RE03-09-13899	03-608303	1.0–2.0	Soil	—	—	0.0271	0.0214	—	—	—	—	—	—	—	—
RE03-09-13900	03-608304	0.0–1.0	Soil	—	—	0.0134 (J)	0.0144 (J)	—	—	0.0164 (J)	—	—	0.0149 (J)	—	0.0211 (J)
RE03-09-13901	03-608304	1.0–2.0	Soil	—	—	0.0492	0.0344	—	—	—	—	—	0.0176 (J)	0.0121 (J)	0.0245 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] — = Not detected.

Table 6.13-1
Samples Collected and Analyses Requested at SWMU 03-045(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-09-13932	03-608316	0–1	Qbt3	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13933	03-608316	1–2	Qbt3	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13934	03-608317	0–1	Soil	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13935	03-608317	1–2	Soil	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13936	03-608318	0–1	Qbt3	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13937	03-608318	1–2	Qbt3	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13938	03-608319	0–1	Soil	10-348	10-347	10-347	10-347	10-347	10-347	10-348
RE03-09-13939	03-608319	1–2	Qbt3	10-348	10-347	10-347	10-347	10-347	10-347	10-348

Table 6.13-2
Inorganic Chemicals above BVs at SWMU 03-045(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Qbt 2,3,4 BV[a]				**0.5**	**1.63**	**7.14**	**4.66**	**11.2**	**0.1**	**0.3**	**1**	**63.5**
Soil BV[a]				**0.83**	**0.4**	**19.3**	**14.7**	**22.3**	**0.1**	**1.52**	**1**	**48.8**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**1.17+05[c]**	**3.13E+03**	**4.00E+02**	**2.35E+01**	**3.91E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**1.70E+06[c]**	**4.54E+04**	**8.00E+02**	**3.41E+02**	**5.68E+03**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**4.65E+05[c]**	**1.24E+04**	**8.00E+02**	**9.29E+01**	**1.55E+03**	**1.55E+03**	**9.29E+04**
RE03-09-13932	03-608316	0–1	Qbt3	—[d]	—	—	—	—	—	1.13 (U)	—	—
RE03-09-13933	03-608316	1–2	Qbt3	—	—	9.71	—	—	—	1.12 (U)	—	—
RE03-09-13934	03-608317	0–1	Soil	1.22 (U)	—	88.2	—	365	—	—	—	161
RE03-09-13935	03-608317	1–2	Soil	1.23 (U)	0.615 (U)	—	—	44	—	—	—	63.7
RE03-09-13936	03-608318	0–1	Qbt3	1.22 (U)	—	26	—	—	—	1.23 (U)	—	—
RE03-09-13937	03-608318	1–2	Qbt3	1.29 (U)	—	27.6	5.22	—	—	1.32 (U)	—	—
RE03-09-13938	03-608319	0–1	Soil	—	—	—	34	39.1	0.374	—	1.76	96.8
RE03-09-13939	03-608319	1–2	Qbt3	1.18 (U)	—	7.3	9.21	14.1	—	1.17 (U)	—	65.1

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] SSL for trivalent chromium.

[d] — = Not detected or not detected above BV.

Table 6.13-3
Organic Chemicals Detected at SWMU 03-045(a)

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	Chrysene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**6.21E+02**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**
RE03-09-13932	03-608316	0–1	Qbt3	—[c]	—	—	—	—	—	—	—	—	—
RE03-09-13933	03-608316	1–2	Qbt3	—	—	—	—	0.0018 (J)	—	—	—	—	—
RE03-09-13934	03-608317	0–1	Soil	0.954	—	1.99	0.0444	0.0314 (J)	3.8	3.35	5.85	1.63	3.56
RE03-09-13935	03-608317	1–2	Soil	—	—	—	0.0573	0.0449	0.0869 (J)	0.0779 (J)	0.148 (J)	—	—
RE03-09-13937	03-608318	1–2	Qbt3	—	—	—	—	0.0027 (J)	—	—	—	—	—
RE03-09-13938	03-608319	0–1	Soil	—	0.00224 (J)	0.0851 (J)	0.137	0.366	0.352 (J)	0.33 (J)	0.6	0.167 (J)	0.348 (J)
RE03-09-13939	03-608319	1–2	Qbt3	—	—	0.0324 (J)	0.0149 (J)	0.0356	0.115	0.101	0.187	0.0501	0.104

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO	TPH-GRO
Residential SSL[a]				**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[d]**	**2.30E+02[e]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03[f]**	**na[g]**
Industrial SSL[a]				**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[d]**	**2.20E+03[e]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03[f]**	**na**
Construction Worker SSL[a]				**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[d]**	**1.24E+03[h]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na**	**na**
RE03-09-13932	03-608316	0–1	Qbt3	—	—	—	—	—	—	—	—	—	0.0129 (J)
RE03-09-13933	03-608316	1–2	Qbt3	—	—	—	—	—	—	—	—	6.58 (J)	0.0191 (J)
RE03-09-13934	03-608317	0–1	Soil	9.3	1.05	1.65	—	0.173 (J)	0.72	8.26	8.32	273	—
RE03-09-13935	03-608317	1–2	Soil	0.157 (J)	—	—	—	—	—	0.102 (J)	0.163 (J)	48 (J)	—
RE03-09-13937	03-608318	1–2	Qbt3	—	—	—	—	—	—	—	—	—	—
RE03-09-13938	03-608319	0–1	Soil	0.671	—	0.157 (J)	0.023	—	—	0.394 (J)	0.721	42	—
RE03-09-13939	03-608319	1–2	Qbt3	0.246	0.0178 (J)	0.0514	—	—	—	0.172	0.215	7.47 (J)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] Isopropylbenzene used as a surrogate based on structural similarity.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[g] na = Not available.

[h] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012219971).

Table 6.14-1
Samples Collected and Analyses Requested at SWMU 03-045(e)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13940	03-608320	0.0–1.0	Soil	10-312	10-312	10-312	10-312	10-312	10-312
RE03-09-13941	03-608320	1.0–2.0	Soil	10-313	10-313	10-313	10-313	10-313	10-313

Table 6.14-2
Inorganic Chemicals above BVs at SWMU 03-045(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Lead	Thallium	Zinc
Soil BV[a]				**0.83**	**0.4**	**22.3**	**0.73**	**48.8**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**4.00E+02**	**7.82E-01**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**8.00E+02**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**8.00E+02**	**3.10E+00**	**9.29E+04**
RE03-09-13940	03-608320	0.0–1.0	Soil	1.09 (U)	0.543 (U)	70.7	—[c]	54.2
RE03-09-13941	03-608320	1.0–2.0	Soil	1.04 (U)	0.522 (U)	99.6	1.04	54.6

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] — = Not detected or not detected above BV.

Table 6.14-3
Organic Chemicals Detected at SWMU 03-045(e)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(b)fluoranthene	Fluoranthene	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene	TPH-DRO
Residential SSL[a]				**1.12E+00**	**2.22E+00**	**1.48E+00**	**2.29E+03**	**2.43E+03**[b]	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03**[c]
Industrial SSL[a]				**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.44E+04**	**1.45E+04**[b]	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03**[c]
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**	**2.13E+02**	**8.91E+03**	**2.81E+03**[b]	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na**[d]
RE03-09-13940	03-608320	0.0–1.0	Soil	0.0024 (J)	0.0058	0.0599 (J)	0.0814 (J)	—[e]	0.0589 (J)	0.0796 (J)	0.000479 (J)	300
RE03-09-13941	03-608320	1.0–2.0	Soil	—	—	—	0.239 (J)	0.00173	0.251 (J)	0.288 (J)	—	3250

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Isopropylbenzene used as a surrogate based on structural similarity.
[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).
[d] na = Not available.
[e] — = Not detected.

Table 6.15-1
Samples Collected and Analyses Requested at SWMU 03-045(f)

Sample ID	Location ID	Depth (ft)	Media	Metals	Nitrate	PCBs	SVOCs	VOCs	Cyanide (Total)
RE03-09-13942	03-608321	0.0–1.0	Soil	10-388	10-388	10-388	10-388	10-388	10-388
RE03-09-13943	03-608321	1.0–2.0	Soil	10-388	10-388	10-388	10-388	10-388	10-388
RE03-09-13944	03-608322	0.0–1.0	Soil	10-388	10-388	10-388	10-388	10-388	10-388
RE03-09-13945	03-608322	1.0–2.0	Soil	10-388	10-388	10-388	10-388	10-388	10-388

Table 6.15-2
Inorganic Chemicals above BVs at SWMU 03-045(f)

Sample ID	Location ID	Depth (ft)	Media	Antimony
Soil BV[a]				**0.83**
Residential SSL[b]				**3.13E+01**
Industrial SSL[b]				**4.54E+02**
Construction Worker SSL[b]				**1.24E+02**
RE03-09-13942	03-608321	0.0–1.0	Soil	0.984 (J)
RE03-09-13943	03-608321	1.0–2.0	Soil	1.03 (U)
RE03-09-13944	03-608322	0.0–1.0	Soil	—[c]
RE03-09-13945	03-608322	1.0–2.0	Soil	1.08

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] — = Not detected or not detected above BV.

Table 6.15-3
Organic Chemicals Detected at SWMU 03-045(f)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1260	Fluoranthene	Isopropylbenzene	Isopropyltoluene[4-]	Phenanthrene	Pyrene
Residential SSL[a]				**6.66E+04**	**2.22E+00**	**2.29E+03**	**2.43E+03**	**2.43E+03[b]**	**1.83E+03**	**1.72E+03**
Industrial SSL[a]				**8.68E+05**	**8.26E+00**	**2.44E+04**	**1.45E+04**	**1.45E+04[b]**	**2.05E+04**	**1.83E+04**
Construction Worker SSL[a]				**2.21E+05**	**7.58E+01**	**8.91+03**	**2.81E+03**	**2.81E+03[b]**	**7.15E+03**	**6.68E+03**
RE03-09-13942	03-608321	0.0–1.0	Soil	—[c]	0.0022 (J)	—	—	—	—	—
RE03-09-13943	03-608321	1.0–2.0	Soil	—	0.0034 (J)	—	—	—	—	—
RE03-09-13944	03-608322	0.0–1.0	Soil	0.00474 (J)	0.0314	0.0257 (J)	—	0.000364 (J)	0.0125 (J)	0.0175 (J)
RE03-09-13945	03-608322	1.0–2.0	Soil	—	0.0047	—	0.000427 (J)	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Isopropylbenzene used as a surrogate based on structural similarity.
[c] — = Not detected.

Table 6.16-1
Samples Collected and Analyses Requested at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Dioxin/Furan	Gamma Spectroscopy	Tritium	Hexavalent Chromium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	VOCs	Cyanide (Total)
CAMO-09-6010	MO-604952	0.0–0.5	Fill	09-2306	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	—*	09-2307
CAMO-09-6011	MO-604952	6.0–7.0	Qbt4	09-2306	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307

*— = Analyses not requested.

Table 6.16-2
Inorganic Chemicals above BVs at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium Hexavalent Ion	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Selenium	Vanadium
Soil BV[a]				**29,200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na[b]**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na**	**1.52**	**39.6**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**0.3**	**17**
Residential SSL[c]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na**	**1.17E+05[d]**	**2.97E+00**	**2.30E+01[e]**	**3.13E+03**	**4.00E+02**	**na**	**1.56E+03**	**1.25E+05**	**3.91E+02**	**3.91E+02**
Industrial SSL[c]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**6.31E+01**	**3.00E+02[e]**	**4.54E+04**	**8.00E+02**	**na**	**2.25E+04**	**1.82E+06**	**5.68E+03**	**5.68E+03**
Construction Worker SSL[c]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**6.56E+01**	**3.46E+01[f]**	**1.24E+04**	**8.00E+02**	**na**	**6.19E+03**	**4.96E+05**	**1.55E+03**	**1.55E+03**
CAMO-09-6010	MO-604952	0.0–0.5	Fill	—[g]	1.13 (UJ)	—	—	0.567 (U)	—	—	0.142 (J)	—	—	—	—	—	1.69	—	—
CAMO-09-6011	MO-604952	6.0–7.0	Qbt4	10,500	1.12 (UJ)	112	1.4	—	4560	15.7	—	4.46	10.5	14	2570	11.4	0.9 (J)	1.14 (U)	21.4

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971) unless otherwise noted.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.16-3
Organic Chemicals Detected at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(b)fluoranthene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]
Residential SSL[a]				**1.12E+00**	**2.22E+00**	**1.48E+00**	**2.29E+03**	**na[b]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.44E+04**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Construction Worker SSL[a]				**4.36E+00**	**7.58E+01**	**2.13E+02**	**8.91E+03**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
CAMO-09-6010	MO-604952	0.0–0.5	Fill	0.0193	0.0196	0.0155 (J)	0.0236 (J)	8.45E-05	0.000194	8.61E-06	0.00000103 (J)	3.32E-05	0.000000673 (J)	0.0000026 (J)	0.00000139 (J)	1.91E-05	0.00000131 (J)	0.000000583 (J)
CAMO-09-6011	MO-604952	6.0–7.0	Qbt4	—[c]	—	—	—	4.59E-06	1.08E-05	0.000000152 (J)	—	4.94E-07	—	0.000000298 (J)	—	1.73E-06	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.83E+03**	**1.72E+03**	**4.50E-04**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**2.05E+04**	**1.83E+04**	**2.04E-03**	**na**
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**7.15E+03**	**6.68E+03**	**1.52E-02**	**na**
CAMO-09-6010	MO-604952	0.0–0.5	Fill	0.000000361 (J)	0.000000784 (J)	1.68E-05	0.00136 (J)	1.57E-05	0.000000407 (J)	1.92E-06	0.000000194 (J)	0.000000495 (J)	5.05E-06	0.0148 (J)	0.0187 (J)	0.000000588 (J)	4.42E-06
CAMO-09-6011	MO-604952	6.0–7.0	Qbt4	—	—	4.61E-07	0.000047 (J)	0.000000334 (J)	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] na = Not available.

[c] — = Not detected.

Table 6.17-1
Samples Collected and Analyses Requested at AOC 03-047(g)

Sample ID	Location ID	Depth (ft)	Media	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-13946	03-608324	0.0–1.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13947	03-608324	1.0–2.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13948	03-608325	0.0–1.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13949	03-608325	1.0–2.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13950	03-608326	0.0–1.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13951	03-608326	1.0–2.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13952	03-608327	0.0–1.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758
RE03-09-13953	03-608327	1.0–2.0	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-757	10-758

Table 6.17-2
Inorganic Chemicals above BVs at AOC 03-047(g)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Lead	Nitrate	Zinc
Soil BV[a]				**0.83**	**0.4**	**22.3**	**na[b]**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**4.00E+02**	**1.25E+05**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**8.00E+02**	**1.82E+06**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**8.00E+02**	**4.96E+05**	**9.29E+04**
RE03-09-13946	03-608324	0.0–1.0	Soil	1.07 (U)	0.537 (U)	—[d]	—	—
RE03-09-13947	03-608324	1.0–2.0	Soil	1.25 (U)	0.624 (U)	24.9	1.56	52.2
RE03-09-13948	03-608325	0.0–1.0	Soil	1.08 (U)	0.538 (U)	—	—	—
RE03-09-13949	03-608325	1.0–2.0	Soil	1.3 (U)	0.648 (U)	37.4	1.43	62.3
RE03-09-13950	03-608326	0.0–1.0	Soil	1.1 (U)	0.551 (U)	—	1.34	—
RE03-09-13951	03-608326	1.0–2.0	Soil	1.25 (U)	0.625 (U)	26.2	1.88	69
RE03-09-13952	03-608327	0.0–1.0	Soil	1.12 (U)	0.56 (U)	—	1.44	59.1
RE03-09-13953	03-608327	1.0–2.0	Soil	1.27 (U)	0.635 (U)	30.8	2.04	63.8

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SSLs from NMED (2012, 219971).
[d] — = Not detected or not detected above BV.

Table 6.17-3
Organic Chemicals Detected at AOC 03-047(g)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Phenanthrene	Pyrene	Tetrachloroethene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+02**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**1.83E+03**	**1.72E+03**	**7.02E+00**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**2.05E+04**	**1.83E+04**	**3.66E+01**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**7.15E+03**	**6.68E+03**	**2.12E+02**
RE03-09-13946	03-608324	0.0–1.0	Soil	0.0241 (J)	—[c]	0.0448	—	—	—	0.198	0.191	0.405	0.112	0.207	0.437	0.0185 (J)	0.0821	0.231	0.522	0.000572 (J)
RE03-09-13948	03-608325	0.0–1.0	Soil	—	—	—	—	—	—	—	—	0.103	—	—	—	—	—	—	—	—
RE03-09-13949	03-608325	1.0–2.0	Soil	—	0.0042 (J)	—	0.364	0.313	0.132	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13950	03-608326	0.0–1.0	Soil	—	0.00208 (J)	—	—	—	—	—	—	—	—	—	0.0148 (J)	—	—	—	0.0141 (J)	—
RE03-09-13951	03-608326	1.0–2.0	Soil	—	0.00486 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13952	03-608327	0.0–1.0	Soil	—	—	—	0.0674	0.126	0.241	0.0142 (J)	—	—	—	0.0118 (J)	0.0248 (J)	—	—	0.0173 (J)	0.027 (J)	—
RE03-09-13953	03-608327	1.0–2.0	Soil	—	—	—	—	—	0.0036 (J)	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Pyrene used as surrogate based on structural similarity.
[c] — = Not detected.

Table 6.18-1
Samples Collected and Analyses Requested at AOC 03-051(c)

Sample ID	Location ID	Depth (ft)	Media	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	Cyanide (Total)
RE03-09-13954	03-608328	2.5–3.5	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-758
RE03-09-13955	03-608328	4.5–5.5	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-758
RE03-09-13956	03-608329	2.5–3.5	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-758
RE03-09-13957	03-608329	4.5–5.5	Soil	10-758	10-758	10-757	10-758	10-757	10-757	10-758

Table 6.18-2
Inorganic Chemicals above BVs at AOC 03-051(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Cobalt	Lead	Manganese	Zinc
Soil BV[a]				**0.83**	**8.17**	**0.4**	**8.64**	**22.3**	**671**	**48.8**
Residential SSL[b]				**3.13E+01**	**3.90E+00**	**7.03E+01**	**2.30E+01**[c]	**4.00E+02**	**1.86E+03**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**1.77E+01**	**8.97E+02**	**3.00E+02**[c]	**8.00E+02**	**2.67E+04**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**5.30E+01**	**2.77E+02**	**3.46E+01**[d]	**8.00E+02**	**4.40E+02**	**9.29E+04**
RE03-09-13954	03-608328	2.5–3.5	Soil	1.26 (U)	—[e]	0.628 (U)	—	25.6	—	114
RE03-09-13955	03-608328	4.5–5.5	Soil	1.17 (U)	8.49	0.586 (U)	10.6	—	988	—
RE03-09-13956	03-608329	2.5–3.5	Soil	1.15 (U)	—	0.574 (U)	—	—	—	—
RE03-09-13957	03-608329	4.5–5.5	Soil	1.18 (U)	—	—	11.2	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] — = Not detected or not detected above BV.

Table 6.18-3
Organic Chemicals Detected at AOC 03-051(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene
Residential SSL[a]				**3.44E+03**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+02**
Industrial SSL[a]				**3.67E+04**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**
RE03-09-13955	03-608328	4.5–5.5	Soil	—[c]	—	0.0091	0.0115	0.0061	—	—	—	—	—
RE03-09-13956	03-608329	2.5–3.5	Soil	0.178	0.383	—	0.038	0.109	1.18	1.16	1.92	0.62	1.19
RE03-09-13957	03-608329	4.5–5.5	Soil	0.227	0.534	—	—	0.0028 (J)	1.36	1.21	1.92	0.63	1.3
RE03-09-13955	03-608328	4.5–5.5	Soil	—	—	—	—	—	—	—	—	—	2.84 (J)
RE03-09-13956	03-608329	2.5–3.5	Soil	—	0.0837 (J)	2.77	0.167	0.511	0.0378 (J)	0.101	1.68	2.51	62.9 (J)
RE03-09-13957	03-608329	4.5–5.5	Soil	0.168	0.115 (J)	3.03	0.229	0.545	0.0625	0.133	2.12	2.56	33.7 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] na = Not available.

Table 6.19-1
Samples Collected and Analyses Requested at AOC 03-052(b)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	Metals	PCBs	SVOCs	VOCs	Cyanide (Total)
0103-97-0163	03-03285	0.0–1.0	Soil	3411R	3410R	—*	—	—	—
0103-97-0164	03-03285	2.0–3.0	Fill	3411R	3410R	—	—	3408R	—
0103-97-0165	03-03286	0.0–1.0	Fill	3411R	3410R	—	—	—	—
0103-97-0166	03-03286	1.0–2.0	Fill	3411R	3410R	—	—	—	—
RE03-09-13982	03-03286	7.0–8.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13983	03-03286	10.0–11.0	Soil	—	10-758	10-757	10-757	10-757	10-758
0103-97-0167	03-03287	0.0–1.0	Fill	3411R	3410R	—	—	—	—
0103-97-0168	03-03287	1.0–2.0	Fill	3411R	3410R	—	—	—	—
0103-97-0169	03-03288	0.0–1.0	Fill	3411R	3410R	—	—	—	—
0103-97-0170	03-03288	1.0–2.0	Fill	3411R	3410R	—	—	—	—
0103-97-0175	03-03291	0.0–1.0	Soil	3411R	3410R	—	—	—	—
RE03-09-13976	03-03291	1.0–2.0	Soil	—	10-602	10-601	10-601	10-601	10-602
0103-97-0176	03-03291	4.0–5.0	Soil	3411R	3410R	—	—	—	—
RE03-09-13977	03-03291	4.0–5.0	Soil	—	10-602	10-601	10-601	10-601	10-602
RE03-10-12247	03-03291	7.0–8.0	Soil	—	10-1604	10-1604	10-1604	10-1604	10-1604
RE03-10-12248	03-03291	10.0–11.0	Qbt3	—	10-1604	10-1604	10-1604	10-1604	10-1604
0103-97-0177	03-03292	0.0–0.67	Fill	3411R	3410R	—	—	—	—
RE03-09-13958	03-608330	3.0–4.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13959	03-608330	5.0–6.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13960	03-608331	3.0–4.0	Qbt3	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13961	03-608331	5.0–6.0	Qbt3	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13962	03-608332	1.0–2.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13963	03-608332	4.0–5.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13964	03-608333	1.0–2.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13965	03-608333	4.0–5.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13966	03-608334	1.0–2.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13967	03-608334	4.0–5.0	Qbt3	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13968	03-608335	1.0–2.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13969	03-608335	4.0–5.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13970	03-608336	1.0–2.0	Soil	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13971	03-608336	4.0–5.0	Qbt3	—	10-577	10-576	10-576	10-576	10-577
RE03-09-13972	03-608337	1.0–2.0	Soil	—	10-602	10-601	10-601	10-601	10-602

Table 6.19-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	Metals	PCBs	SVOCs	VOCs	Cyanide (Total)
RE03-09-13973	03-608337	4.0–5.0	Soil	—	10-602	10-601	10-601	10-601	10-602
RE03-09-13974	03-608338	1.0–2.0	Soil	—	10-602	10-601	10-601	10-601	10-602
RE03-09-13975	03-608338	4.0–5.0	Soil	—	10-602	10-601	10-601	10-601	10-602
RE03-09-13978	03-608340	1.0–2.0	Soil	—	10-728	10-727	10-727	10-727	10-728
RE03-09-13979	03-608340	4.0–5.0	Soil	—	10-728	10-727	10-727	10-727	10-728
RE03-09-13981	03-608341	1.0–2.0	Soil	—	10-728	10-727	10-727	10-727	10-728
RE03-09-13980	03-608341	4.0–5.0	Soil	—	10-728	10-727	10-727	10-727	10-728
RE03-09-13984	03-608343	1.0–2.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13985	03-608343	4.0–5.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13986	03-608344	1.0–2.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13987	03-608344	4.0–5.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13988	03-608345	1.0–2.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13989	03-608345	4.0–5.0	Soil	—	10-758	10-757	10-757	10-757	10-758
RE03-09-13990	03-608346	1.0–2.0	Soil	—	10-759	10-759	10-759	10-759	10-759
RE03-09-13991	03-608346	4.0–5.0	Soil	—	10-759	10-759	10-759	10-759	10-759

*— = Analyses not requested.

Table 6.19-2
Inorganic Chemicals above BVs at AOC 03-052(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Manganese	Nickel	Selenium	Silver	Sodium	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**482**	**6.58**	**0.3**	**1**	**2770**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**671**	**15.4**	**1.52**	**1**	**915**	**39.6**	**48.8**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**4.00E+02**	**na**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**3.91E+02**	**na**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**8.00E+02**	**na**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**5.68E+03**	**na**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**8.00E+02**	**na**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**1.55E+03**	**na**	**1.55E+03**	**9.29E+04**
0103-97-0163	03-03285	0.0–1.0	Soil	—[g]	7.7 (UJ)	—	—	0.64 (U)	—	—	—	—	—	—	—	—	—	2.2 (U)	—	—	—
0103-97-0164	03-03285	2.0–3.0	Fill	—	7.6 (UJ)	—	—	0.63 (U)	—	—	—	—	—	—	—	—	—	2.2 (U)	—	—	—
0103-97-0165	03-03286	0.0–1.0	Fill	—	6.7 (UJ)	—	—	0.55 (U)	—	—	—	—	—	—	—	—	—	1.9 (U)	—	—	—
0103-97-0166	03-03286	1.0–2.0	Fill	—	7.2 (UJ)	—	—	0.6 (U)	—	—	—	—	64 (J-)	—	—	—	—	2.1 (U)	—	—	—
RE03-09-13982	03-03286	7.0–8.0	Soil	—	1.2 (U)	—	—	0.602 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13983	03-03286	10.0–11.0	Soil	—	1.22 (U)	—	—	0.611 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
0103-97-0167	03-03287	0.0–1.0	Fill	—	7.4 (UJ)	—	—	0.62 (U)	—	—	—	—	—	—	—	—	—	2.2 (U)	—	—	49.8
0103-97-0168	03-03287	1.0–2.0	Fill	—	7.1 (UJ)	—	—	0.59 (U)	—	—	—	—	45 (J-)	—	—	—	—	2.1 (U)	—	—	—
0103-97-0169	03-03288	0.0–1.0	Fill	—	7.3 (UJ)	—	—	0.6 (U)	—	—	—	—	—	—	—	—	—	2.1 (U)	—	—	—
0103-97-0170	03-03288	1.0–2.0	Fill	—	7.5 (UJ)	—	—	0.62 (U)	—	—	—	—	—	—	—	—	—	2.2 (U)	—	—	—
0103-97-0175	03-03291	0.0–1.0	Soil	—	6.7 (UJ)	—	—	0.55 (U)	—	—	21.5	—	—	—	—	—	—	1.9 (U)	—	—	—
0103-97-0176	03-03291	4.0–5.0	Soil	—	7.1 (UJ)	—	—	0.59 (U)	—	—	13.7	—	—	—	1000 (J+)	20	—	2.1 (U)	—	—	—
RE03-09-13977	03-03291	4.0–5.0	Soil	—	1.16 (U)	—	—	0.58 (U)	—	—	16.7	—	27.9	—	1420	—	—	—	—	—	—
RE03-10-12247	03-03291	7.0–8.0	Soil	—	1.14 (U)	—	—	0.569 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-10-12248	03-03291	10.0–11.0	Qbt3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.08 (UJ)	—	—	—	—
0103-97-0177	03-03292	0.0–0.67	Fill	—	5.9 (UJ)	—	—	0.61 (J)	—	—	—	—	—	—	—	—	—	1.7 (U)	—	—	152
RE03-09-13958	03-608330	3.0–4.0	Soil	—	1.32 (U)	—	—	0.662 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13959	03-608330	5.0–6.0	Soil	—	1.2 (U)	—	—	0.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13960	03-608331	3.0–4.0	Qbt3	—	1.15 (U)	—	—	—	—	—	—	—	—	—	—	—	1.15 (U)	—	—	—	—
RE03-09-13961	03-608331	5.0–6.0	Qbt3	—	1.2 (U)	—	—	—	—	—	—	—	—	—	—	—	1.19 (U)	—	—	—	—
RE03-09-13962	03-608332	1.0–2.0	Soil	—	1.14 (U)	—	—	0.568 (U)	—	20.7	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13963	03-608332	4.0–5.0	Soil	—	1.2 (U)	—	—	0.599 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13964	03-608333	1.0–2.0	Soil	—	1.1 (U)	—	—	0.548 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13965	03-608333	4.0–5.0	Soil	—	1.08 (U)	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13966	03-608334	1.0–2.0	Soil	—	1.05 (U)	—	—	0.523 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13967	03-608334	4.0–5.0	Qbt3	17,000	1.21 (U)	430 (J)	3.17	—	4980	8.35	5.8	6.21	11.7	2690 (J+)	—	16.5 (U)	1.16 (U)	—	—	—	—
RE03-09-13968	03-608335	1.0–2.0	Soil	—	1.05 (U)	—	—	0.525 (U)	—	—	—	—	25.5	—	873	—	—	—	—	—	—
RE03-09-13969	03-608335	4.0–5.0	Soil	—	1.13 (U)	327 (J)	2.04	0.567 (U)	—	—	9.23	—	—	—	1350	16.9 (U)	—	—	—	—	—

Table 6.19-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Manganese	Nickel	Selenium	Silver	Sodium	Vanadium	Zinc
Qbt3 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**482**	**6.58**	**0.3**	**1**	**2770**	**17**	**63.5**
Fill/Soil BV[a]				**29,200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**671**	**15.4**	**1.52**	**1**	**915**	**39.6**	**48.8**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**4.00E+02**	**na**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**3.91E+02**	**na**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**8.00E+02**	**na**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**5.68E+03**	**na**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**8.00E+02**	**na**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**1.55E+03**	**na**	**1.55E+03**	**9.29E+04**
RE03-09-13970	03-608336	1.0–2.0	Soil	—	1.12 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13971	03-608336	4.0–5.0	Qbt3	13,700	1.19 (U)	161 (J)	2	—	3460	8.15	—	7.6	—	2530 (J+)	—	15.3 (U)	1.19 (U)	—	—	18.3	—
RE03-09-13972	03-608337	1.0–2.0	Soil	—	0.983 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13973	03-608337	4.0–5.0	Soil	—	1 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13974	03-608338	1.0–2.0	Soil	—	1.04 (U)	—	—	0.518 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13975	03-608338	4.0–5.0	Soil	—	1.17 (U)	811 (J)	—	0.583 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13978	03-608340	1.0–2.0	Soil	—	1.19 (UJ)	—	—	0.594 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13979	03-608340	4.0–5.0	Soil	—	1.28 (UJ)	—	—	0.642 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13981	03-608341	1.0–2.0	Soil	—	1.24 (UJ)	312 (J+)	—	0.621 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13980	03-608341	4.0–5.0	Soil	—	1.22 (UJ)	—	—	0.61 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13984	03-608343	1.0–2.0	Soil	—	1.17 (U)	—	—	0.583 (U)	—	—	—	—	—	—	—	—	—	—	1010	—	—
RE03-09-13985	03-608343	4.0–5.0	Soil	—	1.22 (U)	—	—	0.611 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13986	03-608344	1.0–2.0	Soil	—	1.12 (U)	—	—	0.56 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13987	03-608344	4.0–5.0	Soil	—	1.18 (U)	—	—	0.59 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13988	03-608345	1.0–2.0	Soil	—	1.22 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13989	03-608345	4.0–5.0	Soil	—	1.15 (U)	—	—	0.575 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13990	03-608346	1.0–2.0	Soil	—	1.2 (U)	—	—	0.601 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-13991	03-608346	4.0–5.0	Soil	—	1.15 (U)	—	—	0.575 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.19-3
Organic Chemicals Detected at AOC 03-052(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03**[b]
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04**[b]
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03**[b]
RE03-09-13982	03-03286	7.0–8.0	Soil	—[c]	0.00695 (J)	—	—	0.0139	0.0075	—	—	—	—
RE03-09-13983	03-03286	10.0–11.0	Soil	—	0.00306 (J)	—	—	0.0163	0.0089	—	—	—	—
RE03-09-13976	03-03291	1.0–2.0	Soil	0.0345 (J)	—	0.0538	—	0.0167	0.0161	0.0977	0.0719	0.231	—
RE03-09-13958	03-608330	3.0–4.0	Soil	—	0.0175 (J)	—	—	0.0018 (J)	—	—	—	—	—
RE03-09-13959	03-608330	5.0–6.0	Soil	—	0.0116 (J)	0.0106 (J)	—	—	—	—	0.0651	0.0903	0.0341 (J)
RE03-09-13960	03-608331	3.0–4.0	Qbt3	—	0.00677 (J)	—	—	—	—	—	—	—	—
RE03-09-13961	03-608331	5.0–6.0	Qbt3	—	—	—	—	—	—	0.0178 (J)	0.0277 (J)	0.0462	0.0211 (J)
RE03-09-13962	03-608332	1.0–2.0	Soil	—	—	—	—	0.0052	0.0061	—	—	—	—
RE03-09-13963	03-608332	4.0–5.0	Soil	—	0.0023 (J)	—	—	—	—	—	—	—	—
RE03-09-13964	03-608333	1.0–2.0	Soil	—	—	—	—	—	0.0022 (J)	—	—	—	—
RE03-09-13965	03-608333	4.0–5.0	Soil	—	0.00254 (J)	—	—	—	0.0028 (J)	—	—	—	—
RE03-09-13966	03-608334	1.0–2.0	Soil	—	—	—	—	0.0029 (J)	0.0039	—	—	—	—
RE03-09-13967	03-608334	4.0–5.0	Qbt3	—	0.00206 (J)	—	—	—	—	—	—	—	—
RE03-09-13969	03-608335	4.0–5.0	Soil	—	0.00943 (J)	—	—	—	—	—	—	—	—
RE03-09-13970	03-608336	1.0–2.0	Soil	—	0.004 (J)	—	—	0.0028 (J)	0.0018 (J)	—	—	—	—
RE03-09-13971	03-608336	4.0–5.0	Qbt3	—	0.00361 (J)	—	—	—	—	—	—	—	—
RE03-09-13973	03-608337	4.0–5.0	Soil	—	0.00391 (J)	—	—	—	—	—	—	—	—
RE03-09-13974	03-608338	1.0–2.0	Soil	—	—	—	—	—	0.0026 (J)	—	—	—	—
RE03-09-13975	03-608338	4.0–5.0	Soil	—	0.00226 (J)	—	—	—	—	—	—	—	—
RE03-09-13978	03-608340	1.0–2.0	Soil	—	—	0.00867 (J)	—	0.0274	0.0221	—	0.021 (J)	0.037 (J)	0.0166 (J)
RE03-09-13979	03-608340	4.0–5.0	Soil	—	0.00809	—	—	0.0026 (J)	—	—	—	—	—
RE03-09-13980	03-608341	4.0–5.0	Soil	—	0.0417	—	—	—	—	—	—	—	—
RE03-09-13984	03-608343	1.0–2.0	Soil	—	—	—	—	—	0.0188	—	—	—	—
RE03-09-13985	03-608343	4.0–5.0	Soil	—	0.0186 (J)	—	—	—	0.0059	—	—	—	—
RE03-09-13986	03-608344	1.0–2.0	Soil	—	—	0.0129 (J)	—	0.581	1.13	0.0665	0.0355 (J)	0.186	0.0143 (J)
RE03-09-13987	03-608344	4.0–5.0	Soil	—	0.0106 (J)	—	0.36	0.306	0.17	—	—	0.114	—
RE03-09-13988	03-608345	1.0–2.0	Soil	—	—	0.00853 (J)	—	0.114	0.0718	0.0455	0.0358 (J)	0.189	0.0248 (J)
RE03-09-13989	03-608345	4.0–5.0	Soil	—	—	—	—	0.006	0.0036 (J)	—	—	—	—
RE03-09-13990	03-608346	1.0–2.0	Soil	—	—	—	—	—	0.04 (J)	—	—	—	—
RE03-09-13991	03-608346	4.0–5.0	Soil	—	0.00606 (J)	—	—	—	0.0019 (J)	—	—	—	—

Table 6.19-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzo(k)fluoranthene	Butanone[2-]	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Isopropyltoluene[4-]	Naphthalene	Phenanthrene	Pyrene
Residential SSL[a]				**1.48E+01**	**3.71E+04**	**1.48E+02**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[d]**	**4.30E+01**	**1.83E+03**	**1.72E+03**
Industrial SSL[a]				**2.34E+02**	**3.75E+05**	**2.34E+03**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[d]**	**2.41E+02**	**2.05E+04**	**1.83E+04**
Construction Worker SSL[a]				**2.06E+03**	**8.43E+04**	**2.06E+04**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[d]**	**1.58E+02**	**7.15E+03**	**6.68E+03**
RE03-09-13982	03-03286	7.0–8.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13983	03-03286	10.0–11.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13976	03-03291	1.0–2.0	Soil	—	—	0.101	0.249	0.03 (J)	—	—	0.0171 (J)	0.207	0.242
RE03-09-13958	03-608330	3.0–4.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13959	03-608330	5.0–6.0	Soil	0.041	—	0.069	0.184	—	0.15	—	—	0.0715	0.135
RE03-09-13960	03-608331	3.0–4.0	Qbt3	—	—	—	—	—	—	—	—	—	—
RE03-09-13961	03-608331	5.0–6.0	Qbt3	0.0133 (J)	—	0.0328 (J)	0.0554	—	0.14	—	—	0.0171 (J)	0.0393 (J)
RE03-09-13962	03-608332	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13963	03-608332	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13964	03-608333	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13965	03-608333	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13966	03-608334	1.0–2.0	Soil	—	—	0.013 (J)	0.0242 (J)	—	—	—	—	—	0.0174 (J)
RE03-09-13967	03-608334	4.0–5.0	Qbt3	—	—	—	0.0183 (J)	—	—	—	—	—	0.0136 (J)
RE03-09-13969	03-608335	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13970	03-608336	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13971	03-608336	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—
RE03-09-13973	03-608337	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13974	03-608338	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13975	03-608338	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13978	03-608340	1.0–2.0	Soil	—	—	0.0239 (J)	0.0622	—	0.0155 (J)	—	—	0.0339 (J)	0.0489
RE03-09-13979	03-608340	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13980	03-608341	4.0–5.0	Soil	—	0.00798 (J)	—	—	—	—	—	—	—	—
RE03-09-13984	03-608343	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13985	03-608343	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13986	03-608344	1.0–2.0	Soil	—	—	0.0692	0.0959	—	—	—	—	0.0603	0.084
RE03-09-13987	03-608344	4.0–5.0	Soil	—	—	—	0.0144 (J)	—	—	—	—	—	—
RE03-09-13988	03-608345	1.0–2.0	Soil	—	—	0.0559	0.107	—	—	—	—	0.0525	0.0965
RE03-09-13989	03-608345	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13990	03-608346	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—
RE03-09-13991	03-608346	4.0–5.0	Soil	—	—	—	—	—	—	0.000817 (J)	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] Isopropylbenzene used as a surrogate based on structural similarity.

Table 6.20-1
Samples Collected and Analyses Requested at SWMU 03-056(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RC03-01-0041	03-14481	0.5–1	Fill	9433R	—*	—	9432R	—	—
RC03-01-0042	03-14482	0.5–1	Fill	9433R	—	—	9432R	—	—
RC03-01-0043	03-14483	0.5–1	Fill	9433R	—	—	9432R	—	—
RC03-01-0044	03-14484	0.5–1	Fill	9433R	—	—	9432R	—	—
RE03-09-13992	03-608347	0–1	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13993	03-608347	1–2	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13994	03-608348	0–1	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13995	03-608348	1–2	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13996	03-608349	0–1	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13997	03-608349	1–2	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13998	03-608350	0–1	Soil	10-245	10-244	10-244	10-244	10-244	10-245
RE03-09-13999	03-608350	1–2	Soil	10-245	10-244	10-244	10-244	10-244	10-245

*— = Analyses not requested.

Table 6.20-2
Inorganic Chemicals above BVs at SWMU 03-056(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Cobalt	Lead	Silver	Zinc
Soil BV[a]				**0.83**	**0.4**	**6120**	**8.64**	**22.3**	**1**	**48.8**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**na**[c]	**2.30E+01**[d]	**4.00E+02**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**na**	**3.00E+02**[d]	**8.00E+02**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**na**	**3.46E+01**[e]	**8.00E+02**	**1.55E+03**	**9.29E+04**
RC03-01-0041	03-14481	0.5–1	Fill	—[f]	—	7850 (J)	—	—	—	—
RC03-01-0042	03-14482	0.5–1	Fill	—	—	6750 (J)	—	—	—	—
RC03-01-0043	03-14483	0.5–1	Fill	—	—	11,500 (J)	—	—	1.6	89.8
RC03-01-0044	03-14484	0.5–1	Fill	—	—	10,400 (J)	—	—	—	—
RE03-09-13992	03-608347	0–1	Soil	1.06 (U)	0.531 (U)	8900 (J)	—	—	—	—
RE03-09-13993	03-608347	1–2	Soil	0.901 (J)	0.55 (U)	—	—	32.2	—	58.2
RE03-09-13994	03-608348	0–1	Soil	1.04 (U)	0.522 (U)	6300 (J)	—	—	—	—
RE03-09-13995	03-608348	1–2	Soil	1.04 (U)	0.521 (U)	—	—	—	—	—
RE03-09-13996	03-608349	0–1	Soil	0.992 (U)	0.496 (U)	9990 (J)	14.7	—	—	—
RE03-09-13997	03-608349	1–2	Soil	1.05 (U)	0.527 (U)	—	—	—	—	—
RE03-09-13998	03-608350	0–1	Soil	1.12 (U)	0.562 (U)	—	—	—	—	—
RE03-09-13999	03-608350	1–2	Soil	1.17 (U)	0.584 (U)	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[f] — = Not detected or not detected above BV.

Table 6.20-3
Organic Chemicals Detected at SWMU 03-056(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.48E+02**	**2.29E+03**	**1.83E+03**	**1.72E+03**	**1.00E+03[b]**
Industrial SSL[a]				**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**2.34E+03**	**2.44E+04**	**2.05E+04**	**1.83E+04**	**1.80E+03[b]**
Construction Worker SSL[a]				**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**2.06E+04**	**8.91E+03**	**7.15E+03**	**6.68E+03**	**na[c]**
RE03-09-13992	03-608347	0–1	Soil	—[d]	—	—	—	—	—	—	—	—	—	—	104 (J+)
RE03-09-13993	03-608347	1–2	Soil	—	—	0.0366	0.0279	—	—	—	—	—	—	—	288
RE03-09-13994	03-608348	0–1	Soil	—	—	—	0.0037	—	—	—	—	0.0117 (J)	—	0.0137 (J)	8.87
RE03-09-13995	03-608348	1–2	Soil	—	—	—	0.0055	—	—	—	—	—	—	0.0113 (J)	10.1
RE03-09-13996	03-608349	0–1	Soil	0.00241 (J)	0.0111 (J)	—	—	0.0218 (J)	0.0138 (J)	0.0163 (J)	0.0175 (J)	0.0378	0.0387	0.0398	3.08 (J)
RE03-09-13997	03-608349	1–2	Soil	0.00196 (J)	—	—	0.0044	—	—	—	—	—	—	—	—
RE03-09-13998	03-608350	0–1	Soil	—	—	0.003 (J)	0.0046	—	—	—	—	0.012 (J)	—	0.0118 (J)	—
RE03-09-13999	03-608350	1–2	Soil	—	—	—	0.0089	—	—	—	—	—	—	—	9.35

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[c] na =Not available.

[d] — = Not detected.

Table 6.21-1
Samples Collected and Analyses Requested at AOC 03-056(k)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Gamma Spectroscopy	Gross Alpha Beta	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	SVOCs	VOCs	Cyanide (Total)
0103-97-0151	03-03281	0.0–0.17	n/a[a]	—[b]	—	—	—	3411R	—	—	—	—	—
0103-97-0152	03-03281	0.5–1.0	Fill	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0153	03-03281	1.83–2.83	Fill	—	—	—	—	3411R	3410R	—	—	3408R	—
RE03-09-14011	03-03281	3.0–4.0	Soil	—	—	—	—	—	—	10-727	10-727	10-727	—
RE03-09-14012	03-03281	6.0–7.0	Fill	—	—	—	—	—	—	10-727	10-727	10-727	—
0103-97-0154	03-03282	0.0–0.5	n/a	—	3411R	3411R	—	3411R	—	—	—	—	—
0103-97-0155	03-03282	0.5–1.5	Fill	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0156	03-03282	1.5–2.17	Soil	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0157	03-03283	0.0–0.25	n/a	—	—	—	—	3411R	—	—	—	—	—
0103-97-0158	03-03283	0.33–1.25	Fill	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0160	03-03284	0.0–0.17	n/a	—	—	—	—	3411R	—	—	—	—	—
0103-97-0161	03-03284	0.5–1.25	Fill	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0171	03-03289	0.0–1.0	Fill	—	3411R	3411R	—	3411R	3410R	—	—	—	—
0103-97-0172	03-03289	3.5–4.5	Soil	—	—	—	—	3411R	3410R	—	—	—	—

Table 6.21-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Gamma Spectroscopy	Gross Alpha Beta	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	SVOCs	VOCs	Cyanide (Total)
0103-97-0173	03-03290	0.0–1.0	Fill	—	—	—	—	3411R	3410R	—	—	—	—
0103-97-0174	03-03290	1.0–1.5	Fill	—	—	—	—	3411R	3410R	—	—	—	—
RE03-09-14009	03-03290	3.0–4.0	Fill	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14010	03-03290	6.0–7.0	Fill	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14000	03-608351	0.0–1.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14001	03-608351	3.0–4.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14002	03-608351	6.0–7.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14003	03-608352	0.0–1.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14004	03-608352	3.0–4.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14005	03-608352	6.0–7.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14006	03-608353	0.0–1.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14007	03-608353	3.0–4.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14008	03-608353	6.0–7.0	Soil	10-728	—	—	10-728	10-728	10-728	10-727	10-727	10-727	10-728
RE03-09-14013	03-608354	1.0–2.0	Fill	—	—	—	—	—	—	10-727	10-727	10-727	—
RE03-09-14014	03-608354	3.0–4.0	Fill	—	—	—	—	—	—	10-727	10-727	10-727	—
RE03-09-14015	03-608355	1.0–2.0	Fill	—	—	—	—	—	—	10-727	10-727	10-727	—
RE03-09-14016	03-608355	3.0–4.0	Soil	—	—	—	—	—	—	10-729	10-729	10-729	—
RE03-09-14017	03-608356	1.0–2.0	Soil	—	—	—	—	—	—	10-729	10-729	10-729	—
RE03-09-14018	03-608356	3.0–4.0	Soil	—	—	—	—	—	—	10-729	10-729	10-729	—
RE03-09-14019	03-608357	1.0–2.0	Soil	—	—	—	—	—	—	10-729	10-729	10-729	—
RE03-09-14020	03-608357	3.0–4.0	Soil	—	—	—	—	—	—	10-729	10-729	10-729	—

[a] n/a = Not applicable.

[b] — = Analyses not requested.

Table 6.21-2
Inorganic Chemicals above BVs at AOC 03-056(k)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Silver
Soil BV[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**1**
Residential SSL[b]				**3.13E+01**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na**[c]	**1.17E+05**[d]	**2.30E+01**[e]	**3.13E+03**	**4.00E+02**	**1.86E+03**	**2.35E+01**	**3.91E+02**
Industrial SSL[b]				**4.54E+02**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06**[d]	**3.00E+02**[e]	**4.54E+04**	**8.00E+02**	**2.67E+04**	**3.41E+02**	**5.68E+03**
Construction Worker SSL[b]				**1.24E+02**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05**[d]	**3.46E+01**[f]	**1.24E+04**	**8.00E+02**	**4.40E+02**	**9.29E+01**	**1.55E+03**
0103-97-0152	03-03281	0.5–1.0	Fill	7.6 (UJ)	—[g]	—	0.63 (U)	—	—	—	—	—	—	—	2.2 (U)
0103-97-0153	03-03281	1.83–2.83	Fill	7.2 (UJ)	—	—	0.6 (U)	—	—	—	—	—	—	—	2.1 (U)
0103-97-0155	03-03282	0.5–1.5	Fill	6.4 (UJ)	—	—	0.53 (U)	—	—	—	—	—	—	—	1.9 (U)
0103-97-0156	03-03282	1.5–2.17	Soil	7.5 (UJ)	—	—	0.62 (U)	—	—	—	—	—	—	—	2.2 (U)
0103-97-0158	03-03283	0.33–1.25	Fill	7.4 (UJ)	—	—	0.61 (U)	—	—	—	—	—	—	—	2.2 (U)
0103-97-0161	03-03284	0.5–1.25	Fill	7 (UJ)	—	—	0.58 (U)	—	—	—	—	—	—	—	2 (U)
0103-97-0171	03-03289	0.0–1.0	Fill	6.6 (UJ)	—	—	0.55 (U)	—	—	—	20.1	24.9 (J-)	—	—	1.9 (U)
0103-97-0172	03-03289	3.5–4.5	Soil	7.4 (UJ)	—	—	0.61 (U)	—	—	—	—	—	—	—	2.1 (U)
0103-97-0173	03-03290	0.0–1.0	Fill	6.3 (UJ)	—	—	0.52 (U)	—	—	—	—	—	—	—	1.8 (U)
0103-97-0174	03-03290	1.0–1.5	Fill	6.9 (UJ)	—	—	0.57 (U)	—	—	—	28.2	—	—	—	2 (U)
RE03-09-14009	03-03290	3.0–4.0	Fill	1.18 (UJ)	—	—	0.589 (U)	—	—	—	—	—	—	—	—
RE03-09-14010	03-03290	6.0–7.0	Fill	1.17 (UJ)	296 (J+)	—	0.585 (U)	—	—	—	—	—	—	—	—
RE03-09-14000	03-608351	0.0–1.0	Soil	1.19 (UJ)	—	—	0.593 (U)	—	—	—	—	—	—	0.113 (J+)	—
RE03-09-14001	03-608351	3.0–4.0	Soil	1.1 (UJ)	—	—	0.55 (U)	—	—	—	—	—	—	—	—
RE03-09-14002	03-608351	6.0–7.0	Soil	1.17 (UJ)	—	1.92	0.585 (U)	—	—	—	—	—	—	—	—
RE03-09-14003	03-608352	0.0–1.0	Soil	1.07 (U)	—	—	—	—	—	—	—	—	1000 (J)	—	—
RE03-09-14004	03-608352	3.0–4.0	Soil	1.18 (UJ)	—	—	0.588 (U)	—	—	—	—	—	—	—	—
RE03-09-14005	03-608352	6.0–7.0	Soil	1.15 (UJ)	—	—	0.574 (U)	6180 (J)	—	—	—	—	—	—	—
RE03-09-14006	03-608353	0.0–1.0	Soil	1.18 (UJ)	—	—	0.591 (U)	—	—	—	—	—	—	—	—
RE03-09-14007	03-608353	3.0–4.0	Soil	1.15 (UJ)	—	—	0.576 (U)	—	25.1 (J)	—	—	—	—	—	—
RE03-09-14008	03-608353	6.0–7.0	Soil	1.15 (UJ)	—	—	0.574 (U)	—	—	15 (J)	—	33.1 (J)	1200 (J)	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.21-3
Organic Chemicals Detected at AOC 03-056(k)

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	Butanone[2-]	Carbon Disulfide	Chrysene	Dibenz(a,h)anthracene
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03**[b]	**3.71E+04**	**1.53E+03**	**1.48E+02**	**1.48E-01**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04**[b]	**3.75E+05**	**8.33E+03**	**2.34E+03**	**2.34E+00**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03**[b]	**8.43E+04**	**1.58E+03**	**2.06E+04**	**2.13E+01**
0103-97-0153	03-03281	1.83–2.83	Fill	NA[c]	—[d]	NA	NA	NA	NA	NA	NA	NA	0.006 (J)	0.004 (J)	NA	NA
RE03-09-14011	03-03281	3.0–4.0	Soil	—	0.0924	—	0.0021 (J)	0.0022 (J)	0.0172 (J)	0.0143 (J)	0.0218 (J)	—	0.0171 (J)	—	0.0147 (J)	—
RE03-09-14012	03-03281	6.0–7.0	Fill	—	0.00606	—	—	—	0.0243 (J)	0.0192 (J)	0.0312 (J)	—	—	—	0.0192 (J)	—
RE03-09-14009	03-03290	3.0–4.0	Fill	—	—	—	0.0041	0.003 (J)	—	—	0.0161 (J)	—	—	—	—	—
RE03-09-14010	03-03290	6.0–7.0	Fill	—	—	—	0.0128	0.0063	—	—	—	—	—	—	—	—
RE03-09-14000	03-608351	0.0–1.0	Soil	0.017 (J)	—	0.0315 (J)	0.0349	0.0212	0.0834	0.0698	0.114	0.0478	—	—	0.0731	—
RE03-09-14001	03-608351	3.0–4.0	Soil	—	0.00243 (J)	—	—	0.0015 (J)	—	—	—	—	—	—	—	—
RE03-09-14002	03-608351	6.0–7.0	Soil	—	0.00351 (J)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14003	03-608352	0.0–1.0	Soil	0.0243 (J)	—	0.0455	0.009	0.0073	0.0959	0.0735	0.127	0.0535	—	—	0.0805	—
RE03-09-14004	03-608352	3.0–4.0	Soil	—	0.104	—	—	—	—	—	—	—	0.0213 (J)	—	—	—
RE03-09-14006	03-608353	0.0–1.0	Soil	0.975	—	1.65	0.0249	0.0362	2.08	1.63	2.59	0.949	—	—	1.78	0.0912 (J)
RE03-09-14007	03-608353	3.0–4.0	Soil	0.026 (J)	—	0.0403	—	0.0074	0.0554	0.0415	0.063	0.0333 (J)	—	—	0.0475	—
RE03-09-14008	03-608353	6.0–7.0	Soil	0.0144 (J)	—	0.0241 (J)	—	0.008	0.0362 (J)	0.0231 (J)	0.0374 (J)	0.0161 (J)	—	—	0.0267 (J)	—
RE03-09-14013	03-608354	1.0–2.0	Fill	0.0397 (J)	0.0285	0.0963	—	—	0.968	1.06	1.68	0.764	0.00237 (J)	—	1.04	—
RE03-09-14014	03-608354	3.0–4.0	Fill	0.018 (J)	0.0167	0.0639	—	—	0.797	0.795	1.27	0.594	—	—	0.764	—
RE03-09-14015	03-608355	1.0–2.0	Fill	0.0202 (J)	0.0169	0.0521	—	0.0084 (J)	0.229	0.233	0.359	0.121	0.00213 (J)	—	0.207	—
RE03-09-14016	03-608355	3.0–4.0	Soil	0.0205 (J)	0.0295 (J)	0.0455	0.0403	0.0535	0.107	0.107	0.125	0.0584	0.00577 (J)	—	0.126	—
RE03-09-14017	03-608356	1.0–2.0	Soil	—	0.0284 (J)	—	0.0383	0.0481	—	—	—	—	0.00415 (J)	—	—	—
RE03-09-14018	03-608356	3.0–4.0	Soil	0.0171 (J)	0.313	0.0105 (J)	—	0.0018 (J)	—	—	—	—	0.00265 (J)	0.00203 (J)	—	—
RE03-09-14019	03-608357	1.0–2.0	Soil	0.114	0.0155 (J)	0.019 (J)	0.019	0.0311	0.0261 (J)	0.0151 (J)	0.017 (J)	—	0.00199 (J)	—	0.0169 (J)	—
RE03-09-14020	03-608357	3.0–4.0	Soil	—	0.386 (J)	—	—	—	—	—	—	—	0.0103 (J)	—	—	—

Table 6.21-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methyl-2-pentanone[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trimethylbenzene[1,2,4-]	Xylene[1,3-]+Xylene[1,4-]
Residential SSL[a]				**7.80E+01[e]**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[f]**	**5.82E+03**	**2.30E+02[e]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**6.20E+01[e]**	**8.14E+03[g]**
Industrial SSL[a]				**1.00E+03[e]**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[f]**	**7.38E+04**	**2.20E+03[e]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**2.60E+02[e]**	**3.98E+03[g]**
Construction Worker SSL[a]				**2.82E+02[h]**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[f]**	**1.85E+04**	**1.24E+03[h]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**6.88E+02[h]**	**7.43E+02[g]**
0103-97-0153	03-03281	1.83–2.83	Fill	NA	NA	NA	NA	—	—	NA	—	NA	NA	—	—	NA
RE03-09-14011	03-03281	3.0–4.0	Soil	—	0.0408	—	—	—	—	—	—	0.021 (J)	0.0243 (J)	0.00134	—	0.000561 (J)
RE03-09-14012	03-03281	6.0–7.0	Fill	—	0.0454	—	—	—	—	—	—	0.0269 (J)	0.0335 (J)	—	—	—
RE03-09-14009	03-03290	3.0–4.0	Fill	—	0.027 (J)	—	—	—	—	—	—	0.0187 (J)	0.0187 (J)	0.000871 (J)	—	—
RE03-09-14010	03-03290	6.0–7.0	Fill	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14000	03-608351	0.0–1.0	Soil	—	0.184	0.0143 (J)	0.0408	—	—	—	—	0.118	0.154	—	—	—
RE03-09-14001	03-608351	3.0–4.0	Soil	—	—	—	—	—	—	—	—	—	—	0.000569 (J)	—	—
RE03-09-14002	03-608351	6.0–7.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14003	03-608352	0.0–1.0	Soil	—	0.256	0.0171 (J)	0.0514	—	—	—	—	0.153	0.152	—	—	—
RE03-09-14004	03-608352	3.0–4.0	Soil	—	—	—	—	0.000425 (J)	—	—	—	—	—	0.00119 (J)	—	0.000425 (J)
RE03-09-14006	03-608353	0.0–1.0	Soil	0.409 (J)	5.22	0.876	0.896	—	—	0.236	0.705	5.05	4.56	—	—	—
RE03-09-14007	03-608353	3.0–4.0	Soil	—	0.135	0.0235 (J)	0.0292 (J)	—	—	0.0099 (J)	0.0307 (J)	0.125	0.101	—	—	—
RE03-09-14008	03-608353	6.0–7.0	Soil	—	0.0789	0.0121 (J)	0.0154 (J)	—	—	—	0.0138 (J)	0.0745	0.061	—	—	—
RE03-09-14013	03-608354	1.0–2.0	Fill	—	1.86	0.022 (J)	0.701	—	—	—	—	0.255	1.54	0.000609 (J)	—	—
RE03-09-14014	03-608354	3.0–4.0	Fill	—	1.4	—	0.534	—	—	—	—	0.169	1.18	—	—	—
RE03-09-14015	03-608355	1.0–2.0	Fill	—	0.474	—	0.124	0.000402 (J)	—	—	—	0.168	0.39	—	—	—
RE03-09-14016	03-608355	3.0–4.0	Soil	—	0.272	0.021 (J)	0.0918	—	—	—	—	0.112	0.245	—	—	—
RE03-09-14017	03-608356	1.0–2.0	Soil	—	0.0273 (J)	—	—	—	—	—	—	0.0265 (J)	0.0251 (J)	0.000599 (J)	—	—
RE03-09-14018	03-608356	3.0–4.0	Soil	—	0.068	0.0181 (J)	—	0.0419	0.00274 (J)	—	—	0.084	0.047	0.000952 (J)	—	—
RE03-09-14019	03-608357	1.0–2.0	Soil	—	0.0502	0.0773	0.0531	—	—	—	—	0.0977	0.0482	0.000474 (J)	—	—
RE03-09-14020	03-608357	3.0–4.0	Soil	—	0.0176 (J)	—	—	7.64	—	—	—	0.0234 (J)	0.0126 (J)	0.00294	0.000581 (J)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] NA = Not analyzed.

[d] — = Not detected.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Isopropylbenzene used as a surrogate based on structural similarity.

[g] Xylenes used as a surrogate based on structural similarity.

[h] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table 6.21-4
Radionuclides Detected or Detected above BVs/FVs at AOC 03-056(k)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236	Uranium-238
Soil BV[a]				**0.2**	**2.29**
Residential SAL[b]				**39**	**150**
Industrial SAL[b]				**150**	**750**
Construction Worker SAL[b]				**100**	**410**
0103-97-0171	03-03289	0.0–1.0	Fill	—[c]	4.44
0103-97-0173	03-03290	0.0–1.0	Fill	—	10.07
0103-97-0174	03-03290	1.0–1.5	Fill	0.203	7.13

Note: All activities are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] SALs for radionuclides from LANL (2012, 228852).
[c] — = Not detected, or not detected above BV/FV.

Table 6.22-1
Samples Collected and Analyses Requested at SWMU 03-059

Sample ID	Location ID	Depth (ft)	Media	Tritium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14048	03-608372	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2707	03-608372	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14050	03-608373	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2708	03-608373	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14053	03-608374	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2710	03-608374	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14055	03-608375	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2709	03-608375	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14056	03-608376	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-09-14057	03-608376	2.0–3.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-09-14058	03-608377	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2711	03-608377	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14060	03-608378	0.0–1.0	Soil	10-173	10-172	10-172	10-171	10-172	10-171	10-171	10-171	10-172
RE03-10-2712	03-608378	2.0–3.0	Soil	10-230	10-229	10-229	10-228	10-229	10-228	10-228	10-228	10-229
RE03-09-14063	03-608379	0.0–1.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14062	03-608379	2.0–3.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14065	03-608380	0.0–1.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14064	03-608380	2.0–3.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14066	03-608381	0.0–1.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14067	03-608381	2.0–3.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189

Table 6.22-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14068	03-608382	0.0–1.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14069	03-608382	2.0–3.0	Soil	10-189	10-189	10-189	10-188	10-189	10-188	10-188	10-188	10-189
RE03-09-14070	03-608383	0.0–1.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14071	03-608383	2.0–3.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14073	03-608384	0.0–1.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14072	03-608384	2.0–3.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14074	03-608385	0.0–1.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14075	03-608385	2.0–3.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14076	03-608386	0.0–1.0	Soil	10-247	10-247	10-247	10-246	10-247	10-246	10-246	10-246	10-247
RE03-09-14077	03-608386	2.0–3.0	Soil	10-247	10-247	10-247	10-246	10-247	10-246	10-246	10-246	10-247
RE03-09-14079	03-608387	0.0–1.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14078	03-608387	2.0–3.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14080	03-608388	0.0–1.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207
RE03-09-14081	03-608388	2.0–3.0	Soil	10-208	10-207	10-207	10-206	10-207	10-206	10-206	10-206	10-207

Table 6.22-2
Inorganic Chemicals above BVs at SWMU 03-059

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Mercury	Nitrate	Perchlorate	Thallium	Zinc
Soil BV[a]				**0.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**na**[b]	**na**	**0.73**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**na**	**1.17E+05**[d]	**2.30E+01**[e]	**3.13E+03**	**4.00E+02**	**2.35E+01**	**1.25E+05**	**5.48E+01**	**7.82E-01**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**na**	**1.70E+06**[d]	**3.00E+02**[e]	**4.54E+04**	**8.00E+02**	**3.41E+02**	**1.82E+06**	**7.95E+02**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**na**	**4.65E+05**[d]	**3.46E+01**[f]	**1.24E+04**	**8.00E+02**	**9.29E+01**	**4.96E+05**	**2.17E+02**	**3.10E+00**	**9.29E+04**
RE03-09-14048	03-608372	0–1	Soil	2.23	1.62	—[g]	—	—	16.2	48.1	0.168	—	—	—	133
RE03-10-2707	03-608372	2–3	Soil	1.11 (U)	0.557 (U)	—	—	—	—	—	—	—	0.00171 (J)	—	—
RE03-09-14050	03-608373	0–1	Soil	0.984 (J)	—	—	—	—	—	25.6	—	—	—	—	—
RE03-10-2708	03-608373	2–3	Soil	1.07 (U)	0.536 (U)	—	—	—	—	—	—	—	0.000602 (J)	—	—
RE03-09-14053	03-608374	0–1	Soil	1.17	0.847	—	—	—	15.2	—	0.653	—	—	—	58.3
RE03-10-2710	03-608374	2–3	Soil	—	—	—	—	—	—	—	0.295	—	—	—	—
RE03-09-14055	03-608375	0–1	Soil	—	0.578 (U)	—	—	—	—	—	—	—	—	—	—
RE03-10-2709	03-608375	2–3	Soil	1.22 (U)	0.61 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-14056	03-608376	0–1	Soil	1.21	0.527 (U)	13,100	—	21.8	—	—	—	—	—	—	—
RE03-09-14057	03-608376	2–3	Soil	1.2	0.569 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-14058	03-608377	0–1	Soil	1.13	—	—	—	—	—	—	—	—	0.00104 (J)	—	—
RE03-10-2711	03-608377	2–3	Soil	1.06 (U)	0.528 (U)	—	—	—	—	—	—	—	—	—	—

Table 6.22-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Mercury	Nitrate	Perchlorate	Thallium	Zinc
Soil BV[a]				**0.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**na[b]**	**na**	**0.73**	**48.8**
Residential SSL[c]				**3.13E+01**	**7.03E+01**	**na**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**4.00E+02**	**2.35E+01**	**1.25E+05**	**5.48E+01**	**7.82E-01**	**2.35E+04**
Industrial SSL[c]				**4.54E+02**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**8.00E+02**	**3.41E+02**	**1.82E+06**	**7.95E+02**	**1.14E+01**	**3.41E+05**
Construction Worker SSL[c]				**1.24E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**8.00E+02**	**9.29E+01**	**4.96E+05**	**2.17E+02**	**3.10E+00**	**9.29E+04**
RE03-09-14060	03-608378	0–1	Soil	1.22	—	—	—	—	—	—	—	—	—	—	49.6
RE03-10-2712	03-608378	2–3	Soil	1.14 (U)	0.568 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-14063	03-608379	0–1	Soil	1.2 (U)	0.598 (U)	—	—	—	—	—	—	1.26 (J-)	—	—	—
RE03-09-14062	03-608379	2–3	Soil	1.21 (U)	0.607 (U)	—	—	—	—	—	—	1.07 (J-)	—	—	—
RE03-09-14065	03-608380	0–1	Soil	1.23 (U)	0.617 (U)	9940	—	—	—	—	—	—	—	—	—
RE03-09-14064	03-608380	2–3	Soil	1.14 (U)	0.569 (U)	—	—	—	—	—	—	1.06 (J-)	—	—	—
RE03-09-14066	03-608381	0–1	Soil	1.23 (U)	0.615 (U)	—	—	—	—	—	—	1.55 (J-)	—	—	—
RE03-09-14067	03-608381	2–3	Soil	—	0.596 (U)	8900	—	—	—	23.6	—	1.14 (J-)	—	—	—
RE03-09-14068	03-608382	0–1	Soil	—	0.607 (U)	—	—	—	—	27.6	—	—	—	1.73	—
RE03-09-14069	03-608382	2–3	Soil	1.14 (U)	0.569 (U)	—	—	—	—	—	—	0.975 (J-)	—	—	—
RE03-09-14070	03-608383	0–1	Soil	1.15 (U)	0.575 (U)	6410	—	—	—	—	—	0.816 (J-)	—	—	—
RE03-09-14071	03-608383	2–3	Soil	1.18 (U)	0.59 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-14073	03-608384	0–1	Soil	1.18 (U)	0.591 (U)	—	—	—	—	—	—	0.862 (J-)	—	—	—
RE03-09-14072	03-608384	2–3	Soil	1.1 (U)	0.551 (U)	—	—	—	—	—	—	—	—	—	—
RE03-09-14074	03-608385	0–1	Soil	1.03 (U)	0.516 (U)	—	—	15.4	—	—	—	0.85 (J-)	—	—	—
RE03-09-14075	03-608385	2–3	Soil	1.18 (U)	0.592 (U)	—	—	—	—	26.6	—	1 (J-)	—	—	—
RE03-09-14076	03-608386	0–1	Soil	1.02 (U)	0.508 (U)	—	—	—	—	—	—	1.1	—	—	—
RE03-09-14077	03-608386	2–3	Soil	1.1 (U)	0.551 (U)	—	—	—	—	—	—	1.81	—	—	—
RE03-09-14079	03-608387	0–1	Soil	—	2.64	—	26.5	—	29.3	37.9	0.339	0.87 (J-)	—	—	133
RE03-09-14078	03-608387	2–3	Soil	1.16 (U)	0.579 (U)	—	—	—	—	—	—	1.98 (J-)	—	—	—
RE03-09-14080	03-608388	0–1	Soil	1.28 (U)	0.638 (U)	—	—	—	—	39.6	—	1.21 (J-)	—	—	71
RE03-09-14081	03-608388	2–3	Soil	1.17 (U)	0.585 (U)	—	—	—	—	—	—	1.14 (J-)	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2012, 219971) unless otherwise noted.

[d] SSLfor trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 6.22-3
Organic Chemicals Detected at SWMU 03-059

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	Benzo(k)fluoranthene	Benzoic Acid
Residential SSL[a]				**3.44E+03**	**1.72E+03[b]**	**6.66E+04**	**1.72E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**2.40E+05[c]**
Industrial SSL[a]				**3.67E+04**	**1.83E+04[b]**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.50E+06[c]**
Construction Worker SSL[a]				**1.86E+04**	**6.68E+03[b]**	**2.21E+05**	**6.68E+04**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**9.52E+05[d]**
RE03-09-14048	03-608372	0–1	Soil	—[e]	—	—	0.0448	—	0.146	0.136	0.23	0.239	0.309	0.0957	0.139	—
RE03-10-2707	03-608372	2–3	Soil	—	—	—	—	—	0.0072	0.0053	—	—	—	—	—	—
RE03-09-14050	03-608373	0–1	Soil	—	—	—	—	—	0.0129	0.0172	0.0144 (J)	—	—	—	—	—
RE03-10-2708	03-608373	2–3	Soil	—	—	—	—	—	0.0064	0.0052	—	—	—	—	—	—
RE03-09-14053	03-608374	0–1	Soil	0.0208 (J)	—	—	—	—	12.3	5.25	—	—	—	—	—	—
RE03-10-2710	03-608374	2–3	Soil	—	—	—	—	—	9.32	2.97	—	—	—	—	—	—
RE03-09-14055	03-608375	0–1	Soil	—	—	—	—	—	0.103	0.0798	—	—	—	—	—	—
RE03-10-2709	03-608375	2–3	Soil	—	—	—	—	—	0.0311	0.0151	—	—	—	—	—	—
RE03-09-14056	03-608376	0–1	Soil	—	—	—	—	—	—	0.0194	0.0124 (J)	—	—	—	—	—
RE03-09-14057	03-608376	2–3	Soil	—	—	—	—	—	—	0.0017 (J)	—	—	—	—	—	—
RE03-09-14058	03-608377	0–1	Soil	—	—	—	—	—	—	0.0129 (J)	0.0222 (J)	0.0152 (J)	0.0268 (J)	0.0129 (J)	—	—
RE03-10-2711	03-608377	2–3	Soil	0.0168 (J)	—	—	0.0241 (J)	—	—	0.0073	0.0606	0.0549	0.118	0.028 (J)	0.0431	—
RE03-09-14060	03-608378	0–1	Soil	—	0.0228 (J)	—	0.041	—	—	—	0.109	0.082	0.216	0.0519	0.0964	—
RE03-10-2712	03-608378	2–3	Soil	—	—	—	—	—	—	—	0.025 (J)	0.0144 (J)	0.0456	0.0162 (J)	0.0127 (J)	—
RE03-09-14062	03-608379	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.496 (J)
RE03-09-14066	03-608381	0–1	Soil	0.0411 (J)	—	—	0.0573	—	—	—	0.0592	0.0428	0.0503	0.0303 (J)	0.0273 (J)	—
RE03-09-14068	03-608382	0–1	Soil	—	—	0.004 (J)	—	0.0182	0.0092	0.0033 (J)	—	—	—	—	—	—
RE03-09-14070	03-608383	0–1	Soil	—	—	—	—	—	0.0024 (J)	0.0382	—	—	—	—	—	—
RE03-09-14071	03-608383	2–3	Soil	—	—	—	—	—	—	0.0023 (J)	—	—	—	—	—	—
RE03-09-14072	03-608384	2–3	Soil	—	—	—	—	—	0.0168 (J)	—	—	—	—	—	—	—
RE03-09-14074	03-608385	0–1	Soil	—	—	—	—	—	—	0.0301	0.0204 (J)	0.0149 (J)	0.0243 (J)	0.0138 (J)	—	—
RE03-09-14075	03-608385	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14076	03-608386	0–1	Soil	—	—	—	—	—	0.0063	0.0116	—	—	—	—	—	—
RE03-09-14077	03-608386	2–3	Soil	0.04	—	—	0.073	—	0.0137	0.0496	0.115	0.0929	0.16	0.0496	—	—
RE03-09-14079	03-608387	0–1	Soil	—	—	—	—	—	0.112	0.0912	0.0276 (J)	0.0316 (J)	0.0529	0.0407 (J)	—	—
RE03-09-14078	03-608387	2–3	Soil	—	—	—	—	—	0.0021 (J)	0.0019 (J)	—	—	—	—	—	—
RE03-09-14080	03-608388	0–1	Soil	—	—	—	0.00877 (J)	—	0.0577	0.0816	0.039 (J)	0.036 (J)	0.0841	0.0397 (J)	—	—
RE03-09-14081	03-608388	2–3	Soil	—	—	—	—	—	—	0.0022 (J)	—	—	—	—	—	—

Table 6.22-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**3.47E+02**	**2.60E+03[c]**	**1.48E+02**	**1.48E-01**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**2.30E+02[c]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03[f]**
Industrial SSL[a]				**1.37E+03**	**9.10E+03[c]**	**2.34E+03**	**2.34E+00**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.200E+03[c]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03[f]**
Construction Worker SSL[a]				**4.76E+03**	**4.76E+04[d]**	**2.06E+04**	**2.13E+01**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**1.24E+03[d]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na[g]**
RE03-09-14048	03-608372	0–1	Soil	0.078 (J)	—	0.272	—	0.468	—	0.0982	—	—	—	0.147	0.424	70.1 (J)
RE03-10-2707	03-608372	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	3.6 (J)
RE03-09-14050	03-608373	0–1	Soil	—	—	0.0138 (J)	—	0.0271 (J)	—	—	—	—	—	—	0.0205 (J)	—
RE03-10-2708	03-608373	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	2.96 (J)
RE03-09-14053	03-608374	0–1	Soil	0.0937 (J)	—	—	—	0.0129 (J)	—	—	—	—	—	—	0.0127 (J)	—
RE03-10-2710	03-608374	2–3	Soil	0.142 (J)	—	—	—	0.011 (J)	—	—	—	—	—	—	—	14 (J)
RE03-09-14055	03-608375	0–1	Soil	—	—	—	—	—	—	—	0.00246 (J)	—	—	—	—	—
RE03-10-2709	03-608375	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14056	03-608376	0–1	Soil	—	1.83	—	—	0.0185 (J)	—	—	—	—	—	0.0144 (J)	0.0167 (J)	5.87 (J)
RE03-09-14057	03-608376	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14058	03-608377	0–1	Soil	—	—	0.0159 (J)	—	0.0347 (J)	—	—	—	—	—	0.0184 (J)	0.0307 (J)	5.33 (J)
RE03-10-2711	03-608377	2–3	Soil	0.0832 (J)	—	0.141	0.0109 (J)	0.098	—	0.0291 (J)	—	—	—	0.0735	0.0871	9.66 (J)
RE03-09-14060	03-608378	0–1	Soil	1.13	—	0.181	—	0.23	—	0.0494	—	—	—	0.0434	0.256	—
RE03-10-2712	03-608378	2–3	Soil	0.172 (J)	—	0.0196 (J)	—	0.0336 (J)	—	0.0132 (J)	—	—	—	—	0.0326 (J)	6.49 (J)
RE03-09-14062	03-608379	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14066	03-608381	0–1	Soil	—	—	0.0504	—	0.17	0.0359 (J)	0.0233 (J)	—	0.0138 (J)	0.0291 (J)	0.209	0.163	—
RE03-09-14068	03-608382	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14070	03-608383	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14071	03-608383	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14072	03-608384	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14074	03-608385	0–1	Soil	—	—	0.0197 (J)	0.028 (J)	0.0495	—	0.0104 (J)	—	—	—	0.0228 (J)	0.0332 (J)	—
RE03-09-14075	03-608385	2–3	Soil	0.0879 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14076	03-608386	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	3.52 (J)
RE03-09-14077	03-608386	2–3	Soil	—	—	0.115	—	0.335	0.0484	0.0437	—	0.00839 (J)	0.015 (J)	0.281	0.306	15.4
RE03-09-14079	03-608387	0–1	Soil	0.109 (J)	—	0.0319 (J)	—	0.0638	—	0.0245 (J)	—	—	—	0.0207 (J)	0.0514	—
RE03-09-14078	03-608387	2–3	Soil	0.0836 (J)	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.22-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO
Residential SSL[a]				**3.47E+02**	**2.60E+03[c]**	**1.48E+02**	**1.48E-01**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**2.30E+02[c]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**1.00E+03[f]**
Industrial SSL[a]				**1.37E+03**	**9.10E+03[c]**	**2.34E+03**	**2.34E+00**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.200E+03[c]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**1.80E+03[f]**
Construction Worker SSL[a]				**4.76E+03**	**4.76E+04[d]**	**2.06E+04**	**2.13E+01**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**1.24E+03[d]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**na[g]**
RE03-09-14080	03-608388	0–1	Soil	0.102 (J)	—	0.0439	—	0.0944	—	0.0333 (J)	—	—	—	0.0346 (J)	0.0648	—
RE03-09-14081	03-608388	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] — = Not detected.

[f] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[g] na = Not available.

Table 6.22-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-059

Sample ID	Location ID	Depth (ft)	Media	Tritium
Soil BV[a]				**na[b]**
Residential SAL[c]				**850**
Industrial SAL[c]				**200000**
Construction Worker SAL[c]				**62000**
RE03-09-14048	03-608372	0.0–1.0	Soil	0.148376
RE03-10-2707	03-608372	2.0–3.0	Soil	0.0317062
RE03-09-14068	03-608382	0.0–1.0	Soil	0.118462
RE03-09-14069	03-608382	2.0–3.0	Soil	0.109395
RE03-09-14071	03-608383	2.0–3.0	Soil	0.0349762
RE03-09-14073	03-608384	0.0–1.0	Soil	0.625006
RE03-09-14072	03-608384	2.0–3.0	Soil	0.0855055
RE03-09-14077	03-608386	2.0–3.0	Soil	0.0346744
RE03-09-14079	03-608387	0.0–1.0	Soil	0.236744
RE03-09-14078	03-608387	2.0–3.0	Soil	1.36423

Note: All activities are in pCi/g.

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

[b] na = Not available.

[c] SALs for radionuclides from LANL (2012, 228852).

Table 6.23-1
Samples Collected and Analyses Requested at AOC C-03-022

Sample ID	Location ID	Depth (ft)	Media	Metals	TPH-DRO
RE03-09-14082	03-608389	1.0–2.0	Soil	10-275	10-275
RE03-09-14083	03-608389	4.0–5.0	Soil	10-275	10-275
RE03-09-14084	03-608390	1.0–2.0	Soil	10-275	10-275
RE03-09-14085	03-608390	4.0–5.0	Soil	10-275	10-275
RE03-09-14086	03-608391	1.0–2.0	Soil	10-275	10-275
RE03-09-14087	03-608391	4.0–5.0	Soil	10-275	10-275
RE03-09-14088	03-608392	1.0–2.0	Soil	10-275	10-275
RE03-09-14089	03-608392	4.0–5.0	Soil	10-275	10-275

Table 6.23-2
Inorganic Chemicals above BVs at AOC C-03-022

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Magnesium
Soil BV[a]				**0.83**	**0.4**	**6120**	**4610**
Residential SSL[b]				**3.13E+01**	**7.03E+01**	**na**[c]	**na**
Industrial SSL[b]				**4.54E+02**	**8.97E+02**	**na**	**na**
Construction Worker SSL[b]				**1.24E+02**	**2.77E+02**	**na**	**na**
RE03-09-14082	03-608389	1.0–2.0	Soil	1.12 (U)	0.56 (U)	—[d]	—
RE03-09-14083	03-608389	4.0–5.0	Soil	1.08 (U)	0.541 (U)	—	—
RE03-09-14084	03-608390	1.0–2.0	Soil	1.08 (U)	0.539 (U)	—	—
RE03-09-14085	03-608390	4.0–5.0	Soil	1.06 (U)	0.53 (U)	—	—
RE03-09-14086	03-608391	1.0–2.0	Soil	1.11 (U)	0.556 (U)	—	—
RE03-09-14087	03-608391	4.0–5.0	Soil	1.06 (U)	0.532 (U)	—	—
RE03-09-14088	03-608392	1.0–2.0	Soil	1.03 (U)	0.517 (U)	33,300	4900
RE03-09-14089	03-608392	4.0–5.0	Soil	1.04 (U)	0.521 (U)	34,100	5080

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] SSLs from NMED (2012, 219971).
[c] na = Not available.
[d] — = Not detected.

Table 6.23-3
Organic Chemicals Detected at AOC C-03-022

Sample ID	Location ID	Depth (ft)	Media	TPH-DRO
Residential SSL[a]				**1.00E+03[b]**
Industrial SSL[a]				**1.80E+03[b]**
Construction Worker SSL[a]				**na[c]**
RE03-09-14082	03-608389	1.0–2.0	Soil	979
RE03-09-14083	03-608389	4.0–5.0	Soil	27,900
RE03-09-14086	03-608391	1.0–2.0	Soil	9.54

Note: All concentrations are in mg/kg.
[a] SSLs from NMED (2012, 219971).
[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).
[c] na = Not available.

Table 7.2-1
Samples Collected and Analyses Requested at SWMU 60-002 (West)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE03-09-14094	03-608393	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14095	03-608393	4–5	Qbt3	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14096	03-608394	1–2	Qbt3	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14097	03-608394	4–5	Qbt3	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14098	03-608395	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14099	03-608395	4–5	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14100	03-608396	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14101	03-608396	4–5	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14102	03-608397	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14103	03-608397	4–5	Qbt3	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14104	03-608398	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-830	10-831
RE03-09-14105	03-608398	4–5	Qbt3	10-831	10-830	10-830	10-830	10-830	10-830	10-831

Table 7.2-2
Samples Collected and Analyses Requested at SWMU 60-002 (Central and East)

Sample ID	Location ID	Site Area	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	TPH-GRO	VOCs
RE60-03-52308	60-22517	East	4–4.5	Qbt4	1884S	—*	1884S	1884S	1884S	1884S
RE60-03-52307	60-22517	East	8.5–9	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52309	60-22517	East	14.5–15	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52312	60-22518	East	4.5–5	Soil	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52314	60-22518	East	14.5–15	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52317	60-22519	East	4.5–5	Soil	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52320	60-22519	East	13.5–14	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52322	60-22520	East	3–3.5	Soil	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52324	60-22520	East	14.5–15	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52327	60-22521	East	4–4.5	Soil	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52329	60-22521	East	14.5–15	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52332	60-22522	East	5.5–6	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-03-52334	60-22522	East	16–17	Qbt4	1884S	—	1884S	1884S	1884S	1884S
RE60-04-53095	60-22680	Central	0–1	Soil	2042S	2042S	2042S	2042S	2042S	2042S
RE60-04-53096	60-22680	Central	1.5–2	Soil	2042S	2042S	2042S	2042S	2042S	2042S
RE60-04-53098	60-22681	Central	0–1	Soil	2042S	2042S	2042S	2042S	2042S	2042S
RE60-04-53099	60-22681	Central	1.5–2	Soil	2042S	2042S	2042S	2042S	2042S	2042S
RE60-04-53100	60-22682	Central	0–1	Soil	2042S	2042S	2042S	2042S	2042S	2042S
RE60-04-53101	60-22682	Central	1.5–2	Soil	—	2042S	—	—	2042S	2042S

*— = Analyses not requested.

Table 7.2-3
Inorganic Chemicals above BVs at SWMU 60-002 (West)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Vanadium
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**0.3**	**17**
Soil BV[a]				**29,200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**1.52**	**39.6**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**3.91E+02**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**5.68E+03**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**1.55E+03**
RE03-09-14094	03-608393	1–2	Soil	—[g]	1.03 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14095	03-608393	4–5	Qbt3	10,500 (J)	1.05 (U)	65.5 (J+)	—	—	2680 (J)	10.8 (J)	5.33 (J)	8.74	14,900 (J)	14.7 (J)	2180 (J+)	—	9.12	1.1 (UJ)	28.2 (J)
RE03-09-14096	03-608394	1–2	Qbt3	10,500 (J)	1.05 (U)	160 (J+)	—	—	—	14.6 (J)	7.24 (J)	7.49	—	15.2 (J)	2030 (J+)	502	8.8	1.06 (UJ)	31.2 (J)
RE03-09-14097	03-608394	4–5	Qbt3	16,000 (J)	1.16 (U)	158 (J+)	1.37	—	5310 (J)	9.17 (J)	—	7.35	—	16.8 (J)	2820 (J+)	—	10.3	1.13 (UJ)	—
RE03-09-14098	03-608395	1–2	Soil	—	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14099	03-608395	4–5	Soil	—	1.07 (U)	—	—	0.536 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14100	03-608396	1–2	Soil	—	1.06 (U)	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14101	03-608396	4–5	Soil	—	1.09 (U)	—	—	0.544 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14102	03-608397	1–2	Soil	—	1.04 (U)	—	—	0.521 (U)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14103	03-608397	4–5	Qbt3	8790 (J)	1.07 (U)	146 (J+)	—	—	4070 (J)	7.94 (J)	—	—	—	69.3 (J)	2050 (J+)	—	6.78	1.05 (UJ)	—
RE03-09-14104	03-608398	1–2	Soil	—	1.07 (U)	331 (J+)	—	—	11,200 (J)	—	—	—	—	—	—	—	—	—	—
RE03-09-14105	03-608398	4–5	Qbt3	10,500 (J)	1.06 (U)	90.5 (J+)	—	—	2460 (J)	9.77 (J)	4.74 (J)	6.69	—	12.4 (J)	2390 (J+)	—	7.11	1.05 (UJ)	23 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 7.2-4
Inorganic Chemicals above BVs at SWMU 60-002 (Central and East)

Sample ID	Location ID	Site Area	Depth (ft)	Media	Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Zinc
Qbt 2,3,4 BV[a]					**7340**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**0.3**	**63.5**
Soil BV[a]					**29,200**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**1.52**	**48.8**
Residential SSL[b]					**7.80E+04**	**3.90E+00**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**1.86E+03**	**1.56E+03**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]					**1.13E+06**	**1.77E+01**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**2.67E+04**	**2.25E+04**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]					**4.07E+04**	**5.30E+01**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**4.40E+02**	**6.19E+03**	**1.55E+03**	**9.29E+04**
RE60-03-52308	60-22517	East	4–4.5	Qbt4	15,350	3.52	52.5	—[g]	—	2440	8.2	3.83	—	17,600	—	2540	—	7.73	0.579	—
RE60-03-52307	60-22517	East	8.5–9	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	539	—	0.54 (U)	—
RE60-03-52309	60-22517	East	14.5–15	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.516 (U)	—
RE60-03-52312	60-22518	East	4.5–5	Soil	—	—	—	—	—	—	—	—	14.7	—	—	—	—	—	—	74.8
RE60-03-52314	60-22518	East	14.5–15	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48 (U)	—
RE60-03-52317	60-22519	East	4.5–5	Soil	—	—	310	—	0.539 (U)	8050	—	—	—	—	—	—	—	—	—	—
RE60-03-52320	60-22519	East	13.5–14	Qbt4	23,720	3.97	108	1.69	—	3470	10.1	—	7.99	15,200	15	3520	—	13.2	0.583 (U)	—
RE60-03-52322	60-22520	East	3–3.5	Soil	—	—	—	—	0.55 (U)	8230	—	10	—	—	—	—	—	16	—	—
RE60-03-52324	60-22520	East	14.5–15	Qbt4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.489 (U)	—
RE60-03-52327	60-22521	East	4–4.5	Soil	—	—	—	—	0.533 (U)	—	—	—	—	—	—	—	—	17.1	—	—
RE60-03-52332	60-22522	East	5.5–6	Qbt4	15,520	3.45	375	—	—	2720	8.23	—	—	—	11.2	2390	—	—	0.542 (U)	—
RE60-03-52334	60-22522	East	16–17	Qbt4	9900	—	—	—	—	—	—	—	—	—	12.4	—	—	8.72	0.565 (U)	—
RE60-04-53096	60-22680	Central	1.5–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	726	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 7.2-5
Organic Chemicals Detected at SWMU 60-002 (West)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	TPH-DRO	TPH-GRO
Residential SSL[a]				**6.66E+04**	**1.72E+04**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+02**	**2.29E+03**	**1.48E+00**	**1.83E+03**	**1.72E+03**	**1.00E+03[c]**	**na[d]**
Industrial SSL[a]				**8.68E+05**	**1.83E+05**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+03**	**2.44E+04**	**2.34E+01**	**2.05E+04**	**1.83E+04**	**1.80E+03[c]**	**na**
Construction Worker SSL[a]				**2.21E+05**	**6.68E+04**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+04**	**8.91E+03**	**2.13E+02**	**7.15E+03**	**6.68E+03**	**na**	**na**
RE03-09-14094	03-608393	1–2	Soil	—[e]	—	—	—	—	—	—	—	—	—	—	—	0.0671 (J)
RE03-09-14095	03-608393	4–5	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	0.0699 (J)
RE03-09-14096	03-608394	1–2	Qbt3	0.0189 (J)	—	—	—	—	—	—	—	—	—	—	13 (J)	0.0642 (J)
RE03-09-14097	03-608394	4–5	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	0.0241 (J)
RE03-09-14098	03-608395	1–2	Soil	—	0.0541 (J)	0.154	0.119 (J)	0.139 (J)	0.0715 (J)	0.132 (J)	0.297	0.221	0.22	0.297	—	0.0142 (J)
RE03-09-14099	03-608395	4–5	Soil	—	—	—	—	—	—	—	—	—	—	—	3.33 (J)	—
RE03-09-14100	03-608396	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	2.93 (J)	0.0212 (J)
RE03-09-14101	03-608396	4–5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.0236 (J)
RE03-09-14102	03-608397	1–2	Soil	—	—	—	—	—	—	—	0.0197 (J)	—	0.0132 (J)	0.0163 (J)	90.5	3.15 (J)
RE03-09-14103	03-608397	4–5	Qbt3	—	—	—	—	—	—	—	—	—	—	—	5.86 (J)	0.0943 (J)
RE03-09-14104	03-608398	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.0312 (J)
RE03-09-14105	03-608398	4–5	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	0.0312 (J)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene used as surrogate based on structural similarity.

[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[d] na = Not available.

[e] — = Not detected.

Table 7.2-6
Organic Chemicals Detected at SWMU 60-002 (Central and East)

Sample ID	Location ID	Site Area	Depth (ft)	Media	Acenaphthene	Acetone	Aroclor-1254	Aroclor-1260	Fluoranthene	Fluorene	Hexanone[2-]	Pyrene	TPH-DRO	TPH-GRO
Residential SSL[a]					**3.44E+03**	**6.66E+04**	**1.12E+00**	**2.22E+00**	**2.29E+03**	**2.29E+03**	**2.10E+02**[b]	**1.72E+03**	**1.00E+03**[c]	**na**[d]
Industrial SSL[a]					**3.67E+04**	**8.68E+05**	**8.26E+00**	**8.26E+00**	**2.44E+04**	**2.44E+04**	**1.40E+03**[b]	**1.83E+04**	**1.80E+03**[c]	**na**
Construction Worker SSL[a]					**1.86E+04**	**2.21E+05**	**4.36E+00**	**7.58E+01**	**8.91E+03**	**8.91E+03**	**1.54E+03**[e]	**6.68E+03**	**na**	**na**
RE60-03-52308	60-22517	East	4–4.5	Qbt4	—[f]	0.0062 (J)	NA[g]	NA	—	—	—	—	3.9	—
RE60-03-52307	60-22517	East	8.5–9	Qbt4	—	0.0044 (J)	NA	NA	—	—	—	—	5.1	—
RE60-03-52309	60-22517	East	14.5–15	Qbt4	—	—	NA	NA	—	—	—	—	1.1 (J)	—
RE60-03-52312	60-22518	East	4.5–5	Soil	—	—	NA	NA	0.0357 (J)	0.0056 (J)	—	0.0443	12.9	—
RE60-03-52314	60-22518	East	14.5–15	Qbt4	—	0.0042 (J)	NA	NA	—	—	—	—	2.2	—
RE60-03-52317	60-22519	East	4.5–5	Soil	—	—	NA	NA	—	—	—	—	1.1 (J)	—
RE60-03-52320	60-22519	East	13.5–14	Qbt4	—	0.0118 (J)	NA	NA	—	—	0.0088	—	3	—
RE60-03-52322	60-22520	East	3–3.5	Soil	—	—	NA	NA	—	—	—	—	1.8 (J)	—
RE60-03-52327	60-22521	East	4–4.5	Soil	—	—	NA	NA	—	—	—	—	1.1 (J)	—
RE60-03-52329	60-22521	East	14.5–15	Qbt4	—	0.0042 (J)	NA	NA	—	—	—	—	11.3	—
RE60-03-52332	60-22522	East	5.5–6	Qbt4	—	—	NA	NA	—	—	—	—	2.6	—
RE60-03-52334	60-22522	East	16–17	Qbt4	—	—	NA	NA	—	—	—	—	2.6	—
RE60-04-53095	60-22680	Central	0–1	Soil	0.0244 (J)	—	—	—	—	—	—	—	—	—
RE60-04-53096	60-22680	Central	1.5–2	Soil	—	—	—	0.0042 (J)	—	—	—	—	—	—
RE60-04-53099	60-22681	Central	1.5–2	Soil	—	—	—	—	—	—	—	—	—	0.0344 (J)
RE60-04-53100	60-22682	Central	0–1	Soil	0.0198 (J)	—	0.0202	0.0162	—	—	—	—	—	—
RE60-04-53101	60-22682	Central	1.5–2	Soil	NA	—	0.0025 (J)	—	NA	NA	—	NA	NA	0.173

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[d] na = Not available.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[f] — = Not detected.

[g] NA = Not analyzed.

Table 7.3-1
Samples Collected and Analyses Requested at AOC 60-004(f)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14208	03-608404	1.0–2.0	Soil	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14209	03-608404	2.0–3.0	Qbt3	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14210	03-608404	4.0–5.0	Qbt3	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14211	03-608404	9.0–10.0	Qbt3	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14212	03-608405	1.0–2.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14213	03-608405	2.0–3.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14214	03-608405	4.0–5.0	Qbt3	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14215	03-608405	9.0–10.0	Qbt3	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14216	03-608406	1.0–2.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14217	03-608406	2.0–3.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14218	03-608406	4.0–5.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14219	03-608406	9.0–10.0	Soil	10-918	10-918	10-917	10-917	10-917	10-917	10-918
RE03-09-14220	03-608407	1.0–2.0	Soil	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14221	03-608407	2.0–3.0	Soil	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14222	03-608407	4.0–5.0	Soil	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14223	03-608407	9.0–10.0	Qbt3	10-941	10-941	10-940	10-940	10-940	10-940	10-941
RE03-09-14224	03-608408	1.0–2.0	Soil	10-853	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14225	03-608408	2.0–3.0	Soil	10-853	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14226	03-608408	4.0–5.0	Soil	10-853	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14227	03-608408	9.0–10.0	Soil	10-853	10-853	10-852	10-852	10-852	10-852	10-853

Table 7.3-2
Inorganic Chemicals above BVs at AOC 60-004(f)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**
Soil BV[a]				**29,200**	**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**
RE03-09-14208	03-608404	1.0–2.0	Soil	—[g]	1.1 (UJ)	—	0.548 (U)	—	—	—	—	—	—
RE03-09-14209	03-608404	2.0–3.0	Qbt3	13,500	1.09 (UJ)	170	—	2250	15.4	8.87	6.86 (J)	15100	21.2
RE03-09-14210	03-608404	4.0–5.0	Qbt3	10,200	—	94	—	3090	12	—	7.72 (J)	—	22.5
RE03-09-14211	03-608404	9.0–10.0	Qbt3	—	1.11 (UJ)	103	—	—	—	—	4.82 (J)	—	16.2
RE03-09-14212	03-608405	1.0–2.0	Soil	—	1.14 (U)	—	0.57 (U)	—	—	—	—	—	—
RE03-09-14213	03-608405	2.0–3.0	Soil	—	1.11 (U)	—	0.557 (U)	—	—	—	—	—	—
RE03-09-14214	03-608405	4.0–5.0	Qbt3	—	1.08 (U)	78.4 (J+)	—	3590 (J+)	33.8	—	—	—	—
RE03-09-14215	03-608405	9.0–10.0	Qbt3	—	1.07 (U)	—	—	—	—	—	—	—	—
RE03-09-14216	03-608406	1.0–2.0	Soil	—	1.14 (U)	—	0.569 (U)	—	—	9.79	—	—	—
RE03-09-14217	03-608406	2.0–3.0	Soil	—	1.12 (U)	—	0.559 (U)	—	—	—	—	—	—
RE03-09-14218	03-608406	4.0–5.0	Soil	—	1.2 (U)	—	0.601 (U)	—	—	—	—	—	—
RE03-09-14219	03-608406	9.0–10.0	Soil	—	1.18 (U)	—	0.591 (U)	—	—	—	—	—	—
RE03-09-14220	03-608407	1.0–2.0	Soil	—	1.01 (U)	—	0.693	—	—	—	65.3 (J)	—	61.1
RE03-09-14221	03-608407	2.0–3.0	Soil	—	1.14 (UJ)	—	0.571 (U)	—	22.8	—	19.8 (J)	—	24.1
RE03-09-14222	03-608407	4.0–5.0	Soil	—	1.21 (UJ)	—	0.606 (U)	—	38.2	—	—	—	—
RE03-09-14223	03-608407	9.0–10.0	Qbt3	—	1.11 (UJ)	—	—	—	25.5	—	—	—	—
RE03-09-14224	03-608408	1.0–2.0	Soil	—	1.11 (U)	—	0.553 (U)	—	—	—	—	—	—
RE03-09-14225	03-608408	2.0–3.0	Soil	—	1.07 (U)	—	0.533 (U)	—	—	—	—	—	—
RE03-09-14226	03-608408	4.0–5.0	Soil	—	1.09 (U)	—	0.546 (U)	—	—	—	—	—	—
RE03-09-14227	03-608408	9.0–10.0	Soil	—	1.1 (U)	—	0.548 (U)	—	—	—	—	—	—

Table 7.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Residential SSL[b]				**na**	**1.86E+03**	**2.35E+01**	**1.56E+03**	**3.91E+02**	**3.91E+02**	**7.82E-01**	**3.91E+02**	**2.35E+04**
Industrial SSL[b]				**na**	**2.67E+04**	**3.41E+02**	**2.25E+04**	**5.68E+03**	**5.68E+03**	**1.14E+01**	**5.68E+03**	**3.41E+05**
Construction Worker SSL[b]				**na**	**4.40E+02**	**9.29E+01**	**6.19E+03**	**1.55E+03**	**1.55E+03**	**3.10E+00**	**1.55E+03**	**9.29E+04**
RE03-09-14208	03-608404	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14209	03-608404	2.0–3.0	Qbt3	2590	—	—	8.1	1.12 (UJ)	—	—	25.6	—
RE03-09-14210	03-608404	4.0–5.0	Qbt3	2720	—	—	—	1.14 (UJ)	—	—	—	98.2 (J-)
RE03-09-14211	03-608404	9.0–10.0	Qbt3	—	—	—	—	1.13 (UJ)	—	—	—	—
RE03-09-14212	03-608405	1.0–2.0	Soil	—	—	—	—	—	—	—	—	99.9
RE03-09-14213	03-608405	2.0–3.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14214	03-608405	4.0–5.0	Qbt3	—	—	—	6.93	1.14 (UJ)	—	—	—	—
RE03-09-14215	03-608405	9.0–10.0	Qbt3	—	—	—	—	1.09 (UJ)	—	—	—	—
RE03-09-14216	03-608406	1.0–2.0	Soil	—	839	—	—	—	—	—	—	—
RE03-09-14217	03-608406	2.0–3.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14218	03-608406	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14219	03-608406	9.0–10.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14220	03-608407	1.0–2.0	Soil	—	—	0.583 (J+)	—	—	1.21	—	—	183 (J-)
RE03-09-14221	03-608407	2.0–3.0	Soil	—	—	—	—	—	—	—	—	67.8 (J-)
RE03-09-14222	03-608407	4.0–5.0	Soil	—	—	—	—	—	—	—	—	56.9 (J-)
RE03-09-14223	03-608407	9.0–10.0	Qbt3	—	—	—	—	1.11 (UJ)	—	—	—	—
RE03-09-14224	03-608408	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—
RE03-09-14225	03-608408	2.0–3.0	Soil	—	—	—	—	—	—	0.937	—	—
RE03-09-14226	03-608408	4.0–5.0	Soil	—	—	—	—	—	—	—	—	54.2
RE03-09-14227	03-608408	9.0–10.0	Soil	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 7.3-3
Organic Chemicals Detected at AOC 60-004(f)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.54E+01**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03**[b]	**1.48E+01**	**3.47E+02**	**1.48E+02**	**6.11E+03**	**1.48E-01**	**7.80E+01**[c]
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.47E+01**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04**[b]	**2.34E+02**	**1.37E+03**	**2.34E+03**	**6.84E+04**	**2.34E+00**	**1.00E+03**[c]
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**1.38E+02**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03**[b]	**2.06E+03**	**4.76E+03**	**2.06E+04**	**2.38E+04**	**2.13E+01**	**2.82E+02**[d]
RE03-09-14212	03-608405	1.0–2.0	Soil	—[e]	—	—	0.0106	0.01	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14213	03-608405	2.0–3.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14214	03-608405	4.0–5.0	Qbt3	—	—	—	0.0021 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14215	03-608405	9.0–10.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14216	03-608406	1.0–2.0	Soil	—	0.00703	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14217	03-608406	2.0–3.0	Soil	—	0.0051 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14218	03-608406	4.0–5.0	Soil	—	0.00482 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14219	03-608406	9.0–10.0	Soil	—	0.00448 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14220	03-608407	1.0–2.0	Soil	0.217	—	0.69	0.116	0.153	0.000707 (J+)	2.33	2.18	3.06	0.973	0.975	0.091 (J)	2.29	0.118 (J)	0.401	0.15 (J)
RE03-09-14221	03-608407	2.0–3.0	Soil	—	—	—	—	0.0028 (J)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14222	03-608407	4.0–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14223	03-608407	9.0–10.0	Qbt3	—	—	—	—	—	—	—	—	—	—	—	0.0949 (J)	—	—	—	—
RE03-09-14224	03-608408	1.0–2.0	Soil	—	—	—	—	0.0033 (J)	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14227	03-608408	9.0–10.0	Soil	—	0.00438 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 7.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dichloroethene[cis-1,2-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO	Trichloroethene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Residential SSL[a]				**1.56E+02**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**4.09E+02**	**2.30E+02[c]**	**4.30E+01**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03[f]**	**na[g]**	**6.20E+01[c]**	**7.80E+02[c]**	**8.14E+02[h]**
Industrial SSL[a]				**2.27E+03**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03[f]**	**na**	**2.60E+02[c]**	**1.00E+04[c]**	**3.98E+03[h]**
Construction Worker SSL[a]				**6.19E+02**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**1.12E+03**	**1.24E+03[d]**	**1.58E+02**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na**	**na**	**6.88E+02[d]**	**3.10E+03[d]**	**7.43E+02[h]**
RE03-09-14212	03-608405	1.0–2.0	Soil	—	—	—	—	0.00255 (J)	—	—	—	—	—	6.03 (J)	—	0.00102 (J)	0.000621 (J)	—
RE03-09-14213	03-608405	2.0–3.0	Soil	—	—	—	—	0.00265 (J)	0.0104 (J)	—	—	—	—	11.6	—	0.000983 (J)	—	—
RE03-09-14214	03-608405	4.0–5.0	Qbt3	—	—	—	—	—	—	—	—	—	—	5.19 (J)	—	—	—	—
RE03-09-14215	03-608405	9.0–10.0	Qbt3	—	—	—	—	0.00234 (J)	—	—	—	—	—	3.37 (J)	—	—	—	—
RE03-09-14216	03-608406	1.0–2.0	Soil	—	—	—	—	0.00284 (J)	—	—	—	—	—	4.09 (J)	—	—	—	—
RE03-09-14217	03-608406	2.0–3.0	Soil	—	—	—	—	0.0026 (J)	—	—	—	—	—	2.82 (J)	—	—	—	—
RE03-09-14218	03-608406	4.0–5.0	Soil	—	—	—	—	0.00291 (J)	—	—	—	—	—	—	—	—	—	—
RE03-09-14219	03-608406	9.0–10.0	Soil	—	—	—	—	0.00292 (J)	—	—	—	—	—	—	—	—	—	—
RE03-09-14220	03-608407	1.0–2.0	Soil	0.000926 (J+)	3.99	0.252	1.05	—	0.0372 (J)	0.106	2.35	2.99	0.000767 (J+)	20.1	0.000446 (J+)	0.000662 (J+)	0.000396 (J+)	0.000565 (J+)
RE03-09-14221	03-608407	2.0–3.0	Soil	—	—	—	—	—	—	—	—	—	—	6.01 (J)	—	—	—	—
RE03-09-14222	03-608407	4.0–5.0	Soil	—	—	—	—	—	0.0105 (J)	—	—	—	—	3.54 (J)	—	—	—	—
RE03-09-14223	03-608407	9.0–10.0	Qbt3	—	—	—	—	—	—	—	—	—	—	3.31 (J)	—	—	—	—
RE03-09-14224	03-608408	1.0–2.0	Soil	—	—	—	—	—	—	—	—	—	—	5.25 (J)	—	—	—	—
RE03-09-14227	03-608408	9.0–10.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] — = Not detected.

[f] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[g] na = Not available.

[h] Xylenes used as a surrogate based on structural similarity.

Table 7.3-4
Radionuclides Detected or Detected above BVs/FVs at AOC 60-004(f)

Sample ID	Location ID	Depth (ft)	Media	Tritium
Qbt 2,3,4 BV[a]				**na**[b]
Soil BV[a]				**na**
Residential SAL[c]				**850**
Industrial SAL[c]				**200,000**
Construction Worker SAL[c]				**62,000**
RE03-09-14208	03-608404	1.0–2.0	Soil	0.040046
RE03-09-14209	03-608404	2.0–3.0	Qbt3	0.0327273
RE03-09-14210	03-608404	4.0–5.0	Qbt3	0.0735814
RE03-09-14211	03-608404	9.0–10.0	Qbt3	0.149279
RE03-09-14212	03-608405	1.0–2.0	Soil	0.234598
RE03-09-14213	03-608405	2.0–3.0	Soil	0.257011
RE03-09-14214	03-608405	4.0–5.0	Qbt3	0.301163
RE03-09-14215	03-608405	9.0–10.0	Qbt3	0.178889
RE03-09-14217	03-608406	2.0–3.0	Soil	0.0448235
RE03-09-14219	03-608406	9.0–10.0	Soil	0.10159
RE03-09-14220	03-608407	1.0–2.0	Soil	0.0902857
RE03-09-14221	03-608407	2.0–3.0	Soil	0.116118
RE03-09-14222	03-608407	4.0–5.0	Soil	0.288519
RE03-09-14223	03-608407	9.0–10.0	Qbt3	0.131011

Note: All activities are in pCi/g.

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

[b] na = Not available.

[c] SALs for radionuclides from LANL (2012, 228852).

Table 7.4-1
Samples Collected and Analyses Requested at SWMU 60-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Isotopic Plutonium	Isotopic Uranium	Metals	Nitrate	PCBs	Perchlorate	SVOCs	Tritium	VOCs	Cyanide (Total)
RE03-09-14228	03-608409	20.0–21.0	Qbt3	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057
RE03-09-14229	03-608409	24.0–25.0	Qbt3	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057
RE03-09-14230	03-608409	29.0–30.0	Qbt3	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057	10-1057
RE03-09-14231	03-608410	18.0–19.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14232	03-608410	22.0–23.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14233	03-608410	27.0–28.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14234	03-608411	18.0–19.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14235	03-608411	22.0–23.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14236	03-608411	27.0–28.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14238	03-608412	10.0–11.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14239	03-608412	14.0–15.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14240	03-608412	18.0–19.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-09-14241	03-608412	23.0–24.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-10-9872	03-608412	35.0–36.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-10-9873	03-608412	55.0–56.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087
RE03-10-9874	03-608412	60.0–61.0	Qbt3	10-1088	10-1088	10-1088	10-1087	10-1087	10-1086	10-1087	10-1086	10-1088	10-1086	10-1087

Table 7.4-2
Inorganic Chemicals above BVs at SWMU 60-006(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Beryllium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**1.21**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**6.58**	**na[b]**	**na**	**0.3**
Residential SSL[c]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+02**	**na**	**1.17E+05[d]**	**3.13E+03**	**4.00E+02**	**na**	**1.56E+03**	**1.25E+05**	**5.48E+01**	**3.91E+02**
Industrial SSL[c]				**1.13E+06**	**4.54E+02**	**1.77E+01**	**2.26E+03**	**na**	**1.70E+06[d]**	**4.54E+04**	**8.00E+02**	**na**	**2.25E+04**	**1.82E+06**	**7.95E+02**	**5.68E+03**
Construction Worker SSL[c]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**1.44E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**8.00E+02**	**na**	**6.19E+03**	**4.96E+05**	**2.17E+02**	**1.55E+03**
RE03-09-14228	03-608409	20.0–21.0	Qbt3	—[e]	1.11 (U)	—	—	—	—	—	—	—	—	1.26	—	1.09 (U)
RE03-09-14229	03-608409	24.0–25.0	Qbt3	—	1.06 (U)	—	—	—	—	—	—	—	—	1.21	—	1.08 (U)
RE03-09-14230	03-608409	29.0–30.0	Qbt3	—	0.987 (U)	—	—	—	—	—	—	—	—	1.23	—	1.05 (U)
RE03-09-14231	03-608410	18.0–19.0	Qbt3	—	1.07 (U)	—	—	—	—	—	—	—	—	1.33 (J-)	—	1.07 (U)
RE03-09-14232	03-608410	22.0–23.0	Qbt3	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—	1.04 (U)
RE03-09-14233	03-608410	27.0–28.0	Qbt3	—	1.06 (U)	—	—	—	—	—	—	—	—	1.5 (J-)	—	1.06 (U)
RE03-09-14234	03-608411	18.0–19.0	Qbt3	—	1.06 (U)	—	—	—	—	—	—	—	—	—	0.000986 (J)	1.08 (U)
RE03-09-14235	03-608411	22.0–23.0	Qbt3	18300 (J+)	1.26 (U)	3.11	2.09	2970	7.84	7.27	11.7	1810 (J+)	13.2	—	0.00165 (J)	1.29 (U)
RE03-09-14236	03-608411	27.0–28.0	Qbt3	—	1.19 (U)	—	1.45	—	—	5.54	—	—	7.38 (J)	—	0.000959 (J)	1.18 (U)
RE03-09-14238	03-608412	10.0–11.0	Qbt3	—	0.981 (U)	—	—	—	—	—	—	—	—	—	—	1.06 (U)
RE03-09-14239	03-608412	14.0–15.0	Qbt3	—	1.04 (U)	—	—	—	—	—	—	—	—	—	—	1.05 (U)
RE03-09-14240	03-608412	18.0–19.0	Qbt3	—	1.02 (U)	—	—	—	—	—	—	—	—	—	0.00128 (J)	1.02 (U)
RE03-09-14241	03-608412	23.0–24.0	Qbt3	—	1.13 (U)	—	—	—	—	—	—	—	7.28 (J)	—	0.00294	1.11 (U)
RE03-10-9872	03-608412	35.0–36.0	Qbt3	—	1.2 (U)	—	—	—	12	—	—	—	—	15.6 (J-)	0.00129 (J)	1.12 (U)
RE03-10-9873	03-608412	55.0–56.0	Qbt3	—	1.01 (U)	—	—	—	—	—	—	—	—	50.7 (J-)	—	1.05 (U)
RE03-10-9874	03-608412	60.0–61.0	Qbt3	—	—	—	—	—	—	—	—	—	—	65 (J-)	—	1.04 (U)

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SSLs from NMED (2012, 219971).
[d] SSL for trivalent chromium.
[e] — = Not detected or not detected above BV.

Table 7.4-3
Organic Chemicals Detected at SWMU 60-006(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1242	Aroclor-1254	Aroclor-1260	Styrene
Residential SSL[a]				**6.66E+04**	**2.22E+00**	**1.12E+00**	**2.22E+00**	**7.28E+03**
Industrial SSL[a]				**8.68E+05**	**8.26E+00**	**8.26E+00**	**8.26E+00**	**5.00E+04**
Construction Worker SSL[a]				**2.21E+05**	**7.58E+01**	**4.36E+00**	**7.58E+01**	**9.99E+03**
RE03-09-14231	03-608410	18.0–19.0	Qbt3	0.0021 (J)	—[b]	—	—	—
RE03-09-14233	03-608410	27.0–28.0	Qbt3	—	0.0356	0.0176	0.0044	0.000764 (J)
RE03-09-14234	03-608411	18.0–19.0	Qbt3	0.00198 (J)	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] — = Not detected.

Table 7.4-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 60-006(a)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Uranium-235/236
Qbt 2,3,4 BV[a]				**na[b]**	**0.09**
Residential SAL[c]				**850**	**39**
Industrial SAL[c]				**200000**	**150**
Construction Worker SAL[c]				**62000**	**100**
RE03-09-14233	03-608410	27.0–28.0	Qbt3	0.0173957	—[d]
RE03-09-14235	03-608411	22.0–23.0	Qbt3	0.063871	—
RE03-09-14236	03-608411	27.0–28.0	Qbt3	0.0682411	—
RE03-10-9872	03-608412	35.0–36.0	Qbt3	—	0.0922

Note: All activities are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2012, 228852).
[d] — = Not detected or not detected above BV/FV.

Table 7.5-1
Samples Collected and Analyses Requested at SWMU 60-007(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14246	03-608413	0.0–1.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14247	03-608413	2.0–3.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14248	03-608413	4.0–5.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14249	03-608414	0.0–1.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14250	03-608414	2.0–3.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14251	03-608414	4.0–5.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14252	03-608415	0.0–1.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14253	03-608415	2.0–3.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14254	03-608415	4.0–5.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14255	03-608416	0.0–1.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14256	03-608416	2.0–3.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
RE03-09-14257	03-608416	4.0–5.0	Soil	10-643	10-644	10-644	10-644	10-644	10-643
AAB5794	60-01019	0.0–1.0	Fill	—*	—	—	—	18086	—
AAB5804	60-01019	0.0–1.0	Soil	20203	18086	18086	—	—	—
AAB5796	60-01021	0.0–1.0	Soil	—	—	—	—	18086	—
AAB5799	60-01024	0.0–1.0	Soil	—	—	—	—	18086	—
AAB5801	60-01025	0.0–1.0	Soil	20203	18086	18086	—	18086	—
AAB5806	60-01026	0.0–1.0	Soil	—	18086	—	—	18086	—
RC60-01-0003	60-10001	0.0–0.5	Fill	9408R	9407R	—	9407R	—	—
RC60-01-0004	60-10002	0.0–0.5	Fill	9408R	9407R	—	9407R	—	—
RC60-01-0005	60-10003	0.0–0.5	Fill	9408R	9407R	—	9407R	—	—
RC60-01-0006	60-10004	0.0–0.5	Fill	9408R	9407R	—	9407R	—	—
RC60-01-0007	60-10005	0.0–0.25	Fill	9408R	9407R	—	9407R	—	—
RC60-01-0008	60-10006	0.0–0.5	Fill	9408R	9407R	—	9407R	—	—

*— = Analyses not requested.

Table 7.5-2
Inorganic Chemicals above BVs at SWMU 60-007(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Thallium
Soil BV[a]				**0.83**	**295**	**0.4**	**6120**	**0.73**
Residential SSL[b]				**3.13E+01**	**1.56E+04**	**7.03E+01**	**na[c]**	**7.82E-01**
Industrial SSL[b]				**4.54E+02**	**2.23E+05**	**8.97E+02**	**na**	**1.14E+01**
Construction Worker SSL[b]				**1.24E+02**	**4.35E+03**	**2.77E+02**	**na**	**3.10E+00**
RE03-09-14246	03-608413	0.0–1.0	Soil	0.956 (J)	—[d]	0.53 (U)	—	—
RE03-09-14247	03-608413	2.0–3.0	Soil	1.07 (U)	—	0.555 (U)	—	—
RE03-09-14248	03-608413	4.0–5.0	Soil	1.67	—	—	—	—
RE03-09-14249	03-608414	0.0–1.0	Soil	1.02 (J)	—	0.553 (U)	—	—
RE03-09-14250	03-608414	2.0–3.0	Soil	1.66	—	0.536 (U)	—	—
RE03-09-14251	03-608414	4.0–5.0	Soil	1.1	—	0.548 (U)	—	—
RE03-09-14252	03-608415	0.0–1.0	Soil	0.989 (J)	—	—	—	—
RE03-09-14253	03-608415	2.0–3.0	Soil	1.44	—	0.546 (U)	—	—
RE03-09-14254	03-608415	4.0–5.0	Soil	1.51	—	0.522 (U)	6900	—
RE03-09-14255	03-608416	0.0–1.0	Soil	0.971 (J)	—	0.55 (U)	—	—
RE03-09-14256	03-608416	2.0–3.0	Soil	1.9	—	—	—	—
RE03-09-14257	03-608416	4.0–5.0	Soil	0.999	—	0.504 (U)	—	—
AAB5801	60-01025	0.0–1.0	Soil	—	331 (J-)	—	NA	—
RC60-01-0003	60-10001	0.0–0.5	Fill	—	—	—	—	0.75

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] na = Not available.

[d] — = Not detected or not detected above BV.

Table 7.5-3
Organic Chemicals Detected at SWMU 60-007(a)

Sample ID	Location ID	Depth (ft)	Media	Toluene	TPH-DRO	TPH-LRO
Residential SSL[a]				**5.27E+03**	**1.00E+03[b]**	**na[c]**
Industrial SSL[a]				**5.77E+04**	**1.80E+03[b]**	**na**
Construction Worker SSL[a]				**1.34E+04**	**na**	**na**
RE03-09-14246	03-608413	0.0–1.0	Soil	—[d]	4.64 (J)	NA[e]
RE03-09-14248	03-608413	4.0–5.0	Soil	—	2.99 (J)	NA
RE03-09-14249	03-608414	0.0–1.0	Soil	—	4.38 (J)	NA
RE03-09-14250	03-608414	2.0–3.0	Soil	—	2.92 (J)	NA
RE03-09-14251	03-608414	4.0–5.0	Soil	—	3.09 (J)	NA
RE03-09-14252	03-608415	0.0–1.0	Soil	—	6.46 (J)	NA
RE03-09-14253	03-608415	2.0–3.0	Soil	—	2.86 (J)	NA
RE03-09-14254	03-608415	4.0–5.0	Soil	—	3.5 (J)	NA
RE03-09-14255	03-608416	0.0–1.0	Soil	—	3.99 (J)	NA
RE03-09-14256	03-608416	2.0–3.0	Soil	—	3.33 (J)	NA
RE03-09-14257	03-608416	4.0–5.0	Soil	—	2.58 (J)	NA
AAB5799	60-01024	0.0–1.0	Soil	0.001 (J)	NA	NA
RC60-01-0003	60-10001	0.0–0.5	Fill	NA	—	130
RC60-01-0006	60-10004	0.0–0.5	Fill	NA	1100	—
RC60-01-0007	60-10005	0.0–0.25	Fill	NA	350	160
RC60-01-0008	60-10006	0.0–0.5	Fill	NA	—	41

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[c] na = Not available.

[d] — = Not detected.

[e] NA = Not analyzed.

Table 7.6-1
Samples Collected and Analyses Requested at SWMU 60-007(b)

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14265	03-608417	0–1	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14267	03-608418	0–0.5	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14269	03-608419	0–0.4	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14271	03-608420	0–0.5	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14273	03-608421	0–1	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14274	03-608421	1–2	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14275	03-608422	0–1	Soil	10-831	10-830	10-830	10-830	10-830	10-831
RE03-09-14276	03-608422	1–2	Soil	10-831	10-830	10-830	10-830	10-830	10-831
RE03-09-14277	03-608423	0–1	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14278	03-608423	1–2	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14279	03-608424	0–1	Soil	10-831	10-830	10-830	10-830	10-830	10-831
RE03-09-14280	03-608424	1–2	Qbt3	10-831	10-830	10-830	10-830	10-830	10-831
RE03-09-14281	03-608425	0–1	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14282	03-608425	1–2	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14283	03-608426	0–1	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14284	03-608426	1–2	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14285	03-608427	0–1	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14286	03-608427	1–2	Qbt3	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14287	03-608428	0–1	Soil	10-853	10-852	10-852	10-852	10-852	10-853
RE03-09-14288	03-608428	1–2	Soil	10-853	10-852	10-852	10-852	10-852	10-853

Table 7.6-2
Inorganic Chemicals above BVs at SWMU 60-007(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Lead	Potassium	Selenium	Sodium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**3500**	**0.3**	**2770**	**63.5**
Soil BV[a]				**29200**	**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**3460**	**1.52**	**915**	**48.8**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**1.56E+04**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**3.13E+03**	**4.00E+02**	**na**	**3.91E+02**	**na**	**2.35E+04**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**2.23E+05**	**8.97E+02**	**na**	**1.70E+06[d]**	**4.54E+04**	**8.00E+02**	**na**	**5.68E+03**	**na**	**3.41E+05**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**4.35E+03**	**2.77E+02**	**na**	**4.65E+05[d]**	**1.24E+04**	**8.00E+02**	**na**	**1.55E+03**	**na**	**9.29E+04**
RE03-09-14265	03-608417	0–1	Soil	—[e]	1.14 (U)	—	0.57 (U)	—	—	—	—	—	—	2240	—
RE03-09-14267	03-608418	0–0.5	Soil	—	1.1 (U)	—	0.548 (U)	—	—	38.9	—	—	—	4270	130
RE03-09-14269	03-608419	0–0.4	Soil	—	1.14 (U)	—	0.572 (U)	—	—	—	—	—	—	5710	—
RE03-09-14271	03-608420	0–0.5	Soil	—	1.14 (U)	—	0.572 (U)	—	—	—	—	3630	—	9420	55.8
RE03-09-14273	03-608421	0–1	Soil	—	1.08 (U)	—	0.539 (U)	—	—	—	—	—	—	—	—
RE03-09-14274	03-608421	1–2	Soil	—	1.03 (U)	—	0.516 (U)	—	—	—	—	—	—	—	—
RE03-09-14275	03-608422	0–1	Soil	—	1.18 (U)	—	—	—	—	—	22.6 (J)	—	—	—	101 (J)
RE03-09-14276	03-608422	1–2	Soil	—	1.1 (U)	—	0.55 (U)	—	—	—	—	—	—	—	—
RE03-09-14277	03-608423	0–1	Soil	—	1.11 (U)	—	0.42 (J)	7330	—	—	—	—	—	—	89.9
RE03-09-14278	03-608423	1–2	Soil	—	1.04 (U)	—	—	—	—	—	—	—	—	—	55.3
RE03-09-14279	03-608424	0–1	Soil	—	1.11 (U)	—	—	—	—	—	—	—	—	—	88.2 (J)
RE03-09-14280	03-608424	1–2	Qbt3	8660 (J)	1.12 (U)	93.7 (J+)	—	2370 (J)	9.14 (J)	6.02	12.5 (J)	—	1.12 (UJ)	—	—
RE03-09-14281	03-608425	0–1	Qbt3	—	1.12 (U)	—	—	—	—	—	—	—	1.15 (U)	—	64.4
RE03-09-14282	03-608425	1–2	Qbt3	—	1.12 (U)	—	—	—	23.5	—	—	—	1.14 (U)	—	—
RE03-09-14283	03-608426	0–1	Qbt3	—	1.21 (U)	—	—	—	—	—	—	—	1.16 (U)	—	—
RE03-09-14284	03-608426	1–2	Qbt3	—	1.1 (U)	—	—	—	—	—	—	—	1.14 (U)	—	—
RE03-09-14285	03-608427	0–1	Qbt3	—	1.11 (U)	—	—	—	—	—	—	—	1.14 (U)	—	—
RE03-09-14286	03-608427	1–2	Qbt3	—	1.14 (U)	—	—	—	—	—	—	—	1.14 (U)	—	—
RE03-09-14287	03-608428	0–1	Soil	—	1.09 (U)	—	0.543 (U)	—	—	—	—	—	—	—	—
RE03-09-14288	03-608428	1–2	Soil	—	1.04 (U)	—	0.518 (U)	—	—	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971).

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] — = Not detected or not detected above BV.

Table 7.6-3
Organic Chemicals Detected at SWMU 60-007(b)

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	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chloromethane
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**3.47E+02**	**2.75E+02**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**1.37E+03**	**1.29E+03**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**4.76E+03**	**2.41E+02**
RE03-09-14265	03-608417	0–1	Soil	—[c]	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14267	03-608418	0–0.5	Soil	—	0.00534 (J)	—	—	—	0.0313 (J)	0.0334 (J)	0.0517	0.0341 (J)	—	0.0812 (J)	—
RE03-09-14269	03-608419	0–0.4	Soil	—	0.00966 (J)	—	—	—	—	—	—	—	—	—	—
RE03-09-14271	03-608420	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14273	03-608421	0–1	Soil	—	—	—	—	0.0038	—	—	0.0214 (J)	—	—	—	0.0418
RE03-09-14274	03-608421	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14275	03-608422	0–1	Soil	—	—	0.0707 (J)	—	—	0.247	0.183	0.294	0.0925 (J)	0.131 (J)	0.389 (J)	—
RE03-09-14276	03-608422	1–2	Soil	—	—	0.0192 (J)	—	—	0.0602	0.0462	0.0714	0.0286 (J)	0.0298 (J)	0.12 (J)	—
RE03-09-14277	03-608423	0–1	Soil	0.0319 (J)	—	0.0577	—	—	0.218	0.216	0.352	0.096	0.13	0.1 (J)	—
RE03-09-14278	03-608423	1–2	Soil	0.0394	—	0.0748	—	—	0.162	0.156	0.218	0.072 (J)	0.0853	—	—
RE03-09-14279	03-608424	0–1	Soil	—	—	0.0162 (J)	—	—	0.0812	0.0862	0.155	0.0464	0.0555	—	—
RE03-09-14280	03-608424	1–2	Qbt3	—	—	—	—	—	0.0187 (J)	0.0126 (J)	0.0198 (J)	—	—	—	—
RE03-09-14281	03-608425	0–1	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14285	03-608427	0–1	Qbt3	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14287	03-608428	0–1	Soil	—	—	—	0.0033	0.0029 (J)	0.021 (J)	0.0221 (J)	0.033 (J)	—	0.0116 (J)	—	—
RE03-09-14288	03-608428	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—

Table 7.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	DDT[4,4'-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene	TPH-DRO	Trimethylbenzene[1,2,4-]
Residential SSL[a]				**1.48E+02**	**1.72E+01**	**2.29E+03**	**2.29E+03**	**1.48E+00**	**2.43E+03[d]**	**1.83E+03**	**1.72E+03**	**5.27E+03**	**1.00E+03[e]**	**6.20E+01[f]**
Industrial SSL[a]				**2.34E+03**	**7.81E+01**	**2.44E+04**	**2.44E+04**	**2.34E+01**	**1.45E+04[d]**	**2.05E+04**	**1.83E+04**	**5.77E+04**	**1.80E+03[e]**	**2.60E+02[f]**
Construction Worker SSL[a]				**2.06E+04**	**1.42E+02**	**8.91E+03**	**8.91E+03**	**2.13E+02**	**2.81E+03[d]**	**7.15E+03**	**6.68E+03**	**1.34E+04**	**na[g]**	**6.88E+02[h]**
RE03-09-14265	03-608417	0–1	Soil	—	—	—	—	—	—	—	—	—	79 (J)	—
RE03-09-14267	03-608418	0–0.5	Soil	0.0468	—	0.0422	—	0.0269 (J)	—	—	0.0576	—	136 (J)	—
RE03-09-14269	03-608419	0–0.4	Soil	—	—	—	—	—	—	—	—	—	57.2 (J)	—
RE03-09-14271	03-608420	0–0.5	Soil	—	—	—	—	—	—	—	—	—	71.5 (J)	—
RE03-09-14273	03-608421	0–1	Soil	—	—	0.0188 (J)	—	—	—	0.0118 (J)	0.0228 (J)	—	43.3	—
RE03-09-14274	03-608421	1–2	Soil	—	—	—	—	—	—	—	—	—	3.19 (J)	—
RE03-09-14275	03-608422	0–1	Soil	0.246	—	0.537	—	0.254	0.000537 (J)	0.393	0.489	0.00103 (J)	63.5 (J)	—
RE03-09-14276	03-608422	1–2	Soil	0.0594	—	0.14	0.0122 (J)	0.065	—	0.112	0.135	—	18	—
RE03-09-14277	03-608423	0–1	Soil	0.258	0.019 (J)	0.533	0.0315 (J)	0.103 (J)	—	0.37	0.591 (J)	—	78.8	—
RE03-09-14278	03-608423	1–2	Soil	0.176	0.0217 (J)	0.402	0.0426	0.0729 (J)	—	0.381	0.435	0.000425 (J)	31.4	—
RE03-09-14279	03-608424	0–1	Soil	0.12	—	0.227	—	0.0802	—	0.108	0.212	—	43.6 (J)	—
RE03-09-14280	03-608424	1–2	Qbt3	0.0128 (J)	—	0.0273 (J)	—	0.0473	—	—	0.0257 (J)	—	16.3	—
RE03-09-14281	03-608425	0–1	Qbt3	—	—	—	—	—	—	—	—	—	5.82 (J)	—
RE03-09-14285	03-608427	0–1	Qbt3	—	—	—	—	—	—	—	—	—	3.79 (J)	0.000413 (J)
RE03-09-14287	03-608428	0–1	Soil	0.0287 (J)	—	0.0517	—	—	—	0.0284 (J)	0.0505	—	19.4	—
RE03-09-14288	03-608428	1–2	Soil	—	—	—	—	—	—	—	—	—	5.2 (J)	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

[c] — = Not detected.

[d] Isopropylbenzene used as a surrogate based on structural similarity.

[e] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] na = Not available.

[h] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table 8.2-1
Samples Collected and Analyses Requested at AOC C-61-002

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE03-09-14300	03-608429	3.0–4.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14301	03-608429	5.0–6.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14302	03-608429	7.0–8.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14303	03-608429	9.0–10.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14304	03-608429	11.0–12.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14305	03-608429	14.0–15.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14306	03-608430	3.0–4.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14307	03-608430	5.0–6.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14308	03-608430	7.0–8.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14309	03-608430	9.0–10.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14310	03-608430	11.0–12.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14311	03-608430	14.0–15.0	Soil	10-345	10-344	10-344	10-344	10-344	10-345
RE03-09-14312	03-608431	3.0–4.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14313	03-608431	5.0–6.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14314	03-608431	7.0–8.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14315	03-608431	9.0–10.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14316	03-608431	11.0–12.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14317	03-608431	14.0–15.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14318	03-608432	3.0–4.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14319	03-608432	5.0–6.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14320	03-608432	7.0–8.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14321	03-608432	9.0–10.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14322	03-608432	11.0–12.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14323	03-608432	14.0–15.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14324	03-608433	3.0–4.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14325	03-608433	5.0–6.0	Soil	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14326	03-608433	7.0–8.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14327	03-608433	9.0–10.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14328	03-608433	11.0–12.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360
RE03-09-14329	03-608433	14.0–15.0	Qbt3	10-360	10-359	10-359	10-359	10-359	10-360

Table 8.2-2
Inorganic Chemicals above BVs at AOC C-61-002

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Mercury	Nickel	Selenium	Thallium	Vanadium
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1.1**	**17**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**0.73**	**39.6**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**2.35E+01**	**1.56E+03**	**3.91E+02**	**7.82E-01**	**3.91E+02**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**1.77E+01**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**3.41E+02**	**2.25E+04**	**5.68E+03**	**1.14E+01**	**5.68E+03**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**9.29E+01**	**6.19E+03**	**1.55E+03**	**3.10E+00**	**1.55E+03**
RE03-09-14300	03-608429	3.0–4.0	Soil	—[g]	1.09 (U)	—	—	—	0.547 (U)	—	—	11.4	—	—	—	—	—	—	—	—	—
RE03-09-14301	03-608429	5.0–6.0	Soil	—	1.13 (U)	—	—	—	0.567 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14302	03-608429	7.0–8.0	Soil	—	1.11 (U)	—	—	—	0.557 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14303	03-608429	9.0–10.0	Soil	—	1.11 (U)	—	—	—	0.556 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14304	03-608429	11.0–12.0	Soil	—	1.06 (U)	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14305	03-608429	14.0–15.0	Soil	—	1.09 (U)	—	—	—	0.546 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14306	03-608430	3.0–4.0	Soil	—	1.15 (U)	—	554	2.06	0.576 (U)	6630 (J+)	—	20.9	—	—	—	—	—	16	2.32 (U)	—	—
RE03-09-14307	03-608430	5.0–6.0	Soil	—	1.12 (U)	—	—	—	0.559 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14308	03-608430	7.0–8.0	Soil	—	1.08 (U)	—	—	—	0.539 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14309	03-608430	9.0–10.0	Soil	—	1.1 (U)	—	—	—	0.552 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14310	03-608430	11.0–12.0	Soil	—	1.08 (U)	—	—	—	0.54 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14311	03-608430	14.0–15.0	Soil	—	1.1 (U)	—	—	—	0.55 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14312	03-608431	3.0–4.0	Soil	—	—	—	—	—	0.659 (U)	6960	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14313	03-608431	5.0–6.0	Soil	—	1.27 (U)	—	—	1.84	0.636 (U)	—	—	—	—	—	—	—	—	—	2.45 (UJ)	—	—
RE03-09-14314	03-608431	7.0–8.0	Soil	—	1.24 (U)	—	992	2.16	—	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14315	03-608431	9.0–10.0	Soil	—	1.16 (U)	—	—	—	0.578 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE03-09-14316	03-608431	11.0–12.0	Qbt3	11,200	1.17 (U)	—	99.2	1.26	—	2220	—	—	5.98	—	—	—	—	—	1.13 (UJ)	—	—
RE03-09-14317	03-608431	14.0–15.0	Qbt3	10,300	0.861 (J)	—	66.8	—	—	2890	—	—	6.05	—	—	1860	—	—	1.16 (UJ)	—	—
RE03-09-14318	03-608432	3.0–4.0	Soil	—	1.14 (J)	—	—	—	—	7520	—	—	—	—	27.6	—	—	—	2.56 (UJ)	1.27	—
RE03-09-14319	03-608432	5.0–6.0	Qbt3	—	1.11 (U)	—	83.3	—	—	—	—	—	—	25,600	—	—	—	—	1.07 (UJ)	—	—
RE03-09-14320	03-608432	7.0–8.0	Qbt3	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.11 (UJ)	—	—
RE03-09-14321	03-608432	9.0–10.0	Qbt3	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.16 (UJ)	—	—
RE03-09-14322	03-608432	11.0–12.0	Qbt3	—	1.15	—	—	—	—	—	—	—	—	—	—	—	—	—	1.13 (UJ)	—	—
RE03-09-14323	03-608432	14.0–15.0	Qbt3	—	0.506 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.12 (UJ)	—	—
RE03-09-14324	03-608433	3.0–4.0	Soil	—	0.92 (J)	—	—	—	—	—	—	—	—	—	23.1	—	—	—	—	—	—
RE03-09-14325	03-608433	5.0–6.0	Soil	—	1.75	—	—	2.22	—	13,100	—	11.2	—	—	22.8	—	—	19.8	—	1.09	—
RE03-09-14326	03-608433	7.0–8.0	Qbt3	19,900	1.2 (J)	4.61 (J-)	288	1.83	—	6350	13.5	5.69	14	19,800	19.4	4430	0.121	17.6	1.34 (UJ)	—	26.4
RE03-09-14327	03-608433	9.0–10.0	Qbt3	—	1.54	—	181	—	—	10,200	—	—	—	—	—	—	0.123	7.31	1.18 (UJ)	—	—

Table 8.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Mercury	Nickel	Selenium	Thallium	Vanadium
Qbt3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1.1**	**17**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**0.73**	**39.6**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**2.35E+01**	**1.56E+03**	**3.91E+02**	**7.82E-01**	**3.91E+02**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**1.77E+01**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**3.41E+02**	**2.25E+04**	**5.68E+03**	**1.14E+01**	**5.68E+03**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**9.29E+01**	**6.19E+03**	**1.55E+03**	**3.10E+00**	**1.55E+03**
RE03-09-14328	03-608433	11.0–12.0	Qbt3	—	0.514 (J)	—	59.9	—	—	3220	—	—	—	23,900	—	—	—	—	1.17 (UJ)	—	—
RE03-09-14329	03-608433	14.0–15.0	Qbt3	—	0.603 (J)	—	76.7	1.25	—	3320	—	—	4.77	—	—	—	—	8.4	1.19 (UJ)	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 8.2-3
Organic Chemicals Detected at AOC C-61-002

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Benzoic Acid	TPH-DRO
Residential SSL[a]				**6.66E+04**	**1.12E+00**	**2.40E+05[b]**	**1.00E+03[c]**
Industrial SSL[a]				**8.68E+05**	**8.26E+00**	**2.50E+06[b]**	**1.80E+03[c]**
Construction Worker SSL[a]				**2.21E+05**	**4.36E+00**	**9.52E+05[d]**	**na[e]**
RE03-09-14300	03-608429	3.0–4.0	Soil	—[f]	—	—	3.05 (J)
RE03-09-14301	03-608429	5.0–6.0	Soil	—	—	0.445 (J)	3.61 (J)
RE03-09-14303	03-608429	9.0–10.0	Soil	—	—	—	3.23 (J)
RE03-09-14304	03-608429	11.0–12.0	Soil	—	—	—	9.38 (J)
RE03-09-14305	03-608429	14.0–15.0	Soil	—	0.0021 (J)	—	2.94 (J)
RE03-09-14307	03-608430	5.0–6.0	Soil	—	—	—	4.58 (J)
RE03-09-14309	03-608430	9.0–10.0	Soil	—	—	—	2.72 (J)
RE03-09-14310	03-608430	11.0–12.0	Soil	—	—	—	2.7 (J)
RE03-09-14311	03-608430	14.0–15.0	Soil	—	—	—	2.8 (J)
RE03-09-14312	03-608431	3.0–4.0	Soil	0.00229 (J)	—	—	—
RE03-09-14313	03-608431	5.0–6.0	Soil	—	—	—	3.98 (J)
RE03-09-14315	03-608431	9.0–10.0	Soil	—	—	—	2.74 (J)
RE03-09-14317	03-608431	14.0–15.0	Qbt3	0.002 (J)	—	—	—
RE03-09-14321	03-608432	9.0–10.0	Qbt3	—	—	—	4.88 (J)
RE03-09-14322	03-608432	11.0–12.0	Qbt3	0.00246 (J)	—	—	—
RE03-09-14324	03-608433	3.0–4.0	Soil	0.00528 (J)	—	—	1450
RE03-09-14327	03-608433	9.0–10.0	Qbt3	0.006 (J)	—	—	—
RE03-09-14328	03-608433	11.0–12.0	Qbt3	0.0034 (J)	—	—	—
RE03-09-14329	03-608433	14.0–15.0	Qbt3	0.00231 (J)	—	—	11.1

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Screening guidelines for diesel No. 2 from NMED (2012, 219971).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] na = Not available.

[f] — = Not detected.

Table 8.3-1
Summary of Characterization and
Confirmation Samples Collected and Analyses Performed during the ACA at SWMU 61-002

Location ID	Sample ID	Depth (ft)	Media	Excavated? (Yes/No)	Analytical Suites Requested (by Request Number)					
					TAL Metals	PCBs	SVOCs	VOCs	TPH-DRO	TPH-GRO
61-24310	RE61-05-58614	1.5–2.0	Soil	No	3019S	3018S	3018S	3018S	—*	—
61-24310	RE61-05-58615	3.0–3.5	Soil	No	3019S	3018S	3018S	3018S	—	—
61-24311	RE61-05-58616	1.5–2.0	Soil	No	3019S	3018S	3018S	3018S	—	—
61-24311	RE61-05-58719	2.5–3.0	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24311	RE61-05-58720	5.0–5.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24312	RE61-05-58618	1.5–2.0	Soil	No	3019S	3018S	3018S	3018S	—	—
61-24312	RE61-05-58717	2.5–3.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24312	RE61-05-58718	5.0–5.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24313	RE61-05-58620	1.5–2.0	Soil	Yes	3019S	3018S	3018S	3018S	—	—
61-24313	RE61-05-58621	3.0–3.5	Soil	Yes	3019S	3018S	3018S	3018S	—	—
61-24313	RE61-05-58711	4.0–4.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24313	RE61-05-58723	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24314	RE61-05-58622	1.5–2.0	Soil	No	3019S	3018S	3018S	3018S	—	—
61-24314	RE61-05-58623	3.0–3.5	Soil	No	3019S	3018S	3018S	3018S	—	—
61-24315	RE61-05-58624	1.5–2.0	Soil	No	3025S	3024S	3024S	3024S	—	—
61-24315	RE61-05-58715	3.0–3.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24315	RE61-05-58716	5.0–5.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24316	RE61-05-58626	1.5–2.0	Soil	No	3025S	3024S	3024S	3024S	—	—
61-24316	RE61-05-58713	2.5–3.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24316	RE61-05-58714	5.0–5.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24317	RE61-05-58628	1.5–2.0	Soil	Yes	3025S	3024S	3024S	3024S	—	—
61-24317	RE61-05-58629	3.0–3.5	Soil	Yes	3025S	3024S	3024S	3024S	—	—
61-24317	RE61-05-58712	4.0–4.5	Soil	No	3773S	3772S	3772S	3772S	—	—
61-24317	RE61-05-58721	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24318	RE61-05-58630	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24318	RE61-05-58631	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24319	RE61-05-58632	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24319	RE61-05-58633	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24320	RE61-05-58634	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24320	RE61-05-58635	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24320	RE61-05-58724	2.5–3.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24320	RE61-05-58722	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24321	RE61-05-58636	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24321	RE61-05-58637	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—

Table 8.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Excavated? (Yes/No)	Analytical Suites Requested (by Request Number)					
					TAL Metals	PCBs	SVOCs	VOCs	TPH-DRO	TPH-GRO
61-24321	RE61-05-58725	2.5–3.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24321	RE61-05-58732	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24322	RE61-05-58638	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24322	RE61-05-58639	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24322	RE61-05-58727	2.5–3.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24322	RE61-05-58726	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24323	RE61-05-58640	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24323	RE61-05-58641	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24323	RE61-05-58728	2.5–3.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24323	RE61-05-58729	5.5–6.0	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24324	RE61-05-58642	0.0–0.5	Soil	No	3043S	3042S	3042S	3042S	—	—
61-24324	RE61-05-58643	1.5–2.0	Soil	No	3043S	3042S	3042S	3042S	—	—
61-24325	RE61-05-58644	0.0–0.5	Soil	No	3043S	3042S	3042S	3042S	—	—
61-24325	RE61-05-58645	1.5–2.0	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24326	RE61-05-58646	0.0–0.5	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24326	RE61-05-58647	1.0–1.5	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24327	RE61-05-58648	0.0–0.5	Fill	No	3043S	3042S	3042S	3042S	—	—
61-24327	RE61-05-58649	1.0–1.5	Fill	No	3043S	3042S	3042S	3042S	—	—
61-24327	RE61-05-58730	1.5–2.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24327	RE61-05-58731	2.5–3.5	Soil	No	3780S	3779S	3779S	3779S	—	—
61-24328	RE61-05-58650	0.0–0.5	Fill	No	3043S	3042S	3042S	3042S	—	—
61-24328	RE61-05-58651	1.5–2.0	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24329	RE61-05-58652	0.0–0.5	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24329	RE61-05-58653	1.5–2.0	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24330	RE61-05-58654	0.0–0.5	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24330	RE61-05-58655	1.5–2.0	Qbt 4	No	3043S	3042S	3042S	3042S	—	—
61-24331	RE61-05-58656	0.0–0.5	Soil	No	3043S	3042S	3042S	3042S	—	—
61-24331	RE61-05-58657	1.5–2.0	Soil	No	3043S	3042S	3042S	3042S	—	—
61-24332	RE61-05-58658	0.0–0.5	Soil	No	3025S	3024S	3024S	3024S	—	—
61-24332	RE61-05-58659	1.5–2.0	Soil	No	3025S	3024S	3024S	3024S	—	—
61-24332	RE61-05-58664	2.5–3.0	Soil	No	3025S	3024S	3024S	3024S	—	—
61-24333	RE61-05-58660	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24333	RE61-05-58661	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24333	RE61-05-58665	2.5–3.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24334	RE61-05-58662	0.0–0.5	Soil	No	3031S	3030S	3030S	3030S	—	—

Table 8.3-1 (continued)

61-24334	RE61-05-58663	1.5–2.0	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24334	RE61-05-58666	3.0–3.5	Soil	No	3031S	3030S	3030S	3030S	—	—
61-24346	RE61-05-58734	4.5–5.0	Soil	No	3836S	3835S	3835S	3835S	3835S	3835S
61-24346	RE61-05-58733	5.5–6.0	Soil	No	3836S	3835S	3835S	3835S	3835S	3835S
61-24347	RE61-05-58735	4.5–5.0	Soil	No	3836S	3835S	3835S	3835S	3835S	3835S
61-24347	RE61-05-58736	5.5–6.0	Soil	No	3836S	3835S	3835S	3835S	3835S	3835S
61-24351	RE61-05-58743	12–12.5	Soil	No	3905S	3905S	3905S	3905S	3905S	3905S
61-24351	RE61-05-58744	19–19.5	Qbt 4	No	3905S	3905S	3905S	3905S	3905S	3905S
61-24352	RE61-05-58745	10–10.5	Soil	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24352	RE61-05-58746	17–17.5	Soil	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24353	RE61-05-58747	10–10.5	Soil	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24353	RE61-05-58748	17.6–18.1	Soil	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24354	RE61-05-58749	10–10.5	Soil	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24354	RE61-05-58750	17.2–17.7	Qbt 4	No	3917S	3916S	3916S	3916S	3916S	3916S
61-24513	RE61-05-59118	0.0–0.5	Soil	No	3322S	3321S	3321S	3321S	—	—
61-24513	RE61-05-59119	1.5–2.0	Soil	No	3322S	3321S	3321S	3321S	—	—
61-24514	RE61-05-59122	0.0–0.5	Soil	No	3322S	3321S	3321S	3321S	—	—
61-24514	RE61-05-59123	1.5–2.0	Soil	No	3322S	3321S	3321S	3321S	—	—
61-24515	RE61-05-59126	0.0–0.5	Soil	No	3322S	3321S	3321S	3321S	—	—
61-24515	RE61-05-59127	1.5–2.0	Soil	No	3322S	3321S	3321S	3321S	—	—
61-26619	RE61-06-71529	23–25	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26620	RE61-06-71532	5.0–7.0	Soil	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26620	RE61-06-71531	23–25	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26621	RE61-06-71534	28–30	Qbt 4	No	5746S	5745S	5745S	5745S	5745S	5745S
61-26621	RE61-06-71533	93–95	Qbt 4	No	5746S	5745S	5745S	5745S	5745S	5745S
61-26622	RE61-06-71535	15–17	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26622	RE61-06-71536	23–25	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26623	RE61-06-71537	38–40	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26623	RE61-06-71538	53–55	Qbt 4	No	5733S	5732S	5732S	5732S	5732S	5732S
61-26985	RE61-06-73161	15–17	Qbt 4	No	5744S	5743S	5743S	5743S	5743S	5743S
61-26985	RE61-06-73162	23–25	Qbt 4	No	5744S	5743S	5743S	5743S	5743S	5743S
61-26986	RE61-06-73166	10–12	Qbt 4	No	5744S	5743S	5743S	5743S	5743S	5743S
61-26986	RE61-06-73164	23–25	Qbt 4	No	5744S	5743S	5743S	5743S	5743S	5743S
61-26987	RE61-06-73168	13–15	Fill	No	6425S	6424S	6424S	6424S	6424S	6424S
61-26987	RE61-06-73167	23–25	Qbt 4	No	6425S	6424S	6424S	6424S	6424S	6424S

*— = Analyses not requested.

Table 8.3-2
Inorganic Chemicals above BVs at SWMU 61-002

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Mercury	Nickel	Selenium	Sodium	Zinc
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**	**0.1**	**6.58**	**0.3**	**2770**	**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**	**0.1**	**15.4**	**1.52**	**915**	**48.8**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**2.35E+01**	**1.56E+03**	**3.91E+02**	**na**	**2.35E+04**
Industrial SSL[b]				**1.13E+06**	**4.54E+02**	**1.77E+01**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**3.41E+02**	**2.25E+04**	**5.68E+03**	**na**	**3.41E+05**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**4.35E_03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**9.29E+01**	**6.19E+03**	**1.55E+03**	**na**	**9.29E+04**
RE61-05-58711	61-24313	4.5–5.0	Soil	—[g]	—	—	351 (J)	2.2	—	7380	—	—	—	—	—	—	—	26.2	—	—	—
RE61-05-58622	61-24314	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	48.4	—	—	—	—	—	—
RE61-05-58624	61-24315	1.5–2.0	Soil	—	—	—	—	—	—	7500	—	—	—	—	—	—	0.12	—	—	—	—
RE61-05-58715	61-24315	3.0–3.5	Soil	—	—	—	308	—	—	7760	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58716	61-24315	5.0–5.5	Soil	—	—	—	—	—	—	—	—	14.1	—	—	—	—	—	17	—	—	—
RE61-05-58713	61-24316	2.5–3.5	Soil	—	—	—	—	3.2	—	—	—		—	—	—	—	—	19	—	—	—
RE61-05-58712	61-24317	4.0–4.5	Soil	—	—	—	328	—	—	—	—	10.2	—	—	—	—	—	—	—	—	—
RE61-05-58630	61-24318	0.0–0.5	Soil	—	—	—	—	—	—	11,300 (J-)	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58631	61-24318	1.5–2.0	Soil	—	—	—	—	—	—	7530 (J-)	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58632	61-24319	0.0–0.5	Soil	—	—	—	—	—	—	11,600 (J-)	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58724	61-24320	2.5–3.5	Soil	—	—	—	—	—	—	—	—	9 (J+)	—	—	—	—	—	—	—	—	—
RE61-05-58732	61-24321	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	2.2	—	—	—	—
RE61-05-58643	61-24324	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	48.9
RE61-05-58645	61-24325	1.5–2.0	Qbt 4	—	0.55 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.54 (U)	—	—
RE61-05-58646	61-24326	0.0–0.5	Qbt 4	—	0.56 (UJ)	—	—	—	—	—	—	—	5.1	—	—	—	—	—	0.45 (U)	—	—
RE61-05-58647	61-24326	1.0–1.5	Qbt 4	—	0.57 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41 (U)	—	—
RE61-05-58651	61-24328	1.5–2.0	Qbt 4	—	0.61 (UJ)	—	—	—	—	—	—	—	5.5	—	—	—	—	—	0.81 (U)	—	—
RE61-05-58652	61-24329	0.0–0.5	Qbt 4	—	0.6 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31 (U)	—	—
RE61-05-58653	61-24329	1.5–2.0	Qbt 4	—	0.63 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83 (U)	—	—
RE61-05-58654	61-24330	0.0–0.5	Qbt 4	—	0.59 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.7 (U)	—	—
RE61-05-58655	61-24330	1.5–2.0	Qbt 4	—	0.61 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.46 (U)	—	—
RE61-05-58658	61-24332	0.0–0.5	Soil	—	—	—	—	—	0.96	—	—	—	—	—	42.6	—	—	—	—	—	555
RE61-05-58659	61-24332	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	51.9	—	—	—	—	—	89.5
RE61-05-58664	61-24332	2.5–3.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	189
RE61-05-58663	61-24334	1.5–2.0	Soil	—	—	—	—	—	—	7020 (J-)	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58666	61-24334	3.0–3.5	Soil	—	—	—	676	2.9	—	10,400 (J-)	—	—	—	—	—	—	—	25	1.7 (J-)	978	—
RE61-05-58734	61-24346	4.5–5.0	Soil	—	—	—	—	—	—	14,900	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58735	61-24347	4.5–5.0	Soil	—	—	—	—	2	—	—	—	—	—	—	—	—	0.15	16.5	—	—	—
RE61-05-58743	61-24351	12–12.5	Soil	—	—	—	326 (J-)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58745	61-24352	10–10.5	Soil	—	—	—	—	—	—	—	—	—	—	—	39.2	—	—	—	—	—	—
RE61-05-58746	61-24352	17–17.5	Soil	—	—	—	—	—	—	—	—	—	—	—	35.4	—	—	—	—	—	—

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	Mercury	Nickel	Selenium	Sodium	Zinc
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**	**0.1**	**6.58**	**0.3**	**2770**	**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**	**0.1**	**15.4**	**1.52**	**915**	**48.8**
Residential SSL[b]				**7.80E+04**	**3.13E+01**	**3.90E+00**	**1.56E+04**	**1.56E+02**	**7.03E+01**	**na[c]**	**1.17E+05[d]**	**2.30E+01[e]**	**3.13E+03**	**5.48E+04**	**4.00E+02**	**na**	**2.35E+01**	**1.56E+03**	**3.91E+02**	**na**	**2.35E+04**
Industrial SSL[b]				**1.13E+05**	**4.54E+02**	**1.77E+01**	**2.23E+05**	**2.26E+03**	**8.97E+02**	**na**	**1.70E+06[d]**	**3.00E+02[e]**	**4.54E+04**	**7.95E+05**	**8.00E+02**	**na**	**3.41E+02**	**2.25E+04**	**5.68E+03**	**na**	**3.41E+05**
Construction Worker SSL[b]				**4.07E+04**	**1.24E+02**	**5.30E+01**	**4.35E+03**	**1.44E+02**	**2.77E+02**	**na**	**4.65E+05[d]**	**3.46E+01[f]**	**1.24E+04**	**2.17E+05**	**8.00E+02**	**na**	**9.29E+01**	**6.19E+03**	**1.55E+03**	**na**	**9.29E+04**
RE61-05-59118	61-24513	0.0–0.5	Soil	—	—	—	—	—	0.44	—	—	—	—	—	—	—	—	—	—	—	96.5
RE61-05-59126	61-24515	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	21.5	—	38.5	—	0.11	—	—	—	88.6
RE61-06-71529	61-26619	23–25	Qbt 4	—	—	5.22	—	—	—	—	—	—	—	—	—	—	—	7.55	11.7	—	—
RE61-06-71532	61-26620	5.0–7.0	Soil	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	7.39	—	—
RE61-06-79531	61-26620	23–25	Qbt 4	29,500 (J+)	—	6.19	238	—	—	—	—	—	—	—	—	—	—	—	3.92	—	—
RE61-06-71534	61-26621	28–30	Qbt 4	—	—	3.02	—	—	—	—	—	—	—	—	26	—	—	—	1.6 (U)	—	—
RE61-06-71533	61-26621	93–95	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	17.6	—	—	—	1.47 (U)	—	—
RE61-06-71535	61-26622	15–17	Qbt 4	—	—	4.53	—	—	—	—	—	—	—	—	52.5	—	—	—	8.18	—	—
RE61-06-71536	61-26622	23–25	Qbt 4	—	—	4.5	—	—	2.9 (U)	—	—	—	—	16,400	45	—	—	—	15.2	—	—
RE61-06-71537	61-26623	38–40	Qbt 4	—	—	3.15	—	—	—	—	—	—	—	—	11.7	—	—	—	8.04	—	—
RE61-06-71538	61-26623	53–55	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—
RE61-06-73161	61-26985	15–17	Qbt 4	17,700 (J+)	—	—	109	—	—	—	—	—	5.16	—	—	1730	—	—	6.5	—	—
RE61-06-73162	61-26985	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.54	—	—
RE61-06-73166	61-26986	10–12	Qbt 4	20,700 (J+)	—	—	81	—	—	—	8.09	—	7.34	—	15.4	2370	—	—	9.41	—	—
RE61-06-73164	61-26986	23–25	Qbt 4	—	—	6.46	—	—	—	—	—	—	—	—	—	—	—	—	5.86	—	—
RE61-06-73167	61-26987	23–25	Qbt 4	10,200 (J+)	—	—	95	—	—	—	—	—	—	—	—	—	—	—	1.62 (U)	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] SSLs from NMED (2012, 219971) unless otherwise noted.

[c] na = Not available.

[d] SSL for trivalent chromium.

[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] — = Not detected or not detected above BV.

Table 8.3-3
Organic Chemicals Detected at SWMU 61-002

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzene[n-]	Butylbenzene[sec-]
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.54E+01**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**2.40E+05[c]**	**3.47E+02**	**3.71E+04**	**3.90E+03[c]**	**3.90E+03[c,d]**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.47E+01**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.50E+06[c]**	**1.37E+03**	**3.75E+05**	**5.10E+04[c]**	**5.10E+04[c,d]**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**1.38E+02**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**9.52E+05[e]**	**4.76E+03**	**8.43E+04**	**1.55E+04[e]**	**1.55E+04**
RE61-05-58614	61-24310	1.5–2.0	Soil	—[f]	—	—	—	0.2 (J)	—	—	—	—	—	—	—	—	—	0.00054 (J)	—
RE61-05-58615	61-24310	3.0–3.5	Soil	—	—	—	—	0.13 (J)	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58616	61-24311	1.5–2.0	Soil	—	—	—	0.082 (J+)	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58618	61-24312	1.5–2.0	Soil	—	—	—	0.45	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58717	61-24312	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58718	61-24312	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58711	61-24313	4.0–4.5	Soil	—	—	—	0.28	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58622	61-24314	1.5–2.0	Soil	—	—	—	2.4	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58623	61-24314	3.0–3.5	Soil	—	0.025	—	0.44	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58624	61-24315	1.5–2.0	Soil	—	—	—	—	—	0.0045 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58715	61-24315	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58716	61-24315	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58626	61-24316	1.5–2.0	Soil	—	—	—	11	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58713	61-24316	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58714	61-24316	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58712	61-24317	4.0–4.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58630	61-24318	0.0–0.5	Soil	—	0.059	—	—	—	—	0.18 (J-)	0.16 (J-)	0.13 (J-)	—	0.17 (J-)	0.28 (J-)	—	—	—	—
RE61-05-58631	61-24318	1.5–2.0	Soil	—	0.045	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58632	61-24319	0.0–0.5	Soil	—	—	—	—	0.08	0.0012 (J)	0.1 (J-)	0.096 (J-)	0.082 (J-)	—	0.11 (J-)	—	—	0.012 (J)	—	—
RE61-05-58633	61-24319	1.5–2.0	Soil	—	0.023 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58634	61-24320	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58635	61-24320	1.5–2.0	Soil	—	0.029	—	—	0.13	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58724	61-24320	2.5–3.5	Soil	0.16 (J)	—	0.3 (J)	—	0.081	—	0.59	0.52	0.39	0.34 (J)	0.54	—	—	—	—	—
RE61-05-58722	61-24320	5.5–6.0	Soil	—	—	—	—	0.049	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58636	61-24321	0.0–0.5	Soil	—	0.038	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58637	61-24321	1.5–2.0	Soil	—	0.035	—	—	0.5	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58725	61-24321	2.5–3.5	Soil	—	—	—	—	0.52	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58638	61-24322	0.0–0.5	Soil	—	0.087	—	—	0.27	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58639	61-24322	1.5–2.0	Soil	—	0.053	—	—	1.3	—	—	—	—	—	—	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzene[n-]	Butylbenzene[sec-]
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.54E+01**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**2.40E+05[c]**	**3.47E+02**	**3.71E+04**	**3.90E+03[c]**	**3.90E+03[c,d]**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.47E+01**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.50E+06[c]**	**1.37E+03**	**3.75E+05**	**5.10E+04[c]**	**5.10E+04[c,d]**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**1.38E+02**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**9.52E+05[e]**	**4.76E+03**	**8.43E+04**	**1.55E+04[e]**	**1.55E+04**
RE61-05-58727	61-24322	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58640	61-24323	0.0–0.5	Soil	—	4.5 (J-)	—	—	0.052	—	—	—	—	—	—	—	—	0.17	—	—
RE61-05-58641	61-24323	1.5–2.0	Soil	—	1 (J-)	—	—	0.11	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58642	61-24324	0.0–0.5	Soil	—	0.023 (J)	—	—	—	0.00028 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58643	61-24324	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	1.3 (J)	—	—	—
RE61-05-58644	61-24325	0.0–0.5	Soil	—	0.17	—	—	—	0.0011 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58645	61-24325	1.5–2.0	Qbt 4	—	0.05	—	—	—	0.00029 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58646	61-24326	0.0–0.5	Qbt 4	—	0.059	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58647	61-24326	1.0–1.5	Qbt 4	—	0.064	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58648	61-24327	0.0–0.5	Fill	—	0.06	—	—	0.096	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58649	61-24327	1.0–1.5	Fill	—	0.032	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58730	61-24327	1.5–2.5	Soil	—	—	—	0.11	0.067	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58650	61-24328	0.0–0.5	Fill	—	0.26 (J)	—	—	0.13	—	—	—	—	—	—	0.15 (J)	—	—	—	—
RE61-05-58651	61-24328	1.5–2.0	Qbt 4	—	0.075	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58652	61-24329	0.0–0.5	Qbt 4	—	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58653	61-24329	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58654	61-24330	0.0–0.5	Qbt 4	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58655	61-24330	1.5–2.0	Qbt 4	—	0.024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58656	61-24331	0.0–0.5	Soil	—	0.083	—	—	—	0.00063 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58657	61-24331	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58658	61-24332	0.0–0.5	Soil	—	—	—	0.47	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58659	61-24332	1.5–2.0	Soil	—	—	—	—	0.13	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58664	61-24332	2.5–3.0	Soil	—	—	—	0.052	0.067	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58660	61-24333	0.0–0.5	Soil	—	0.054	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58661	61-24333	1.5–2.0	Soil	—	0.063	—	0.33	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58665	61-24333	2.5–3.0	Soil	—	0.032	—	0.22	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58662	61-24334	0.0–0.5	Soil	—	0.75 (J-)	—	—	0.068	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58663	61-24334	1.5–2.0	Soil	—	0.093	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58666	61-24334	3.0–3.5	Soil	—	0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58734	61-24346	4.5–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzene[n-]	Butylbenzene[sec-]
Residential SSL[a]				**3.44E+03**	**6.66E+04**	**1.72E+04**	**1.12E+00**	**2.22E+00**	**1.54E+01**	**1.48E+00**	**1.48E-01**	**1.48E+00**	**1.72E+03[b]**	**1.48E+01**	**2.40E+05[c]**	**3.47E+02**	**3.71E+04**	**3.90E+03[c]**	**3.90E+03[c,d]**
Industrial SSL[a]				**3.67E+04**	**8.68E+05**	**1.83E+05**	**8.26E+00**	**8.26E+00**	**8.47E+01**	**2.34E+01**	**2.34E+00**	**2.34E+01**	**1.83E+04[b]**	**2.34E+02**	**2.50E+06[c]**	**1.37E+03**	**3.75E+05**	**5.10E+04[c]**	**5.10E+04[c,d]**
Construction Worker SSL[a]				**1.86E+04**	**2.21E+05**	**6.68E+04**	**4.36E+00**	**7.58E+01**	**1.38E+02**	**2.13E+02**	**2.13E+01**	**2.13E+02**	**6.68E+03[b]**	**2.06E+03**	**9.52E+05[e]**	**4.76E+03**	**8.43E+04**	**1.55E+04[e]**	**1.55E+04**
RE61-05-58733	61-24346	5.5–6.0	Soil	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58735	61-24347	4.5–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58736	61-24347	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58743	61-24351	12–12.5	Soil	—	0.59	—	—	—	—	—	—	—	—	—	—	—	0.11	—	—
RE61-05-58744	61-24351	19–19.5	Qbt 4	—	0.39	—	—	—	—	—	—	—	—	—	—	—	0.11	—	—
RE61-05-58745	61-24352	10–10.5	Soil	—	—	—	—	—	27	—	—	—	—	—	—	—	—	—	—
RE61-05-58746	61-24352	17–17.5	Soil	—	2.4 (J)	—	—	—	0.11 (J)	—	—	—	—	—	—	—	—	—	—
RE61-05-58748	61-24353	17.6–18.1	Soil	—	—	—	—	—	—	—	—	—	—	—	0.23 (J)	—	0.15	—	—
RE61-05-58750	61-24354	17.2–17.7	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	—	—
RE61-05-59118	61-24513	0.0–0.5	Soil	—	0.018 (J)	—	0.08	0.029 (J)	—	—	—	—	—	—	—	0.34	0.0039 (J)	—	—
RE61-05-59119	61-24513	1.5–2.0	Soil	—	0.0055 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59122	61-24514	0.0–0.5	Soil	—	0.0057 (J)	—	0.2	—	—	—	—	—	—	—	—	—	0.0015 (J)	—	—
RE61-05-59123	61-24514	1.5–2.0	Soil	—	0.014 (J)	—	—	—	—	—	—	—	—	—	—	—	0.0012 (J)	—	—
RE61-05-59126	61-24515	0.0–0.5	Soil	—	0.038	—	—	0.1	—	—	—	—	—	—	—	—	0.01 (J)	—	—
RE61-05-59127	61-24515	1.5–2.0	Soil	—	0.028	—	—	—	—	—	—	—	—	—	—	—	0.0054 (J)	—	—
RE61-06-71529	61-26619	23–25	Qbt 4	—	0.045 (J+)	—	—	—	—	—	—	—	—	—	—	—	0.00565 (J)	—	—
RE61-06-71532	61-26620	5.0–7.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71531	61-26620	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71534	61-26621	28–30	Qbt 4	—	0.447	—	—	—	—	—	—	—	—	—	—	—	0.221	—	—
RE61-06-71533	61-26621	93–95	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71535	61-26622	15–17	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.4
RE61-06-71536	61-26622	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.74
RE61-06-71537	61-26623	38–40	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71538	61-26623	53–55	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73161	61-26985	15–17	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73162	61-26985	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73164	61-26986	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73168	61-26987	13–15	Qbt 4	—	—	—	0.00642	—	—	—	—	—	—	—	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chlorobenzene	Chloroethane	Chloromethane	Chrysene	Di-n-octyl phthalate	Dibromo-3-chloropropane[1,2-]	Dibromoethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dichloroethene[cis/trans 1,2-]	Ethylbenzene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno[1,2,3-cd]pyrene	Isopropylbenzene	Isopropyltoluene[4-]
Residential SSL[a]				**2.60E+03[c]**	**3.76E+02**	**2.98E+04**	**2.75E+02**	**1.48E+02**	**7.30E+02[c]**	**1.86E+00**	**5.88E-01**	**2.31E+03**	**3.17E+01**	**1.56E+02[g]**	**6.84E+01**	**2.29E+03**	**2.29E+03**	**2.10E+02[c]**	**1.48E+00**	**2.43E+03**	**2.43E+03[h]**
Industrial SSL[a]				**9.10E+03[c]**	**2.12E+03**	**1.41E+05**	**1.29E+03**	**2.34E+03**	**7.40E+03[c]**	**1.08E+00**	**3.22E+00**	**1.40E+04**	**1.77E+02**	**2.27E+03[g]**	**3.78E+02**	**2.44E+04**	**2.44E+04**	**1.40E+03[c]**	**2.34E+01**	**1.45E+04**	**1.45E+04[h]**
Construction Worker SSL[a]				**4.76E+04[e]**	**4.06E+02**	**2.61E+04**	**2.41E+02**	**2.06E+04**	**3.72E+03[e]**	**5.07E+00**	**1.60E+00**	**2.71E+03**	**8.31E+02**	**6.19E+02[g]**	**1.83E+03**	**8.91E+03**	**8.91E+03**	**1.54E+03[e]**	**2.13E+02**	**2.81E+03**	**2.81E+03[h]**
RE61-05-58614	61-24310	1.5–2.0	Soil	—	—	—	0.021	—	—	0.0015 (J)	—	0.00074 (J)	—	—	—	—	—	—	—	—	—
RE61-05-58615	61-24310	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58616	61-24311	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58618	61-24312	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58717	61-24312	2.5–3.5	Soil	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58718	61-24312	5.0–5.5	Soil	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58711	61-24313	4.0–4.5	Soil	—	—	—	0.0049 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58622	61-24314	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58623	61-24314	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58624	61-24315	1.5–2.0	Soil	—	0.13	—	—	—	—	—	—	0.066	0.069	—	—	—	—	—	—	—	—
RE61-05-58715	61-24315	3.0–3.5	Soil	—	—	—	0.0029 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58716	61-24315	5.0–5.5	Soil	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58626	61-24316	1.5–2.0	Soil	—	0.029	—	—	—	—	—	—	0.013	—	—	—	—	—	—	—	—	—
RE61-05-58713	61-24316	2.5–3.5	Soil	—	—	—	0.0029 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58714	61-24316	5.0–5.5	Soil	—	—	—	0.0021 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58712	61-24317	4.0–4.5	Soil	—	—	—	0.0036 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58630	61-24318	0.0–0.5	Soil	—	—	—	—	0.18 (J-)	—	—	—	—	—	—	—	0.43 (J-)	—	—	0.11 (J-)	—	—
RE61-05-58631	61-24318	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58632	61-24319	0.0–0.5	Soil	0.17 (J-)	—	—	—	0.11 (J-)	—	—	—	—	—	—	—	0.22 (J-)	—	—	—	—	—
RE61-05-58633	61-24319	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.14 (J-)	—	—	—	—	—
RE61-05-58634	61-24320	0.0–0.5	Soil	0.66 (J-)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58635	61-24320	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.083 (J-)	—	—	—	—	—
RE61-05-58724	61-24320	2.5–3.5	Soil	—	—	—	—	0.67	—	—	—	—	—	—	—	1.7	0.16 (J)	—	0.37 (J)	—	—
RE61-05-58722	61-24320	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58636	61-24321	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58637	61-24321	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58725	61-24321	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58638	61-24322	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58639	61-24322	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58727	61-24322	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.12 (J)	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chlorobenzene	Chloroethane	Chloromethane	Chrysene	Di-n-octyl phthalate	Dibromo-3-chloropropane[1,2-]	Dibromoethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dichloroethene[cis/trans 1,2-]	Ethylbenzene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno[1,2,3-cd]pyrene	Isopropylbenzene	Isopropyltoluene[4-]
Residential SSL[a]				**2.60E+03[c]**	**3.76E+02**	**2.98E+04**	**2.75E+02**	**1.48E+02**	**7.30E+02[c]**	**1.86E+00**	**5.88E-01**	**2.31E+03**	**3.17E+01**	**1.56E+02[g]**	**6.84E+01**	**2.29E+03**	**2.29E+03**	**2.10E+02[c]**	**1.48E+00**	**2.43E+03**	**2.43E+03[h]**
Industrial SSL[a]				**9.10E+03[c]**	**2.12E+03**	**1.41E+05**	**1.29E+03**	**2.34E+03**	**7.40E+03[c]**	**1.08E+00**	**3.22E+00**	**1.40E+04**	**1.77E+02**	**2.27E+03[g]**	**3.78E+02**	**2.44E+04**	**2.44E+04**	**1.40E+03[c]**	**2.34E+01**	**1.45E+04**	**1.45E+04[h]**
Construction Worker SSL[a]				**4.76E+04[e]**	**4.06E+02**	**2.61E+04**	**2.41E+02**	**2.06E+04**	**3.72E+03[e]**	**5.07E+00**	**1.60E+00**	**2.71E+03**	**8.31E+02**	**6.19E+02[g]**	**1.83E+03**	**8.91E+03**	**8.91E+03**	**1.54E+03[e]**	**2.13E+02**	**2.81E+03**	**2.81E+03[h]**
RE61-05-58640	61-24323	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58641	61-24323	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58642	61-24324	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58643	61-24324	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	0.00081 (J)	—	—	—	—	—	—	0.00047 (J)
RE61-05-58644	61-24325	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	0.0047 (J)	—	—	—	—	—	—	—
RE61-05-58645	61-24325	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	0.0017 (J)	—	—	—	—	—	—	—
RE61-05-58646	61-24326	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58647	61-24326	1.0–1.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58648	61-24327	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58649	61-24327	1.0–1.5	Fill	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58730	61-24327	1.5–2.5	Soil	—	0.0013 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58650	61-24328	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58651	61-24328	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58652	61-24329	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58653	61-24329	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58654	61-24330	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58655	61-24330	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58656	61-24331	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58657	61-24331	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58658	61-24332	0.0–0.5	Soil	—	0.01	—	—	—	—	—	—	0.0057	—	—	—	—	—	—	—	—	—
RE61-05-58659	61-24332	1.5–2.0	Soil	—	0.0068	—	—	—	—	—	—	0.0036 (J)	—	—	—	—	—	—	—	—	—
RE61-05-58664	61-24332	2.5–3.0	Soil	—	0.0069	—	—	—	—	—	—	0.0036 (J)	—	—	—	—	—	—	—	—	—
RE61-05-58660	61-24333	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58661	61-24333	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.019
RE61-05-58665	61-24333	2.5–3.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58662	61-24334	0.0–0.5	Soil	0.31 (J-)	—	—	—	—	—	—	—	—	—	—	—	0.099 (J-)	—	—	—	—	—
RE61-05-58663	61-24334	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58666	61-24334	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58734	61-24346	4.5–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	1.3 (J)	—	—	—	—	0.23 (J)	—
RE61-05-58733	61-24346	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	0.72	1.1

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chlorobenzene	Chloroethane	Chloromethane	Chrysene	Di-n-octyl phthalate	Dibromo-3-chloropropane[1,2-]	Dibromoethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dichloroethene[cis/trans 1,2-]	Ethylbenzene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno[1,2,3-cd]pyrene	Isopropylbenzene	Isopropyltoluene[4-]
Residential SSL[a]				**2.60E+03[c]**	**3.76E+02**	**2.98E+04**	**2.75E+02**	**1.48E+02**	**7.30E+02[c]**	**1.86E+00**	**5.88E-01**	**2.31E+03**	**3.17E+01**	**1.56E+02[g]**	**6.84E+01**	**2.29E+03**	**2.29E+03**	**2.10E+02[c]**	**1.48E+00**	**2.43E+03**	**2.43E+03[h]**
Industrial SSL[a]				**9.10E+03[c]**	**2.12E+03**	**1.41E+05**	**1.29E+03**	**2.34E+03**	**7.40E+03[c]**	**1.08E+00**	**3.22E+00**	**1.40E+04**	**1.77E+02**	**2.27E+03[g]**	**3.78E+02**	**2.44E+04**	**2.44E+04**	**1.40E+03[c]**	**2.34E+01**	**1.45E+04**	**1.45E+04[h]**
Construction Worker SSL[a]				**4.76E+04[e]**	**4.06E+02**	**2.61E+04**	**2.41E+02**	**2.06E+04**	**3.72E+03[e]**	**5.07E+00**	**1.60E+00**	**2.71E+03**	**8.31E+02**	**6.19E+02[g]**	**1.83E+03**	**8.91E+03**	**8.91E+03**	**1.54E+03[e]**	**2.13E+02**	**2.81E+03**	**2.81E+03[h]**
RE61-05-58735	61-24347	4.5–5.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-58736	61-24347	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.5
RE61-05-58743	61-24351	12–12.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.024	—	—	—
RE61-05-58744	61-24351	19–19.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.047	—	—	—
RE61-05-58745	61-24352	10–10.5	Soil	—	—	0.65 (J)	0.44 (J)	—	—	—	—	—	—	—	230	—	—	—	—	9.5	—
RE61-05-58746	61-24352	17–17.5	Soil	—	—	—	—	—	—	—	—	—	—	—	6.9	—	—	—	—	1	3.9
RE61-05-58748	61-24353	17.6–18.1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.047	—	—	—
RE61-05-58750	61-24354	17.2–17.7	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.015 (J)	—	—	—
RE61-05-59118	61-24513	0.0–0.5	Soil	—	—	—	—	—	0.075 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59119	61-24513	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59122	61-24514	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59123	61-24514	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59126	61-24515	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59127	61-24515	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71529	61-26619	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71532	61-26620	5.0–7.0	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71531	61-26620	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71534	61-26621	28–30	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0371 (J)	—	—	—
RE61-06-71533	61-26621	93–95	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71535	61-26622	15–17	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	51.5	—	—	—	—	—	—
RE61-06-71536	61-26622	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	47.8	—	—	—	—	10.9	—
RE61-06-71537	61-26623	38–40	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-71538	61-26623	53–55	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73161	61-26985	15–17	Qbt 4	—	—	—	—	—	—	—	0.000509 (J)	—	—	—	—	—	—	—	—	—	—
RE61-06-73162	61-26985	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73164	61-26986	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-06-73168	61-26987	13–15	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methyl-2-pentanone[4-]	Methylene chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Styrene	Tetrachloroethene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3+1,4]
Residential SSL[a]				**5.82E+03**	**4.09E+02**	**2.30E+02[c]**	**4.30E+00**	**1.83E+03**	**3.40E+03[c]**	**1.72E+03**	**7.28E+03**	**7.02E+00**	**5.27E+03**	**1.00E+03[i]**	**na[j]**	**6.20E+01[c]**	**7.80E+02[c]**	**8.14E+02**	**8.98E+02**	**8.14E+02[k]**
Industrial SSL[a]				**7.38E+04**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**2.10E+04[c]**	**1.83E+04**	**5.00E+04**	**3.66E+01**	**5.77E+04**	**1.80E+03[i]**	**na**	**2.60E+02[c]**	**1.00E+04[c]**	**3.98E+03**	**4.41E+03**	**3.98E+03[k]**
Construction Worker SSL[a]				**1.85E+04**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**1.51E+04[e]**	**6.68E+03**	**9.99E+03**	**2.12E+02**	**1.34E+04**	**na**	**na**	**3.32E+02[e]**	**3.10E+03[e]**	**7.43E+02**	**8.23E+02**	**7.43E+02[k]**
RE61-05-58614	61-24310	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA[l]	NA	—	—	—	—	—
RE61-05-58615	61-24310	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58616	61-24311	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58618	61-24312	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58717	61-24312	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58718	61-24312	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58711	61-24313	4.0–4.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58622	61-24314	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58623	61-24314	3.0–3.5	Soil	—	—	—	—	—	—	—	—	0.001 (J)	0.0012 (J)	NA	NA	—	—	—	—	—
RE61-05-58624	61-24315	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58715	61-24315	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58716	61-24315	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58626	61-24316	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58713	61-24316	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58714	61-24316	5.0–5.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58712	61-24317	4.0–4.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58630	61-24318	0.0–0.5	Soil	—	—	—	—	0.36 (J-)	—	0.39 (J-)	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58631	61-24318	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	0.00088 (J)	NA	NA	—	—	—	—	—
RE61-05-58632	61-24319	0.0–0.5	Soil	—	—	—	—	0.15 (J-)	—	0.21 (J-)	—	—	0.0014 (J)	NA	NA	—	—	—	—	—
RE61-05-58633	61-24319	1.5–2.0	Soil	—	—	—	—	0.13 (J-)	—	0.16 (J-)	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58634	61-24320	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58635	61-24320	1.5–2.0	Soil	—	—	—	—	—	—	0.092 (J-)	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58724	61-24320	2.5–3.5	Soil	—	—	—	—	1.4	—	1.3	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58722	61-24320	5.5–6.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58636	61-24321	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58637	61-24321	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58725	61-24321	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58638	61-24322	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58639	61-24322	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58727	61-24322	2.5–3.5	Soil	—	—	—	—	—	—	0.092 (J)	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58640	61-24323	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methyl-2-pentanone[4-]	Methylene chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Styrene	Tetrachloroethene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3+1,4]
Residential SSL[a]				**5.82E+03**	**4.09E+02**	**2.30E+02[c]**	**4.30E+00**	**1.83E+03**	**3.40E+03[c]**	**1.72E+03**	**7.28E+03**	**7.02E+00**	**5.27E+03**	**1.00E+03[i]**	**na[j]**	**6.20E+01[c]**	**7.80E+02[c]**	**8.14E+02**	**8.98E+02**	**8.14E+02[k]**
Industrial SSL[a]				**7.38E+04**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**2.10E+04[c]**	**1.83E+04**	**5.00E+04**	**3.66E+01**	**5.77E+04**	**1.80E+03[i]**	**na**	**2.60E+02[c]**	**1.00E+04[c]**	**3.98E+03**	**4.41E+03**	**3.98E+03[k]**
Construction Worker SSL[a]				**1.85E+04**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**1.51E+04[e]**	**6.68E+03**	**9.99E+03**	**2.12E+02**	**1.34E+04**	**na**	**na**	**3.32E+02[e]**	**3.10E+03[e]**	**7.43E+02**	**8.23E+02**	**7.43E+02[k]**
RE61-05-58641	61-24323	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58642	61-24324	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58643	61-24324	1.5–2.0	Soil	—	—	—	—	—	—	—	—	0.00082 (J)	0.00074 (J)	NA	NA	—	—	—	—	—
RE61-05-58644	61-24325	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	0.0014 (J)	NA	NA	—	—	—	—	—
RE61-05-58645	61-24325	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	0.00069 (J)	NA	NA	—	—	—	—	—
RE61-05-58646	61-24326	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	0.00075 (J)	NA	NA	—	—	—	—	—
RE61-05-58647	61-24326	1.0–1.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58648	61-24327	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	0.00093 (J)	NA	NA	—	—	—	—	—
RE61-05-58649	61-24327	1.0–1.5	Fill	—	—	—	—	—	—	—	—	—	0.00069 (J)	NA	NA	—	—	—	—	—
RE61-05-58730	61-24327	1.5–2.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58650	61-24328	0.0–0.5	Fill	—	—	—	—	—	—	—	—	—	0.001 (J)	NA	NA	—	—	—	—	—
RE61-05-58651	61-24328	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58652	61-24329	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58653	61-24329	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	0.00072 (J)	NA	NA	—	—	—	—	—
RE61-05-58654	61-24330	0.0–0.5	Qbt 4	—	—	—	—	—	—	—	—	—	0.00098 (J)	NA	NA	—	—	—	—	—
RE61-05-58655	61-24330	1.5–2.0	Qbt 4	—	—	—	—	—	—	—	—	—	0.001 (J)	NA	NA	—	—	—	—	—
RE61-05-58656	61-24331	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	0.00073 (J)	NA	NA	—	—	—	—	—
RE61-05-58657	61-24331	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	0.00073 (J)	NA	NA	—	—	—	—	—
RE61-05-58658	61-24332	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58659	61-24332	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58664	61-24332	2.5–3.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58660	61-24333	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58661	61-24333	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	0.0051 (J)	NA	NA	—	—	—	—	—
RE61-05-58665	61-24333	2.5–3.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58662	61-24334	0.0–0.5	Soil	—	—	—	—	—	—	0.12 (J-)	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58663	61-24334	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58666	61-24334	3.0–3.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-58734	61-24346	4.5–5.0	Soil	—	—	2	1.5	—	0.85 (J)	—	0.13 (J)	—	1.7 (J)	67	1400 (J+)	9.5	3.1	11	—	—
RE61-05-58733	61-24346	5.5–6.0	Soil	—	—	3.8	2.8	—	3.5	—		—	0.56	130	1400 (J+)	42	8.9	22	—	—
RE61-05-58735	61-24347	4.5–5.0	Soil	—	—	—	—	—	—	—	0.11 (J)	—	—	—	120	3.2	1.3 (J)	0.39 (J)	—	—
RE61-05-58736	61-24347	5.5–6.0	Soil	—	—	10	5.8	—	—	—	—	—	2.5	220	1100 (J+)	33	11	29	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methyl-2-pentanone[4-]	Methylene chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Styrene	Tetrachloroethene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3+1,4]
Residential SSL[a]				**5.82E+03**	**4.09E+02**	**2.30E+02[c]**	**4.30E+00**	**1.83E+03**	**3.40E+03[c]**	**1.72E+03**	**7.28E+03**	**7.02E+00**	**5.27E+03**	**1.00E+03[i]**	**na[j]**	**6.20E+01[c]**	**7.80E+02[c]**	**8.14E+02**	**8.98E+02**	**8.14E+02[k]**
Industrial SSL[a]				**7.38E+04**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**2.10E+04[c]**	**1.83E+04**	**5.00E+04**	**3.66E+01**	**5.77E+04**	**1.80E+03[i]**	**na**	**2.60E+02[c]**	**1.00E+04[c]**	**3.98E+03**	**4.41E+03**	**3.98E+03[k]**
Construction Worker SSL[a]				**1.85E+04**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**1.51E+04[e]**	**6.68E+03**	**9.99E+03**	**2.12E+02**	**1.34E+04**	**na**	**na**	**3.32E+02[e]**	**3.10E+03[e]**	**7.43E+02**	**8.23E+02**	**7.43E+02[k]**
RE61-05-58743	61-24351	12–12.5	Soil	—	—	—	—	—	—	—	—	0.0029 (J)	—	—	0.46	0.0019 (J)	—	—	—	—
RE61-05-58744	61-24351	19–19.5	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	1.4	—	—	—	—	—
RE61-05-58745	61-24352	10–10.5	Soil	—	—	230	1300	—	53	—	—	—	380	8500	16000	610	210	870	—	—
RE61-05-58746	61-24352	17–17.5	Soil	—	3.6	5.9	4.8	—	4.2	—	—	—	4	1100	2400	54	29	68	—	—
RE61-05-58748	61-24353	17.6–18.1	Soil	—	—	—	—	—	—	—	—	—	—	—	0.36	—	—	—	—	—
RE61-05-58750	61-24354	17.2–17.7	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE61-05-59118	61-24513	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-59119	61-24513	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-59122	61-24514	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-59123	61-24514	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-59126	61-24515	0.0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—
RE61-05-59127	61-24515	1.5–2.0	Soil	—	—	—	—	—	—	—	—	—	—	NA	NA	0.0003 (J)	—	—	—	—
RE61-06-71529	61-26619	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	4.24	0.133	—	—	—	—	—
RE61-06-71532	61-26620	5.0–7.0	Soil	—	—	—	—	—	—	—	—	—	—	3.43	—	—	—	—	—	—
RE61-06-71531	61-26620	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	7.5	0.035 (J)	—	—	—	—	—
RE61-06-71534	61-26621	28–30	Qbt 4	0.0108	—	—	—	—	—	—	—	—	—	79.8	0.221	—	—	—	—	—
RE61-06-71533	61-26621	93–95	Qbt 4	—	0.00229 (J)	—	—	—	—	—	—	—	—	—	0.0901 (J)	—	—	—	—	—
RE61-06-71535	61-26622	15–17	Qbt 4	—	—	82.1	66.4	—	58.4	—	—	—	21.7	2990	6560	559	212	—	133	276
RE61-06-71536	61-26622	23–25	Qbt 4	—	—	78.9	71.2	—	52.9	—	—	—	21.8	3730	6210	518	191	—	116	251
RE61-06-71537	61-26623	38–40	Qbt 4	—	—	0.0184 (J)	0.0179 (J)	—	—	—	—	—	—	3.45	0.129	—	—	—	—	—

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methyl-2-pentanone[4-]	Methylene chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Styrene	Tetrachloroethene	Toluene	TPH-DRO	TPH-GRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3+1,4]
Residential SSL[a]				**5.82E+03**	**4.09E+02**	**2.30E+02[c]**	**4.30E+00**	**1.83E+03**	**3.40E+03[c]**	**1.72E+03**	**7.28E+03**	**7.02E+00**	**5.27E+03**	**1.00E+03[i]**	**na[j]**	**6.20E+01[c]**	**7.80E+02[c]**	**8.14E+02**	**8.98E+02**	**8.14E+02[k]**
Industrial SSL[a]				**7.38E+04**	**4.70E+03**	**2.20E+03[c]**	**2.41E+02**	**2.05E+04**	**2.10E+04[c]**	**1.83E+04**	**5.00E+04**	**3.66E+01**	**5.77E+04**	**1.80E+03[i]**	**na**	**2.60E+02[c]**	**1.00E+04[c]**	**3.98E+03**	**4.41E+03**	**3.98E+03[k]**
Construction Worker SSL[a]				**1.85E+04**	**1.12E+03**	**1.24E+03[e]**	**1.58E+02**	**7.15E+03**	**1.51E+04[e]**	**6.68E+03**	**9.99E+03**	**2.12E+02**	**1.34E+04**	**na**	**na**	**3.32E+02[e]**	**3.10E+03[e]**	**7.43E+02**	**8.23E+02**	**7.43E+02[k]**
RE61-06-71538	61-26623	53–55	Qbt 4	—	—	0.00751 (J)	—	—	—	—	—	—	—	1.97	0.0715 (J)	—	—	—	—	—
RE61-06-73161	61-26985	15–17	Qbt 4	—	—	—	—	—	0.000274 (J)	—	—	—	—	—	0.0474 (J)	—	0.000749 (J)	—	0.00242	—
RE61-06-73162	61-26985	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	0.0558 (J)	—	—	—	—	—
RE61-06-73164	61-26986	23–25	Qbt 4	—	—	—	—	—	—	—	—	—	—	—	0.117 (J)	—	—	—	—	—
RE61-06-73168	61-26987	13–15	Qbt 4	—	0.0067	—	—	—	—	0.0129	—	—	—	1.07 (J)	—	—	—	—	—	—

Notes: All concentrations are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971) unless noted otherwise.

[b] Pyrene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] Butylbenzene[n-] used as a surrogate based on structural similarity.

[f] — = Not detected.

[g] SSL is for dichloroethene[cis 1,2-] from NMED (2012, 219971).

[h] Isopropylbenzene used as a surrogate based on structural similarity.

[i] Screening guideline is for diesel No. 2 from NMED (2012, 219971).

[j] na = Not available.

[k] Xylenes used as a surrogate based on structural similarity.

[l] NA = Not analyzed.

Table 10.1-1
Summary of Investigation Results and Recommendations

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined or No Further Sampling Warranted?	Potential Unacceptable Risk?	Recommendation
TA-03					
	SWMU 03-002(c)	Former storage area	Yes	No	Complete without controls
	AOC 03-003(d)	Transformer pad—PCB only site	No	No	Additional extent sampling
03-009(a)-00	SWMU 03-009(a)	Surface disposal	Yes	Yes Residential	Complete with controls
	SWMU 03-029	Landfill	Yes	No	Complete without controls
	SWMU 03-045(g)	Storm drain	Yes	No	Complete without controls
	SWMU 03-009(i)	Surface disposal site	Yes	No	Complete without controls
03-012(b)-00	SWMU 03-012(b)	Operational release	Yes	No	Complete without controls
	SWMU 03-045(b)	Outfall	No	No	Additional extent sampling
	SWMU 03-045(c)	Outfall	No	Yes Residential	Additional extent sampling
03-013(a)-00	SWMU 03-052(f)	Outfall	Yes	Yes Residential	Complete with controls
	SWMU 03-013(i)	Operational release	No	No	Additional extent sampling
03-014(a)-99	AOC 03-014(b2)	Outfall associated with former WWTP	Yes	No	Complete without controls
	AOC 03-014(c2)	Outfall associated with former WWTP	No	Yes Residential	Additional extent sampling
	SWMU 03-014(k)	Structure associated with former WWTP	Yes	No	Complete without controls
	SWMU 03-014(l)	Structure associated with former WWTP	Yes	No	Complete without controls
	SWMU 03-014(m)	Structure associated with former WWTP	Yes	No	Complete without controls
	SWMU 03-014(n)	Structure associated with former WWTP	Yes	No	Complete without controls
	SWMU 03-014(o)	Structure associated with former WWTP	Yes	Yes Residential	Complete with controls
	SWMU 03-014(u)	Structure associated with former WWTP	Yes	No	Complete without controls
	SWMU 03-056(d)	Drum storage	Yes	No	Complete without controls

Table 10.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined or No Further Sampling Warranted?	Potential Unacceptable Risk?	Recommendation
03-015-00	SWMU 03-015	Outfall	Yes	Yes Residential	Complete with controls
	AOC 03-053	Operational facility	Yes	Yes Residential	Complete with controls
	SWMU 03-021	Outfall	Yes	No	Complete without controls
	AOC 03-038(d)	Waste lines	No	n/a*	Additional nature and extent investigation
	SWMU 03-045(a)	Outfall	Yes	Yes Residential	Complete with controls
	SWMU 03-045(e)	Outfall	No	No	Delayed investigation but additional extent sampling to be conducted
	SWMU 03-045(f)	Outfall	Yes	No	Complete without controls
	SWMU 03-045(h)	Outfall	Yes	No	Evaluation to be completed in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area
	AOC 03-047(g)	Drum storage	Yes	No	Complete without controls
	AOC 03-051(c)	Soil contamination	Yes	No	Complete without controls
	AOC 03-052(b)	Storm drainage	Yes	No	Complete without controls
	SWMU 03-056(a)	Storage area	Yes	No	Complete without controls
	AOC 03-056(k)	Container storage area	Yes	Yes Residential	Complete with controls
03-059-00	SWMU 03-059	Storage area—PCB site	Yes	Yes Residential	Complete with controls
	AOC C-03-022	Kerosene tanker trailer	No	n/a	Additional nature and extent investigation

Table 10.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined or No Further Sampling Warranted?	Potential Unacceptable Risk?	Recommendation
TA-60					
	SWMU 60-002	Storage areas (west, central, east)	Yes	No	Complete without controls
	AOC 60-004(f)	Storage area	Yes	Yes Residential	Complete with controls
	SWMU 60-006(a)	Septic system	Yes	No (no complete pathways for exposure)	Complete without controls
	SWMU 60-007(a)	Release	No	No	Additional extent sampling
	SWMU 60-007(b)	Release	Yes	No	Complete without controls
TA-61					
	AOC C-61-002	Subsurface contamination	No	No	Additional extent sampling
	SWMU 61-002	Transformer storage area—PCB site	Yes	Yes Residential	Complete with controls

Note: Shading denotes consolidated unit.
*n/a = Not applicable.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
%RSD	percent relative standard deviation
ACA	accelerated corrective action
AI	adequate intake
AK	acceptable knowledge
ALARA	as low as reasonably achievable
AOC	area of concern
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
BV	background value
CCV	continuing calibration verification
CFR	Code of Federal Regulations
CMR	Chemistry and Metallurgy Research
COC	chain of custody
Consent Order	Compliance Order on Consent
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
CSM	conceptual site model
CST	Chemical Science and Technology (a Laboratory division)
CVAA	cold vapor atomic absorption
D&D	decontamination and decommissioning
DAF	dilution attenuation factor
DDT	dichlorophenyltrichloroethylene
DL	detection limit
DOE	Department of Energy (U.S.)
DGPS	differential global positioning system
dpm	disintegrations per minute
DRO	diesel range organic
DU	depleted uranium
EDL	estimated detection limit

Eh	oxidation–reduction potential
EM	electromagnetic
EP	Environmental Programs Directorate
EPA	Environmental Protection Agency (U.S.)
EPC	exposure point concentration
EQL	estimated quantitation limit
ER	Environmental Restoration (Project)
ESL	ecological screening level
eV	electronvolt
FIP	field implementation plan
FV	fallout value
GC/MS	gas chromatography/mass spectrometry
GPR	ground-penetrating radar
GPS	global positioning system
GRO	gasoline range organic
HI	hazard index
HIR	historical investigation report
HQ	hazard quotient
HR	home range
HSA	hollow-stem auger
ICS	interference check sample
ICV	initial calibration verification
I.D.	inside diameter
ID	identification
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
kVA	kilo volt amperes
LAL	lower acceptance limit
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
LOAEL	lowest observed adverse effect level

LRO	lubrication range organic
MASW	multianalysis of shear waves
MCPA	methyl chlorophenoxy acetic acid
MCPP	2-(2-methyl-4- chlorophenoxy) propionic
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
MSW	Municipal Solid Waste
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NOAEL	no observed adverse effect level
NPDES	National Pollutant Discharge Elimination System
NSSB	National Security Science Building
NTS	Nevada Test Site
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PCE	tetrachloroethane
PID	photoionization detector
PPE	personal protective equipment
PQL	practical quantitation limit
PRG	preliminary remediation goal
PSTB	Petroleum Storage Tank Bureau (New Mexico)
QA	quality assurance
QC	quality control
Qbt	Tshirege Member of the Bandelier Tuff
RAGS	Risk Assessment Guidance for Superfund (EPA)
RBDM	risk-based decision making
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDA	recommended daily allowance

RESRAD	residual radioactive (model)
RfD	reference dose
RFI	RCRA facility investigation
RLW	radioactive liquid waste
RLWTF	Radioactive Liquid Waste Treatment Facility
RPD	relative percent difference
SAL	screening action level
SCL	sample collection log
SERF	Sanitary Effluent Reclamation Facility
SF	slope factor
SMO	Sample Management Office
SOP	standard operating procedure
SOW	statement of work
SSL	soil screening level
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWSC	Sanitary Wastewater Systems Consolidation
T&E	threatened and endangered
TA	technical area
TAL	target analyte list
TCDD	tetrachlorodibenzo-p-dioxin(2,3,7,8-)
TCE	trichloroethene
TEF	toxic equivalency factor
TPH	total petroleum hydrocarbon
TRV	toxicity reference value
UAL	upper acceptance limit
UCL	upper confidence limit
UTL	upper tolerance limit
VCA	voluntary corrective action
VOC	volatile organic compound
WCSF	waste characterization strategy form
WWTP	wastewater treatment plant
XRF	x-ray fluorescence

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 parameters.

Appendix B

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes field methods implemented during the 2009 investigation at Upper Sandia Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). Table B-1.0-1 provides a summary of field investigation methods, and the following sections provide more detailed descriptions of these methods. All activities were conducted in accordance with approved subcontractor procedures technically equivalent to Laboratory standard operating procedures (SOPs) listed in Table B-1.0-2 and available at http://www.lanl.gov/community-environment/environmental-stewardship/plans-procedures.php.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted during the 2009 investigation. 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 volatile organic compounds (VOCs) was performed as necessary for health and safety purposes. Field screening for radioactivity was performed on every sample submitted to the Sample Management Office (SMO). Field-screening results for all investigation activities are described in section 3.2-3 and presented in Table 3.2-2 of the supplemental investigation report.

B-3.1 Field Screening for VOCs

Field screening for VOCs was conducted for all samples, except as noted in section B-10.0. Screening was conducted using a MiniRae 2000 photoionization detector (PID) equipped with an 11.7-electronvolt lamp. Screening was performed in accordance with the manufacturer's specifications and SOP-06.33, Headspace Vapor Screening with a Photoionization Dectector. Screening was performed on each sample collected, and screening measurements were recorded on the field sample collection logs (SCLs) and chain-of-custody (COC) forms, provided on DVD in Appendix G. The field-screening results are presented in Table 3.2-2 of the supplemental investigation report.

B-3.2 Field Screening for Radioactivity

All samples collected were field screened for radioactivity before they were submitted to the SMO, targeting alpha and beta/gamma emitters. A Laboratory radiological control technician (RCT) conducted radiological screening using an Eberline E-600 radiation meter with an SHP-380AB alpha/beta scintillation detector held within 1 in. of the sample. The Eberline E-600 with attachment SHP-380AB 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 used to detect beta and gamma emissions and is thinly coated with zinc sulfide for detection of alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute. Screening measurements were recorded on the SCLs and COC forms and are provided on DVD in Appendix G. The screening results are presented in Table 3.2-2 of the supplemental investigation report.

B-4.0 FIELD INSTRUMENT CALIBRATION

Instrument calibration and/or function check was completed daily. Several environmental factors affected the instruments' integrity, including air temperature, atmospheric pressure, wind speed, and humidity. Calibration of the PID was conducted by the site-safety officer. Calibration of the Eberline E-600 was conducted by the RCT. All calibrations were performed according to the manufacturer's specifications and requirements.

B-4.1 MiniRAE 2000 Instrument Calibration

The MiniRAE 2000 PID was calibrated both to ambient air and a standard reference gas (100 ppm isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Calibration with the standard reference gas determined a second point of the sensor calibration curve. Each calibration was within 3% of 100 ppm isobutylene, qualifying the instrument for use.

The following calibration information was recorded daily on operational calibration logs:

- instrument identification (ID) number
- final span settings
- date and time
- concentration and type of calibration gas used (isobutylene at 100 ppm)
- name of the personnel performing the calibration

All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration.

B-4.2 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 and the applicable radiation detection instrument manual.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used for collecting surface and subsurface samples, including soil, fill, tuff, and sediment samples, according to the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721).

B-5.1 Surface Sampling Methods

Surface samples were collected using either hand-auger or spade-and-scoop methods in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger Sampling, or SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. A hand auger or spade and scoop were used to collect material in approximately 6-in. increments. Samples for VOC analysis were collected immediately to minimize the loss of subsurface VOCs during the sample collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. Table B-1.0-1 provides additional details on the collection of samples for VOC analysis. The description provided is specific to the sampling method rather than to the media (e.g., soil samples are collected using the spade-and-scoop method in the same manner as sediment samples). The remaining 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 they were transported to the SMO. Samples were managed in accordance with an approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and WES-EDA-QP-219, Sample Control and Field Documentation.

Sample collection tools were decontaminated (see section B-5.8) immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment.

B-5.2 Borehole Logging

Continuous boring logs were completed for all boreholes drilled with a hollow-stem auger (HSA) drill rig. During drilling, all boreholes were continuously cored and logged in 5-ft intervals. 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 Tuff Sampling Methods

Subsurface samples were collected in accordance with an approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger Sampling.

Subsurface samples were collected using the hand auger method, assisted by a power auger where necessary. Samples for VOC analysis were collected immediately to minimize the loss of subsurface VOCs during the sample collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. Table B-1.0-1 provides additional details on collection of samples for VOC analysis. The description provided is specific to the sampling method rather than to the media (e.g., soil samples are collected using the hand auger method in the same manner as sediment samples). The remaining 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 they were transported to the SMO. Samples were managed in accordance with an approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and WES-EDA-QP-219, Sample Control and Field Documentation.

Sample collection tools were decontaminated (see section B-5.8) immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment.

B-5.4 Test Pit Excavation and Grab Sampling

Four test pits were excavated at an inactive surface disposal site consisting of construction debris, including crushed tuff, pieces of concrete, rock, and piles of fill. Two grab samples were collected within each pit at depths of 5 ft and 10 ft below ground surface (bgs) to characterize the material. Excavation was completed using a backhoe. The excavated soil was staged a minimum of 3 ft from the edge of the excavation, and the excavations were appropriately benched to allow access and egress. After sample collection, the excavations were backfilled with clean fill material. The excavated soil was managed as investigation-derived waste (IDW), as described in Appendix D.

B-5.5 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. QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as a regular investigation sample 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), after decontamination, with deionized water. 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 1 per day at the time samples were collected for VOCs. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process.

B-5.6 Sample Documentation and Handling

Field personnel completed an SCL and 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. Swipe samples were collected from the exterior of sample containers and analyzed by the RCT before the sample containers were removed from the site. Samples were transported to the SMO for processing and shipment to off-site contract analytical laboratories. The SMO personnel reviewed and approved the SCLs and COC forms and accepted custody of the samples.

B-5.7 Borehole Abandonment

All boreholes were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, Monitoring Well and Borehole Abandonment, by filling the boreholes with bentonite chips up to 2–3 ft from the ground surface. The chips were hydrated and clean soil was placed on top. The pavement was patched as necessary depending on existing site conditions. All cuttings were managed as IDW, as described in Appendix D.

B-5.8 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. Decontamination of the drilling equipment was conducted 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. Decontaminated equipment was surveyed by an RCT before it was released from the site.

B-5.9 Site Demobilization and Restoration

All drilling equipment was demobilized from the site on December 22, 2009. Before equipment was removed from the site, a Laboratory RCT screened the equipment for radioactivity to ensure all materials were clean of site contamination. All temporary fencing and staging areas (except the waste management area) were dismantled and returned to preinvestigation conditions. All excavated and disturbed areas were regraded and reseeded with native grass mix in the spring of 2010.

B-6.0 SEPTIC TANK REMOVAL AND EXCAVATION

One septic tank, Solid Waste Management Unit (SWMU) 60-006(a), was removed in accordance with the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721). An excavator was used to remove the 1000-gal. concrete septic tank and associated piping. A 6-in. inlet line to the septic tank was plugged with concrete and the end taped over. Plastic sheeting was placed in the bottom of the excavation to use as a marker before it was backfilled with overburden and clean fill. The excavated soil was managed as IDW, as described in Appendix D. Following the tank removal, confirmation samples were collected beneath the tank using a HSA drill rig.

The specific sequence of activities associated with the septic tank and waste removal was as follows: (1) mobilization, including preparing excavation documents, identifying underground utilities, and conducting excavation readiness assessment; (2) site preparation, including the installing fencing and storm water controls and conducting a preexcavation survey; (3) removal of waste, including the stockpiling, characterization, and disposal of waste at the appropriate facility; (4) surveying the limits of excavation and establishing subgrade; (5) performing confirmation sampling; (6) backfilling, including compacting and revegetating the surface, after demobilization.

B-7.0 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-8.0 GEOPHYSICAL SURVEYS

ARM Geophysics (a division of ARM Group, Inc.) performed a nonintrusive geophysical investigation at SWMU 03-029, a former landfill, using the multianalysis of shear waves (MASW) method as well as ground-penetrating radar (GPR). The survey was conducted to locate a buried waste disposal site within an area approximately 150 ft long by 400 ft wide.

Six MASW traverses and 16 GPR profiles were completed within the survey area. The MASW survey used a 24-channel Geometrics Geode seismograph with 48 Oyo/Geospace 4.5 Hz geophones connected by two 24-takeout spread cables. The GPR survey was conducted using a GSSI Model No. SIR3000 GPR with a 200-MHz antenna. The results of the geophysical surveys are included in Appendix E.

B-9.0 IDW STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with EP-DIR-SOP-10021, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (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, 103404.43; NMED 2008, 102721). Details of IDW management for the Upper Sandia Canyon Aggregate Area investigation are presented in Appendix D.

B-10.0 DEVIATIONS FROM THE WORK PLAN

Several proposed sampling locations identified in the approved investigation work plan (LANL 2008, 103404.43; NMED 2008, 102721) were moved as a result of site conditions encountered during the field activities. These locations were moved because they were sited on top of, or next to, underground utilities, could not be sampled as a result of refusal, or were inaccessible. When locations were moved, the new locations were sited as close as possible to the planned locations. Deviations to specific sampling locations are described in Table B-10.0-1. Additional deviations to the approved work plan scope are discussed below.

- The investigation work plan required specific (e.g., 0.0–1.0 ft bgs) and relative (e.g., soil-tuff interface, base of structure) sampling intervals, but in some cases the sampling intervals overlapped and the samples collected served a dual purpose. For example, at location 03-608180 in SWMU 03-009(a), samples were planned for the soil-tuff interface and the specific interval of 9.0–10.0 ft bgs. The soil-tuff interface was encountered at the interval of 9.0–10.0 ft bgs, so a single sample was collected at this depth to represent both the soil-tuff interface and the interval of 9.0–10.0 ft bgs. The proposed samples not collected for this reason are presented in Table B-10.0-1.

- The investigation work plan required 16 samples to be collected from 4 borehole locations around and downgradient of SWMUs 03-014(k,l,m,n). At each location, samples were to be collected from 0.0–1.0 ft bgs, 0.0–1.0 ft beneath the sand-and-gravel layer at the base of bed, at the bed-tuff interface, and 5.0 ft below the bed-tuff interface. At all 4 boreholes, the bed-tuff interface corresponded to the same interval as the 0.0–1.0-ft interval beneath the base of the bed. This eliminated 1 sampling interval at each location. In addition, 1 sample could not be collected at location 03-608273 from 8.0–9.0 ft bgs because no material could be recovered during drilling. Therefore, a total of 11 samples were collected at SWMUs 03-014(k,l,m,n) instead of the 16 proposed samples.
- The investigation work plan required six samples to be collected from three borehole locations at SWMU 03-014(u). The depths defined in the field implementation plan indicate “0.0–1.0 ft bgs” and either “base of tank” or “soil/tuff interface,” whichever is reached first. Only one sample was collected at location 03-608283 because the surface sample met both criteria defined in FIP and, therefore, is representative of both “0.0–1.0 ft bgs” and “soil/tuff interface.”
- The NMED approval with modifications letter required samples to be collected at an additional depth interval at locations 03-608281, 03-608282, and 03-608283 at SWMU 03-014(u) (NMED 2008, 102721). However, based on the available data and the reevaluation of nature and extent presented in this supplemental investigation report (section 6.9.8.4), no additional samples are necessary. The extent of contamination is defined and/or further sampling for extent is not warranted at SWMU 03-014(u). Therefore, additional depth samples at locations 03-608281, 03 608282, and 03-608283 are not warranted.
- The investigation work plan required four samples to be collected from one borehole in the seepage pit at SWMU 60-006(a) to define the nature and vertical extent of contamination. After the seepage pit was located and was found to be filled with gravel, a borehole was drilled at the northern edge and downgradient of the pit. The samples were collected as directed in the work plan at the same four depth intervals (taking into account the change in elevation from south to north). Additional samples were also collected from three deeper intervals that corresponded to 35.0–36.0, 45.0–46.0, and 60.0–61.0 ft bgs to define vertical extent.
- The investigation work plan required 12 samples to be collected from 3 borehole locations to determine the extent of contamination identified in previous sampling efforts at SWMU 03-009(a). During the drilling of borehole 03-608180, the sample collected at depth 9.0–10.0 ft bgs overlapped with the soil-tuff interface sample and, therefore, represents both soil-tuff interface and 9.0–10.0 ft bgs. A total of 11 total samples were collected from SWMU 03-009(a).
- The investigation work plan required six samples to be collected from three locations (including one historical location) in a sludge-drying bed at SMWU 03-014(o) to define the vertical extent of contamination. Samples were collected using a backhoe instead of the proposed hand auger because the beds contained extensive loose gravel. The work plan proposed sampling at depths of 4.0–5.0 ft and 6.0–7.0 ft bgs; however, field conditions limited the use of the backhoe (mainly because of the loose gravel within and around the bed and the compacted tuff at 5 ft bgs), the following samples were collected instead: 3.0–4.0 ft bgs (under the bed liner) and 5.0–6.0 ft bgs (2 ft below the drainline).

- The NMED approval with modifications letter required an additional sampling location be added in the drainage northeast of the SWMU 03-015 (NMED 2008, 102721). However, a site visit in May 2012 determined that samples collected from a “drainage” to the northeast of the site at locations 03-608294, 03-608295, and 03-608296 were not related to the site (i.e., there was no drainage in the area and runoff did not flow in that direction). Therefore, an additional sampling location in the “drainage” to the northeast is not warranted or representative of the site. In addition, based on the available data and the reevaluation of nature and extent presented in this supplemental investigation report (section 6.10.1.4), the lateral extent of contamination is defined and/or further sampling for lateral extent is not warranted.
- The investigation work plan required four samples to be collected from two historical locations at SMWU 03-021, locations 03-03329 and 03-03331, to confirm Phase I Resource Conservation and Recovery Act facility investigation results and to further characterize the vertical extent of contamination. Based on the confirmed presence of a buried water line, the original location was moved 5 ft to the north for 03-03329 and 5 ft to the south for location 03-03331.
- The approved investigation work plan required the collection of two sediment samples from each of the four locations within the upper drainage at SWMU 60-007(b). However, because tuff was exposed at the surface and there was very little sediment, only one sample could be collected from each location. A later attempt to obtain tuff samples at the four locations was unsuccessful because the site was no longer accessible as a result of extensive snow accumulation from plowing the parking lot next to the drainage. However, based on the available data and the reevaluation of nature and extent presented in this supplemental investigation report (section 7.6.4.4), the extent of contamination is defined and/or further sampling for extent is not warranted. Therefore, additional depth samples at locations 03-608417, 03-608418, 03-608419, and 03-608420 are not warranted.

B-11.0 REFERENCES

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

Copies of the master reference set are maintained at the New NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), July 2008. “Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-08-4798, Los Alamos, New Mexico. (LANL 2008, 103404.43)

NMED (New Mexico Environment Department), August 12, 2008. “Approval with Modifications Upper Sandia Canyon Aggregate Area Investigation Work Plan,” 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, 102721)

Table B-1.0-1
Brief Description of Field Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method is typically used to collect shallow (i.e., approximately 0.0-12.0 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. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The remaining sample material was placed in a clean stainless-steel bowl for transfer into various sample containers.
Hand Auger Sampling	This method is typically used to sample soil or sediment at depths of less than 10.0–15.0 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 sampling depth. When the desired depth was reached, the auger was decontaminated before the hole was advanced through the sample depth. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The remaining sample material was placed in a clean stainless-steel bowl for transfer into various sample containers.
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. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The remaining core was collected as a discrete sample from the desired depth and placed in a clean stainless-steel bowl for transfer into various sample containers.
Headspace Vapor Screening	Individual soil, rock, or sediment samples were field-screened for VOCs by placing a portion of the sample in a plastic sample bag or in a glass container with a foil-sealed cover. The container was sealed and gently shaken and allowed to equilibrate for 5 min. The sample was then screened by inserting a PID probe into the container and measuring and recording any detected vapors.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing and ensured the sample containers and the containers used for transport were free of external contamination. Field team members packaged all samples to minimize the possibility of breakage during transport. After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged for shipping the samples to 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.

Table B-1.0-1 (continued)

Method	Summary
Field Quality Control Samples	Field quality control samples were collected as follows: *Field Duplicates*: at a frequency 10%; collected at the same time as a regular sample and submitted for the same analyses *Equipment Rinsate Blank*: at a frequency of 10%; collected by rinsing sampling equipment with deionized water that was collected in a sample container and submitted for laboratory analysis *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.
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 4°C.
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. 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 the containers from deteriorating. A waste storage area was established before waste was generated. Waste storage areas located in controlled areas of the Laboratory were controlled 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 D.

Table B-1.0-2
SOPs Used for Investigation Activities at Upper Sandia Canyon Aggregate Area

SOP-5028, Coordinating and Evaluating Geodetic Surveys
SOP-5034, Monitoring Well and Borehole Abandonment
SOP-5056, Sample Containers and Preservation
SOP-5057, Handling, Packaging, and Transporting Field Samples
WES-ESA-QP-219, Sample Control and Field Documentation
SOP-5059, Field Quality Control Samples
SOP-5061, Field Decontamination of Equipment
SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities
EP-DIR-SOP-10021, Characterization and Management of Environmental Program Waste
SOP-5245, Background Value Comparisons – Inorganic Chemicals
SOP-5246, Background Value Comparisons – Radionuclides
SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples
SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
SOP-06.33, Headspace Vapor Screening with a Photoionization Detector

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.

Table B-10.0-1
Summary of Sampling Deviations from the Approved Work Plan

Site ID	Work Plan Location	Sample Location ID	Description of Deviation
TA-03			
SWMU 03-009(a)	9a-3	03-608180	Soil-tuff interface corresponded to 9.0–10.0 ft bgs proposed sample; one sample collected at this depth.
SWMU 03-013(i)	13i-13	03-608230	Moved approximately 6 in east because of concrete
SWMUs 03-014(k,l,m,n)	14k-6	03-608270	Bed-tuff interface corresponded to proposed sample at 0.0–1.0 ft below base of bed; one sample collected at this depth (6.0–7.0 ft bgs).
	14k-7	03-608271	Bed-tuff interface corresponded to proposed sample at 0.0–1.0 ft below base of bed; one sample collected at this depth (6.0–7.0 ft bgs).
	14k-8	03-608272	Bed-tuff interface corresponded to proposed sample at 0.0–1.0 ft below base of bed; one sample collected at this depth (3.0–4.0 ft bgs).
	14k-9	03-608273	No sample collected from 8.0–9.0 ft bgs because of insufficient recovery

Table B-10.0-1 (continued)

Site ID	Work Plan Location	Sample Location ID	Description of Deviation
TA-03 (continued)			
SMWU 03-014(o)	14o-1	03-03204	Samples collected using a backhoe instead of hand auger
	14o-2	03-608276	Samples collected using a backhoe instead of hand auger
	14o-3	03-608275	Samples collected using a backhoe instead of hand auger
SWMU 03-014(u)	14u-1	03-608281	No sample collected at deeper depth
	14u-2	03-608282	No sample collected at deeper depth
	14u-3	03-608283	Only one sample collected at 0.0–1.0 ft. No sample collected at deeper depth.
SWMU 03-015	n/a	n/a	No samples collected in drainage northeast of SWMU
SWMU 03-021	21-1	03-611944	Moved 5 ft south from historical sampling location 03-03329
	21-2	03-611943	Moved 5 ft south from historical sampling location 03-03331
	21-3	03-608303	Moved 4 ft south
AOC C-03-022	C22-4	03-608392	Moved 2 ft east because of auger refusal at 4 ft bgs
SWMU 03-045(a)	45a-1	03-608316	Moved 3 ft south because of concrete/rebar
AOC 03-052(b)	52b-7	03-608332	Moved 2 ft west
SWMU 03-059	59-4	03-608386	Hit concrete 5.0–6.0 ft thick; failed to get through with concrete drill. Moved 5 ft north, encountered concrete; moved 5 ft east, encountered concrete; moved 5 ft northeast, encountered concrete. Put new location halfway between 03-608385 and proposed 03-608386 location per the Laboratory subcontractor technical representative; final measurement of 31 ft west of original location. All holes backfilled, plugged, and sealed.
TA-60			
SWMU 60-006(a)	Seepage Pit	n/a*	Not removed, considered no risk, additional sampling conducted
	6a-4	03-608412	Borehole moved 4 ft north, downgradient of the seepage pit and extended to 3 ft below bottom elevation of pit for a total of seven samples collected
SWMU 60-007(b)	7b-1	03-608417	Moved 10 ft south. Additionally, only 0.0–1.0 ft bgs sediment sample collected because tuff was encountered at 1 ft bgs.
	7b-2	03-608418	Moved 10 ft west. Additionally, only 0.0–0.5 ft bgs sediment sample collected because tuff was encountered at 0.5 ft bgs.
	7b-3	03-608419	Moved 15 ft east. Additionally, only 0.0–0.5 ft bgs sediment sample collected because tuff was encountered at 0.4 ft bgs.
	7b-4	03-608420	Moved 3 ft east. Additionally, only 0.0–0.5 ft bgs sediment sample collected because tuff was encountered at 0.5 ft bgs.
TA-61			
AOC C-61-002	C2-2	03-608430	Moved 5 ft south

*n/a = Not applicable.

Appendix C

Borehole Logs
(on CD included with this document)

Appendix D

Investigation-Derived Waste Management

D-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 Upper Sandia Canyon Aggregate Area at Technical Area 03 (TA-03), TA-60, and TA-61 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) EP-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 orders, and Laboratory policies and procedures.

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. Analytical data and information on wastes generated during previous investigations and/or acceptable knowledge (AK) were used to complete the WCSF. The WCSF is included in this appendix as Attachment D-1 (on CD).

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, and radioactivity, if applicable.

Wastes were staged in clearly marked, 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 minimized the generation of waste. Waste minimization was accomplished by implementing the most recent version of the “Los Alamos National Laboratory Hazardous Waste Minimization Report.”

D-2.0 WASTE STREAMS

The IDW streams generated and managed during the investigation of Upper Sandia Canyon Aggregate Area are described below and are summarized in Table D-2.0-1. The waste stream numbers correspond with those identified in the WCSF.

- WCSF Waste Stream #1: Municipal Solid Waste (MSW) consisted of noncontact trash and debris and empty sample preservation containers. Approximately 2.5 yd^3 of waste was generated, and was determined to be nonhazardous, nonradioactive municipal solid waste. It was stored in plastic-lined trash cans and disposed of at the former Los Alamos County Landfill.
- WCSF Waste Stream #2: Drill cuttings consisted of sediment, soil, and rock removed during hollow-stem auger drilling. Approximately, 5.5 yd^3 of drill cuttings was generated during this investigation and stored in 1-yd^3 wrangler bags. All wrangler bags were directly sampled. The cuttings were land-applied in accordance with the NMED-approved Notice of Intent Decision Tree, Land Application of IDW Solids from Construction of Wells and Boreholes and the Radiological Decision Tree (SOP ENV-RCRA-QOP-011.1).

- WCSF Waste Stream #3: Contact waste consisted of spent personal protective equipment, material used in dry decontamination of sampling equipment (e.g., paper towels), and sampling equipment and other materials that contacted, or potentially contacted, contaminated environmental media and could not be decontaminated. This waste included, but was not limited to, plastic sheeting (e.g., tarps and liners), gloves, paper towels, plastic and glass sample bottles, and disposable sampling supplies. 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. Approximately 0.8 yd^3 of contact waste was generated and disposed of at an authorized off-site disposal facility.
- WCSF Waste Streams #4, #5, and #6: No decontamination fluids were generated, no petroleum-contaminated soils were found, and no American Radiation Services (Rad-Van) samples were returned.
- WCSF Waste Stream #7: Concrete, steel, and septic tank debris waste consisted of concrete with rebar and tuff. Approximately 10 yd^3 of septic tank debris was generated from this activity, all from the removal of Solid Waste Management Unit 60-006(a), the septic tank. The debris was determined to be industrial waste and was disposed of at an authorized off-site disposal facility.
- WCSF Waste Stream #8: No liquid or sludge was found in the septic tank.

Table D-2.0-1
Summary of IDW Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
Municipal Solid	MSW	2.5 yd^3	AK	Plastic bags	Off-site municipal landfill
Drill Cuttings	Industrial	5.5 yd^3	Direct sampling	1-yd^3 wrangler bags	Land application
Contact Waste	Industrial	0.8 yd^3	AK and analytical results of site characterization	5-gal. drums	Authorized off-site disposal facility
Concrete, Steel, and Septic Tank Debris	Industrial	10 yd^3	AK and analytical results of site characterization	20-yd^3 rolloff bin	Authorized off-site disposal facility

Attachment D-1

Waste Characterization Strategy Form
(on CD included with this document)

Appendix E

Geophysical Surveys

February 1, 2010

Ms. Deborah Steven
4200 W. Jemez Rd
Suite 502 (4th flr)
Los Alamos, New Mexico 87544

Re: Geophysical Survey Results
SWMU 03-029 Landfill Delineation
ARM Project 09303

Dear Ms. Steven:

ARM Geophysics, a division of ARM Group Inc. (ARM), has prepared this report to provide the results of the geophysical survey performed at SWMU 03-029 for Terranear PMC (TPMC) at the Los Alamos National Laboratory, Los Alamos, New Mexico. The objective of the survey was to attempt to locate possible buried trenches reported to contain asphalt at Solid Waste Management Unit (SWMU) 03-029.

SWMU 03-029 was previously surveyed with electromagnetic geophysical techniques to locate anomalies that could potentially represent areas of buried asphalt. One anomalous area was detected that could represent possible buried asphalt. This area was excavated by TPMC personnel and the anomaly did not contain buried asphalt.

The scope of work included the use of multiple geophysical methods to optimize data collection. ARM recommended performing multi-analysis of shear waves (MASW) surveys within SWMU 03-029. The MASW method was recommended because the seismic wave would detect areas of lesser compaction, such as buried debris, and is capable of detecting shallow objects of interest. ARM also collected several ground penetrating radar (GPR) profiles over the SWMU 03-029 area.

ARM collected six MASW traverses and 16 GPR profiles within the survey area. Each profile is provided on figures presented at the end of the text and a detailed discussion of each of the profiles is provided in the following sections.

MULTI-ANALYSIS OF SHEAR WAVE

Seismic surveys are able to discriminate between and among materials with relatively different physical properties (i.e. density), based on the velocity of the seismic wave as it travels through each discrete layer. In general, the more rigid the material, the faster the wave will travel through it.

Propagation velocity (also known as phase velocity) of surface waves is frequency (wavelength) dependent. This property is known as dispersion. The dispersiveness of soils is determined mainly by the vertical variation in shear wave velocity (Vs). By recording fundamental-mode Rayleigh waves propagating from the source to receiver, the dispersive properties directly beneath the seismic spread can be measured and represented by a curve (dispersion curve). This curve is used to estimate the vertical variation of Vs (1-D Vs profile) through a process called inversion.

The MASW method utilizes pattern-recognition techniques. It employs multiple receivers (geophones) equally spaced along a linear survey line and measures the travel-times of seismic waves generated by an implosive source (e.g., sledge hammer). This approach allows recognition of the various propagation characteristics of the seismic wavefield. Once the dispersive properties of the fundamental mode Rayleigh waves are identified (via pattern recognition), a corresponding signal curve is extracted and used in the inversion of a 1-D Vs profile. This profile best represents the vertical Vs distribution at the middle of the receiver spread. By moving the same shot-receiver configuration incrementally along a preset survey line, multiple measurements can be made, each producing a 1-D Vs profile that, when all gathered together, is used to construct a 2-D Vs cross-section along the survey line.

MASW has been used to map bedrock topography, identify bedrock fractures, abandoned mine workings, waste pits and trenches, and evaluate sink activity (e.g., voids, pinnacles, zones of enhanced weathering) to depths upwards of approximately 120 feet below ground surface (BGS). Unlike refraction, MASW is not constrained by velocity inversion (high speed layer overlying a lower speed layer), and it can be used in urbanized environments where noise associated with vehicle traffic and buried utilities that typically mask body waves do not significantly impact the robust (larger amplitude) surface waves.

MASW Data Collection

Multi-channel Analysis Surface Wave (MASW) Surveys were performed along six traverses. Their locations are shown on Figure 1. The total line length of each MASW traverse is longer than the actual distance imaged so that there is sufficient data collected to produce a profile.

The MASW survey was carried-out using a 24-channel Geometrics Geode seismograph with 48 Oyo/Geospace 4.5 Hz geophones connected by two 24-takeout spread cables. Data were acquired using the following parameters:

- Geophone spacing = 5 feet
- Offset (distance between source and first geophone) = 25 feet
- Source offset = 5 feet
- Record length = 700 msec
- Sampling interval = 62.5 *u*sec
- All acquisition filters out

- Shot gather = 15 traces
- Staked shots/station = 5

MASW Data Processing
The MASW data profiles were processed using the software program *SurfSeis*. The first step in processing of the seismic data is to convert the seismic data (SEG-2) into the processing format and combine all shot gathers into a single file for each seismic line. The data file is then assigned field geometry and recompiled into a roll-along mode data set. The geophysicist then identifies the range of surface wave velocities for each shot gather and conducts a dispersion-curve analysis for all shot gathers. An inversion analysis for all dispersion-curves analyzed is performed to determine the 1-dimensional shear wave velocities. A 2-dimensional shear wave velocity profile is then constructed by interpolating the 1-dimensional shear wave velocities profiles using a Kriging algorithm. The number of folds of data towards the ends of the survey line decreases so data quality decreases.

GROUND PENETRATING RADAR

GPR is an electromagnetic instrument that transmits and records radar (electromagnetic [EM]) pulses). GPR systems produce cross-sectional images of subsurface features by transmitting discrete radar pulses into the subsurface and recording the echoes or reflections from interfaces between materials with differing dielectric properties. To conduct a GPR survey, an antenna containing a transmitter and a receiver is slowly pulled along the ground surface. The transmitter radiates short pulses of high frequency EM energy into the ground. When the wave encounters the interface between two materials having different dielectric constants (dielectric permittivity), a portion of the energy is reflected back. The contrast in dielectric permittivity between the two media can be quantified by a reflection coefficient at the media interface. The magnitude of the reflection coefficient increases as the contrast in dielectric constant increases. The signal is transmitted to a control unit, displayed on a color monitor, and digitally recorded.

Air or air-filled voids have dielectric permittivity of 1. Soils, concrete, and other materials have higher permittivities such as: 5.5 for dry concrete; 6 for sandy soil, and 15 for wet sand. Due to the contrast in dielectric properties between the anticipated subsurface materials and metallic pipes, the locations of the pipes should be discernible in the GPR data.

The effective penetration depth of a radar system is controlled by the dielectric permittivity, the electrical conductivity (usually dictated by moisture content) of the soils and the frequency of the antenna. In highly conductive materials (such as clay), the pulse is dissipated at very shallow depths. Two-way travel time on the GPR records can furnish estimates of depth if the dielectric constant for subsurface materials is known. If it is unknown, then an approximate depth can be obtained by using published average dielectric constants for the site soils. During this survey ARM used 6.25 as the dielectric constant.

Resolution of the GPR system is dependent on the frequency of the antenna used during the survey. Very high frequency antennae (900 megahertz [MHz] or greater) can resolve small features (less than an inch in diameter) but can penetrate to a maximum depth of 2 feet or shallower. Lower frequency antennae (100 to 500 MHz) can resolve objects deeper in the subsurface (up to 50 feet bgs, depending on soil conditions) but usually miss objects near surface. There is a tradeoff between depth penetration and resolution; in some cases it may be necessary to utilize two or more antennae to collect the necessary depth and resolution information.

GPR Data Collection

GPR profiles were collected along four of the ER traverses as well as along Mill and Searle Streets. The GPR survey was conducted using a GSSI Model No. SIR3000 GPR with a 200-MHz antenna manufactured by GSSI of North Salem, New Hampshire.
ARM ran a test line with the 200 MHZ antenna in order to determine the optimum recording parameters for the GPR at this site. These parameters include the range (amount of time the instrument records after transmitting an EM pulse), scan rate (number of recorded traces or scans per second), transmitter pulse rate (frequency at which the EM pulses are transmitted), instrument gains, and filter settings. These settings are automatically stored in a header file with the digital GPR data.

A marker switch on the antenna unit was used to identify control points (fiducial markers) on the GPR records. With the 200 MHZ antenna, as the GPR antenna is moved along each traverse, the marker switch was keyed at 5-foot intervals in order to maintain a distance record on each of the GPR files. The digital GPR data were reviewed in real time on a color monitor and stored on the GPR hard drive. Information such as line location, direction, and fiducial marker locations were recorded in the field notes.

GPR Data Processing

The SIR3000 system stores each GPR file digitally in the memory of the radar unit. At the conclusion of the survey, all GPR data files collected during the investigation were downloaded to the network computers at the ARM office. To begin the processing, each GPR file was edited to remove stagnant points (areas where the data collector paused or had to maneuver around obstacles). These areas show up as flat lines and images, and are of no value to the overall survey.

After removal of stagnant areas, the GPR files were converted and saved as bitmap images. The bitmap files were transferred into Surfer, a commercial software package. By using Surfer, distance markers and other annotations can be added to the records.

GEOPHYSICAL SURVEY RESULTS

MASW

The locations of each of the MASW traverses were recorded with GPS equipment and are shown on Figure 1. The coordinates are presented in US State Plane NAD83 NM Central Zone, US survey feet. The MASW data profiles were collected to evaluate the subsurface for anomalous areas that could represent buried asphalt. Areas of non-compacted and less dense material have lower shear velocities than dense materials such as bedrock. Each profile was reviewed for areas of low shear velocities in configurations that could represent buried trenches of asphalt.

MASW Line 00
Along Line 00 from northeast to southwest, 34 seismic shots were collected along a total inline distance of 270 feet. The processed seismic profile is presented on Figure 2.

Based on the MASW data, the subsurface material (within 20 feet of the ground surface) has a shear velocity of less than 1,800 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering. The lower velocity zones at the inline distance of approximately 100 feet (station #1025) correspond to a drainage channel that was present at the ground surface.

MASW Line 01
Along Line 01 from southwest to northeast, 24 seismic shots were collected along a total inline distance of 255 feet. The processed seismic profile is presented on Figure 2.

Based on the MASW data, the subsurface material (within 20 feet of the ground surface) has a shear velocity of less than 2,400 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering.

MASW Line 02
Along Line 02 from northeast to southwest, 33 seismic shots were collected along a total inline distance of 300 feet. The processed seismic profile is presented on Figure 3.

Based on the MASW data, the subsurface material (within 10 feet of the ground surface) has a shear velocity of 1,400 to 1,700 ft/sec. From approximately 10 feet to 25 feet BGS the shear velocity ranges from 950 to 1,250 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering.

MASW Line 03
Along Line 03 from northeast to southwest, 26 seismic shots were collected along a total inline distance of 265 feet. The processed seismic profile is presented on Figure 3.

Based on the MASW data, the subsurface material (within 10 feet of the ground surface) has a shear velocity of 1,300 to 1,700 ft/sec. From approximately 10 feet to 20 feet BGS the shear velocity ranges from 950 to 1,150 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering.

MASW Line 04
Along Line 04 from southeast to northwest, 22 seismic shots were collected along a total inline distance of 245 feet. The processed seismic profile is presented on Figure 4.

Based on the MASW data, the subsurface material (within 10 feet of the ground surface) has a shear velocity greater than 1,300 ft/sec. From approximately 10 feet to 22 feet BGS the shear velocity ranges from 950 to 1,150 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering.

MASW Line 05
Along Line 05 from northeast to northwest, 14 seismic shots were collected along a total inline distance of 205 feet. The processed seismic profile is presented on Figure 4.

Due to the limited space, MASW Line 05 presents approximately 60 linear feet of data. Based on the limited MASW data, the subsurface material (within 20 feet of the ground surface) has a shear velocity of less than 1,450 ft/sec. The MASW profile indicates that the subsurface does not appear to have anomalous areas that could represent buried asphalt. The profile indicates near homogenous layering.

Ground Penetrating Radar

The locations of each of the GPR traverses were recorded with GPS equipment and are shown on Figure 5. The coordinates are presented in US State Plane NAD83 NM Central Zone, US survey feet.

Sixteen GPR profiles were collected in two orientations across the area of interest and are shown on Figure 5. The profiles are provided as Figures 6 through 14. Based on the GPR records, it appears as if the GPR energy was able to record information to a depth of approximately 10 feet.

GPR Profiles 01 and 02
GPR Profiles 01 and 02 are oriented northwest to southeast and located on the west side of the survey area. GPR Profile 01 is 70 feet long and GPR Profile 02 is 105 feet. These profiles are presented on Figure 6.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that indicates a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer with different electrical properties. The third layer is located below 7.5 feet BGS. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profiles 03 and 04
GPR Profiles 03 and 04 are oriented northwest to southeast and located on the west side of the survey area. Both profiles are 115 feet long. These profiles are presented on Figure 7.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer which appears to be less dense. The third layer is located below 7.5 feet BGS. On each profile, there is a parabolic anomaly located at the inline distance of approximately 95 feet and located approximately 9 feet BGS. Its location is coincident with a broad, linear, and discontinuous anomaly located by the previous terrain conductivity survey. This isolated anomaly may represent buried rock, void or possibly an old pipe segment. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profiles 05 and 06
GPR Profiles 05 and 06 are oriented northwest to southeast and located in the central area of the survey area. GPR Profile 05 is 100 feet long and GPR Profile 06 is 60 feet long. These profiles are presented on Figure 8.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 7.5 feet BGS. The anomaly present on GPR Profile 05 at the inline distance of 15 feet was caused by the antenna loosing contact with the ground surface. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profiles 07, 08 and 09
GPR Profiles 07, 08, and 09 are oriented northwest to southeast and located in the central area of the survey area. The profiles are 80 feet, 75 feet, and 70 feet long, respectively. These profiles are presented on Figure 9.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 7.5 feet BGS. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profiles 10 and 11
GPR Profiles 10 and 11 are oriented northwest to southeast and located in the eastern portion of the survey area. The profiles are 65 feet and 90 feet long, respectively. These profiles are presented on Figure 10.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 7.5 feet. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profiles 12 and 13
GPR Profiles 12 and 13 are oriented northwest to southeast and located in the eastern portion of the survey area. The profiles are 125 feet and 145 feet long, respectively. These profiles are presented on Figure 11.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 7.5 feet

BGS. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profile 14

GPR Profile 14 is oriented northeast to southwest and located on the south side of the survey area. The profile is 195 feet long and presented on Figure 12.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 10 feet BGS. Starting at the inline distance of 100 feet, high amplitude reflections are observed. The location of this anomaly is consistent with the hyperbolic anomalies observed in lines 3 and 4, as well as the EM anomaly identified during the previous terrain conductivity survey. This layer shows several breaks, at the inline distance of 115 feet, 130 feet, and 155 feet. These breaks in the subsurface layer may correspond to trenching activity that occurred previously at the site. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profile 15

GPR Profile 15 is oriented southwest to northeast and located in the central portion of the survey area. The profile is 90 feet long and presented on Figure 13.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 10 feet BGS. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

GPR Profile 16

GPR Profile 16 is oriented southwest to northeast and located in the central portion of the survey area. The profile is 150 feet long and presented on Figure 14.

The GPR profiles indicate the presence of three layers in the subsurface. Approximately 2.5 feet BGS is bright reflection that may indicate a change in the subsurface material. From approximately 3 feet to 7.5 BGS there is a second layer. The third layer is located below 10 feet BGS. Overall the GPR profile indicates homogenous layers in the subsurface. The GPR did not detect the presence of anomalies that could represent buried asphalt.

SURVEY LIMITATIONS

Based on the preceding discussion, geophysical surveys are typically not 100-percent accurate and they cannot always completely define subsurface conditions. ARM will not accept responsibility for inherent technique limitations, survey limitations, potentially foreseen or unforeseen site-specific conditions, or alleged operator error. By receiving this report and/or using or relying upon the data, figures, and information provided with this report, including any markings placed on the ground surface, the Client, Owner, and all persons in any way using or relying on the information collected from this survey accept all liability for the use, reliance, and actions taken based on the information collected in the survey and contained in the report, and shall hold ARM harmless for any and all damages allegedly resulting from or actually resulting from the information collected from this survey.

The client hereby agrees that, to the fullest extent permitted by law, ARM's total liability to Client and the Owner for any and all injuries, claims, losses, expenses, or damages whatsoever arising out of or in any way relating to the project from any cause or causes including but not limited to ARM's negligence, errors, omissions, strict liability, or breach of contract, shall not exceed the total amount paid by the Client or the Owner for the services of ARM for this survey.

SUMMARY

ARM collected six MASW profiles, and 16 GPR traverses within the survey area to locate anomalies that may represent possible buried asphalt. The MASW and GPR surveys did not detect the presence of anomalies with characteristics of buried asphalt along the profiles.

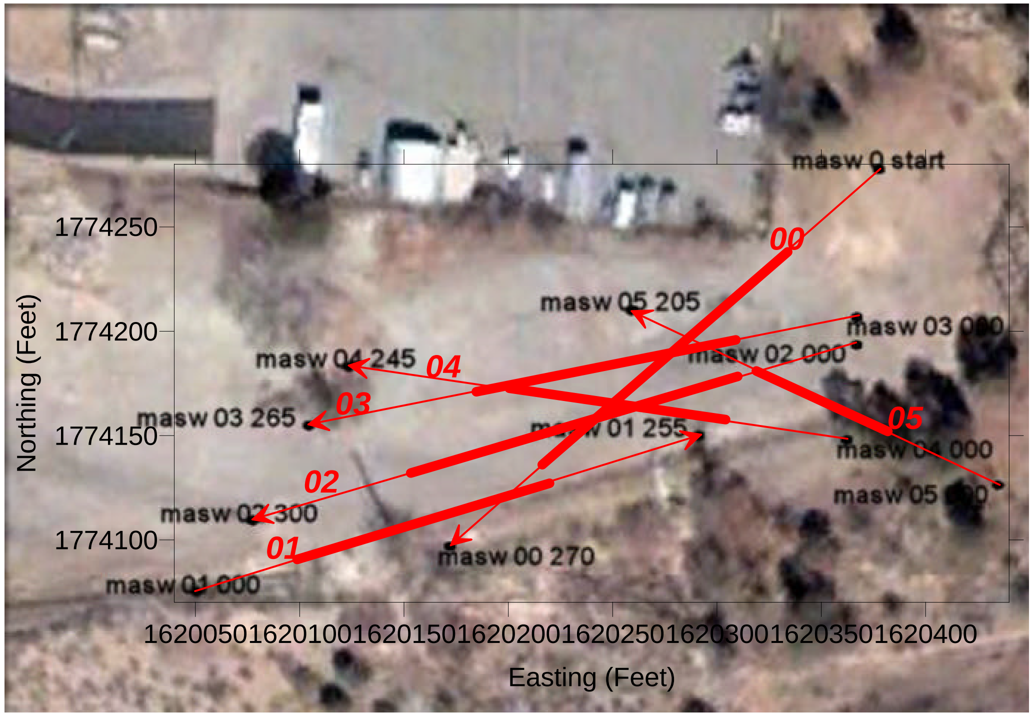
ARM appreciates the opportunity to provide geophysical services to the TerranearPMC on this project. If you have any questions regarding this report, please feel free to call either of the undersigned.

Respectfully submitted,

Beth A. Williams

Beth A. Williams, PG
Senior Geophysicist

M. Scott McQuown, P.G.
Senior Geophysicist



Feet

0 50 100 150 200

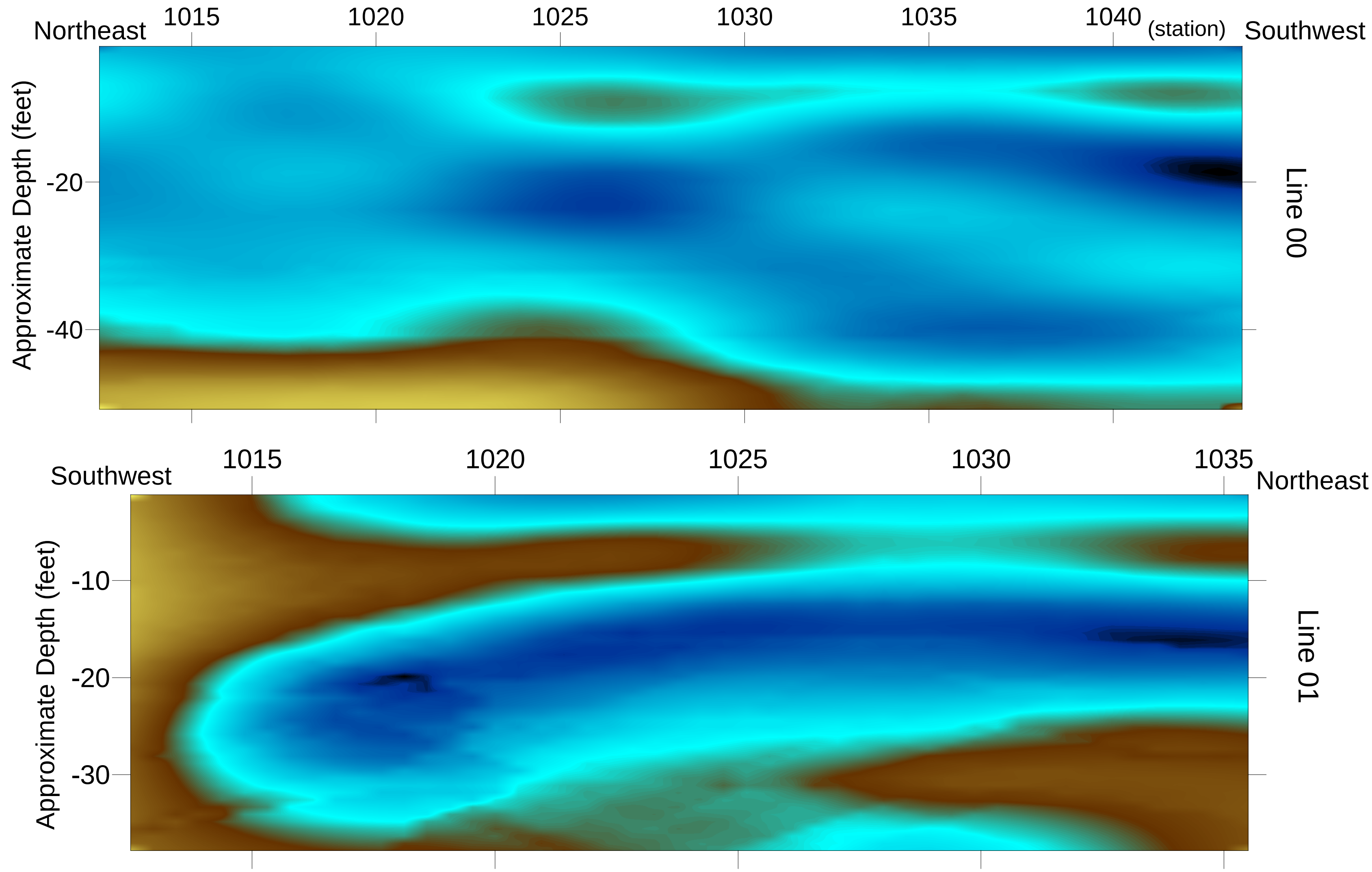
05 — Location and Orientation of MASW Traverse

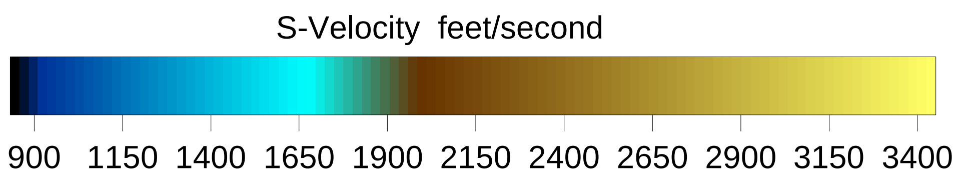
Location of Presented MASW Data

Coordinates are in
NAD83 NM Central
US Survey Feet

N

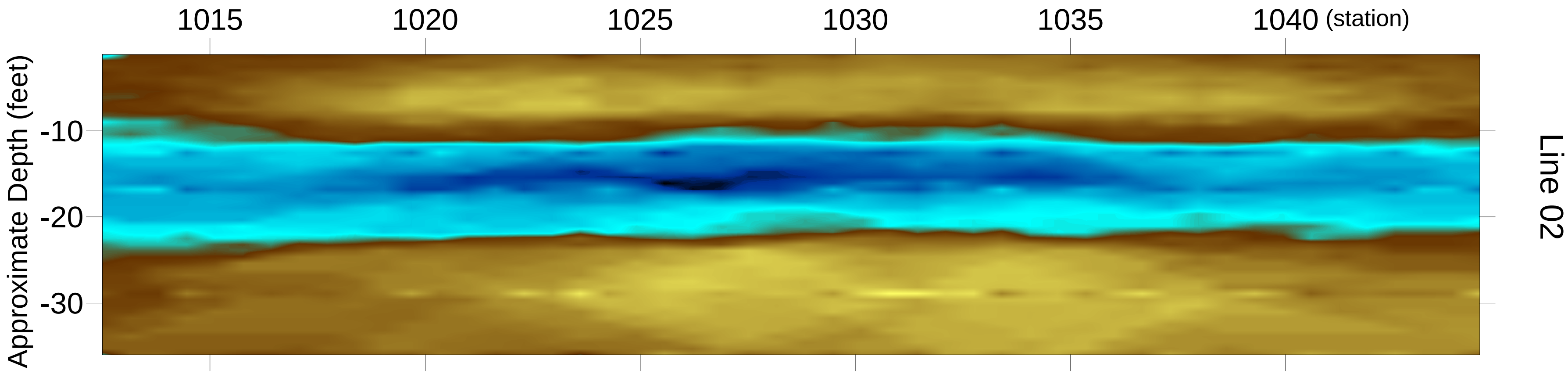
Location of MASW Traverses	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS *Surface & Borehole Geophysics*	Figure 1

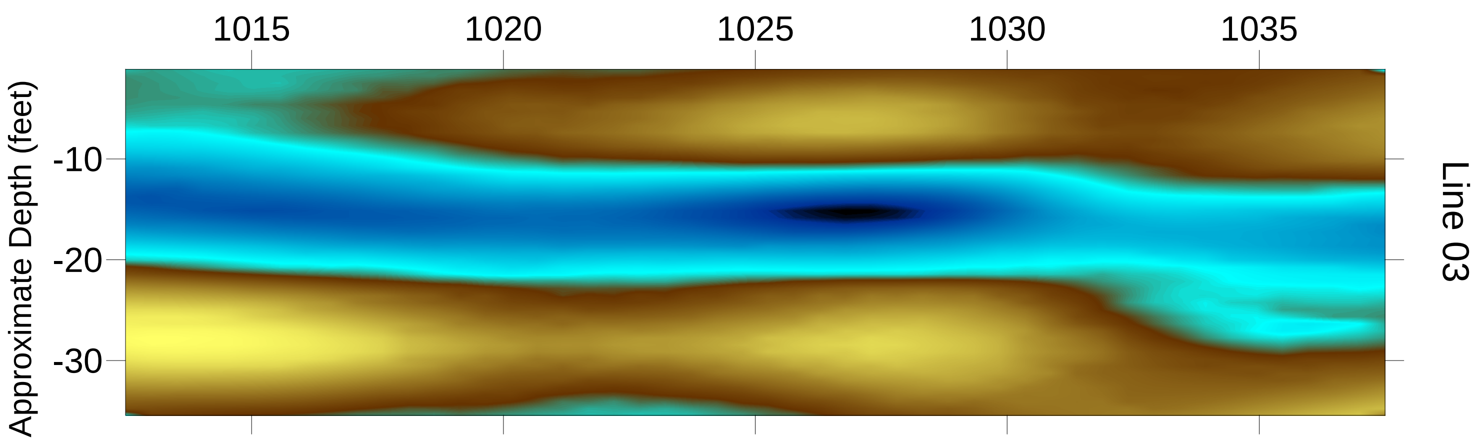


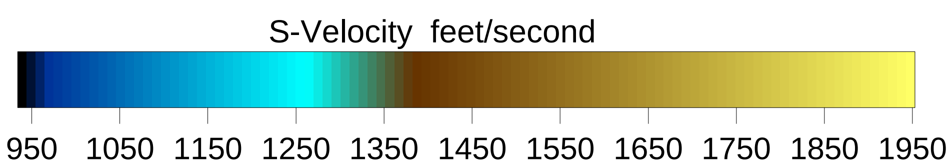


Interpretation may change if additional data becomes available.

MASW Profiles 00 and 01	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS Surface & Borehole Services — *Surface & Borehole Geophysics*	Figure 2







Interpretation may change if additional data becomes available.

MASW Profiles 02 and 03

TerranearPMC
SWMU 03-029
Los Alamos National Laboratory

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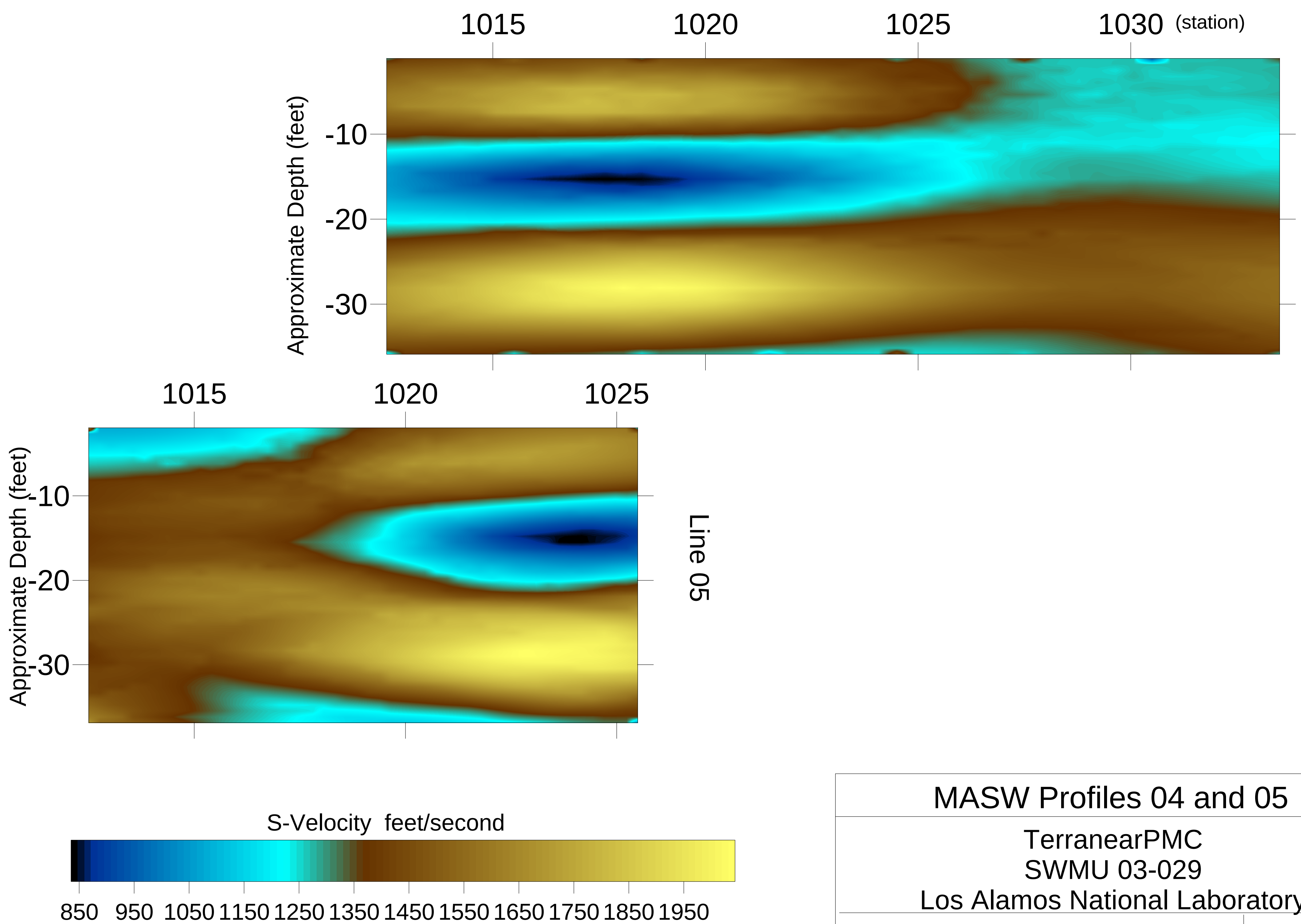
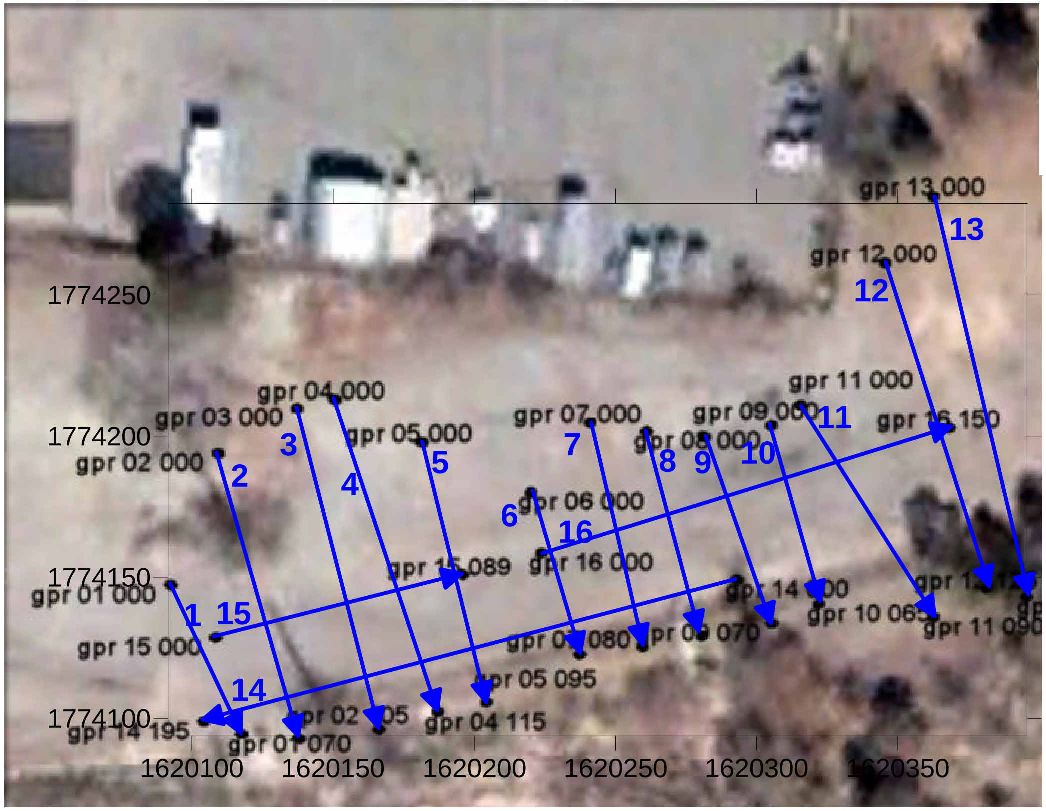
ARM GEOPHYSICS *Surface & Borehole Geophysics*	Figure 3



Interpretation may change if
additional data becomes available.

MASW Profiles 04 and 05	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS *Surface & Borehole Geophysics*	Figure 4

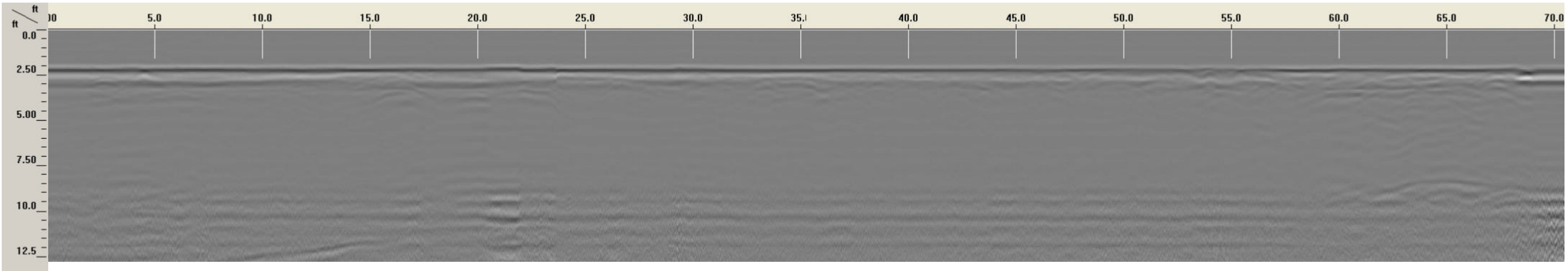


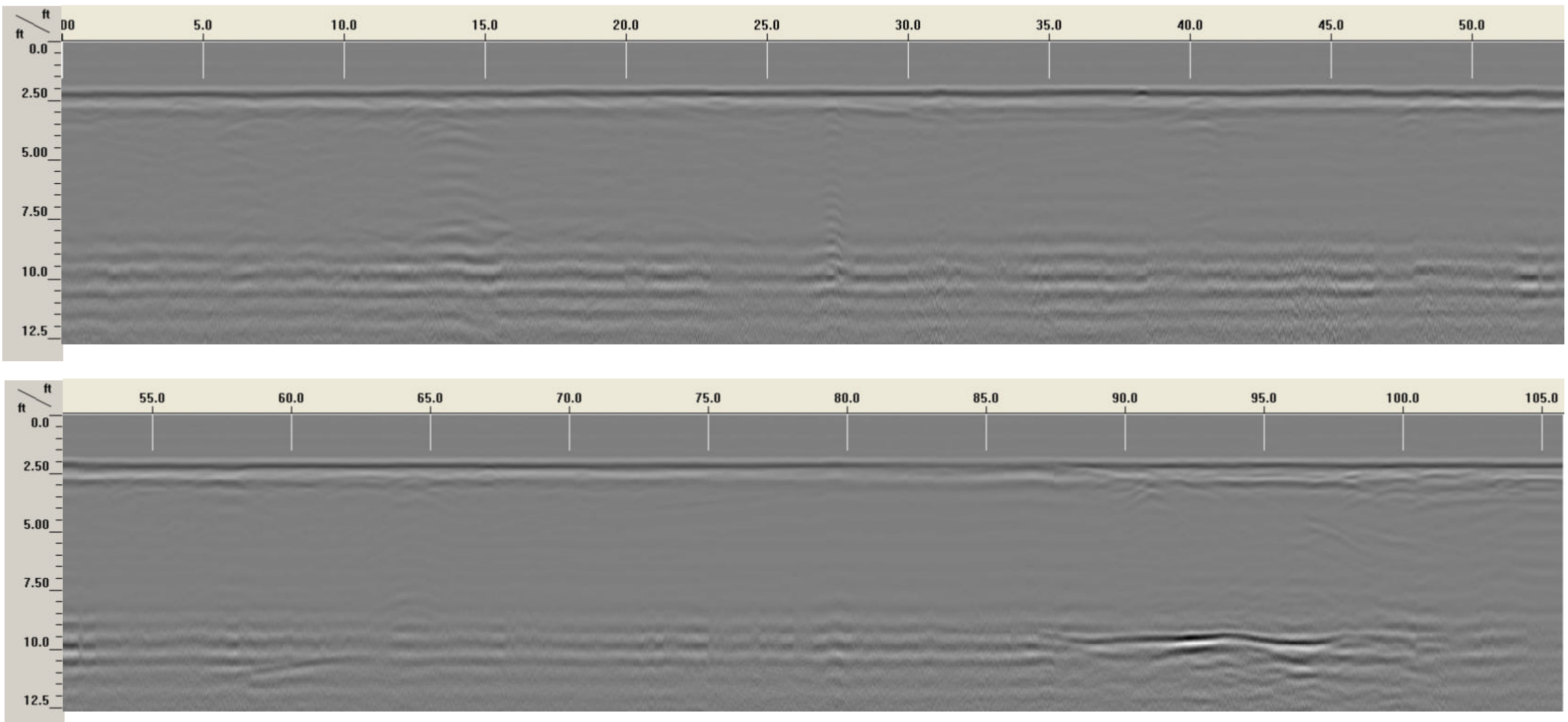
N

13 → Location and Orientation of GPR Profile

Coordinates are in
NAD83 NM Central
US Survey Feet

Location of GPR Traverses	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS *Surface & Borehole Geophysics*	Figure 5



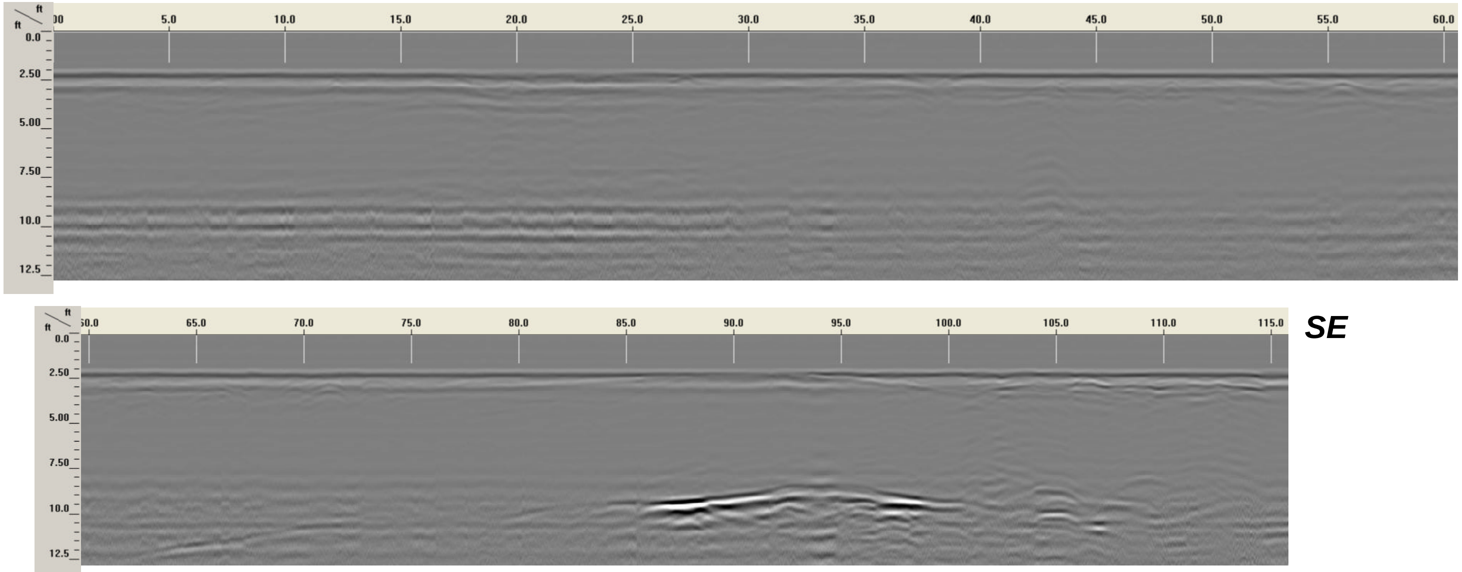


Interpretation may change if additional data becomes available.

GPR Profiles 01 and 02	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS Surface & Borehole Geophysics	Figure 6

NW

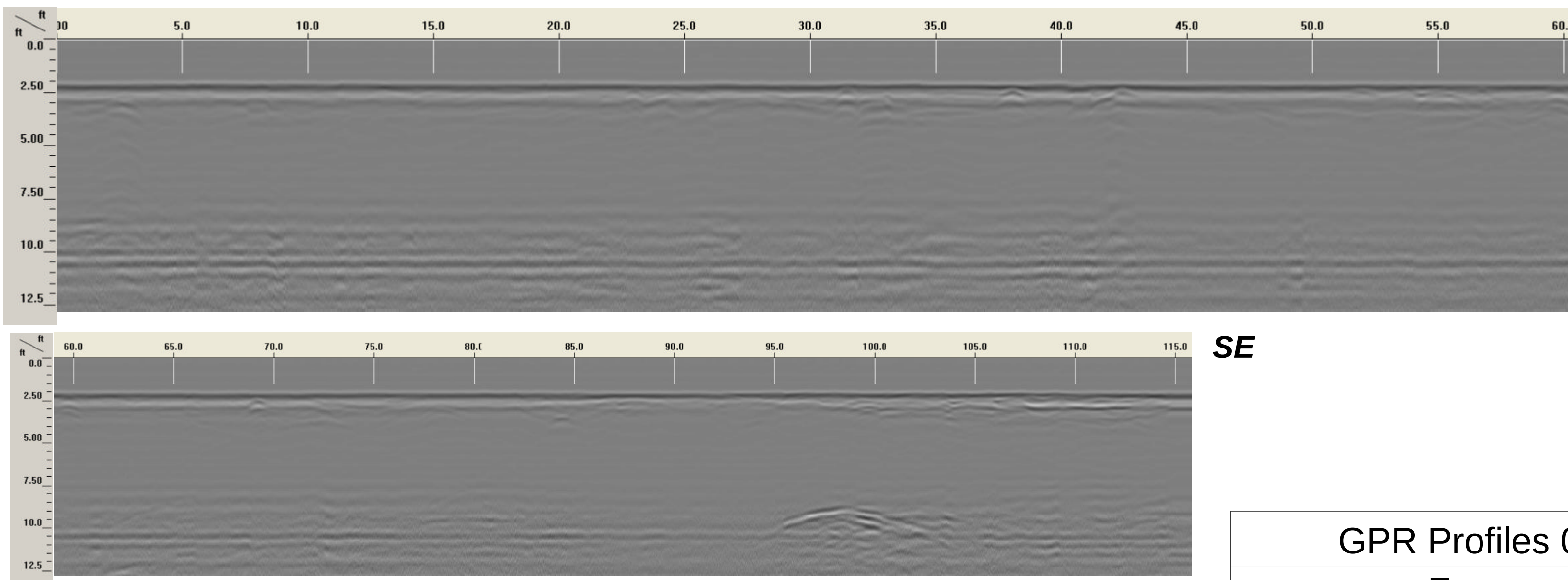
Line 03



SE

NW

Line 04



SE

Interpretation may change if additional data becomes available.

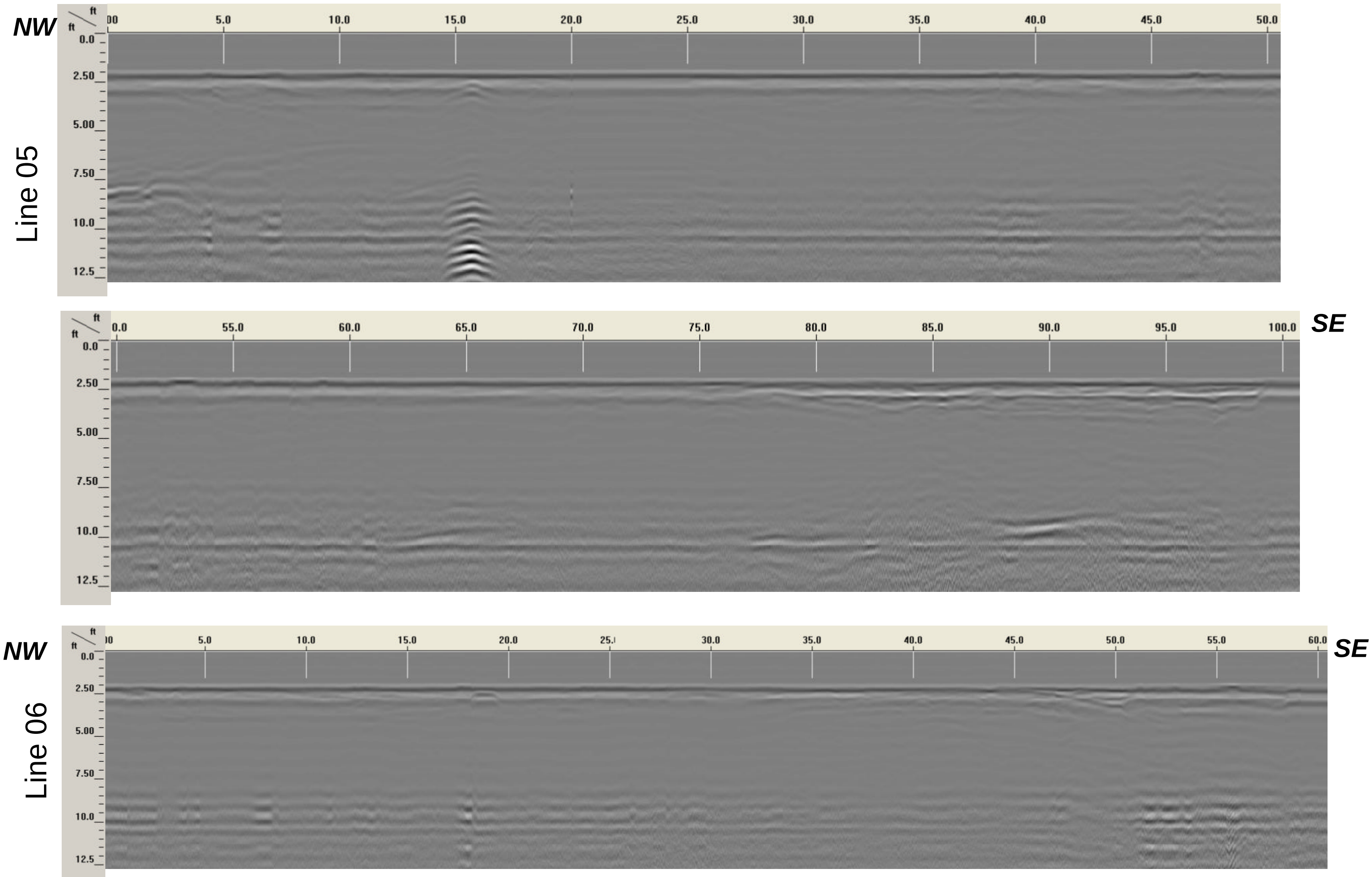
GPR Profiles 03 and 04

TerranearPMC
SWMU 03-029
Los Alamos National Laboratory

February 2010 | 09303

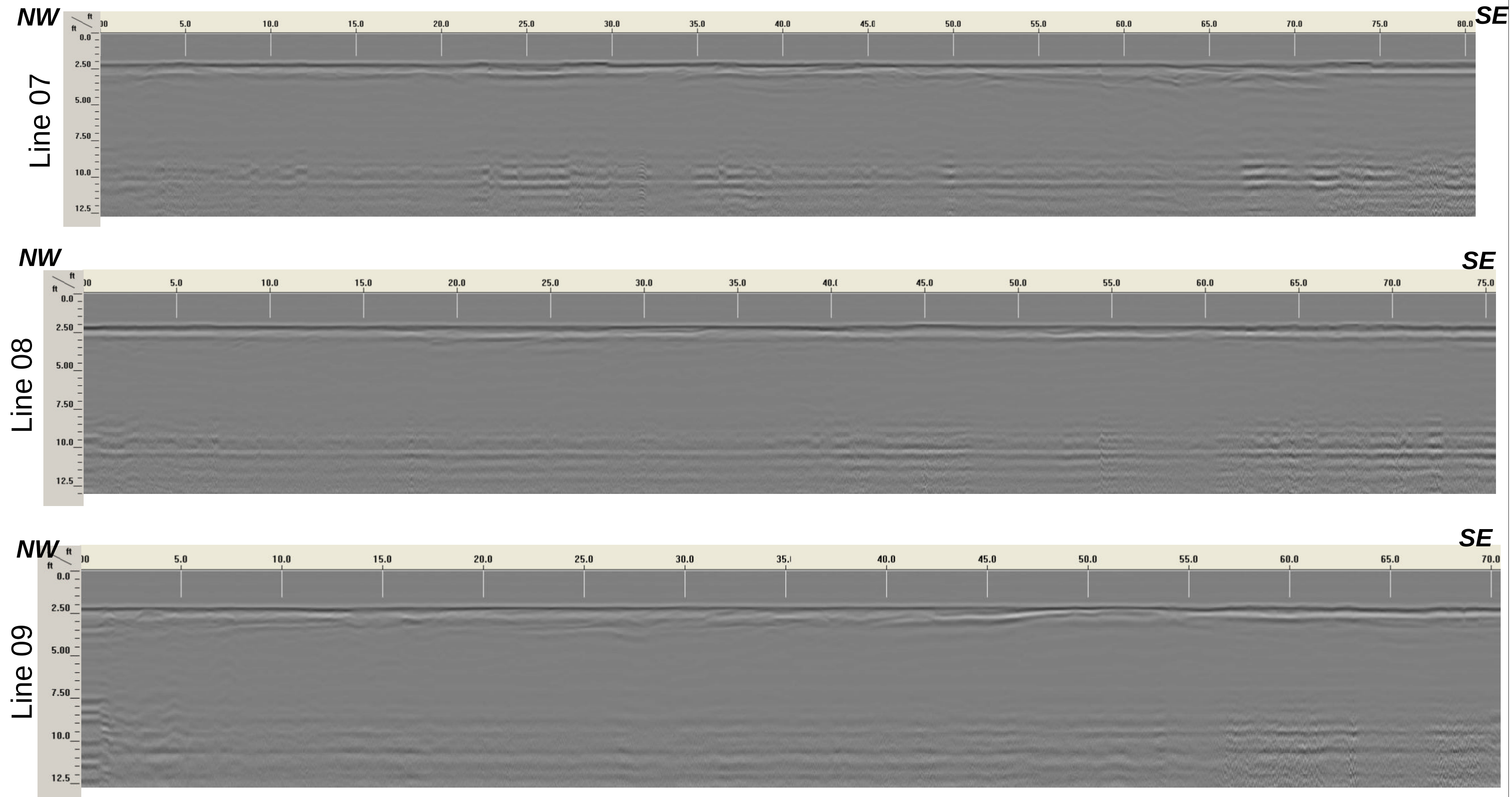
Surface & Borehole Geophysics

Figure 7



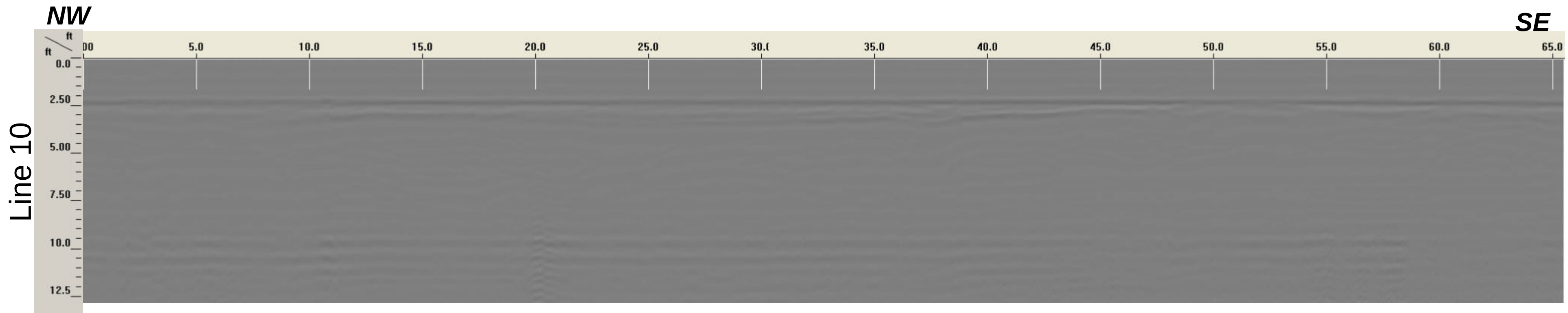
Interpretation may change if
additional data becomes available.

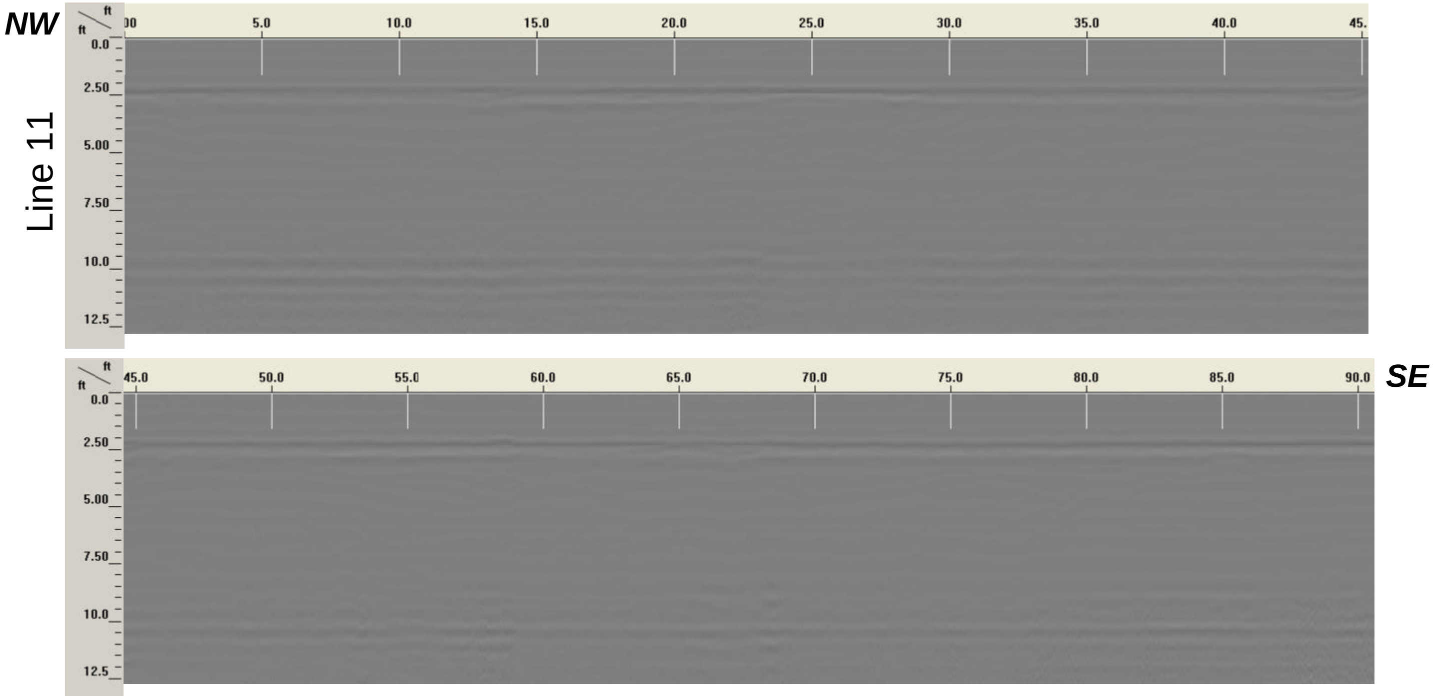
GPR Profiles 05 and 06	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS Surface & Borehole Services — *Surface & Borehole Geophysics*	Figure 8



Interpretation may change if
additional data becomes available.

GPR Profiles 07, 08, and 09	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
Surface & Borehole Geophysics	Figure 9



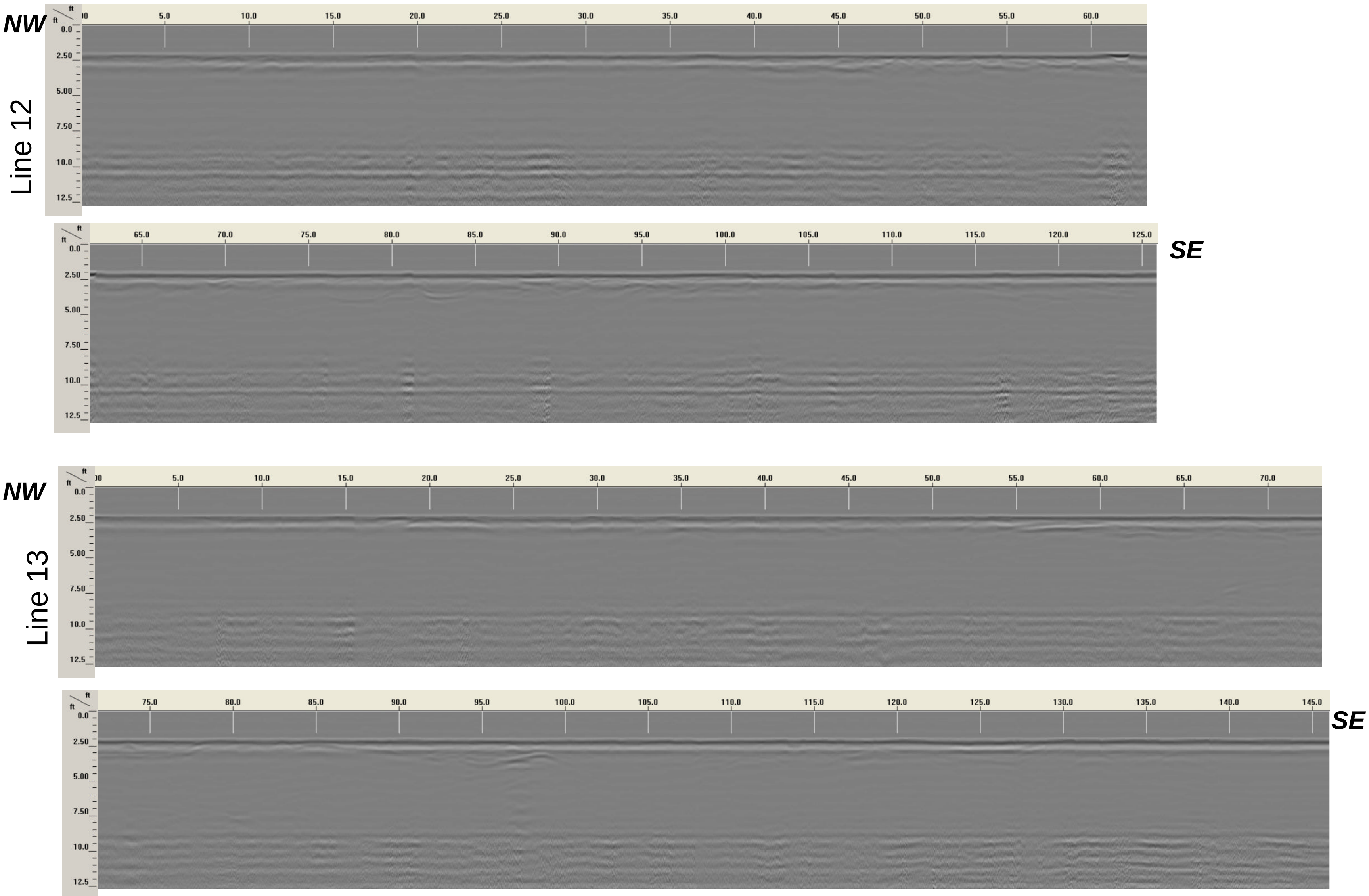


Interpretation may change if
additional data becomes available.

GPR Profiles 10 and 11

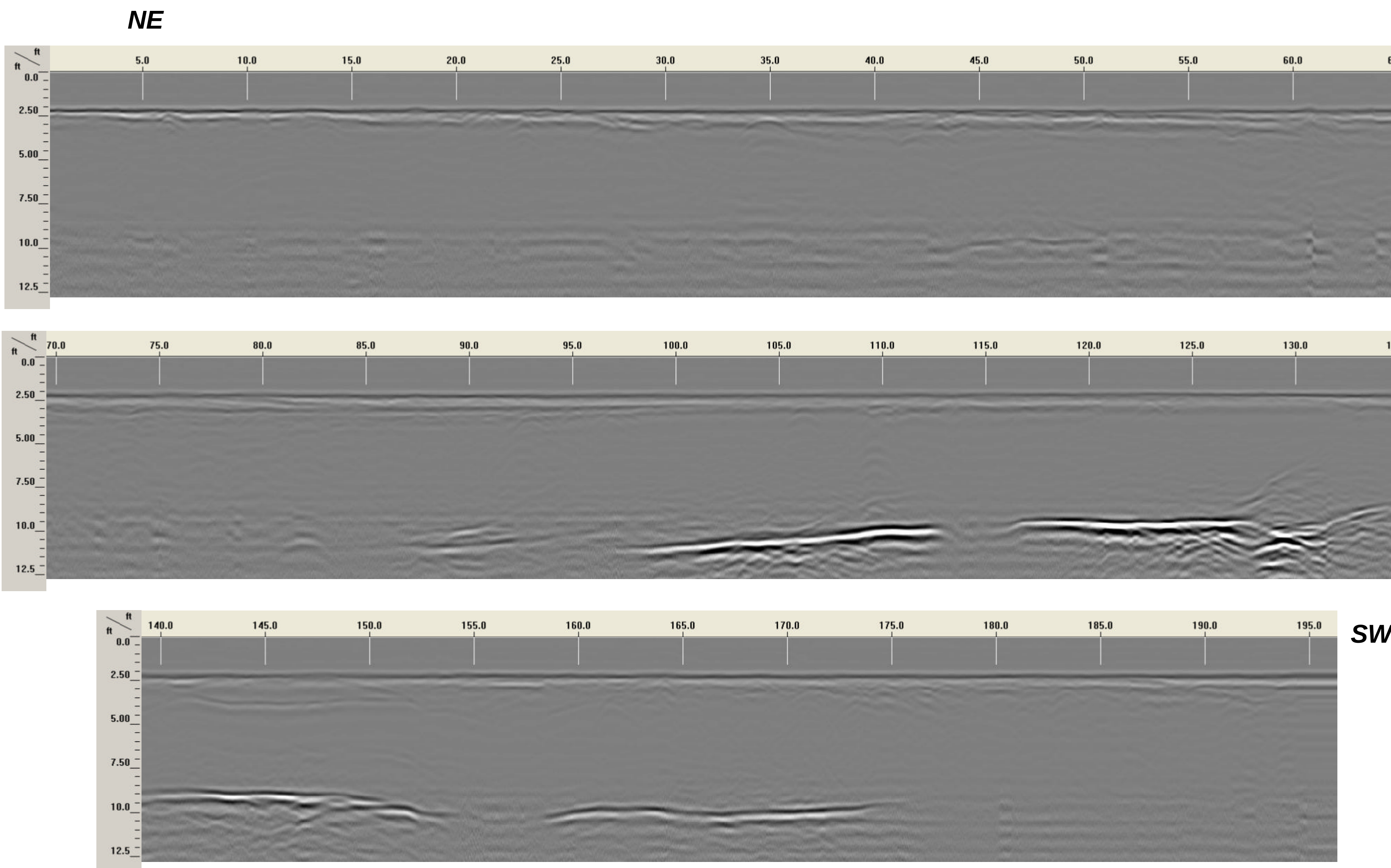
TerranearPMC
SWMU 03-029
Los Alamos National Laboratory

February 2010	09303
ARM Geophysics — *Surface & Borehole Geophysics*	Figure 10



Interpretation may change if additional data becomes available.

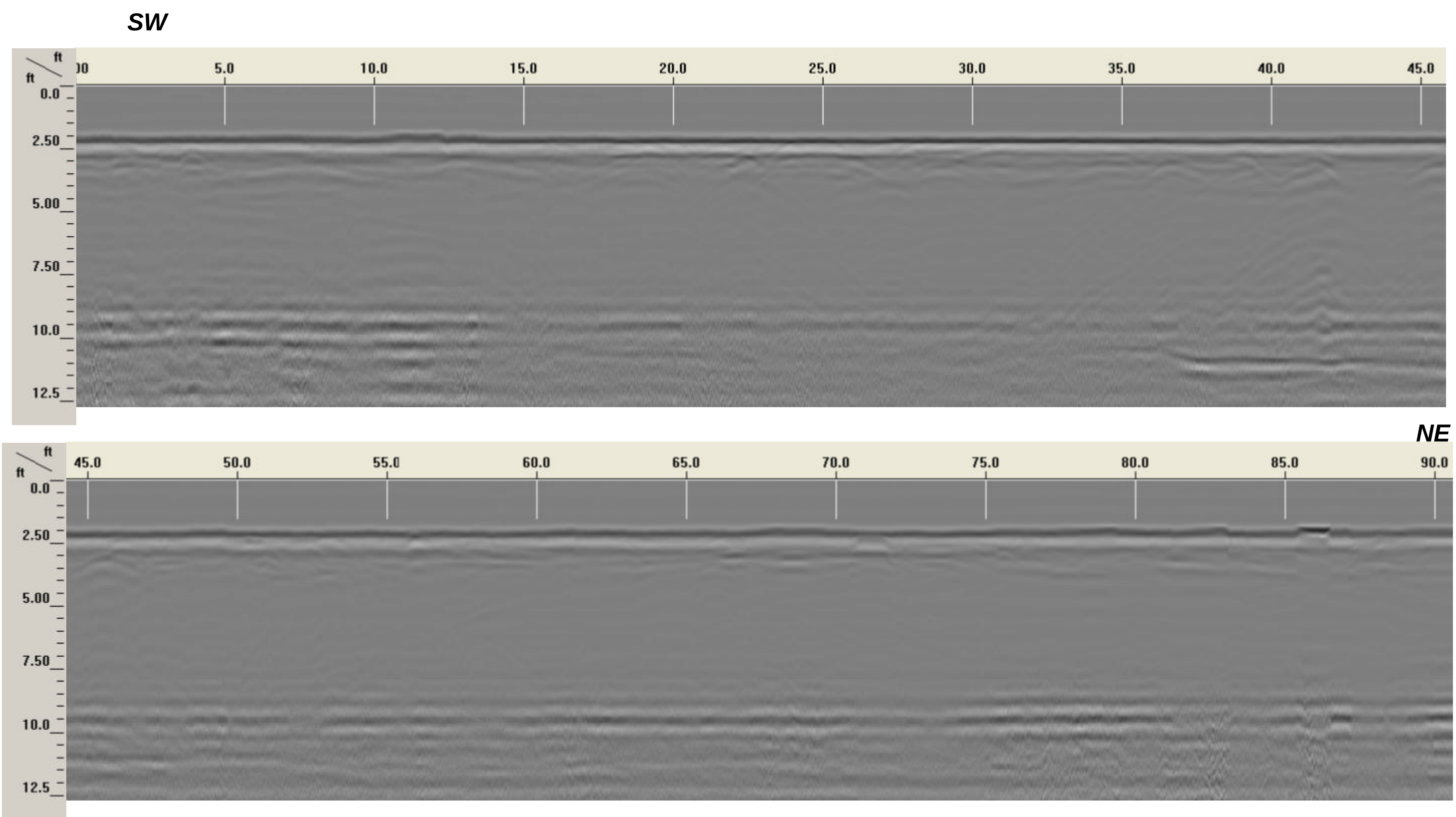
GPR Profiles 12 and 13	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS — *Surface & Borehole Geophysics*	Figure 11



Line 14

Interpretation may change if
additional data becomes available.

GPR Profile 14	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS Surface & Borehole Services — *Surface & Borehole Geophysics*	Figure 12

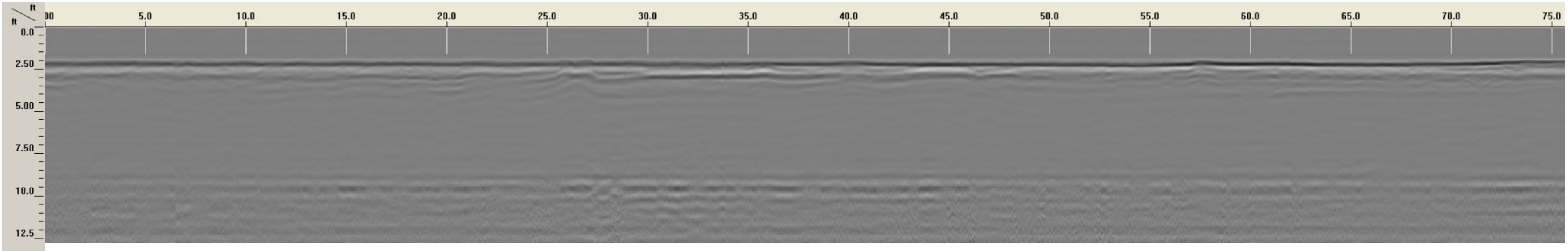


Line 15

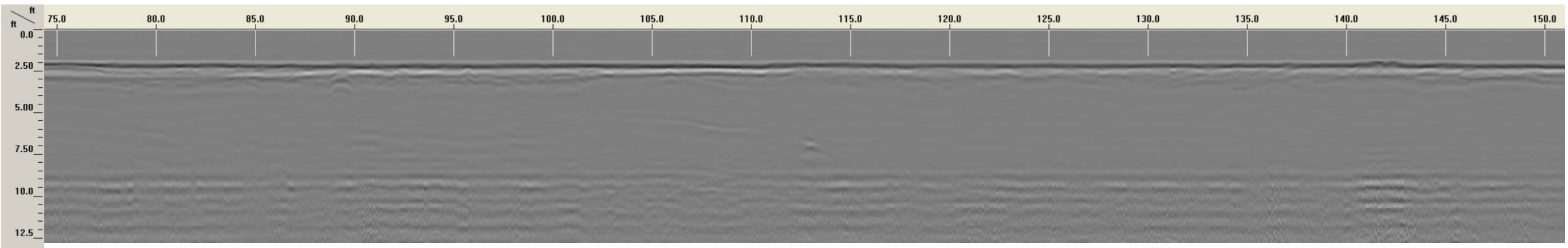
Interpretation may change if
additional data becomes available.

GPR Profile 15	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
Surface & Borehole Geophysics	Figure 13

SW



NE



Line 16

Interpretation may change if
additional data becomes available.

GPR Profile 16	
TerranearPMC SWMU 03-029 Los Alamos National Laboratory	
February 2010	09303
ARM GEOPHYSICS *Surface & Borehole Geophysics*	Figure 14

Appendix F

Analytical Program

F-1.0 INTRODUCTION

This appendix discusses the analytical methods and data-quality review for samples collected during investigations (1994 to 2010) at the Upper Sandia Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). Additionally, this appendix summarizes the effects of data-quality issues on the acceptability of the analytical data.

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the Quality Assurance Project Plan Requirements for Sampling and Analysis (LANL 1996, 054609), and the Laboratory's statements of work (SOWs) for analytical laboratories (LANL 1995, 049738; LANL 2000, 071233). The results of the QA/QC procedures were used to estimate the accuracy, bias, and precision of the analytical measurements. Samples for QC include method blanks, matrix spikes (MSs), laboratory control samples (LCSs), internal standards (IS), initial calibration verifications (ICVs) and continuing calibration verifications (CCVs), surrogates, and tracers.

The type and frequency of laboratory QC analyses are described in the SOWs for analytical laboratories (LANL 1995, 049738; LANL 2000, 071233). Other QC factors, such as sample preservation and holding times, were also assessed in accordance with the requirements outlined in standard operating procedure (SOP) EP-ERSS-SOP-5056, Sample Containers and Preservation.

The following SOPs, available at http://www.lanl.gov/community-environment/environmental-stewardship/plans-procedures.php, were used for data validation:

- SOP-5161, Routine Validation of Volatile Organic Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data
- SOP-5163, Routine Validation of Organochlorine Pesticides and PCB Analytical Data
- SOP-5165, Routine Validation of Metals Analytical Data
- SOP-5166, Routine Validation of Gamma Spectroscopy Data, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data
- SOP-5169 Routine Validation of Dioxin Furan Analytical Data (EPA Method 1618 and SW-846 EPA Method 8290)
- SOP-5171, Routine Validation of Total Petroleum Hydrocarbons Gasoline Range Organics/Diesel Range Organics Analytical Data (Method 8015B)
- SOP-5191, Routine Validation of LC/MS/MS Perchlorate Analytical Data (SW-846 EPA Method 6850)

Routine data validation was performed for each data package (also referred to as request numbers), and analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines, where applicable (EPA 1994, 048639; EPA 1999, 066649). As a result of the data validation and assessment efforts, qualifiers are assigned to the analytical records as appropriate. The data-qualifier definitions are provided in Appendix A. Sample collection logs (SCLs), and chain-of-custody (COCs) forms are provided in Appendix G. The analytical data, instrument printouts, and data validation reports are provided in Appendix G.

F-2.0 ANALYTICAL DATA ORGANIZATION

Historical data evaluated in this report were collected from 1994 to 2008 during Resource Conservation and Recovery Act facility investigations and several corrective actions. All data records include a vintage code field denoting how and where samples were submitted for analyses. All historical data evaluated in this report were revalidated by current quality control metrics.

F-2.1 Historical Laboratory Screening Data and Sample Documentation

Samples collected before 1995–1996 were analyzed internally at the Laboratory's Chemical Science and Technology (CST) on-site and off-site laboratories. Historical data analyzed on-site by CST have been determined by the Laboratory to be screening-level quality only and are not used for decision-making purposes. Therefore, CST on-site data are removed from reporting datasets used to assess site contamination and/or risk and presented separately as screening data. Data analyzed off-site by CST are determined to be of sufficient quality for decision-making purposes only if complete data packages can be located and the analytical data are reviewed and revalidated to current QA standards.

F-3.0 INORGANIC CHEMICAL ANALYSES

A total of 734 samples (plus 77 field duplicates) collected within the Upper Sandia Canyon Aggregate Area were analyzed for inorganic chemicals. All 734 samples (plus 77 field duplicates) were analyzed for target analyte list (TAL) metals; 158 samples (plus 20 field duplicates) were analyzed for nitrate; 188 samples (plus 26 field duplicates) were analyzed for perchlorate; 52 samples (plus 3 field duplicates) were analyzed for hexavalent chromium; and 443 samples (plus 50 field duplicates) were analyzed for total cyanide. The analytical methods used for inorganic chemicals are listed in Table F-1.0-1.

Tables within the investigation report summarize all samples collected and the analyses requested from the Upper Sandia Canyon Aggregate Area. All inorganic chemical results are provided on DVD in Appendix G.

F-3.1 Inorganic 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. To assess the accuracy and precision of inorganic chemical analyses, LCSs, preparation blanks, MSs, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed as part of the investigation. 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. For some of the analyses performed before the 1995 SOW was implemented, slightly different QA/QC procedures may have been followed.

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 recovery (%R) should fall within the control limits of 75%–125% (LANL 1995, 049738; LANL 2000, 071233).

The 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; it 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 75%–125%, inclusive, for all spiked analytes (LANL 1995, 049738; LANL 2000, 071233).

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 within the acceptance range of 80%–120%. The QC acceptance limits are ±20%.

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 datasets are summarized in the following subsections.

F-3.2 Data Quality Results for Inorganic Chemicals

The majority of the analytical results were qualified as not detected (U) because the analytes were not detected by the respective analytical methods. No quality issues were associated with the data presented.

F-3.2.1 Chain of Custody

SCL/COC forms were maintained properly for all samples analyzed for inorganic chemicals (Appendix G).

F-3.2.2 Sample Documentation

All samples analyzed for inorganic chemicals were properly documented on SCL/COC forms in the field (Appendix G).

F-3.2.3 Sample Dilutions

Some samples were diluted for inorganic chemical analyses. No qualifiers were applied to any inorganic chemical sample results because of dilutions.

F-3.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

F-3.2.5 Holding Times

A total of 11 TAL metals were qualified as estimated not detected (UJ) because the extraction/analytical holding times were exceeded by less than 2 times the published method holding times.

A total of 20 TAL metals were qualified as estimated and biased low (J-) because the extraction/analytical holding times were exceeded by less than 2 times the published method holding times.

F-3.2.6 Initial and Continuing Calibration Verifications

Nine TAL metals results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

One mercury result was qualified as estimated and biased high (J+) because the ICV and/or CCV were recovered above the upper limit.

F-3.2.7 Interference Check Sample and/or Serial Dilutions

Three TAL metals results were qualified as estimated (J) because the serial dilution sample RPD was greater than 10% and the sample result was greater than 50 times the MDL.

F-3.2.8 Laboratory Duplicate Samples

A total of 24 TAL metals results were qualified as estimated not detected (UJ) because the sample and the duplicate sampling results were greater than or equal to 5 times the reporting limit (RL) and the duplicate RPD was greater than 35% for soil samples.

Three TAL metals results were qualified as estimated (J) because the duplicate sample was analyzed on a non-Laboratory sample.

A total of 607 TAL metals results were qualified as estimated (J) because the sample and the duplicate sampling results were greater than or equal to 5 times the RL, and the duplicate RPD was greater than 35% for soil samples.

F-3.2.9 Preparation Blanks

A total of 166 TAL metals results and 2 cyanide results were qualified as not detected (U) because the sampling results were less than or equal to 5 times the concentration of the related analytes in the method blank.

A total of 164 TAL metals results and 19 total cyanide results were qualified as not detected (U) because the sampling results were less than or equal to the concentration of the related analyte in the initial calibration blank and or continuing calibration blank.

A total of 257 TAL metals results and 16 nitrate results were qualified as not detected (U) because the sampling results were less than or equal to 5 times the concentration of the related analyte in the equipment or rinsate blank.

A total of 187 TAL metals results were qualified as estimated (J) because the sampling results were greater than 5 times the concentration of the related analytes in the method blank.

F-3.2.10 Matrix Spike Samples

A total of 292 TAL metals results and 34 nitrate results were qualified as estimated not detected (UJ) because a low recovery (%R <75%) was observed for these analytes in the associated spike sample.

A total of 9 TAL metals results and 13 nitrate results were qualified as estimated not detected (UJ) because a high recovery (%R >125%) was observed for these analytes in the associated spike sample.

A total of 577 TAL metals results and 25 nitrate results were qualified as estimated and biased low (J-) because a low recovery (%R <75%) was observed for these analytes in the associated spike sample.

A total of 1398 TAL metals results and 2 nitrate results were qualified as estimated and biased high (J+) because a high recovery (%R >125%) was observed for these analytes in the associated spike sample.

Two perchlorate results were qualified as estimated and not detected (UJ) because the MS/matrix spike duplicate (MSD) RPD was greater than 20%.

F-3.2.11 Laboratory Control Sample Recoveries

A total of 15 TAL metals results were qualified as estimated not detected (UJ) because a low recovery (%R <75%) was observed for these analytes in the associated LCS.

One TAL metals result was qualified as estimated and biased low (J-) because a low recovery (%R <75%) was observed for this analysis in the associated LCS.

A total of 19 TAL metals results were qualified as estimated and biased high (J+) because a high recovery (%R > 125%) was observed for these analytes in the associated LCS.

F-3.2.12 Detection Limits

A total of 710 TAL metals results and two hexavalent chromium results were qualified as estimated (J) because the sampling result was reported as detected between the estimated detection limit (EDL) and the MDL.

A total of 1445 TAL metals results, 1 nitrate result, 1 hexavalent chromium result, 22 perchlorate results, and 20 total cyanide results were qualified as estimated (J) because the sampling result was reported as detected between the practical quantitation limit (PQL) and the MDL.

F-3.2.13 Rejected Results

A total of 41 TAL metals results (22 antimony, 7 barium, and 12 manganese) were qualified as rejected (R) because the associated MS recovery was less than 30%, indicating a low bias.

A total of 45 TAL metals results (10 magnesium, 11 nickel, and 24 silicon dioxide) were qualified as rejected (R) because the associated MS recovery was less than 10%, indicating an extremely low bias.

A total of 10 inorganic results (6 nitrate and 4 mercury) were qualified as rejected (R) because the extraction/analytical holding time were exceeded by more than 2 times the published method for holding times.

A focused validation was performed on the inorganic chemical data (TAL metals and hexavalent chromium) collected for SWMU 03-012(b) during 2002 and 2003. Based on the professional judgment of the analytical chemist performing the validation, all 32 hexavalent chromium results for 2002 were qualified as rejected (R). The initial calibration for these analyses was not performed within 24 h, as required by the analytical procedure. The analytical laboratory did an initial calibration on July 30, 2002, and the samples were analyzed on September 24 and 25, 2002. Although continuing calibrations were performed, the initial calibration was performed approximately 2 mo before sample analyses.

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 to conduct the risk assessments. The results of other qualified data were used as reported and did not affect the usability of the sampling results.

F-4.0 ORGANIC CHEMICAL ANALYSES

A total of 705 samples (plus 82 field duplicates) collected within the Upper Sandia Canyon Aggregate Area were analyzed for organic chemicals. A total of 618 samples (plus 74 field duplicates) were analyzed for volatile organic chemicals (VOCs); 651 samples (plus 75 field duplicates) were analyzed for semivolatile organic chemicals (SVOCs); 647 samples (plus 80 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 2 samples were analyzed for dioxins/furans; 27 samples (plus 1 field duplicate) were analyzed for pesticides; 10 samples were analyzed for herbicides; 449 samples (plus 54 field duplicates) were analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO); and 100 samples (plus 16 field duplicates) were analyzed for TPH gasoline range organics (GRO). 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 F-1.0-1.

Tables within the supplemental investigation report summarize all samples collected from the Upper Sandia Canyon Aggregate Area and the analyses requested. All organic chemical results are provided on DVD in Appendix G.

F-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, MSs, 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 2000, 071233) and described briefly in the paragraphs 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 that the initial calibration is still holding and 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 within the method-specific acceptance criteria.

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; it 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 2000, 071233).

MS 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 lower acceptance limit (LAL) and upper acceptance limit (UAL).

A surrogate compound (a surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but is not normally 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 percent recovery for ISs should be within the range of 50%–200%.

Details regarding the quality of the organic chemical analytical data included in the dataset are summarized in the following sections.

F-4.2 Data Quality Results for Organic Chemicals

The majority of the analytical results were qualified as not detected (U) because the analytes were not detected by the respective analytical methods. No quality issues were associated with the data presented.

Two SVOC and 32 VOC results were qualified as not detected (U) because the mass spectra did not meet specifications.

Five TPH-DRO results were qualified as estimated not detected (UJ) because the project chemist identified quality deficiencies in the reported data that required further qualification.

A total of 12 dioxin/furan results were qualified as estimated not detected (UJ) because the instrument performance sample did not pass method acceptance criteria.

A total of 12 dioxin/furan results were qualified as estimated (J) because the instrument performance sample did not pass method acceptance criteria.

F-4.2.1 Maintenance of COC

COC forms were maintained properly for all samples analyzed for organic chemicals (Appendix G).

F-4.2.2 Sample Documentation

All samples analyzed for organic chemicals were properly documented on the SCL in the field (Appendix G).

F-4.2.3 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

F-4.2.4 Holding Times

A total of 1260 SVOC results were qualified as estimated not detected (UJ) because the extraction holding times were exceeded by less than 2 times the published method holding times.

A total of 32 SVOC results were qualified as estimated and biased low (J-) because the extraction holding times were exceeded by less than 2 times the published method holding times.

F-4.2.5 Initial and Continuing Calibration Verifications

A total of 22 PCB results, 47 SVOC results, and 46 VOC results were qualified as estimated not detected (UJ) because the associated percent relative standard deviation (%RSD) or percent difference (%D) exceeded criteria in the initial or continuing calibration standard.

Three PCB results, 79 pesticide results, 2903 SVOC results, and 2403 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Two SVOC results, four PCB results, one TPH-DRO result, and five VOC results were qualified as estimated (J) because the associated %RSD or %D exceeded criteria in the initial or continuing calibration standard.

Two dioxin/furan results, 36 SVOC results, and 80 VOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method specific limits.

A total of 118 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

F-4.2.6 Surrogate Recoveries

Two TPH-DRO results, 298 SVOC results, 2 TPH-GRO results, 34 PCB results, and 211 VOC results were qualified as estimated not detected (UJ) because the associated surrogate was recovered below the LAL but was greater than or equal to 10% R, which indicates the potential for a low bias in the results.

Three TPH-GRO results and eight PCB results were qualified as estimated and biased low (J-) because the associated surrogate was recovered below the LAL but was greater than or equal to 10% R.

Two TPH-GRO results were qualified as estimated and biased low (J-) because the associated surrogate was recovered at less than 10% R.

Two TPH-DRO results, four TPH-GRO results, one PCB result, and seven VOC results were qualified as estimated and biased high (J+) because the surrogate %R value is greater than the UAL, which indicates a potential for a high bias in the results and a potential for false positive results.

F-4.2.7 IS Responses

A total of 167 SVOC results and 147 VOC results were qualified as estimated not detected (UJ) because the associated IS area counts were less than 50% but greater than 10% R when compared with the area counts in the previous continuing calibration standard.

Two SVOC results and two VOC results were qualified as estimated (J) because the associated IS area counts were less than 50% but greater than 10% R when compared with the area counts in the applicable continuing calibration standard.

F-4.2.8 Method Blanks

A total of 13 TPH-DRO results, 2 PCB results, 13 SVOC results, and 222 VOC results were qualified as not detected (U) because the associated sample concentration was less than 5 times (10 times for common laboratory contaminants) the concentration of the related analyte in the method blank.

A total of 17 VOC results were qualified as not detected (U) because the sample result is less than or equal to 5 times (10 times for common laboratory contaminants) the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.

One VOC result was qualified as estimated (J) because the analyte was detected in the method blank and the sample result was greater than 5 times (10 times for common laboratory contaminants) the concentration in the method blank.

F-4.2.9 Matrix Spikes

A total of 44 TPH-DRO results and 1 TPH-GRO result were qualified as estimated not detected (UJ) because a low recovery (%R <70%) was observed for these analytes in the associated spike sample.

Three TPH-DRO results were qualified as estimated not detected (UJ) because the MS/MSD RPD was greater than 30%.

Twelve TPH-DRO results were qualified as estimated (J) because the MS/MSD %R was greater than or equal to 10% but less than 70%.

Nine TPH-DRO results were qualified as estimated (J) because the MS/MSD RPD was greater than 30%.

A total of 84 TPH-DRO results and 11 TPH-GRO results were qualified as estimated (J) because a low recovery (%R < 70%) was observed for these analytes in the associated spike sample.

Three TPH-DRO results were qualified as estimated and biased high (J+) because the MS/MSD %R was greater than 130%.

F-4.2.10 Laboratory Duplicate Samples

Laboratory duplicates collected for organic chemical analyses indicated acceptable precision for all samples.

F-4.2.11 Laboratory Control Sample Recoveries

A total of 58 SVOC results and 25 VOC results were qualified as estimated not detected (UJ) because a low recovery (%R <75%) was observed for these analytes in the associated LCS.

One VOC results was qualified as estimated and biased high (J+) because a high recovery (%R >125%) was observed in the associated LCS.

F-4.2.12 Quantitation and Method Detection Limits

Three dioxin/furan results, 112 PCB results, 2 pesticide results, 816 SVOC results, 113 TPH-DRO results, 18 TPH-GRO results, and 226 VOC results were qualified as estimated (J) because the sampling result was reported as detected between the PQL and the MDL.

F-4.2.13 Rejected Data

Six TPH-DRO, 59 SVOC, and five VOC results were qualified as rejected (R) because a low recovery (<10%) was observed for these analytes in the associated LCSs.

Three SVOC, 21 VOC, 2 PCB, 2 TPH-DRO, and 2 TPH-GRO results were qualified as rejected (R) because the affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.

Sixty-eight SVOC results were qualified as rejected (R) because a low recover (<10%) was observed for the associated surrogates.

A total of 1145 SVOC results were qualified as rejected (R) because IS information was not available.

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 were available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and did not affect the usability of the sampling results.

F-5.0 RADIONUCLIDE ANALYSES

A total of 252 samples (plus 29 field duplicates) collected within the Upper Sandia Canyon Aggregate Area were analyzed for radionuclides. A total of 146 samples (plus 24 field duplicates) were analyzed for americium-241; 5 samples were analyzed for gamma-emitting radionuclides; 2 samples were analyzed for alpha/beta emitting radionuclides; 138 samples (plus 13 field duplicates) were analyzed for tritium; 169 samples (plus 24 field duplicates) were analyzed for isotopic plutonium; 175 samples (plus 22 field duplicates) were analyzed for isotopic uranium; and 39 samples (plus 3 field duplicates) were analyzed for strontium-90. The analytical methods used for radionuclides are listed in Table F-1.0-1.

Tables in the investigation report summarize all samples collected from the Upper Sandia Canyon Aggregate Area and the analyses requested. All radionuclide results are provided on DVD (Appendix G).

F-5.1 Radionuclide QA/QC Samples

All procedures were followed as required by the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233). Some sampling 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 not to data quality issues.

To assess the accuracy and precision of the radionuclide analyses, LCSs, method blanks, MS samples, laboratory duplicate samples, and tracers were analyzed as part of the 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 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 %R should fall between the control limits of 80%–120%.

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; it 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 75%–125%.

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 radionuclide 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 dataset are summarized in the following subsections.

F-5.2 Data Quality Results for Radionuclides

F-5.2.1 Chain of Custody

COC forms were maintained properly for all samples (Appendix G).

F-5.2.2 Sample Documentation

All samples were properly documented on the SCL in the field (Appendix G).

F-5.2.3 Sample Dilutions

Some samples were diluted for radionuclide analyses. No qualifiers were applied to any radionuclide sample results because of dilutions.

F-5.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

F-5.2.5 Holding Times

Holding-time criteria were met for all samples analyzed for radionuclides.

F-5.2.6 Method Blanks

Results for samples analyzed for radionuclides were not qualified because of blank contamination.

F-5.2.7 Matrix Spike Samples

The MS criteria were met for all samples analyzed for radionuclides.

F-5.2.8 Tracer Recoveries

A total of four isotopic plutonium results and eight isotopic uranium results were qualified as estimated not detected (UJ) because the tracer is less than the LAL but greater than or equal to 10% R.

A total of 16 isotopic uranium results were qualified as estimated and biased low (J-) because the tracer is less than the LAL but greater than or equal to 10% R.

F-5.2.9 Laboratory Control Sample Recoveries

LCS recovery criteria were met for all samples analyzed for radionuclides.

F-5.2.10 Laboratory Duplicate Samples Recoveries

Laboratory duplicate sample recovery criteria were met for all samples analyzed for radionuclides.

F-5.2.11 Rejected Data

A total of two gross alpha results, two gross beta results, and two tritium results were qualified as rejected (R) because the required MS information is 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 were available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and did not affect the usability of the sampling results.

F-6.0 REFERENCES

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

Copies of the master reference set are maintained at the New Mexico Environment Department Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

EPA (U.S. Environmental Protection Agency), February 1994. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," EPA-540/R-94/013, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1994, 048639)

EPA (U.S. Environmental Protection Agency), October 1999. "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA540/R-99/008, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1999, 066649)

LANL (Los Alamos National Laboratory), July 1995. "Statement of Work (Formerly Called "Requirements Document") - Analytical Support, (RFP number 9-XS1-Q4257), (Revision 2 - July, 1995)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1995, 049738)

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory document LA-UR-96-441, Los Alamos, New Mexico. (LANL 1996, 054609)

LANL (Los Alamos National Laboratory), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

Table F-1.0-1
Inorganic Chemical, Organic Chemical, and Radionuclide Analytical Methods for Samples Collected from the Upper Sandia Canyon Aggregate Area

Analytical Method	Analytical Description	Analytical Suite
EPA 300.0	Ion chromatography	Anions
EPA 905.0	Beta counting	Strontium-90
EPA 906.0	Distillation and liquid scintillation	Tritium
EPA SW-846: 6010/6010B	Inductively coupled plasma emission spectroscopy—atomic emission spectroscopy	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc (TAL metals)
EPA SW-846:6020	Inductively coupled plasma mass spectrometry	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, uranium, vanadium, and zinc (TAL metals)
EPA SW-846: 9012A	Automated colorimetric/off-line distillation	Total cyanide
EPA SW-846:6850	Liquid chromatography–mass spectrometry/mass spectrometry	Perchlorate
EPA SW-846:7470A	Cold vapor atomic absorption (CVAA)	Mercury
EPA SW-846:7471	CVAA	Mercury
EPA SW-846:7471A	CVAA	Mercury
EPA SW-846: 8082	Gas chromatography	PCBs
EPA SW-846: 8260 and 8260B	Gas chromatography–mass spectrometry (GC/MS)	VOCs
EPA TO-15	GC/MS	VOCs
EPA SW-846: 8270 and 8270C	GC/MS	SVOCs
EPA SW-846: 8290	High resolution gas chromatography/high resolution mass spectrometry	Dioxins/furans
Generic: gamma spectroscopy	Gamma spectroscopy	Americium-241, cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
HASL Method 300	Chemical separation alpha spectrometry	Isotopic uranium, isotopic plutonium, americium-241

Appendix G

Analytical Suites and Results and Analytical Reports
(on DVD included with this document)

Appendix H

Box Plots and Statistical Results

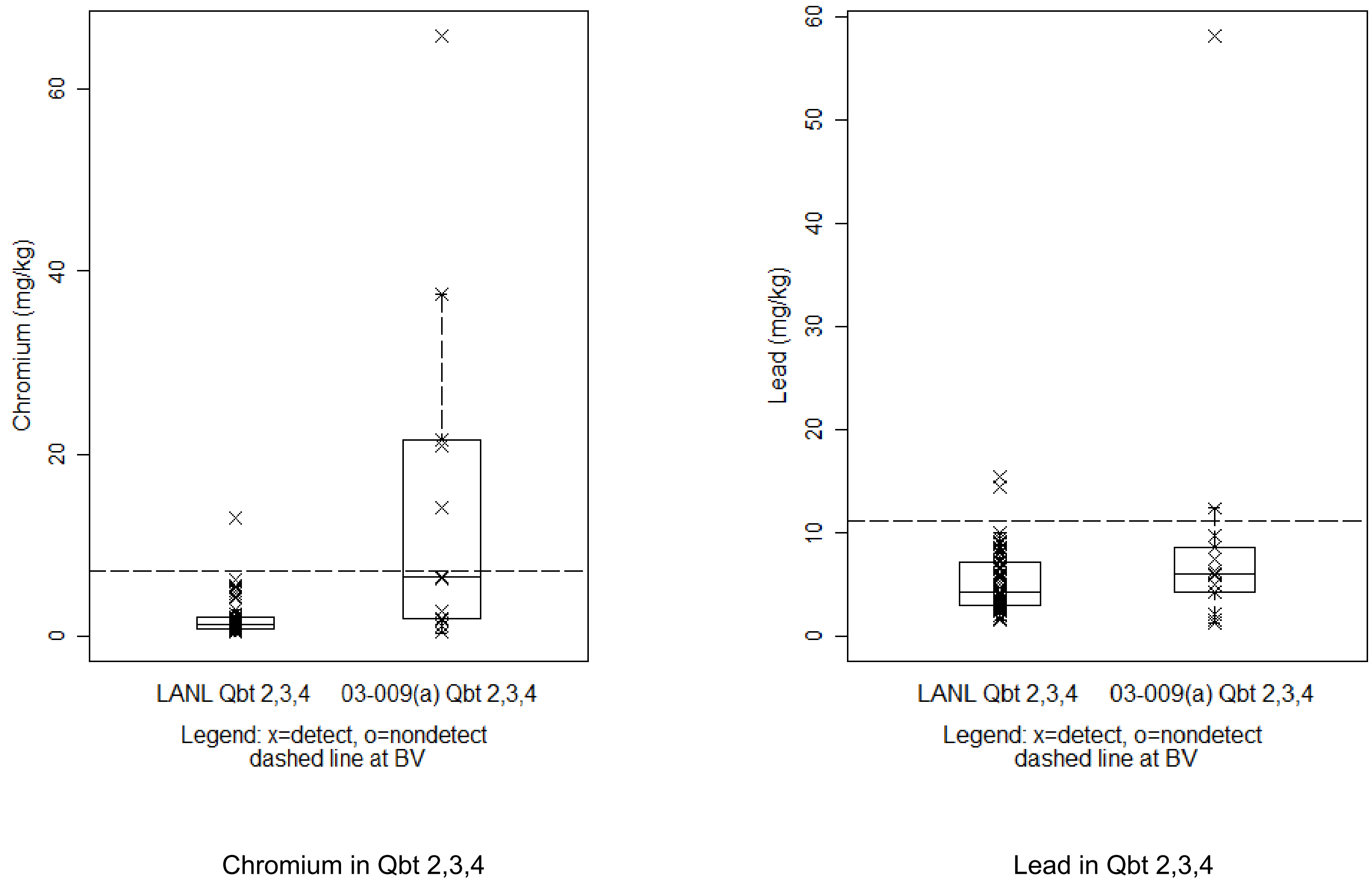
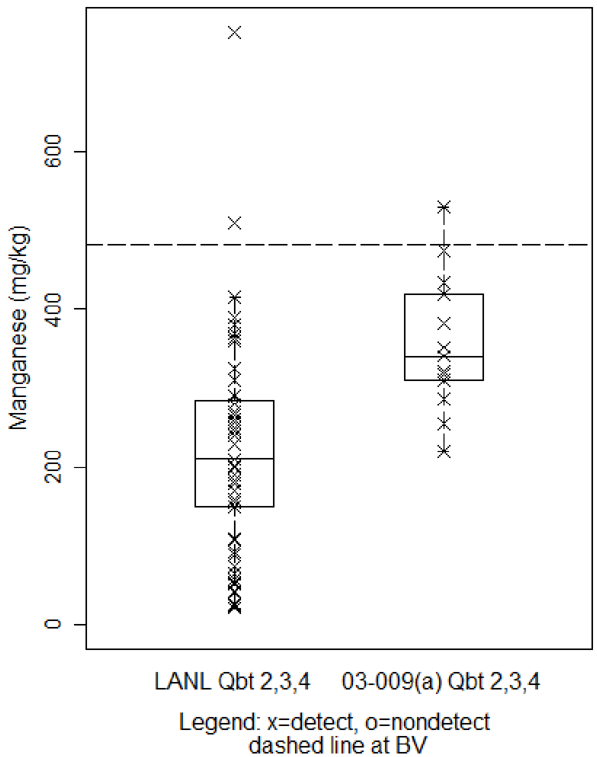
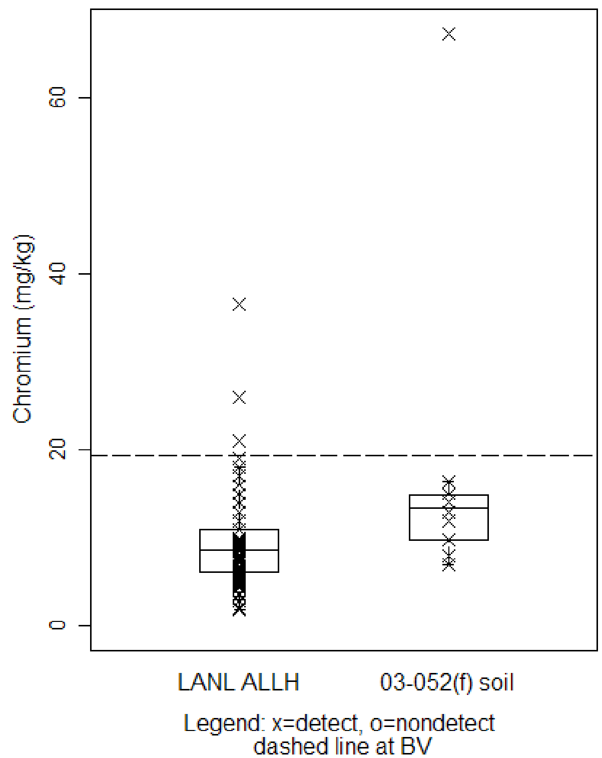


Figure H-1 Box plots for chromium and lead in tuff at SWMU 03-009(a)

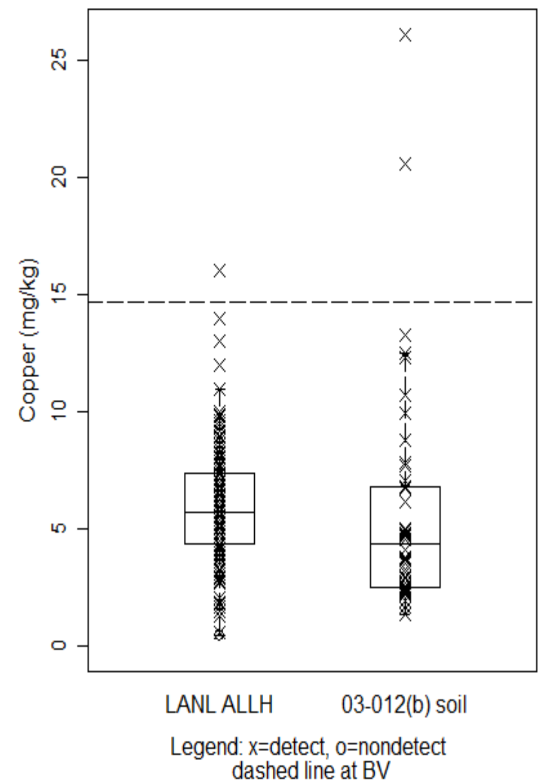


Manganese in Qbt 2,3,4

Figure H-2 Box plot for manganese in tuff at SWMU 03-009(a)

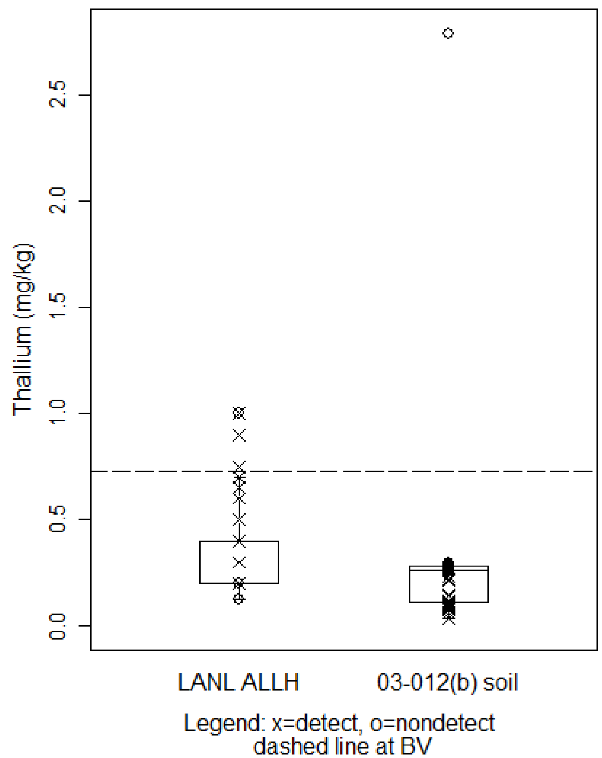


Chromium in soil

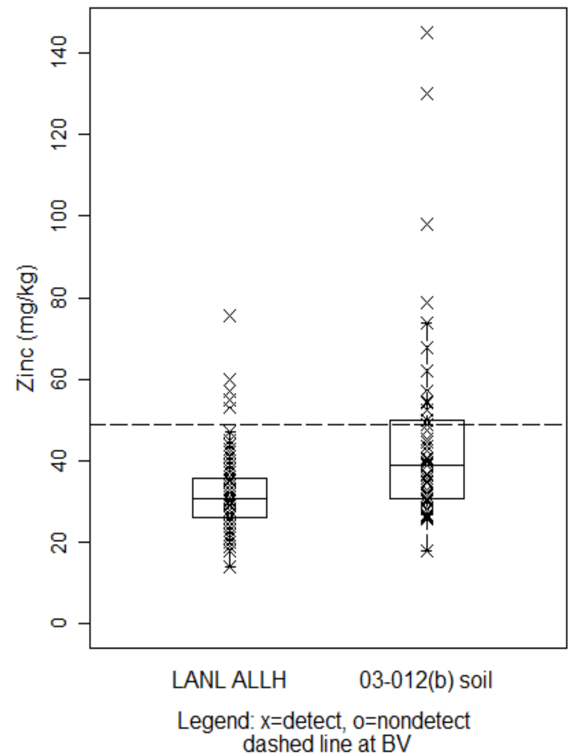


Copper in soil

Figure H-3 Box plots for chromium and copper in soil at SWMU 03-012(b)

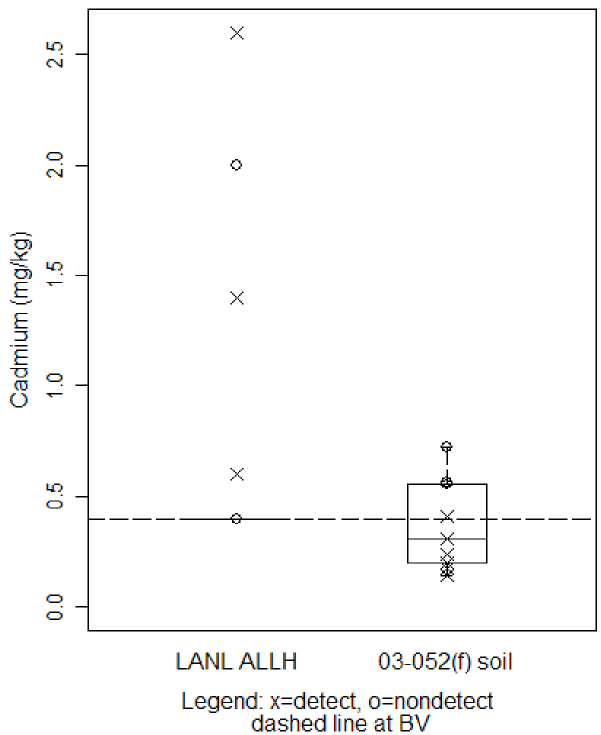


Thallium in soil

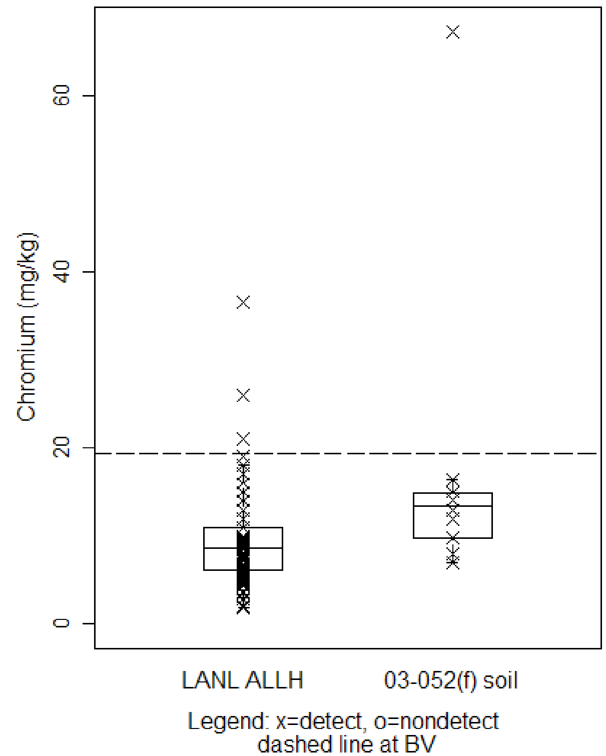


Zinc in soil

Figure H-4 Box plots for thallium and zinc in soil at SWMU 03-012(b)

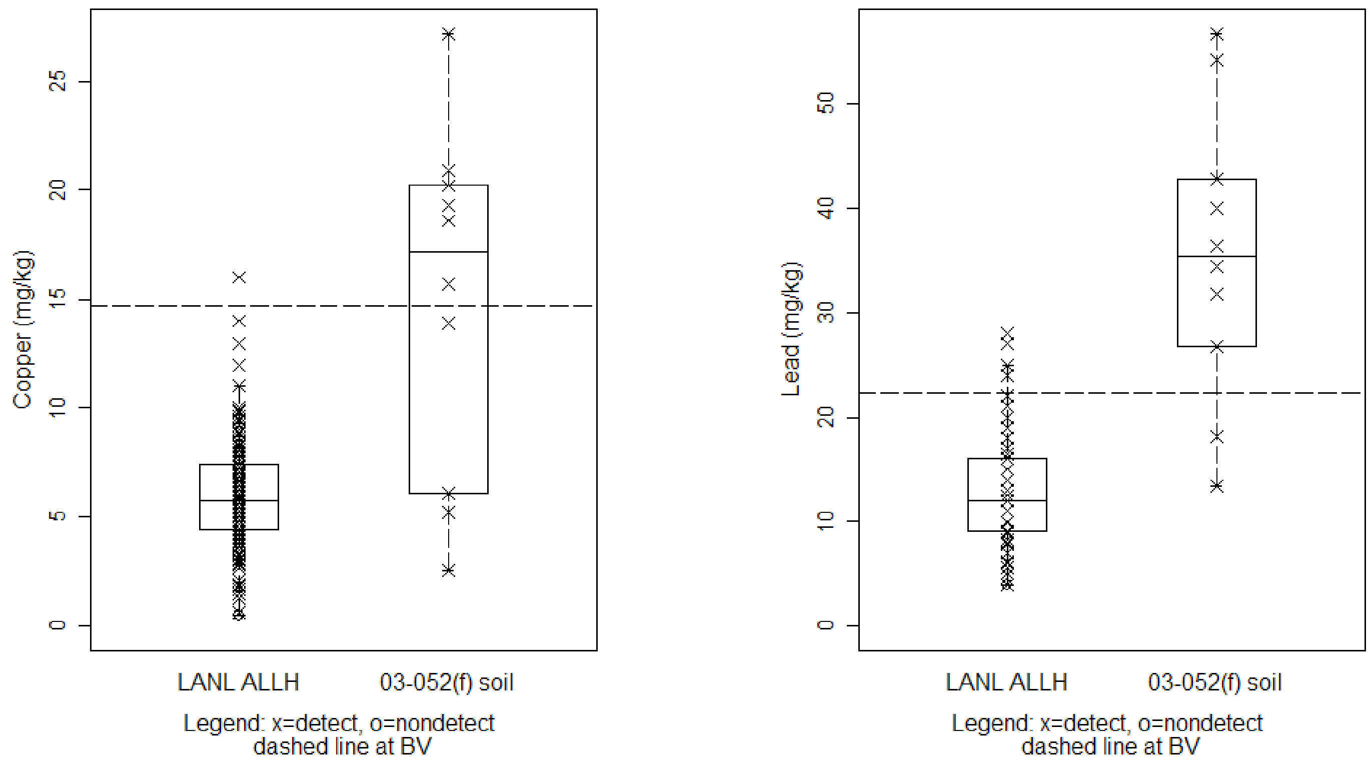


Cadmium in soil



Chromium in soil

Figure H-5 Box plots for cadmium and chromium in soil at SWMU 03-052(f)



Copper in soil

Lead in soil

Figure H-6 Box plots for copper and lead in soil at SWMU 03-052(f)

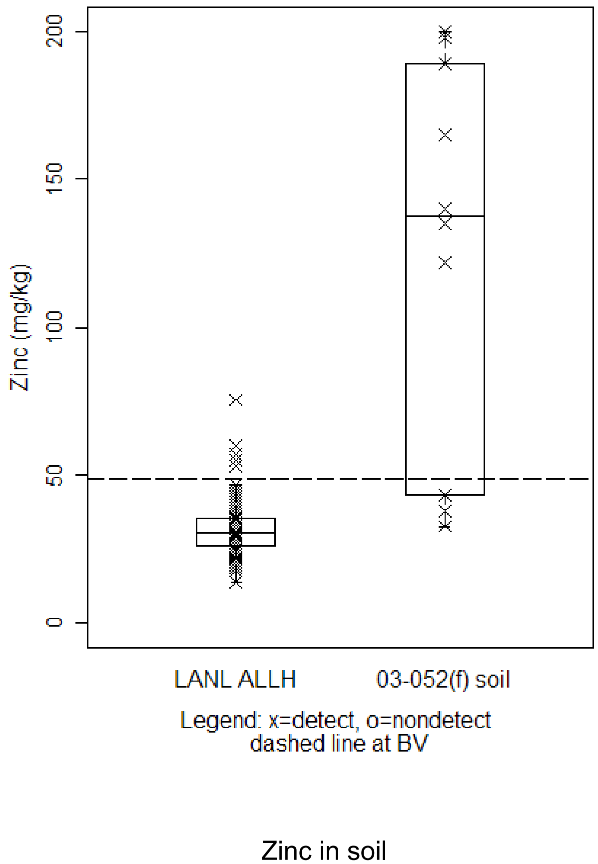
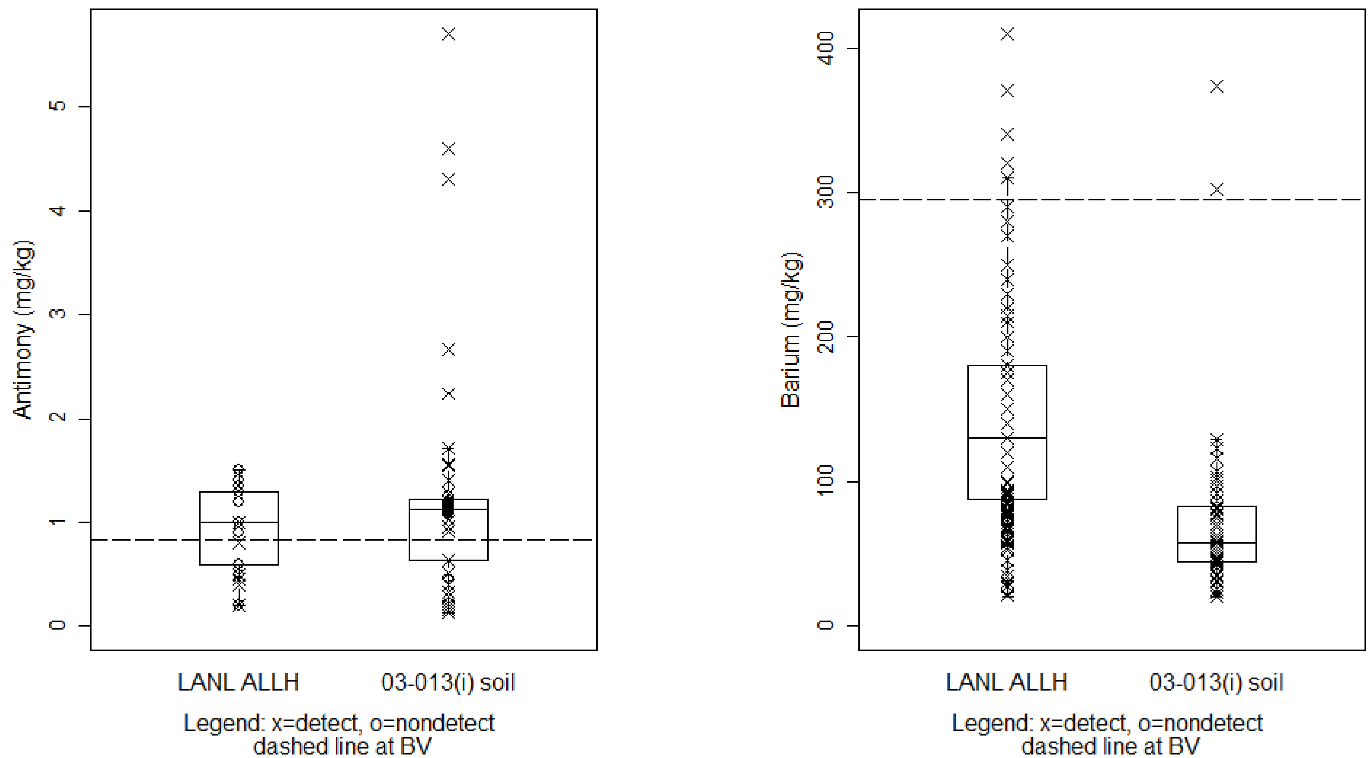


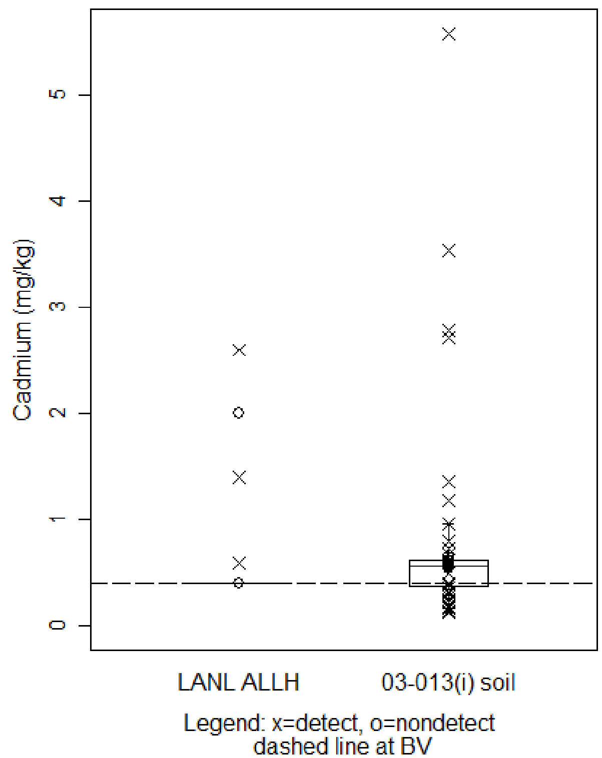
Figure H-7 Box plot for zinc in soil at SWMU 03-052(f)



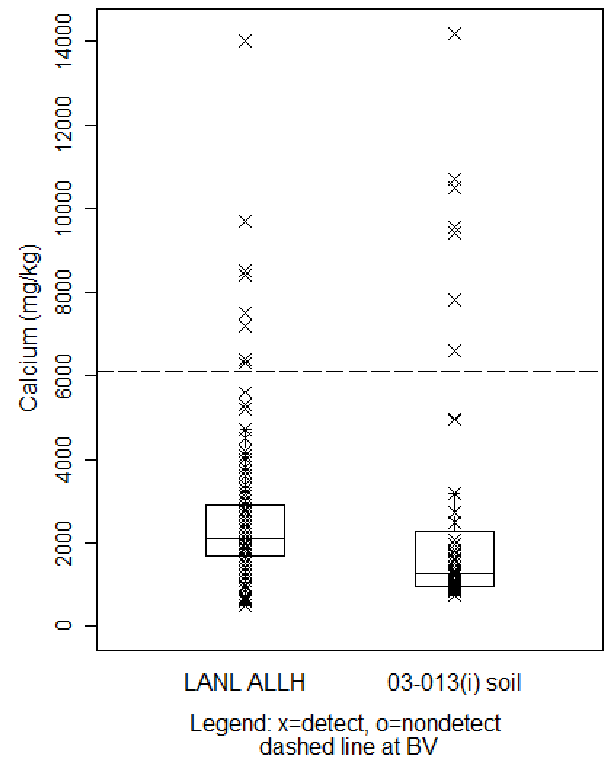
Antimony in soil

Barium in soil

Figure H-8 Box plots for antimony and barium in soil at SWMU 03-013(i)

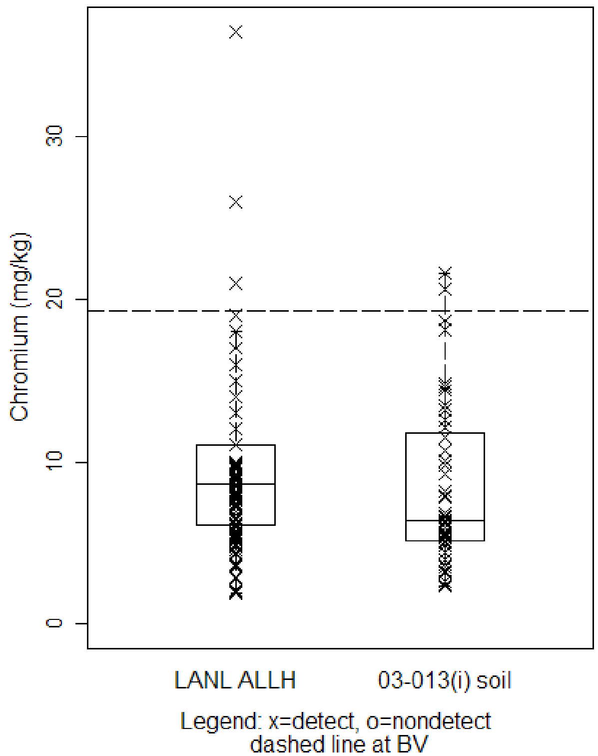


Cadmium in soil

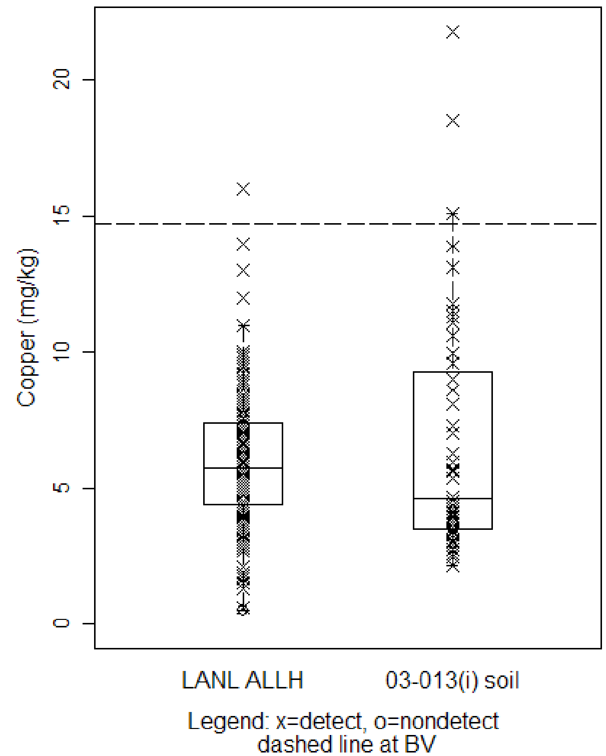


Calcium in soil

Figure H-9 Box plots for cadmium and calcium in soil at SWMU 03-013(i)

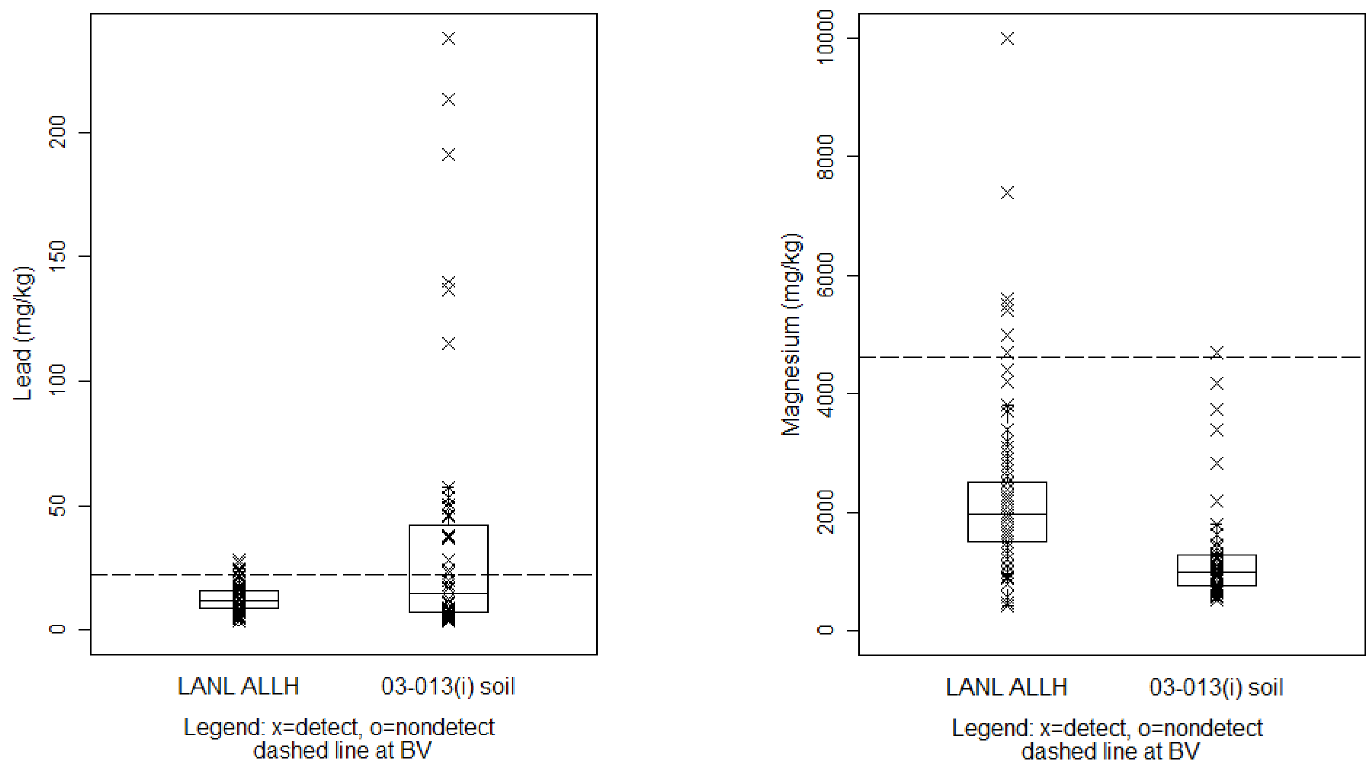


Chromium in soil



Copper in soil

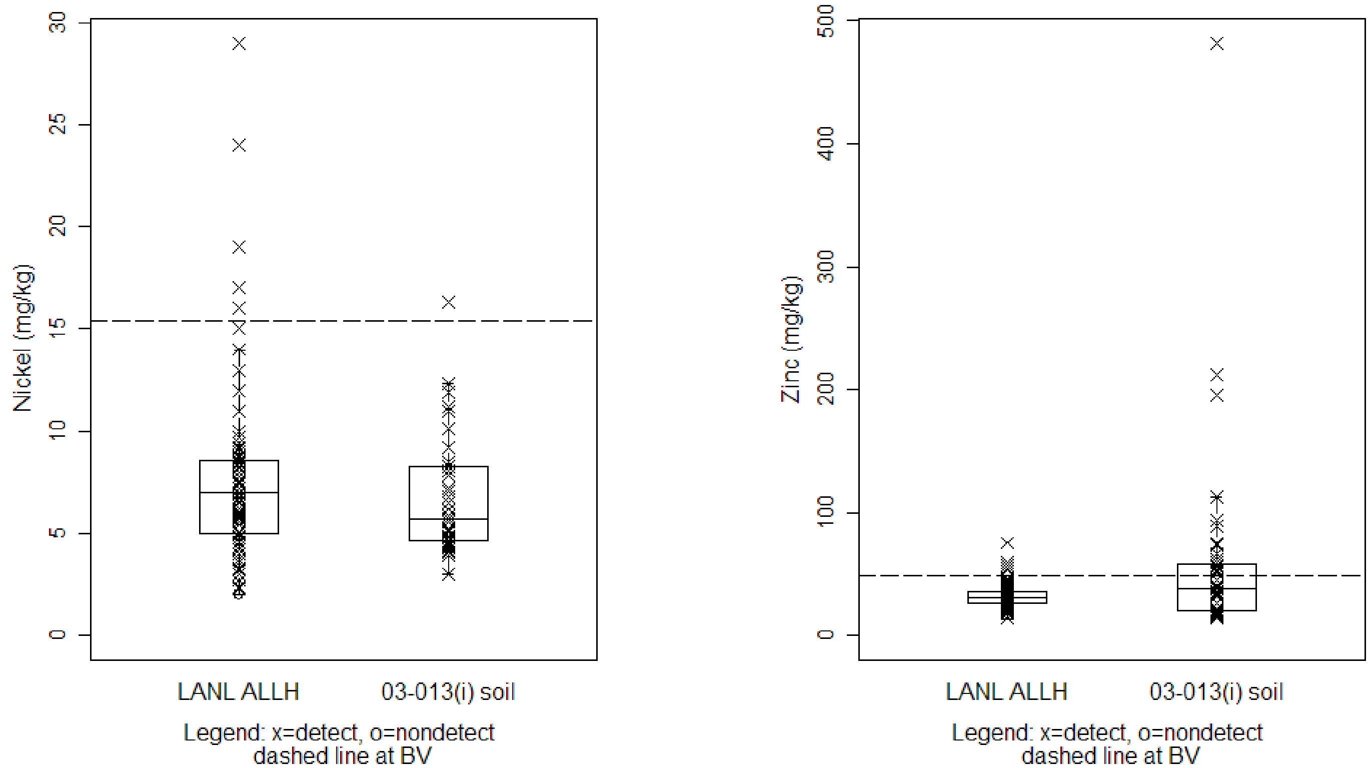
Figure H-10 Box plots for chromium and copper in soil at SWMU 03-013(i)



Lead in soil

Magnesium in soil

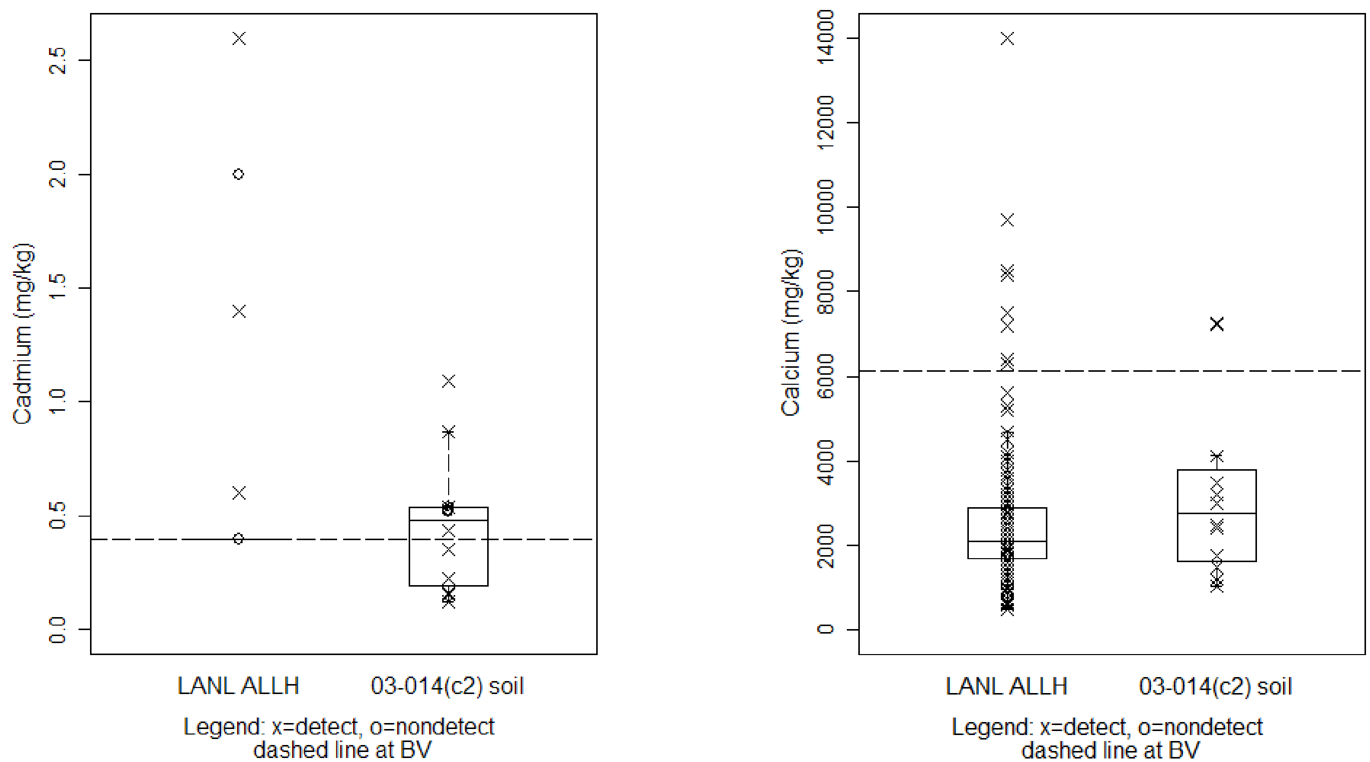
Figure H-11 Box plots for lead and magnesium in soil at SWMU 03-013(i)



Nickel in soil

Zinc in soil

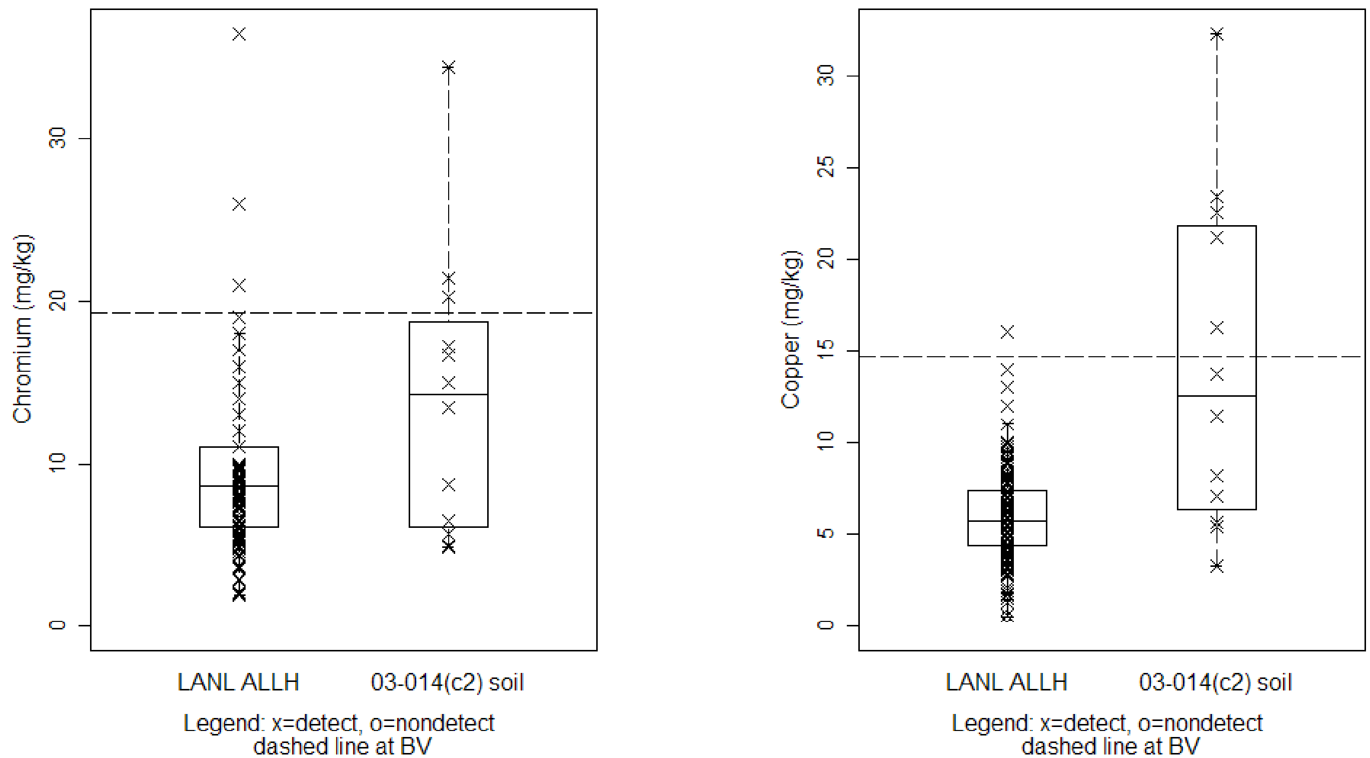
Figure H-12 Box plots for nickel and zinc in soil at SWMU 03-013(i)



Cadmium in soil

Calcium in soil

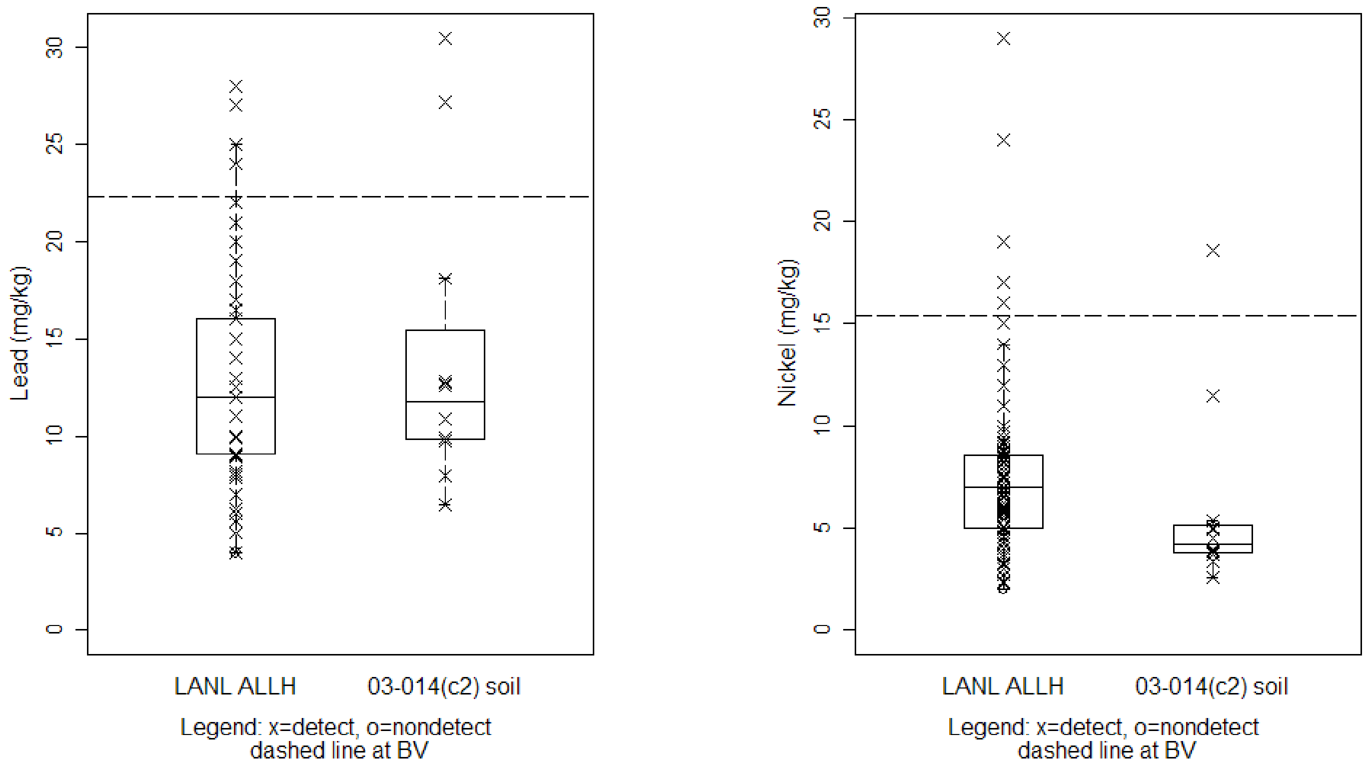
Figure H-13 Box plots for cadmium and calcium in soil at AOC 03-014(c2)



Chromium in soil

Copper in soil

Figure H-14 Box plots for chromium and copper in soil at AOC 03-014(c2)



Lead in soil

Nickel in soil

Figure H-15 Box plots for lead and nickel in soil at AOC 03-014(c2)

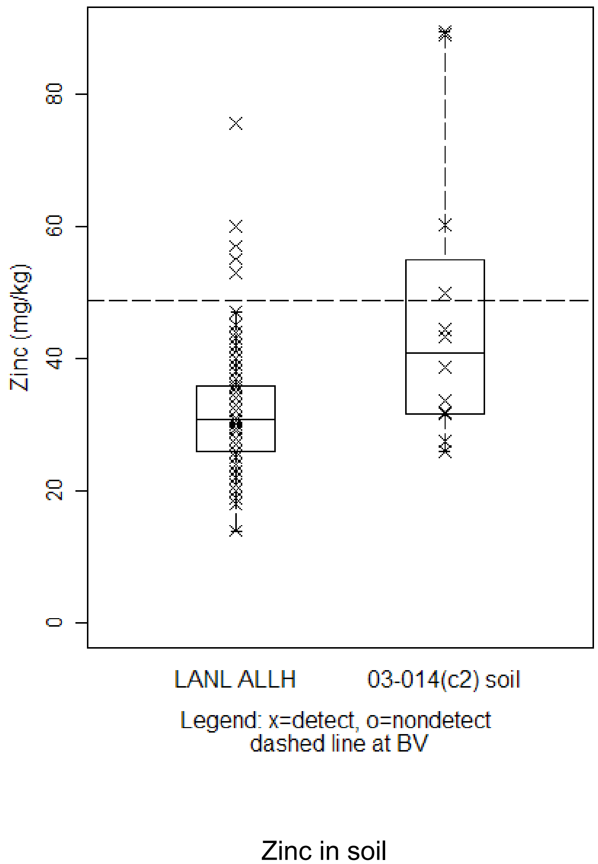
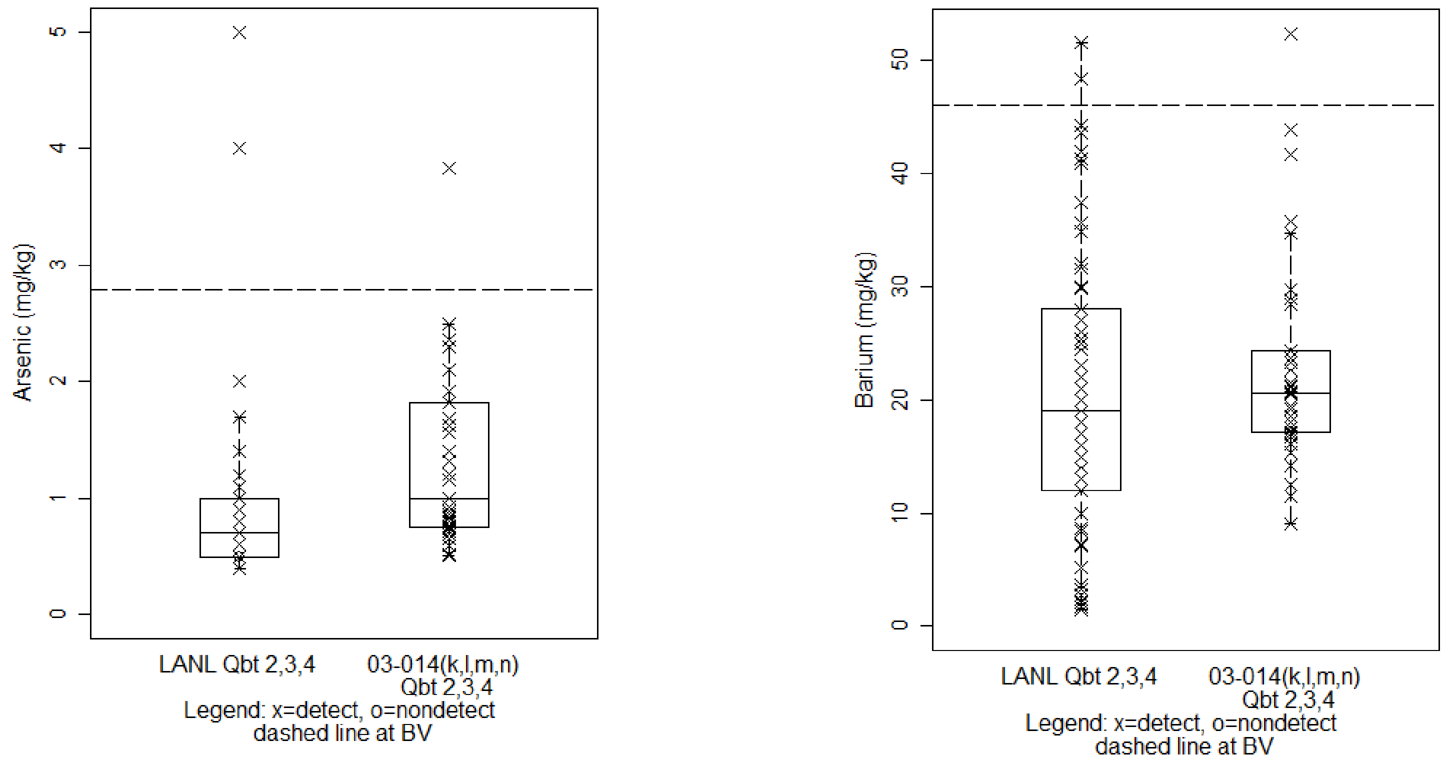


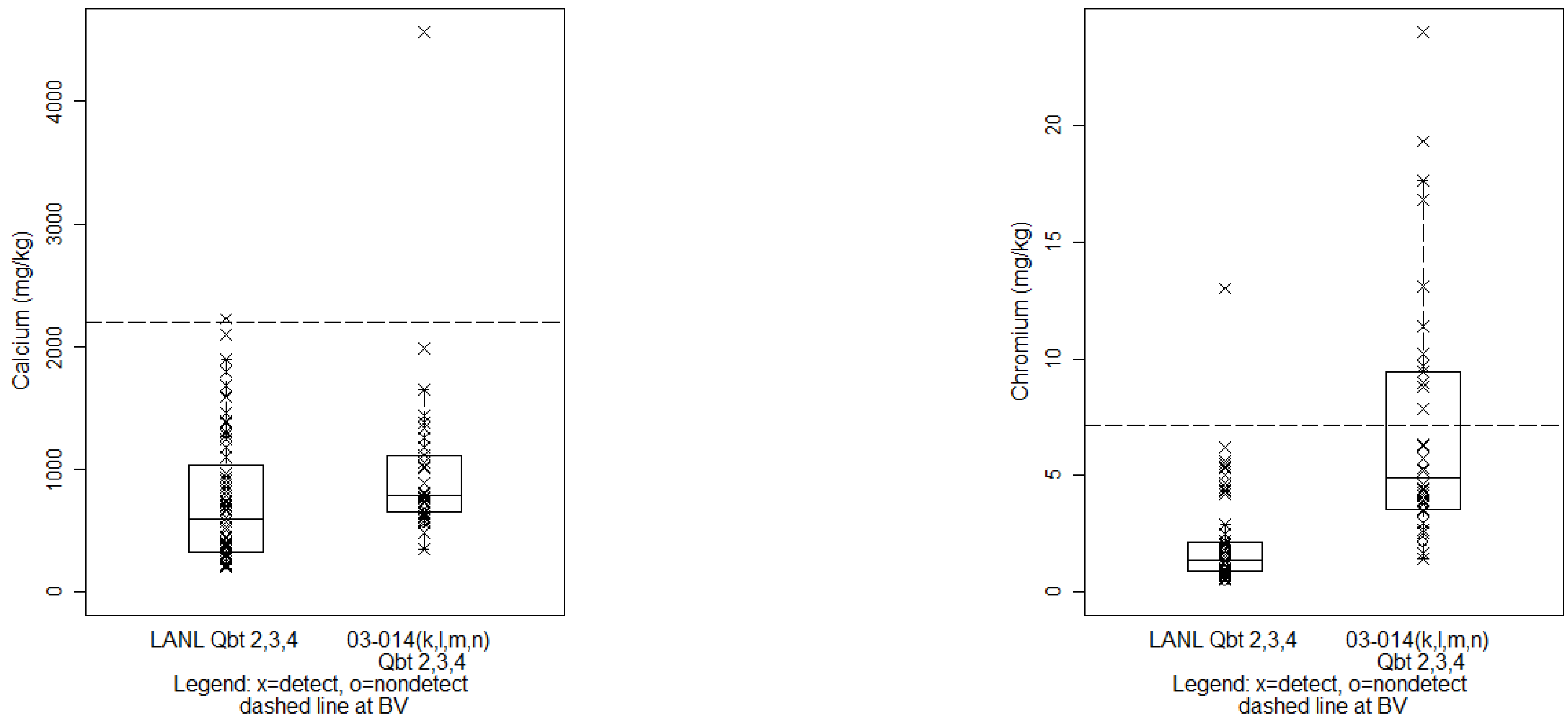
Figure H-16 Box plot for zinc in soil at AOC 03-014(c2)



Arsenic in Qbt 2,3,4

Barium in Qbt 2,3,4

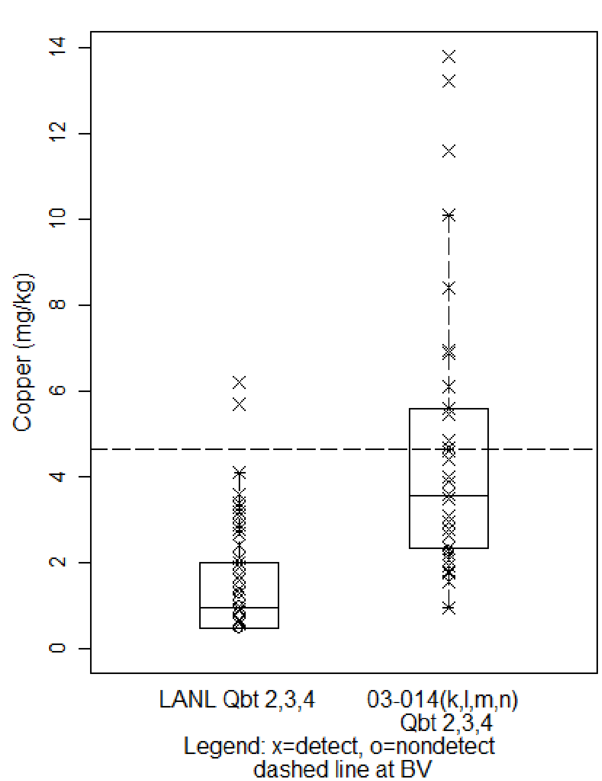
Figure H-17 Box plot for arsenic and barium in tuff at SWMUs 03-014(k,l,m,n)



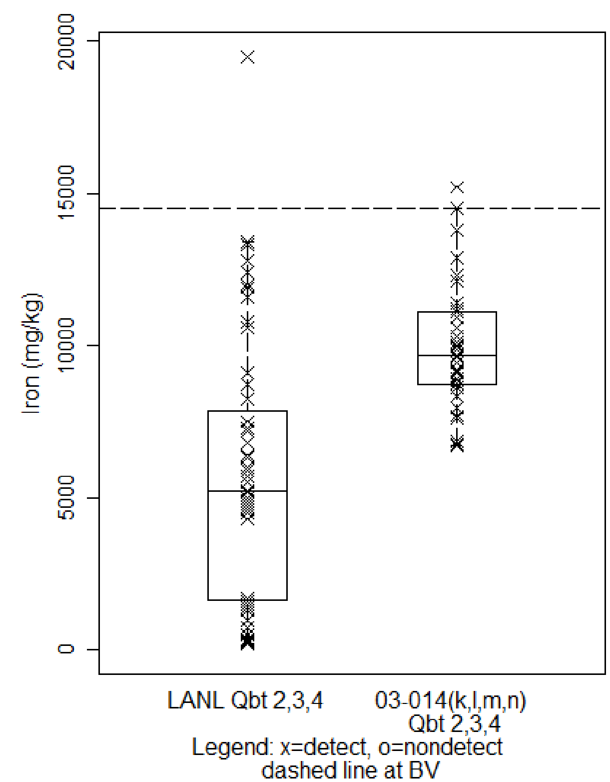
Calcium in Qbt 2,3,4

Chromium in Qbt 2,3,4

Figure H-18 Box plots for calcium and chromium in tuff at SWMUs 03-014(k,l,m,n)

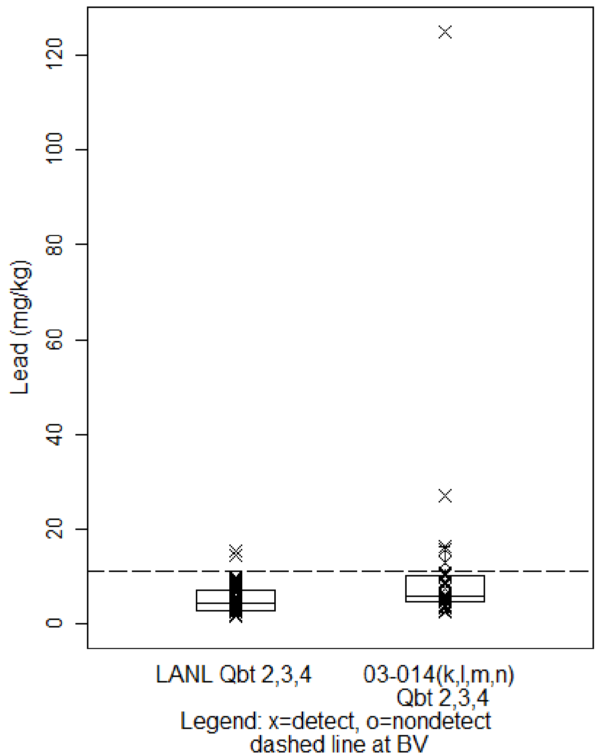


Copper in Qbt 2,3,4

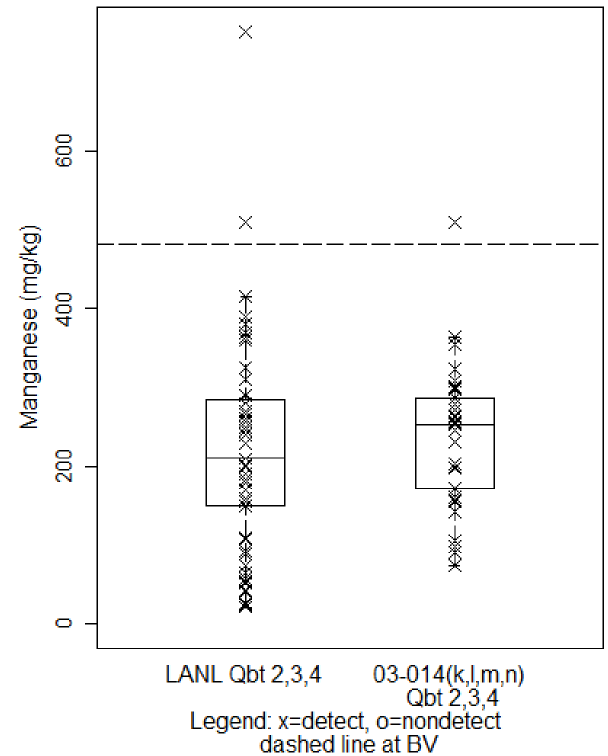


Iron in Qbt 2,3,4

Figure H-19 Box plots for copper and iron in tuff at SWMUs 03-014(k,l,m,n)

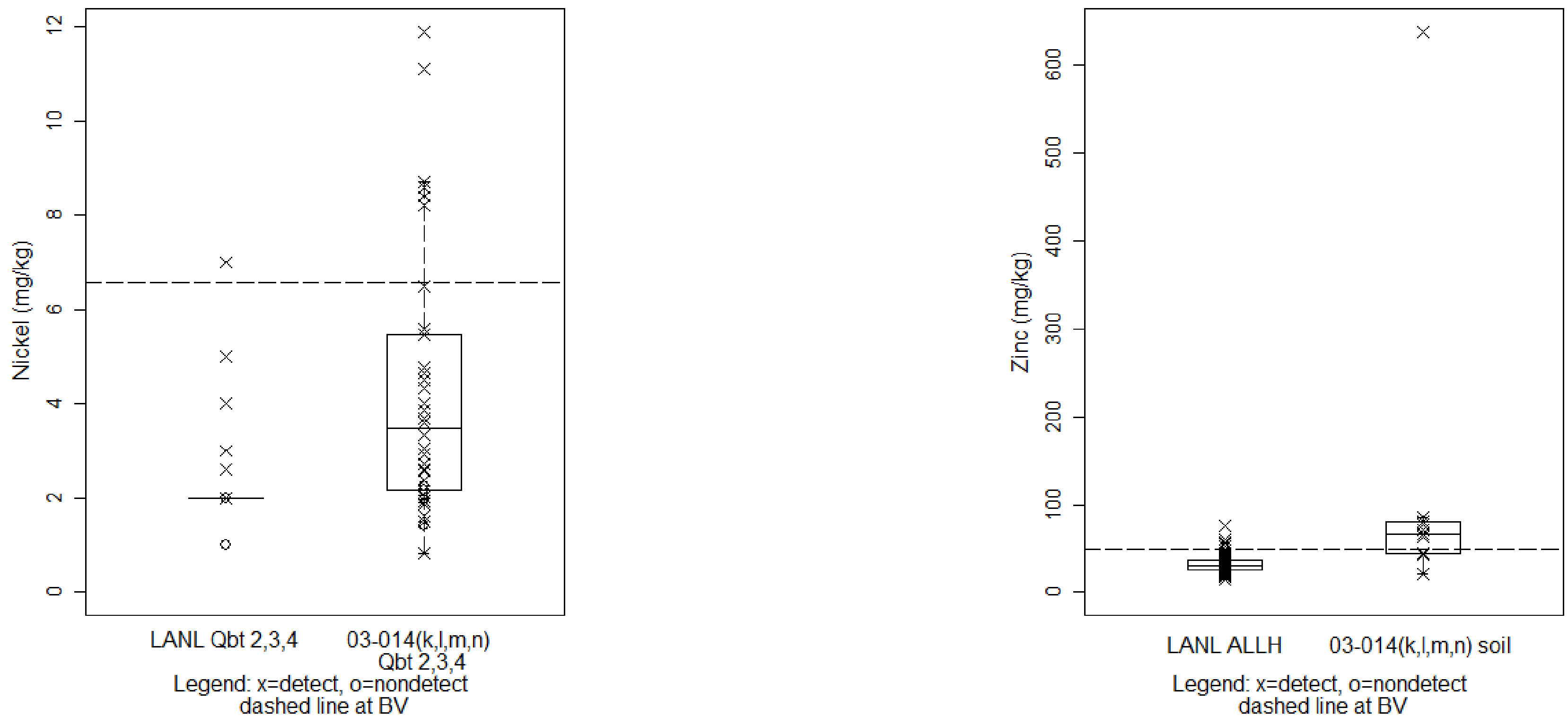


Lead in Qbt 2,3,4



Manganese in Qbt 2,3,4

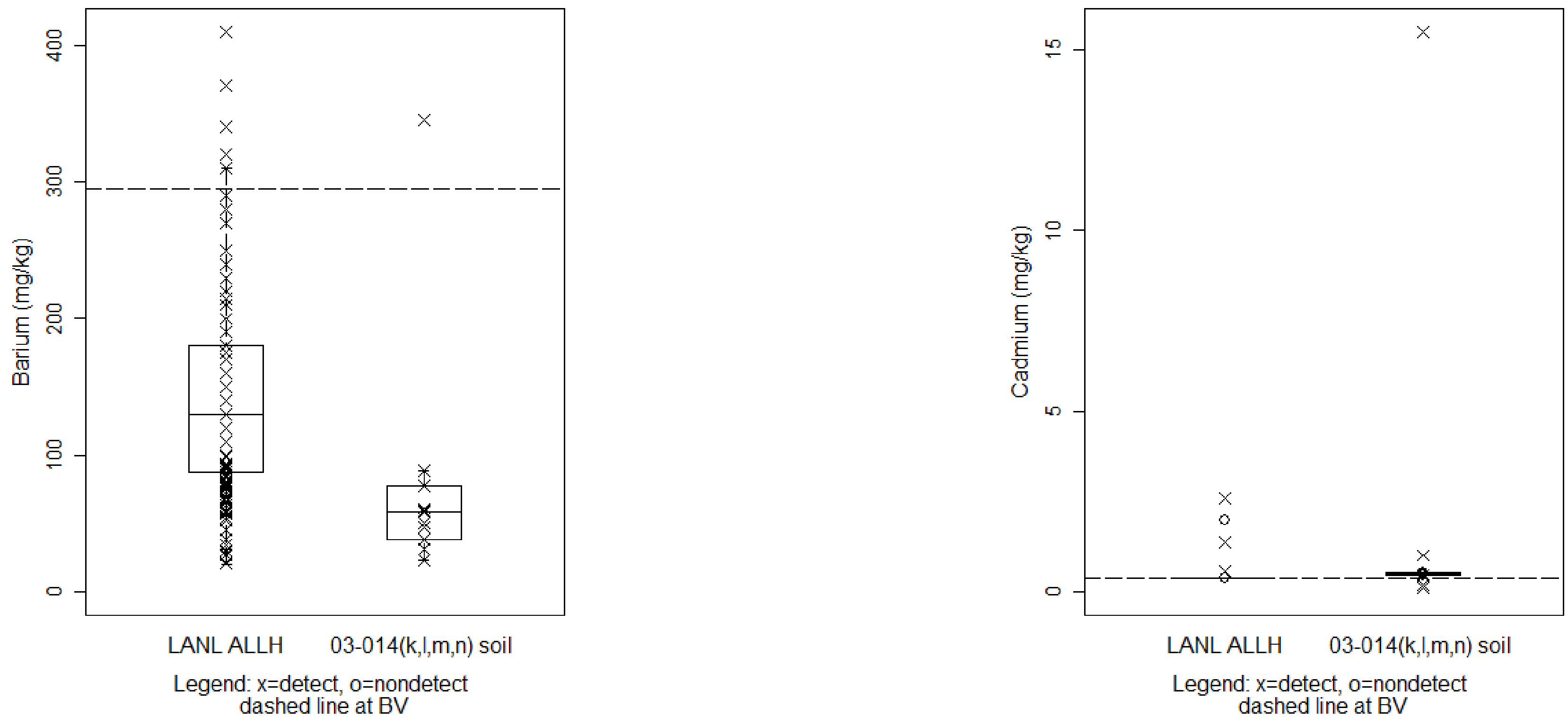
Figure H-20 Box plots for lead and manganese in tuff at SWMUs 03-014(k,l,m,n)



Nickel in Qbt 2,3,4

Zinc in Qbt 2,3,4

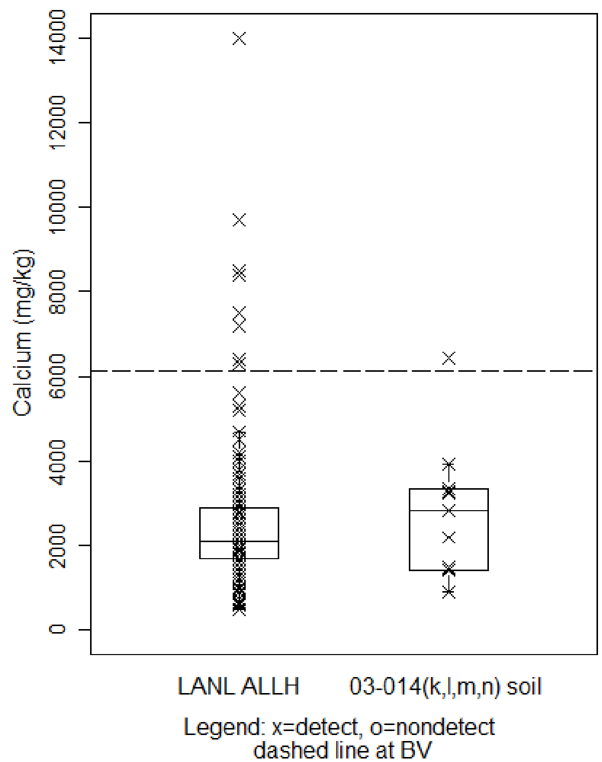
Figure H-21 Box plots for nickel and zinc in tuff at SWMUs 03-014(k,l,m,n)



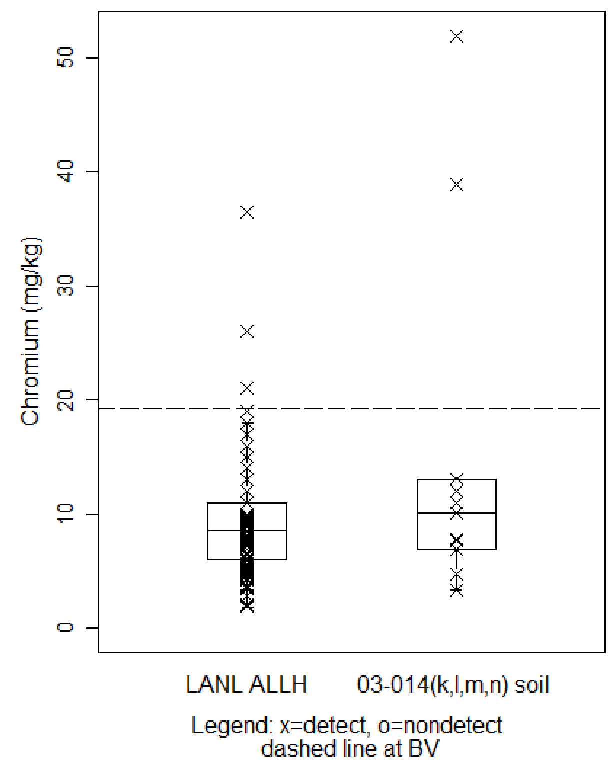
Barium in soil

Cadmium in soil

Figure H-22 Box plots for barium and cadmium in soil at SWMUs 03-014(k,l,m,n)

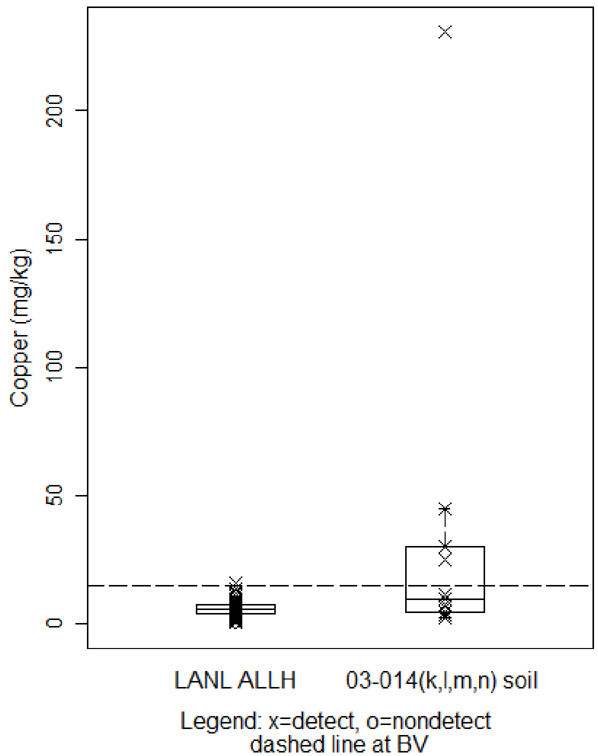


Calcium in soil

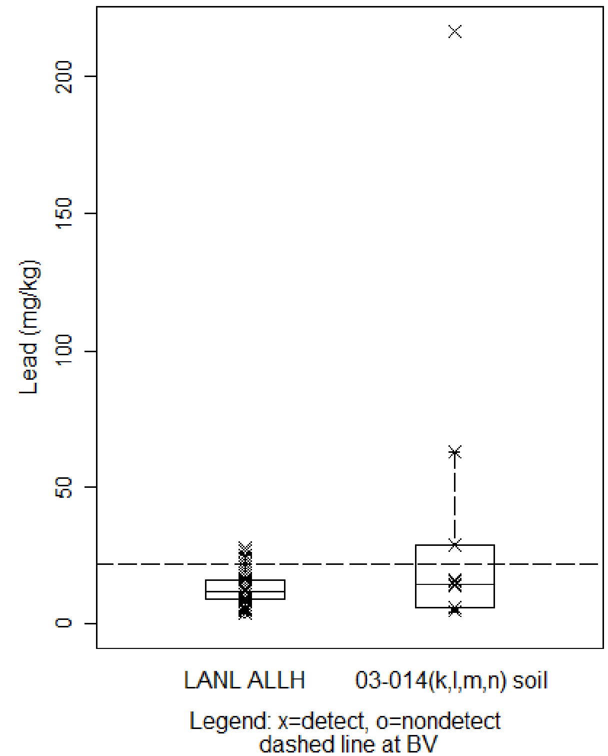


Chromium in soil

Figure H-23 Box plots for calcium and chromium in soil at SWMUs 03-014(k,l,m,n)

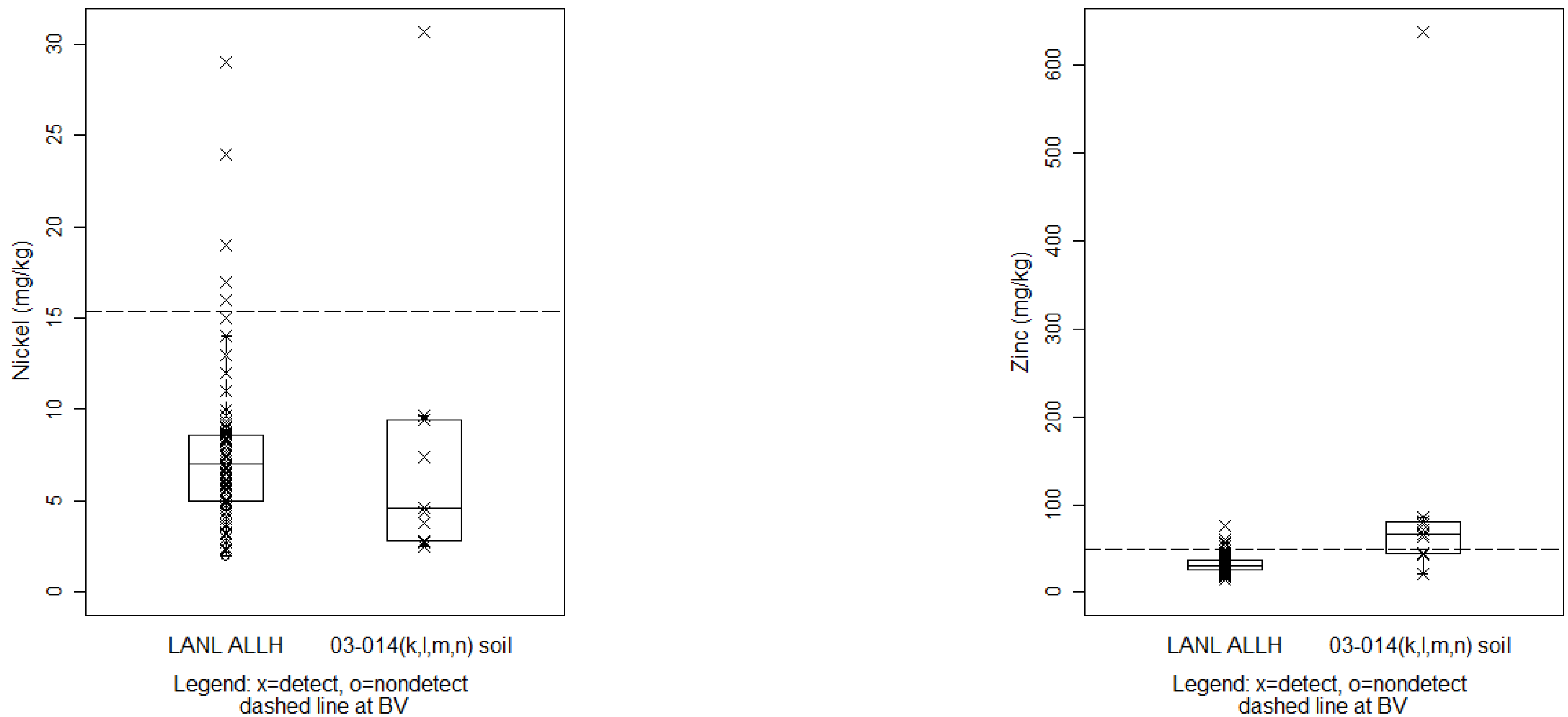


Copper in soil



Lead in soil

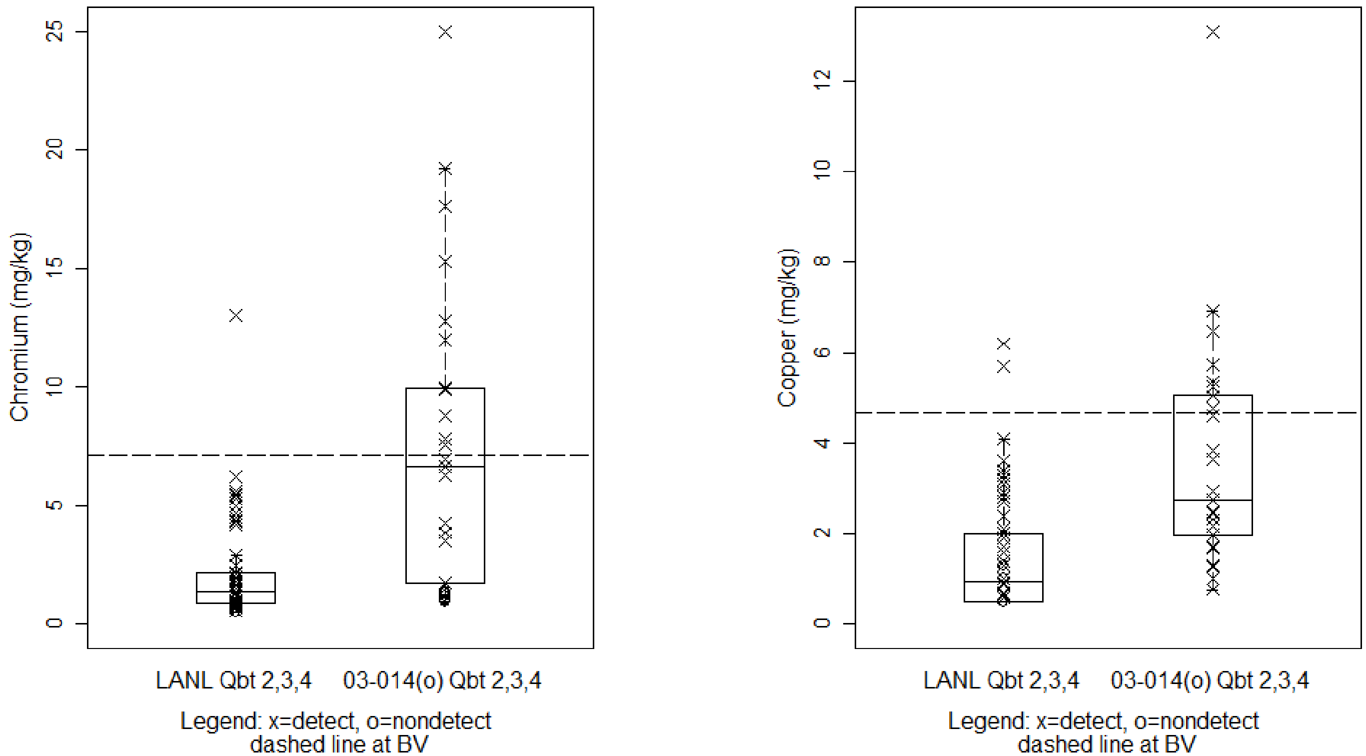
Figure H-24 Box plots for copper and lead in soil at SWMUs 03-014(k,l,m,n)



Nickel in soil

Zinc in soil

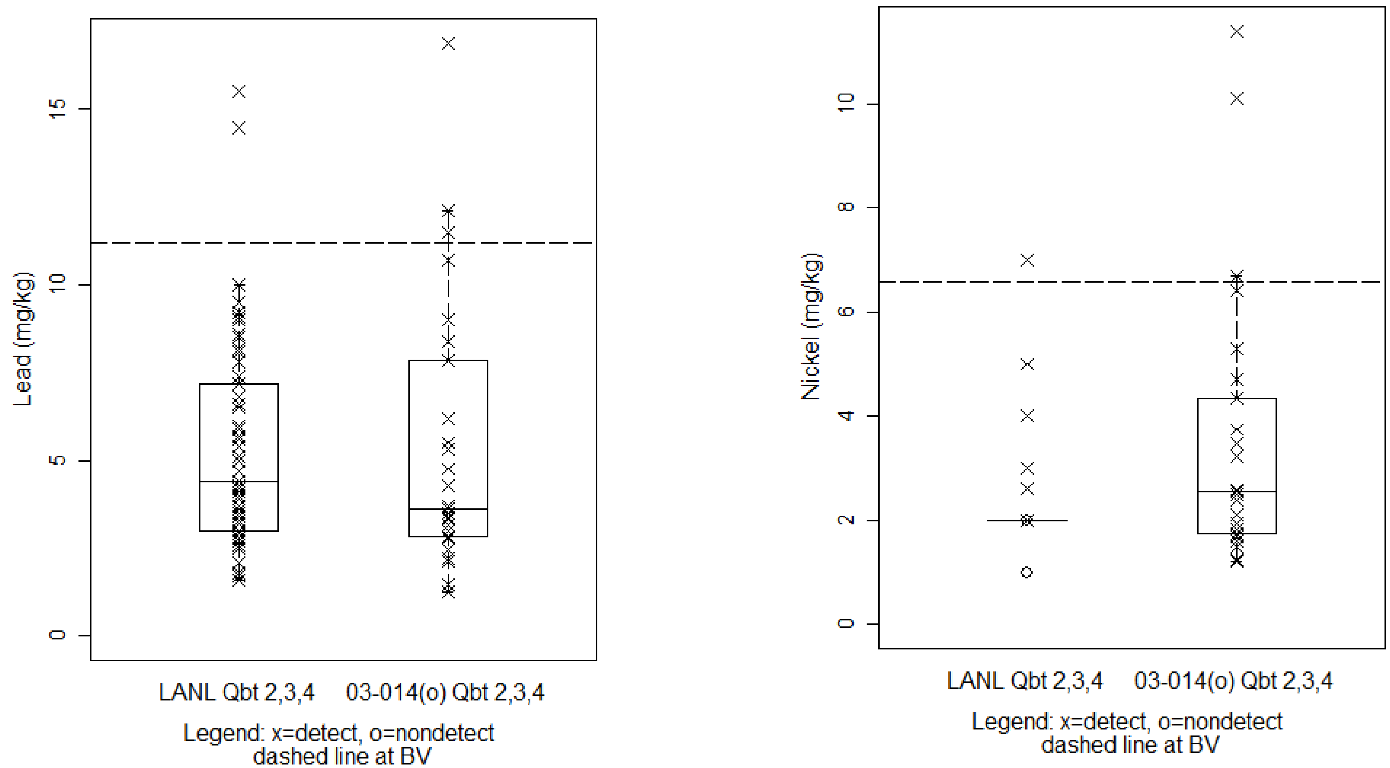
Figure H-25 Box plots for nickel and zinc in soil at SWMUs 03-014(k,l,m,n)



Chromium in Qbt 2,3,4

Copper in Qbt 2,3,4

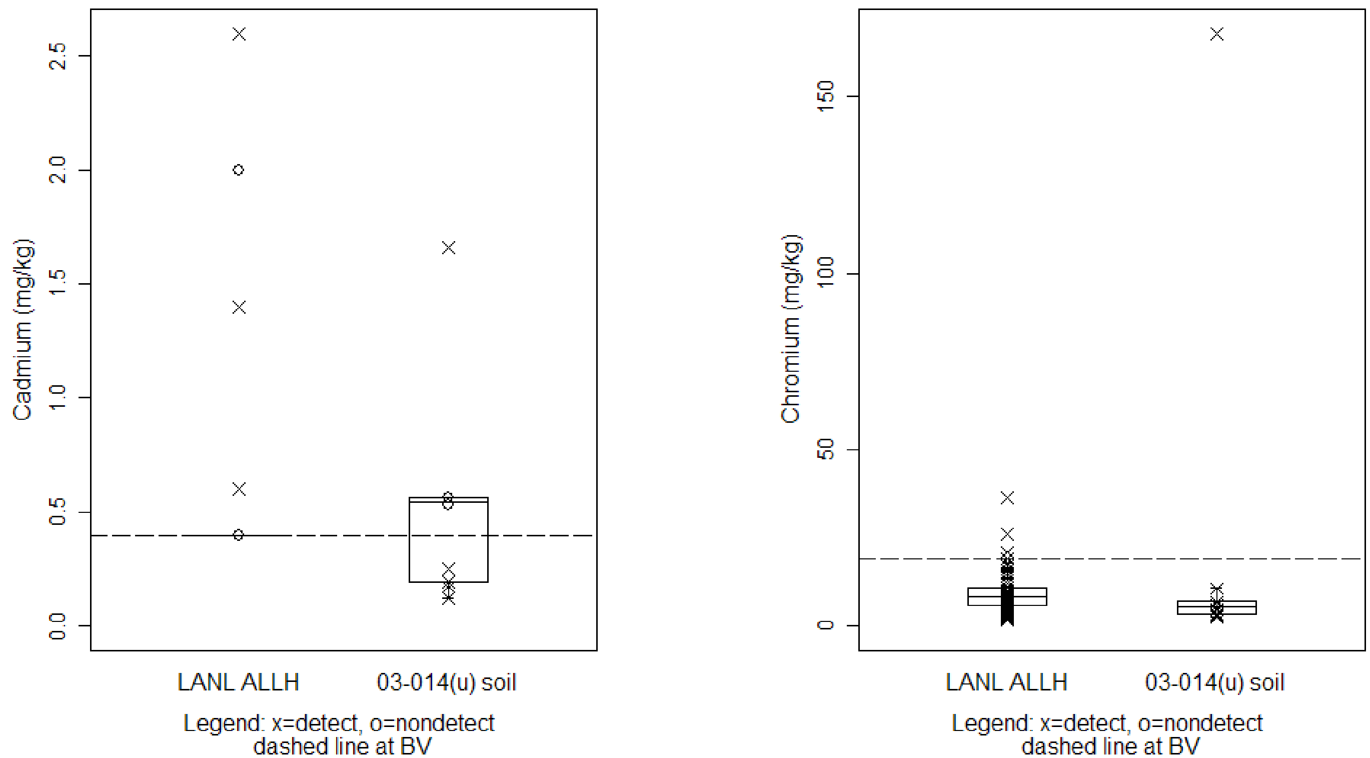
Figure H-26 Box plots for chromium and copper in tuff at SWMU 03-014(o)



Lead in Qbt 2,3,4

Nickel in Qbt 2,3,4

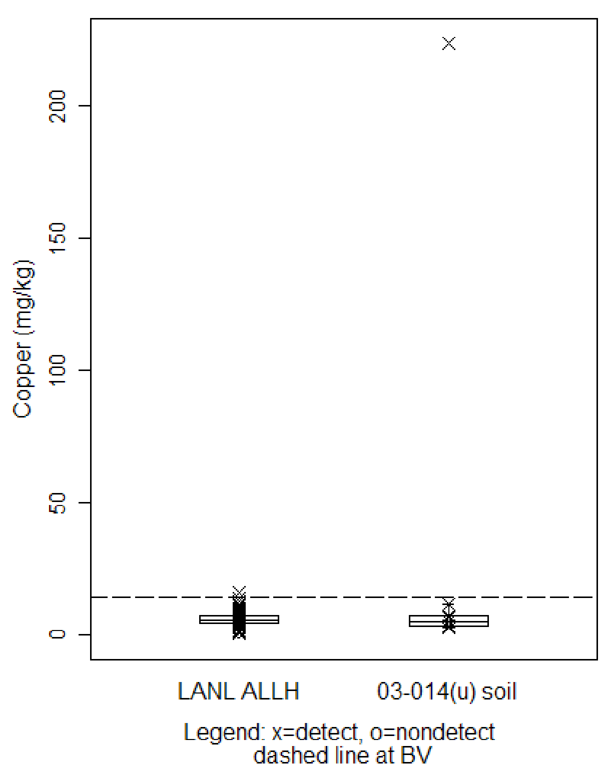
Figure H-27 Box plots for lead and nickel in tuff at SWMU 03-014(o)



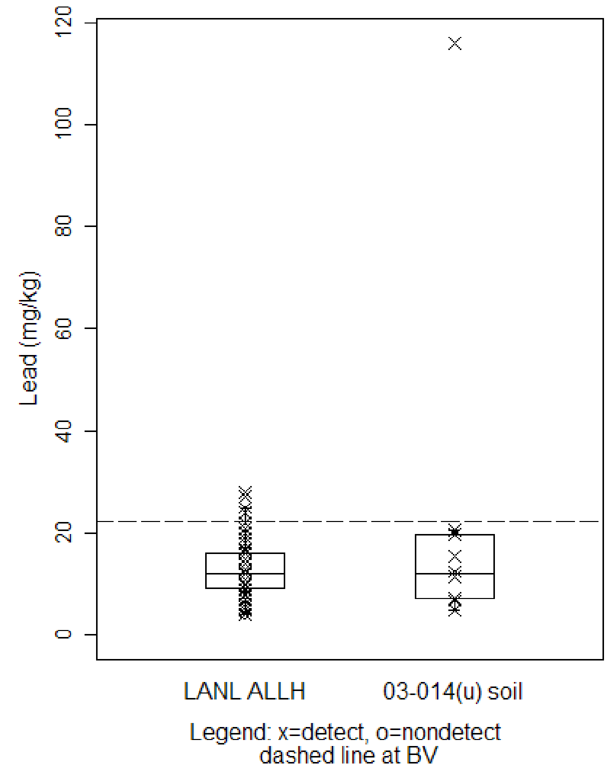
Cadmium in soil

Chromium in soil

Figure H-28 Box plots for cadmium and chromium in soil at SWMU 03-014(u)

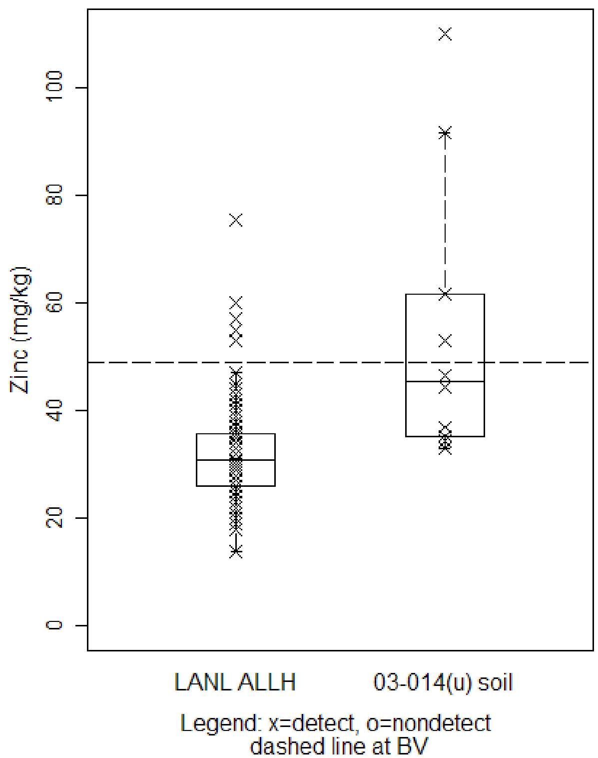


Copper in soil



Lead in soil

Figure H-29 Box plots for copper and lead in soil at SWMU 03-014(u)



Zinc in soil

Figure H-30 Box plot for zinc in soil at SWMU 03-014(u)

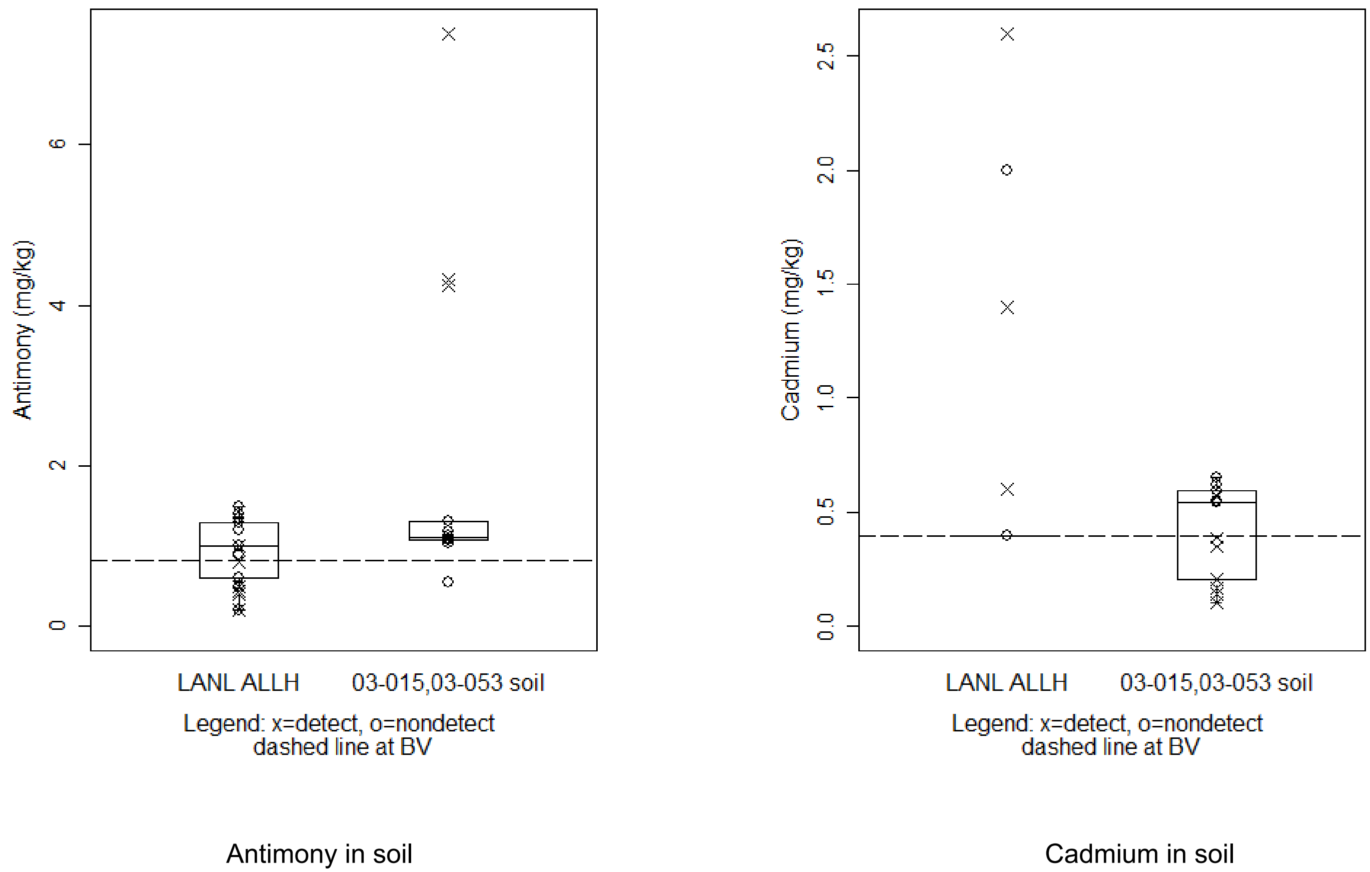
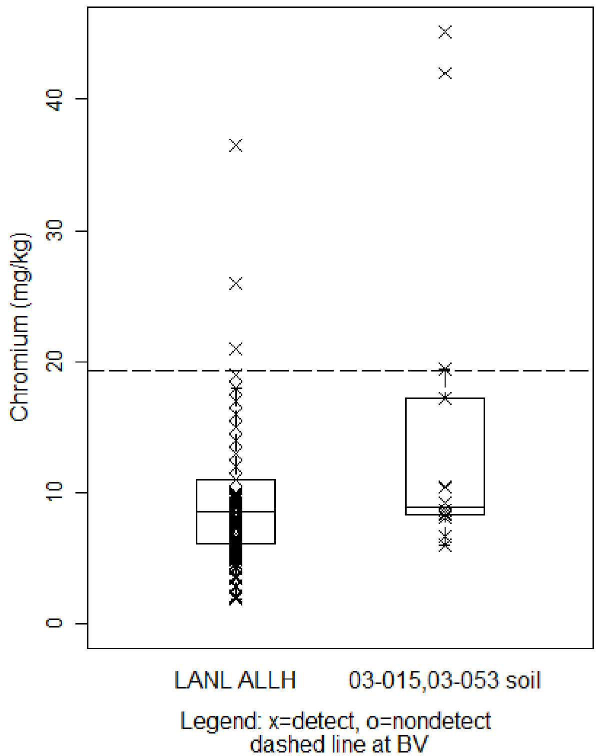
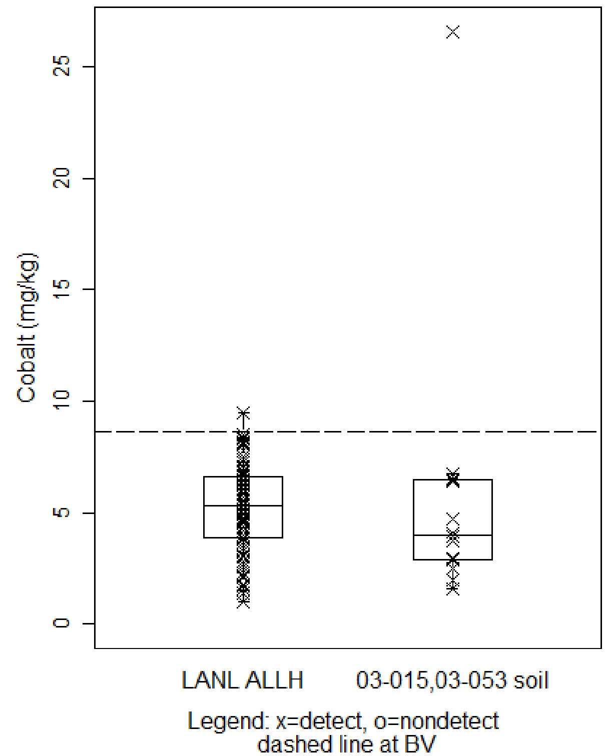


Figure H-31 Box plots for antimony and cadmium in soil at SWMU 03-015 and AOC 03-053



Chromium in soil



Cobalt in soil

Figure H-32 Box plots for chromium and cobalt in soil at SWMU 03-015 and AOC 03-053

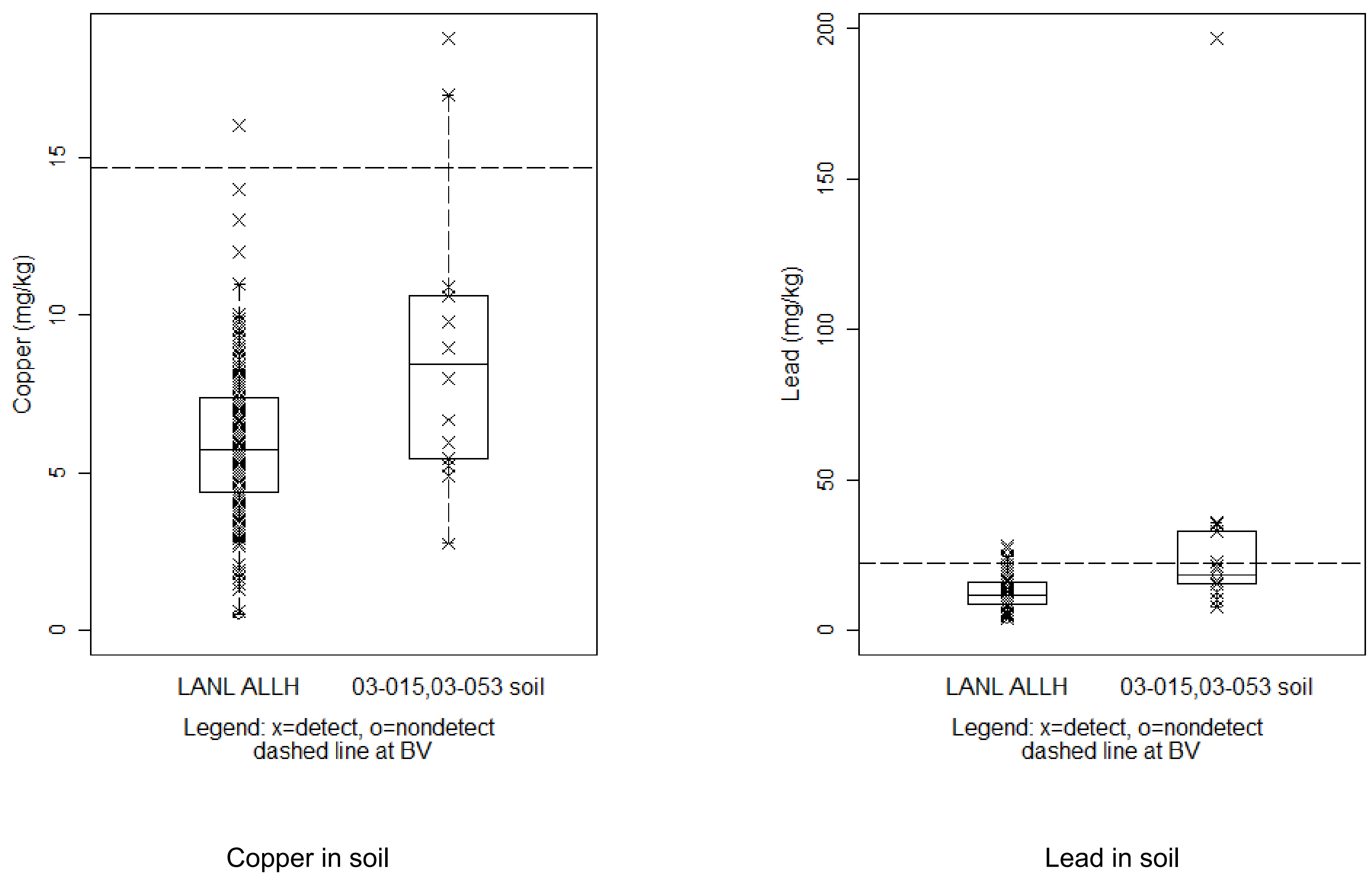
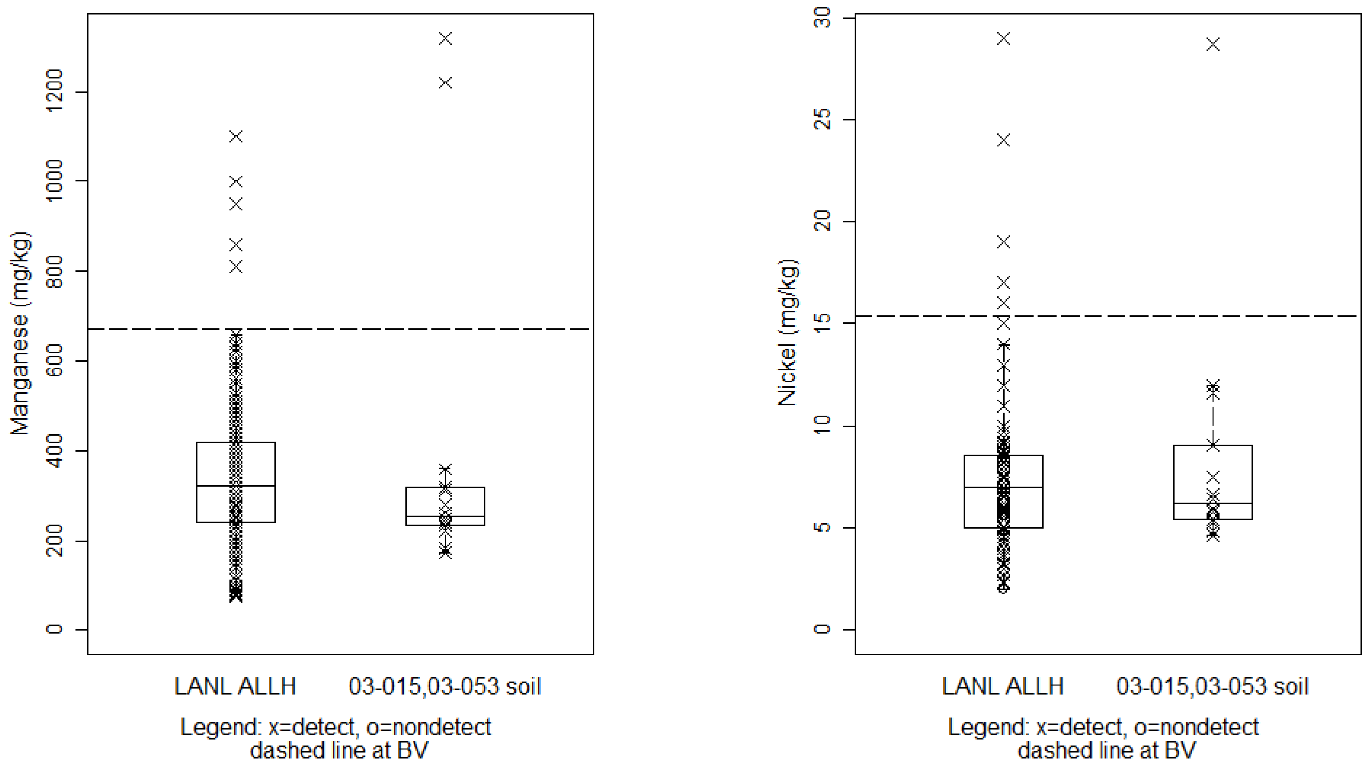


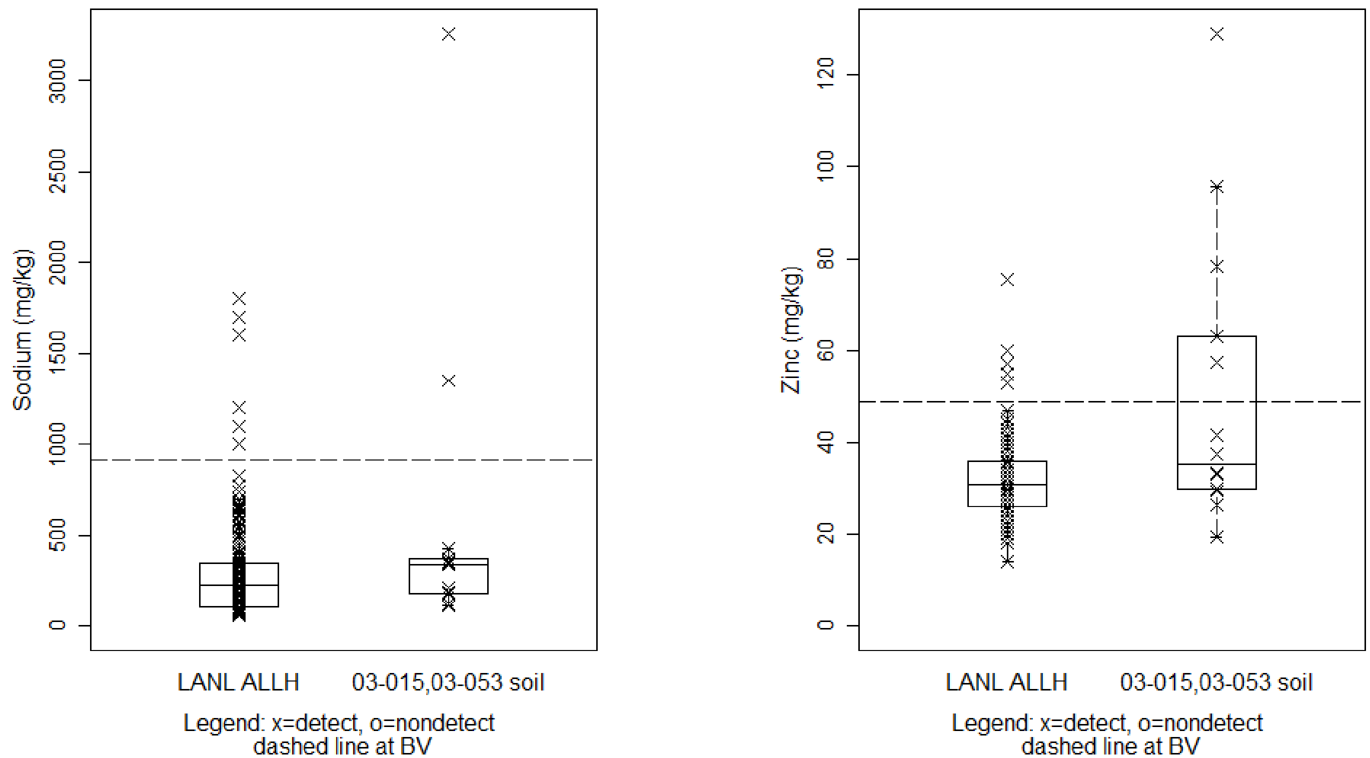
Figure H-33 Box plots for copper and lead in soil at SWMU 03-015 and AOC 03-053



Manganese in soil

Nickel in soil

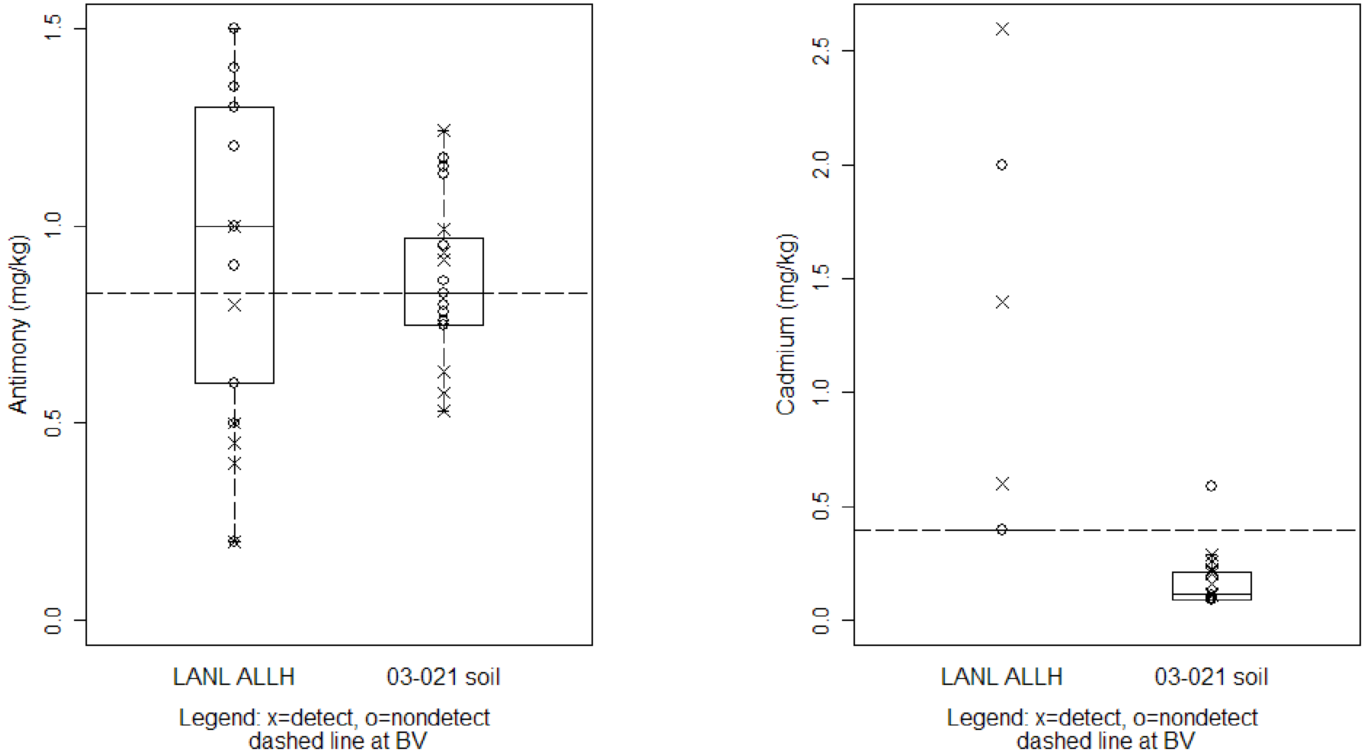
Figure H-34 Box plots for manganese and nickel in soil at SWMU 03-015 and AOC 03-053



Sodium in soil

Zinc in soil

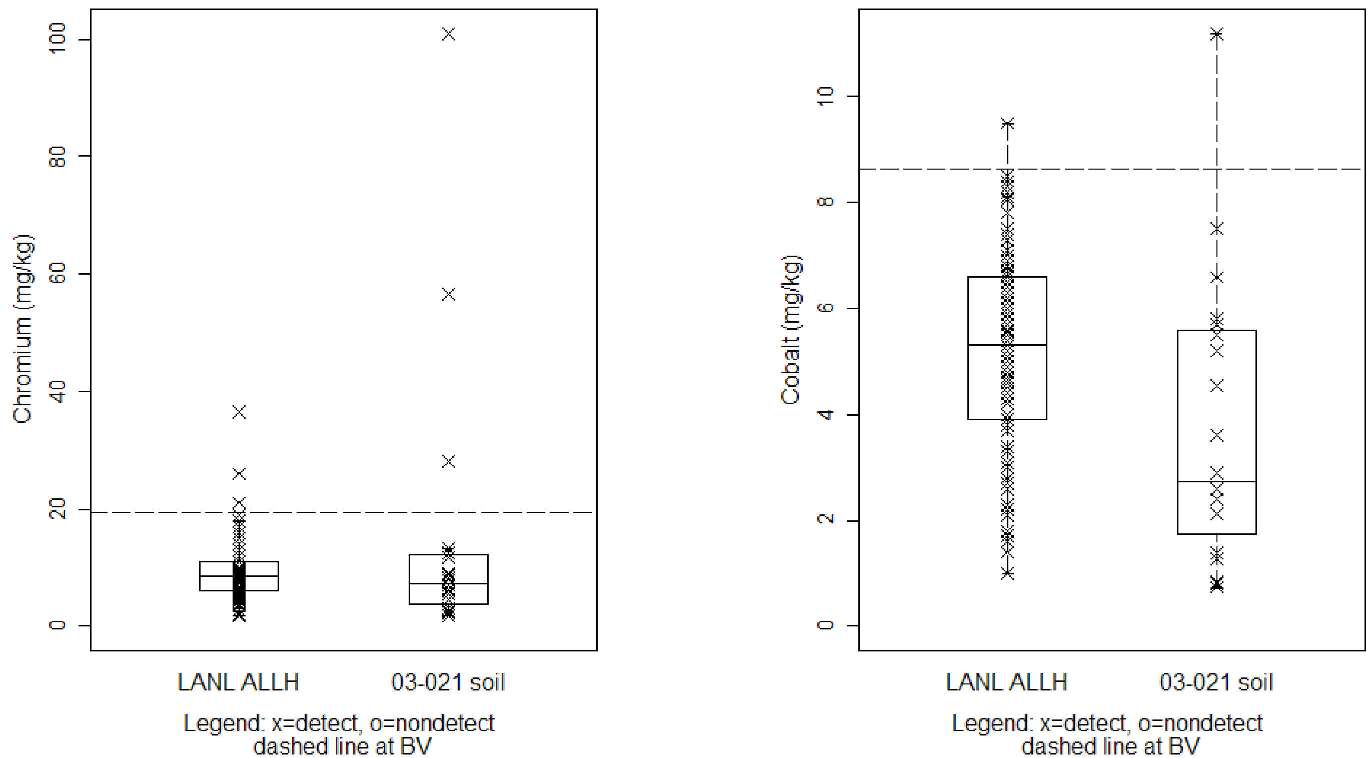
Figure H-35 Box plots for sodium and zinc in soil at SWMU 03-015 and AOC 03-053



Antimony in soil

Cadmium in soil

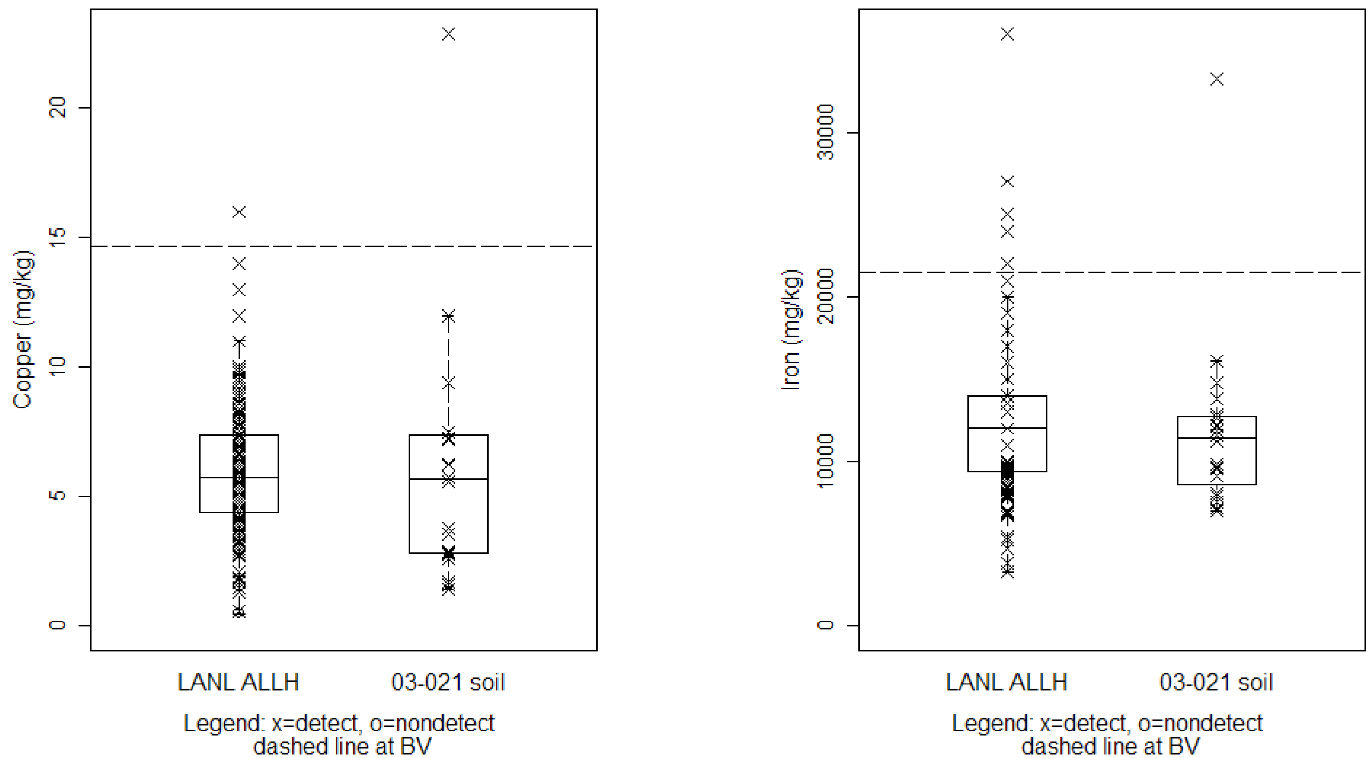
Figure H-36 Box plots for antimony and cadmium in soil at SWMU 03-021



Chromium in soil

Cobalt in soil

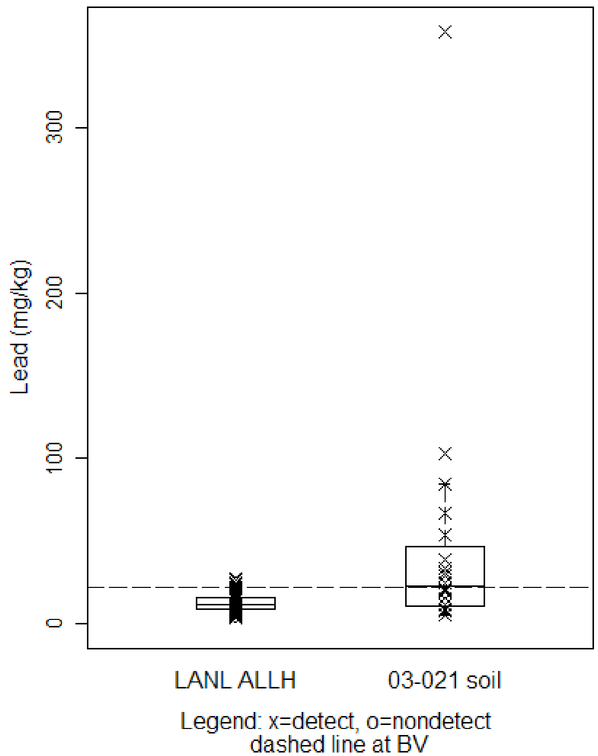
Figure H-37 Box plots for chromium and cobalt in soil at SWMU 03-021



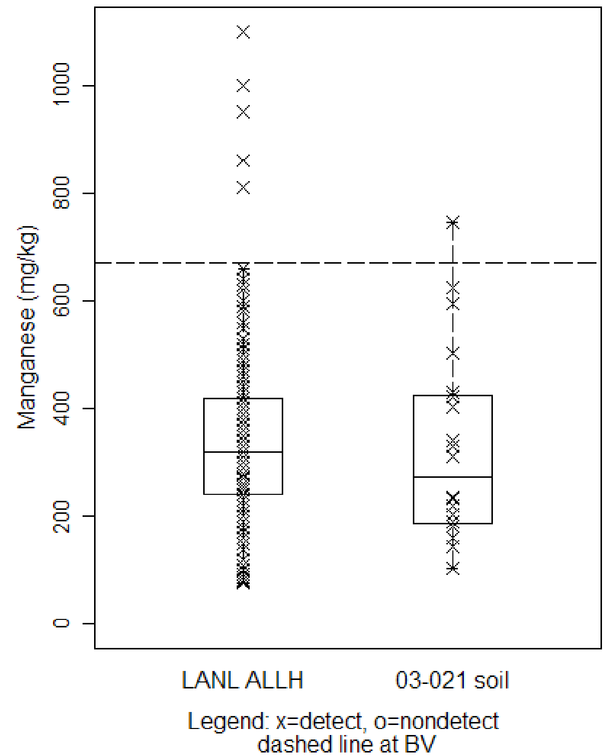
Copper in soil

Iron in soil

Figure H-38 Box plots for copper and iron in soil at SWMU 03-021

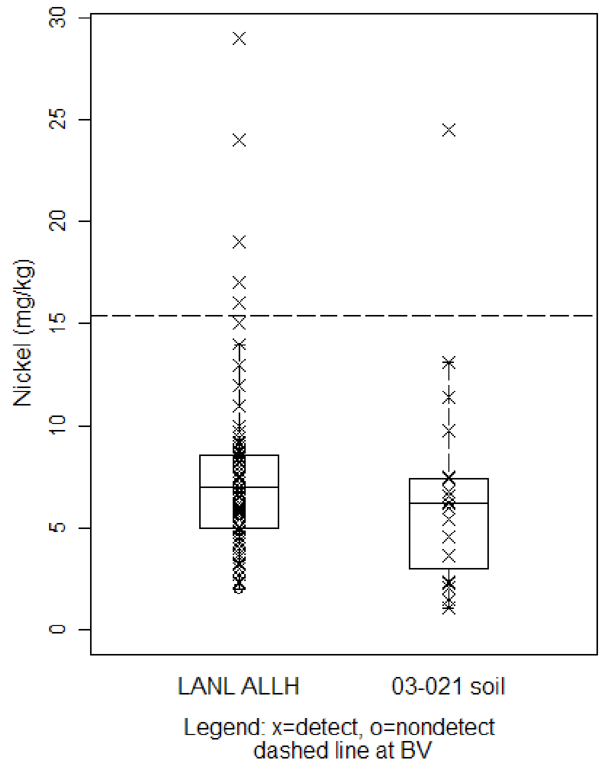


Lead in soil

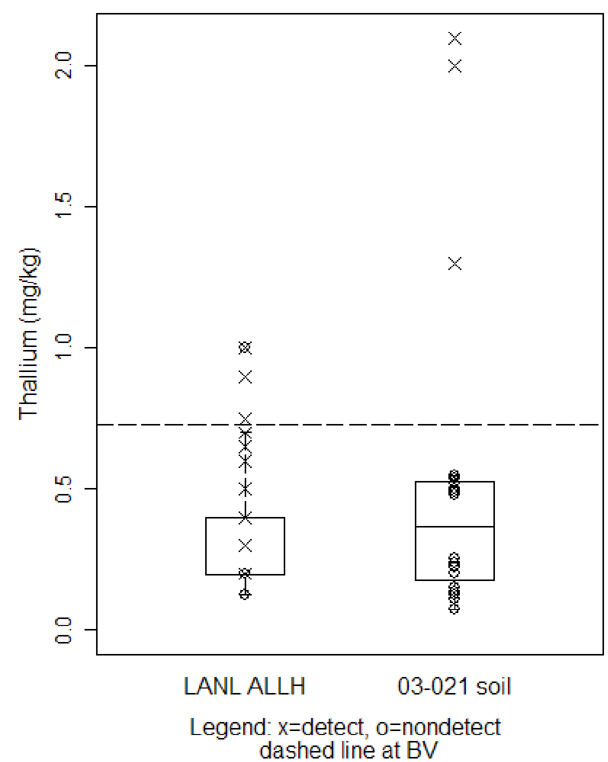


Manganese in soil

Figure H-39 Box plots for lead and manganese in soil at SWMU 03-021



Nickel in soil



Thallium in soil

Figure H-40 Box plots for nickel and thallium in soil at SWMU 03-021

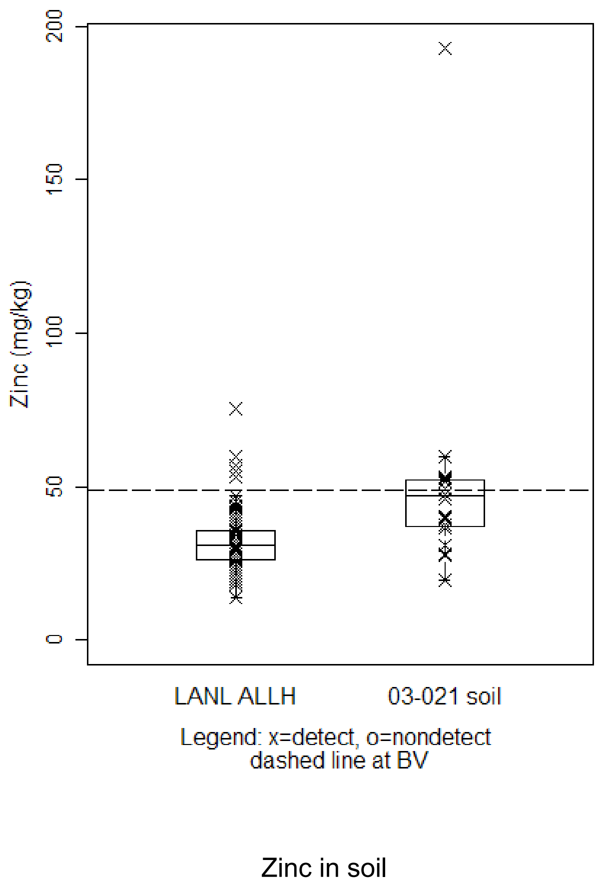
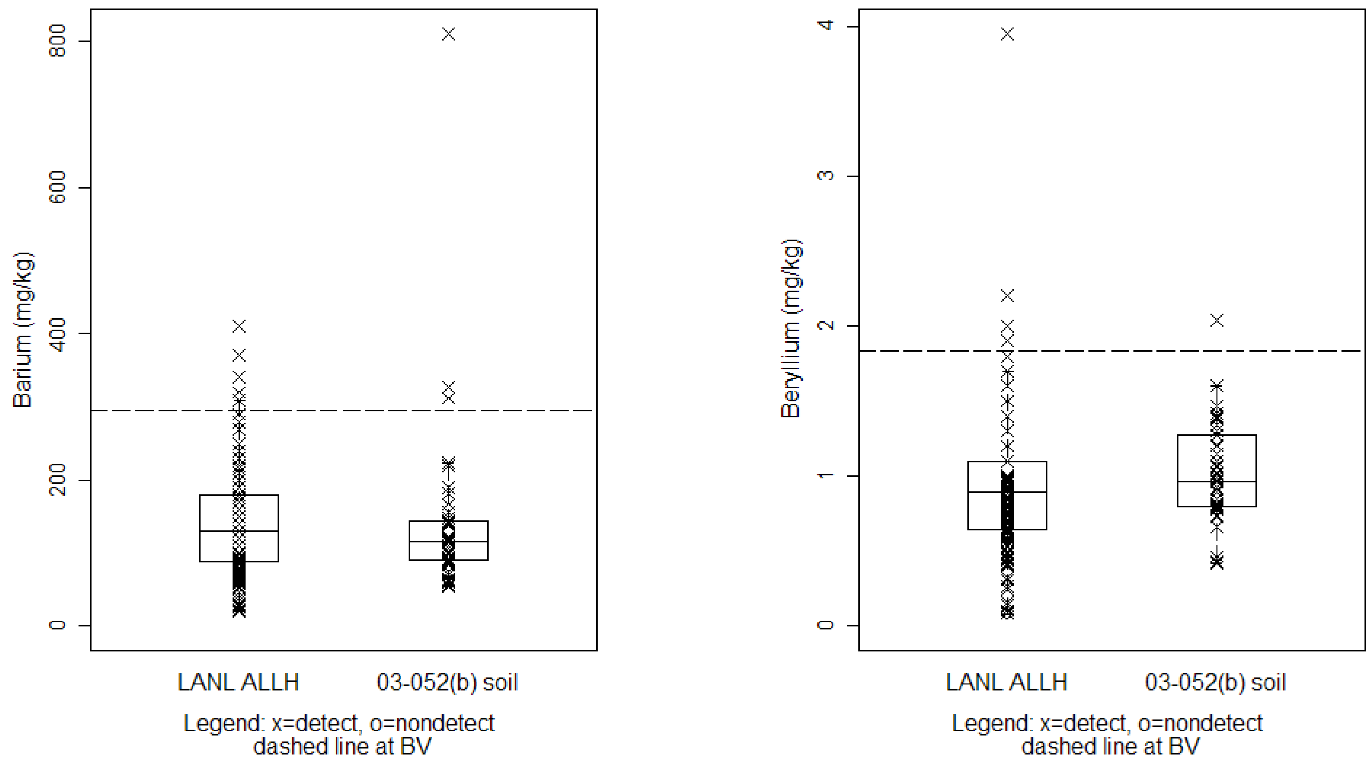


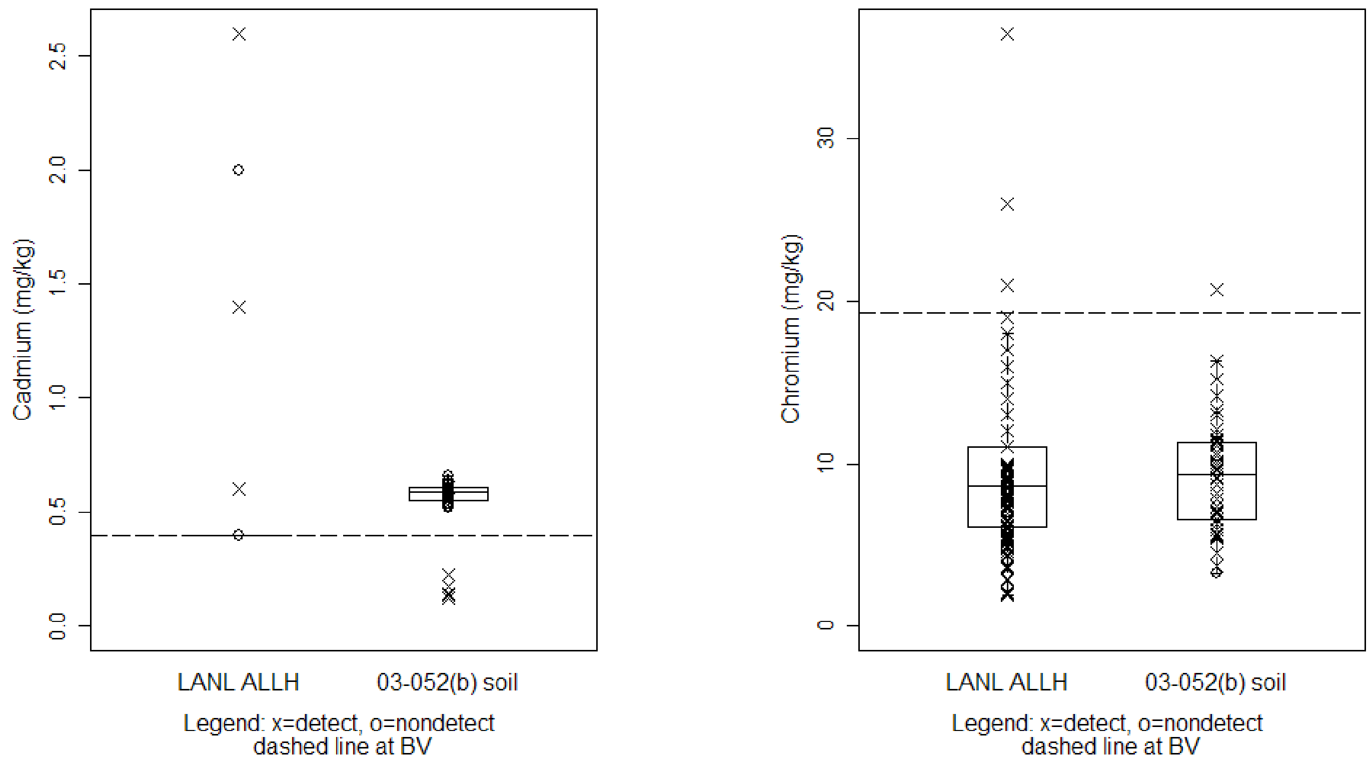
Figure H-41 Box plot for zinc in soil at SWMU 03-021



Barium in soil

Beryllium in soil

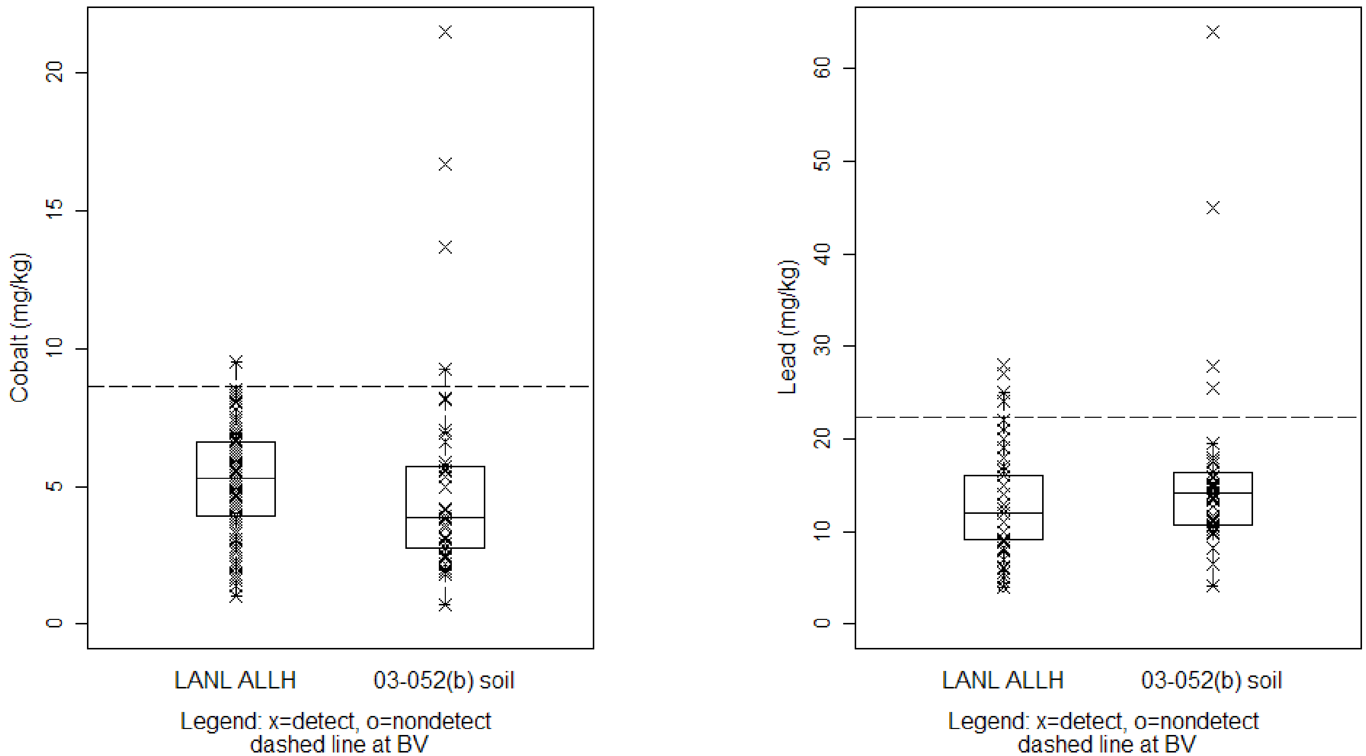
Figure H-42 Box plots for barium and beryllium in soil at AOC 03-052(b)



Cadmium in soil

Chromium in soil

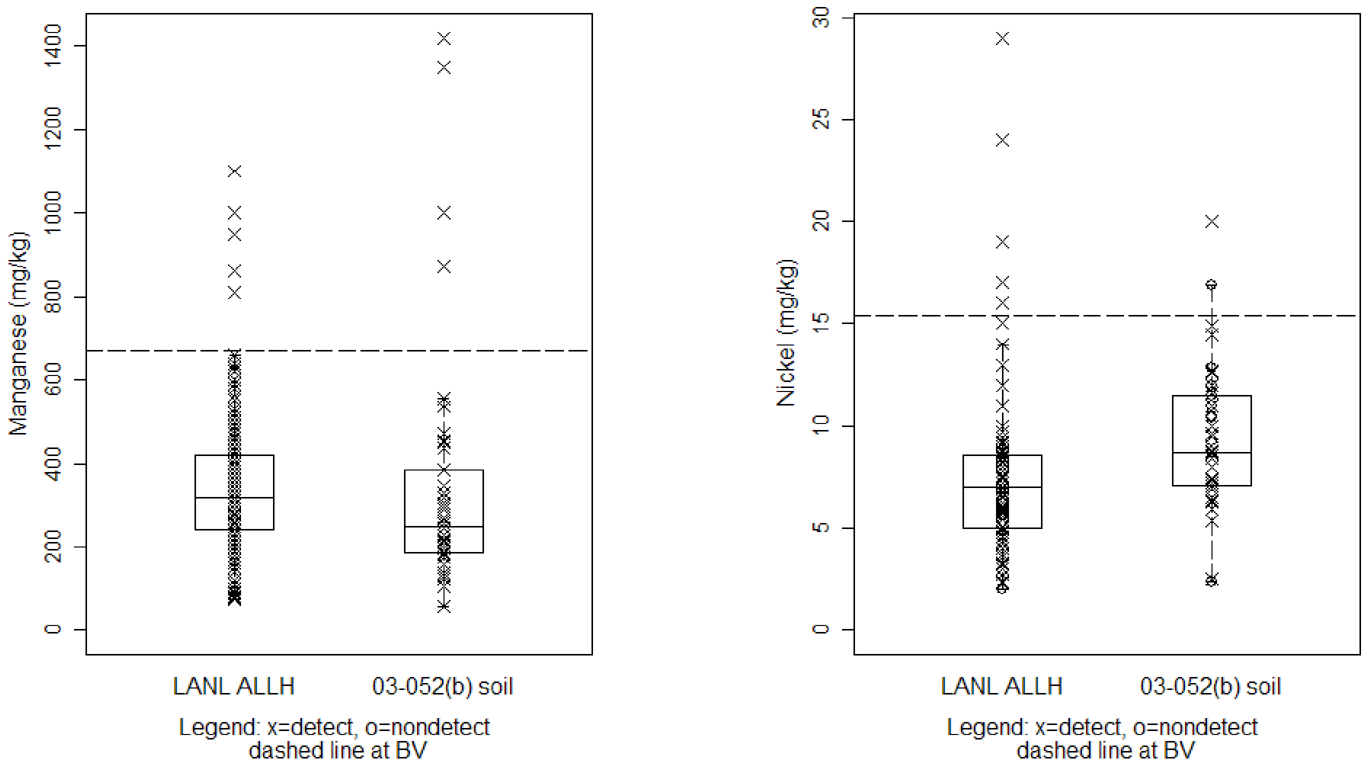
Figure H-43 Box plots for cadmium and chromium in soil at AOC 03-052(b)



Cobalt in soil

Lead in soil

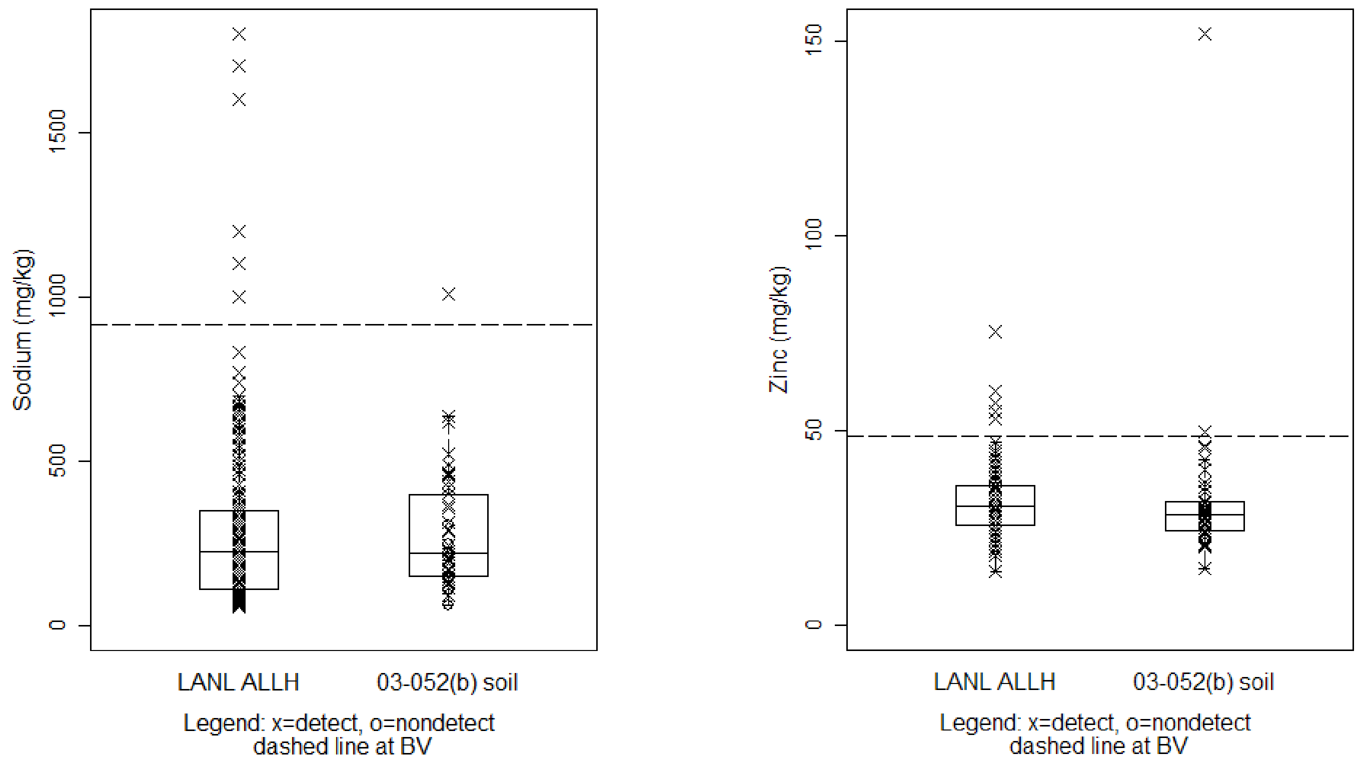
Figure H-44 Box plots for cobalt and lead in soil at AOC 03-052(b)



Manganese in soil

Nickel in soil

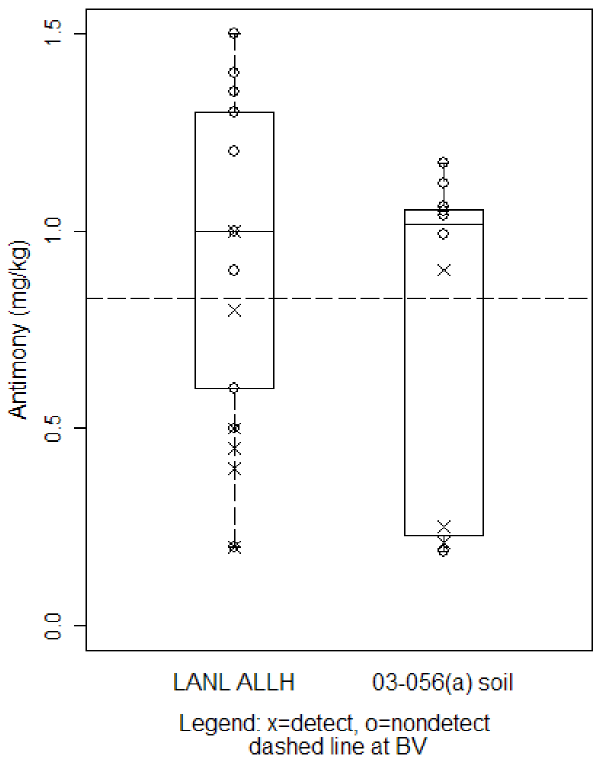
Figure H-45 Box plots for manganese and nickel in soil at AOC 03-052(b)



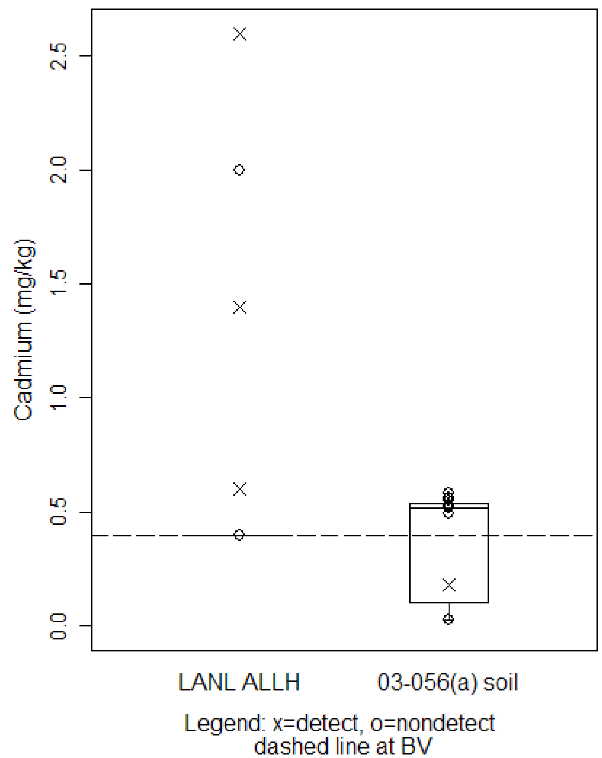
Sodium in soil

Zinc in soil

Figure H-46 Box plots for sodium and zinc in soil at AOC 03-052(b)

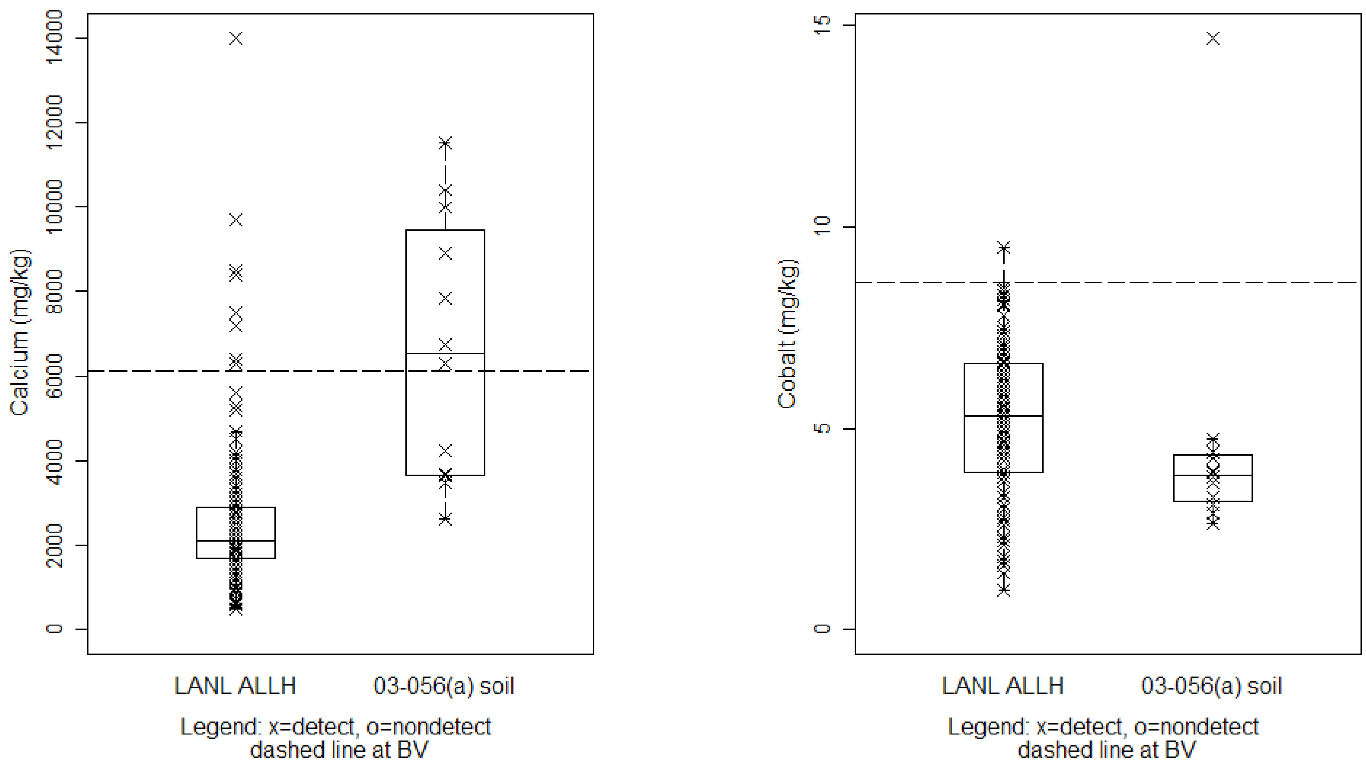


Antimony in soil



Cadmium in soil

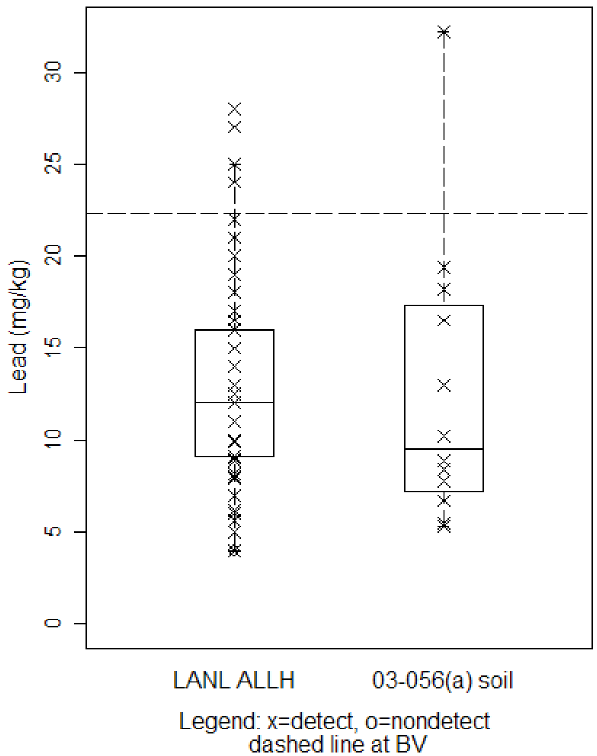
Figure H-47 Box plots for antimony and cadmium in soil at SWMU 03-056(a)



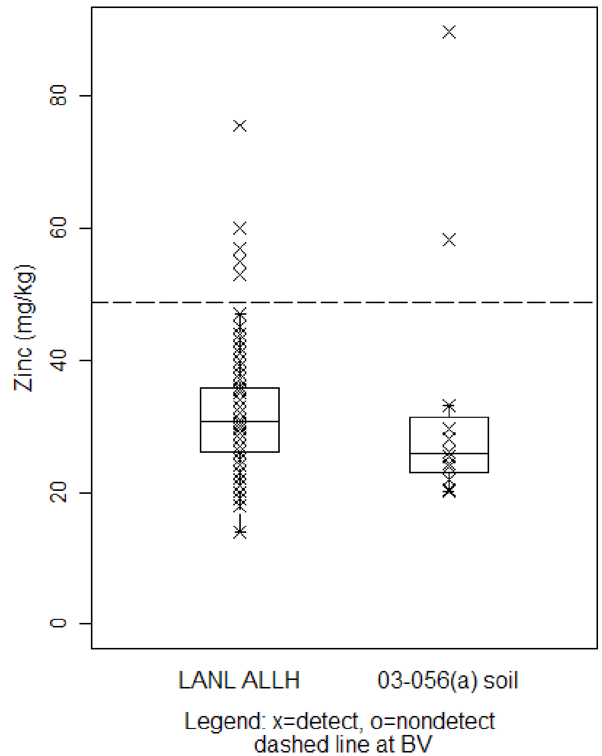
Calcium in soil

Cobalt in soil

Figure H-48 Box plots for calcium and cobalt in soil at SWMU 03-056(a)

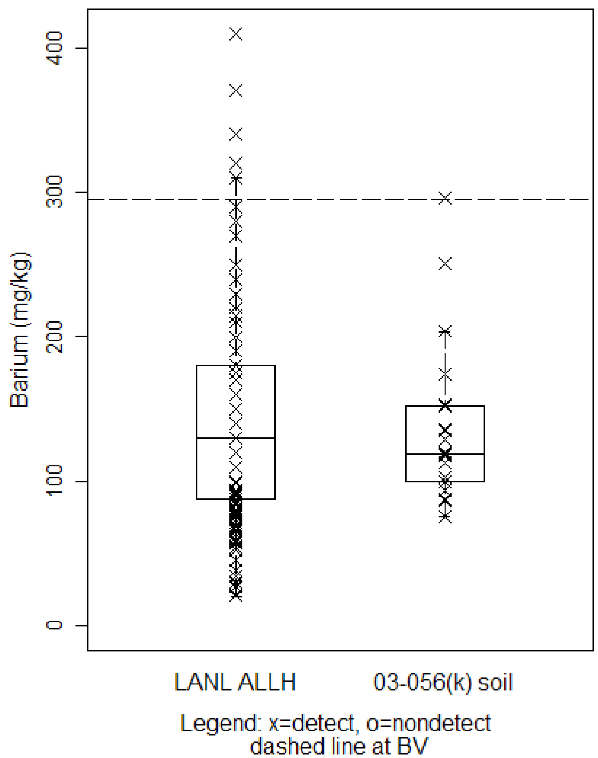


Lead in soil

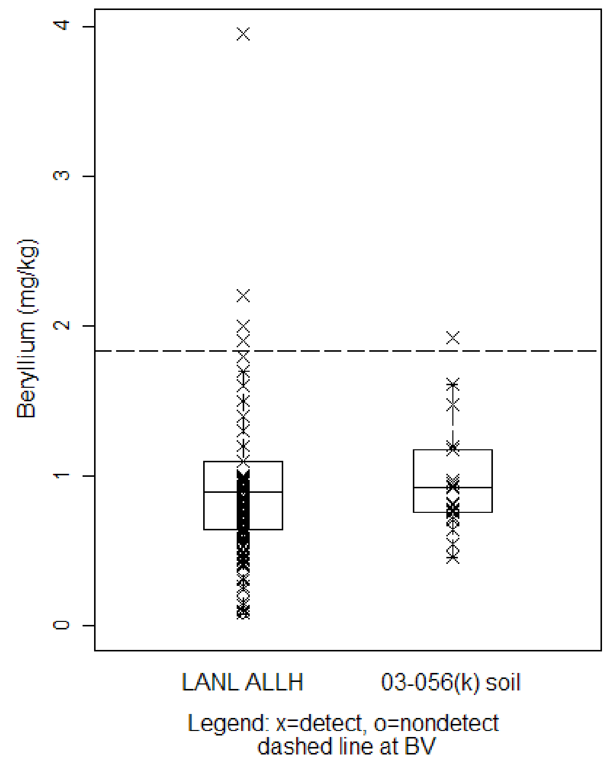


Zinc in soil

Figure H-49 Box plots for lead and zinc in soil at SWMU 03-056(a)

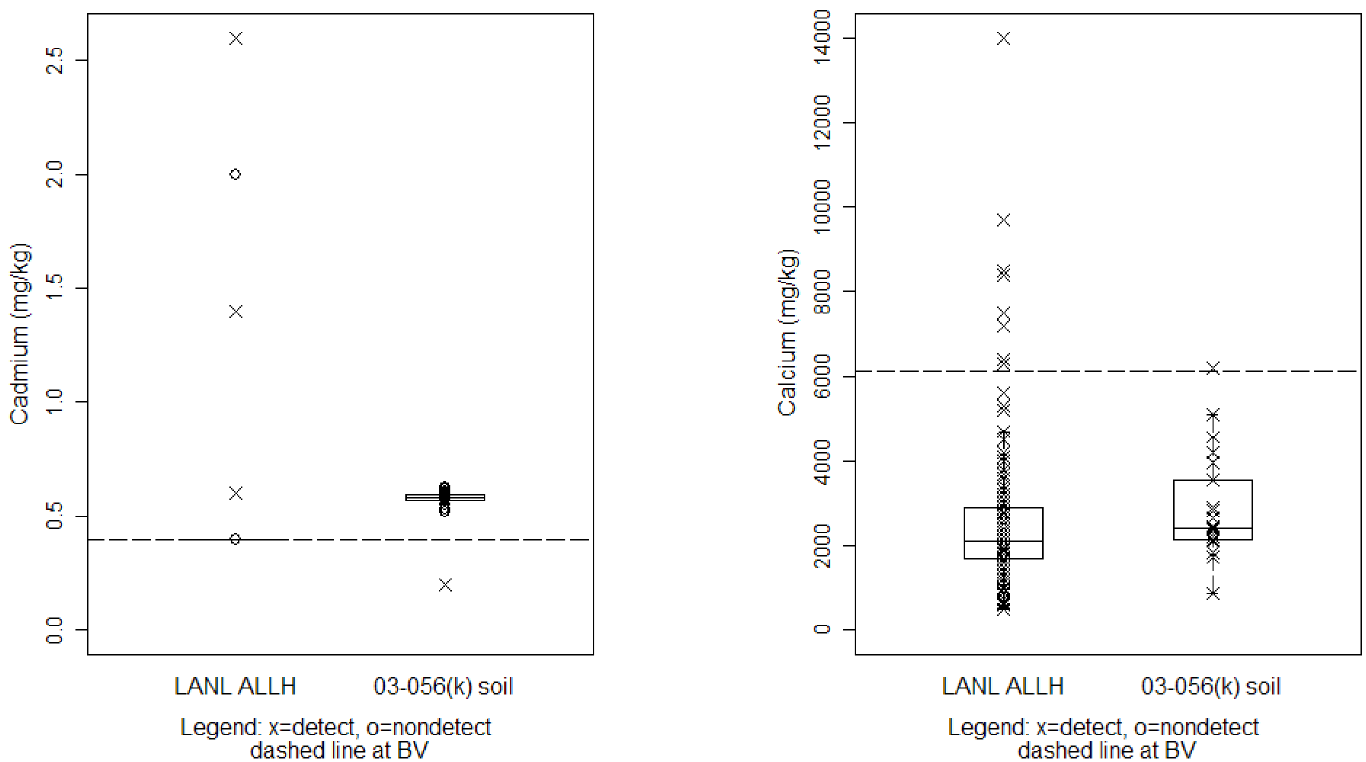


Barium in soil



Beryllium in soil

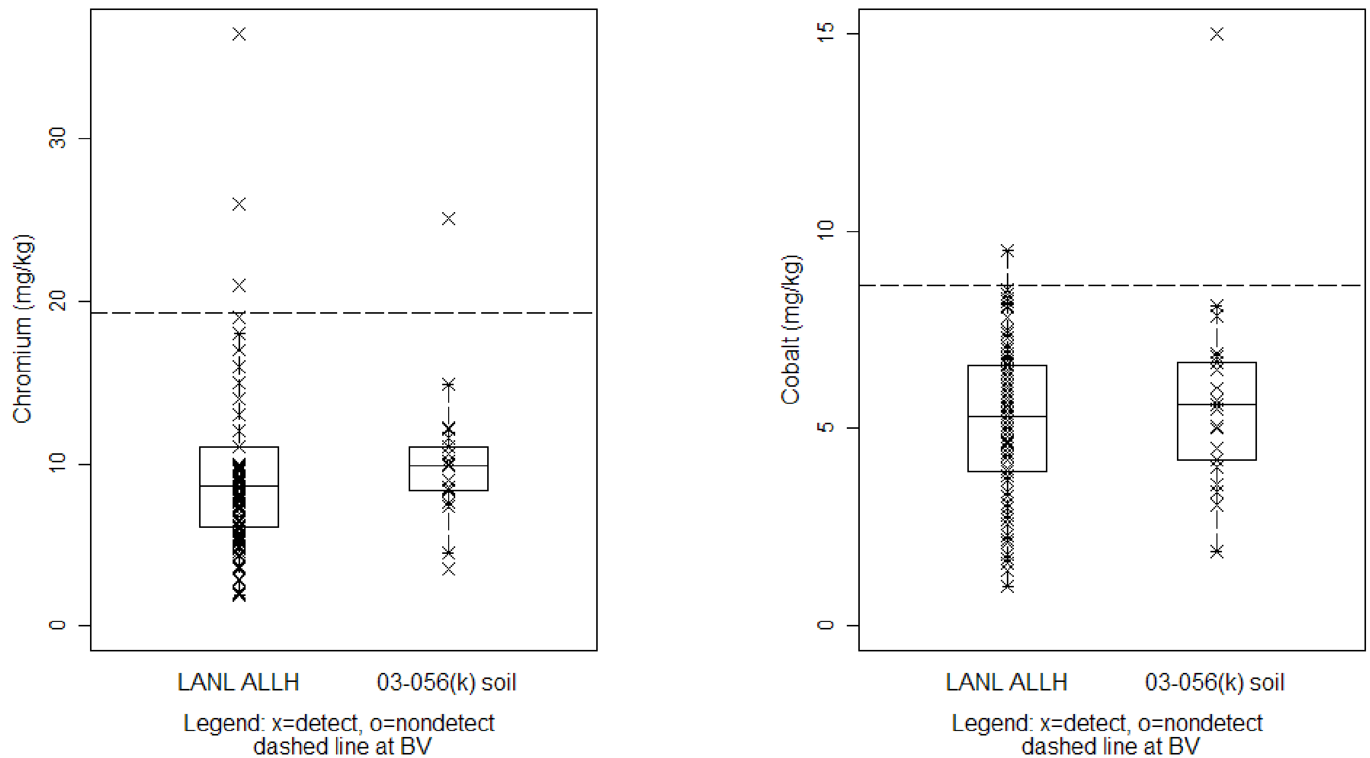
Figure H-50 Box plots for barium and beryllium in soil at AOC 03-056(k)



Cadmium in soil

Calcium in soil

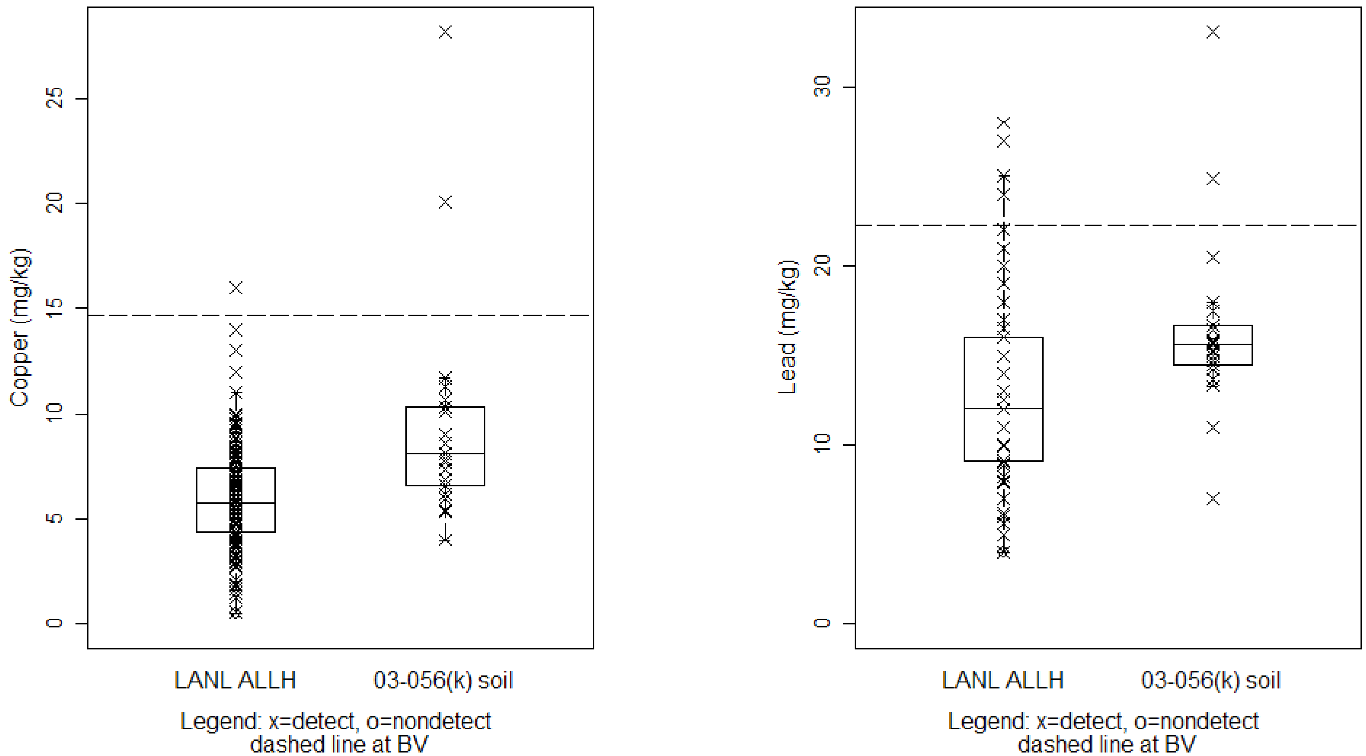
Figure H-51 Box plots for cadmium and calcium in soil at AOC 03-056(k)



Chromium in soil

Cobalt in soil

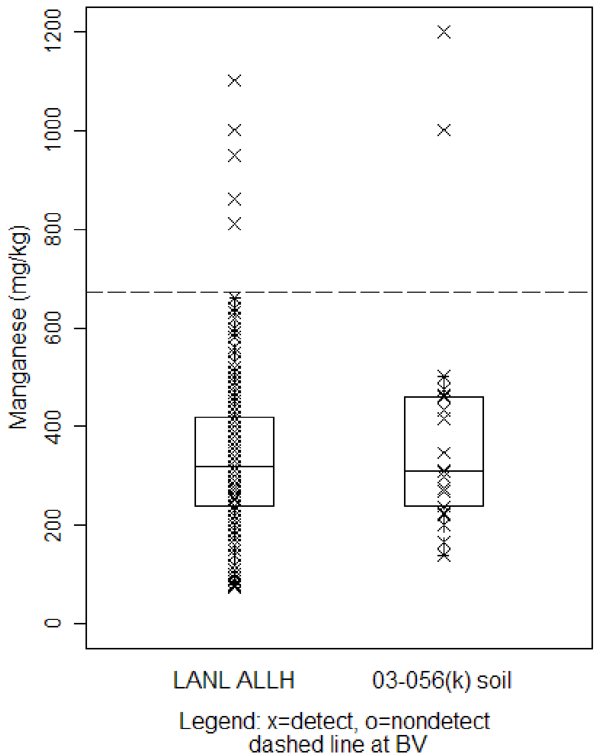
Figure H-52 Box plots for chromium and cobalt in soil at AOC 03-056(k)



Copper in soil

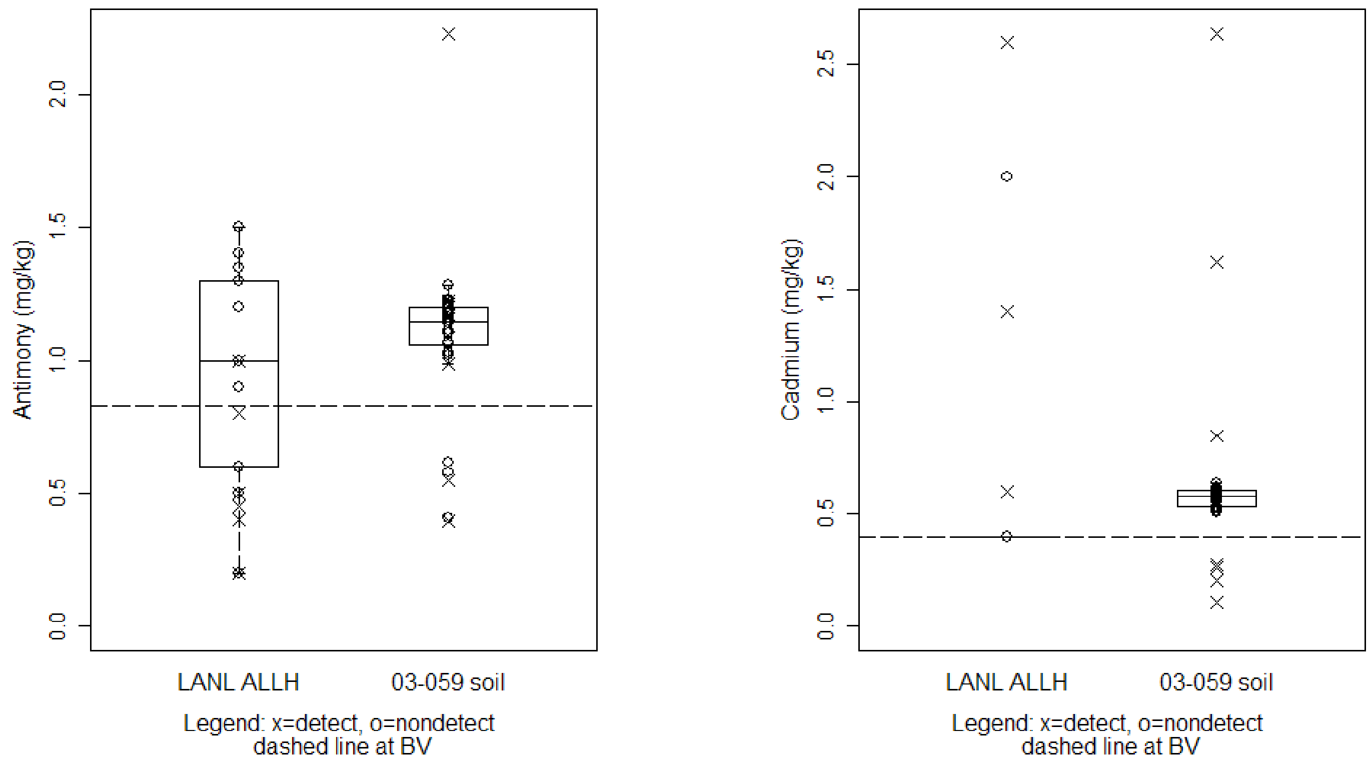
Lead in soil

Figure H-53 Box plots for copper and lead in soil at AOC 03-056(k)



Manganese in soil

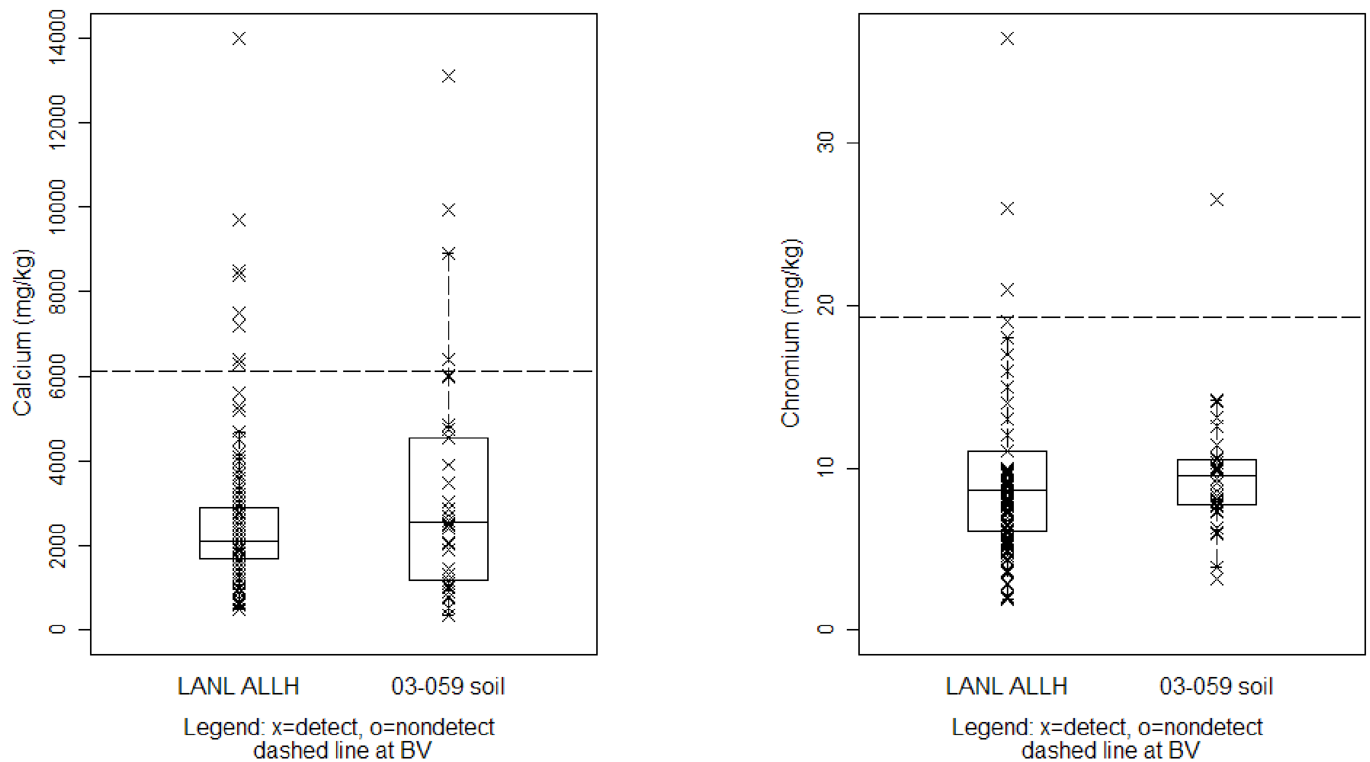
Figure H-54 Box plot for manganese in soil at AOC 03-056(k)



Antimony in soil

Cadmium in soil

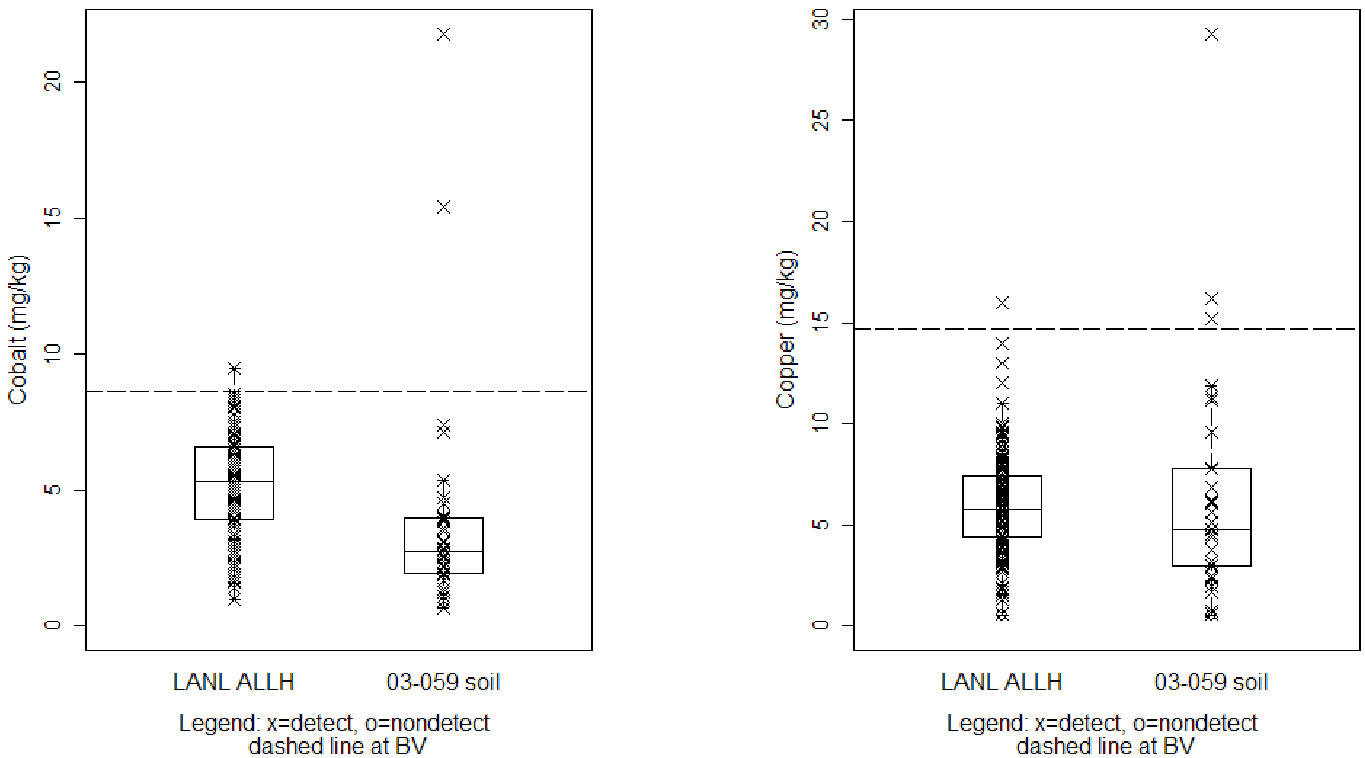
Figure H-55 Box plots for antimony and cadmium in soil at SWMU 03-059



Calcium in soil

Chromium in soil

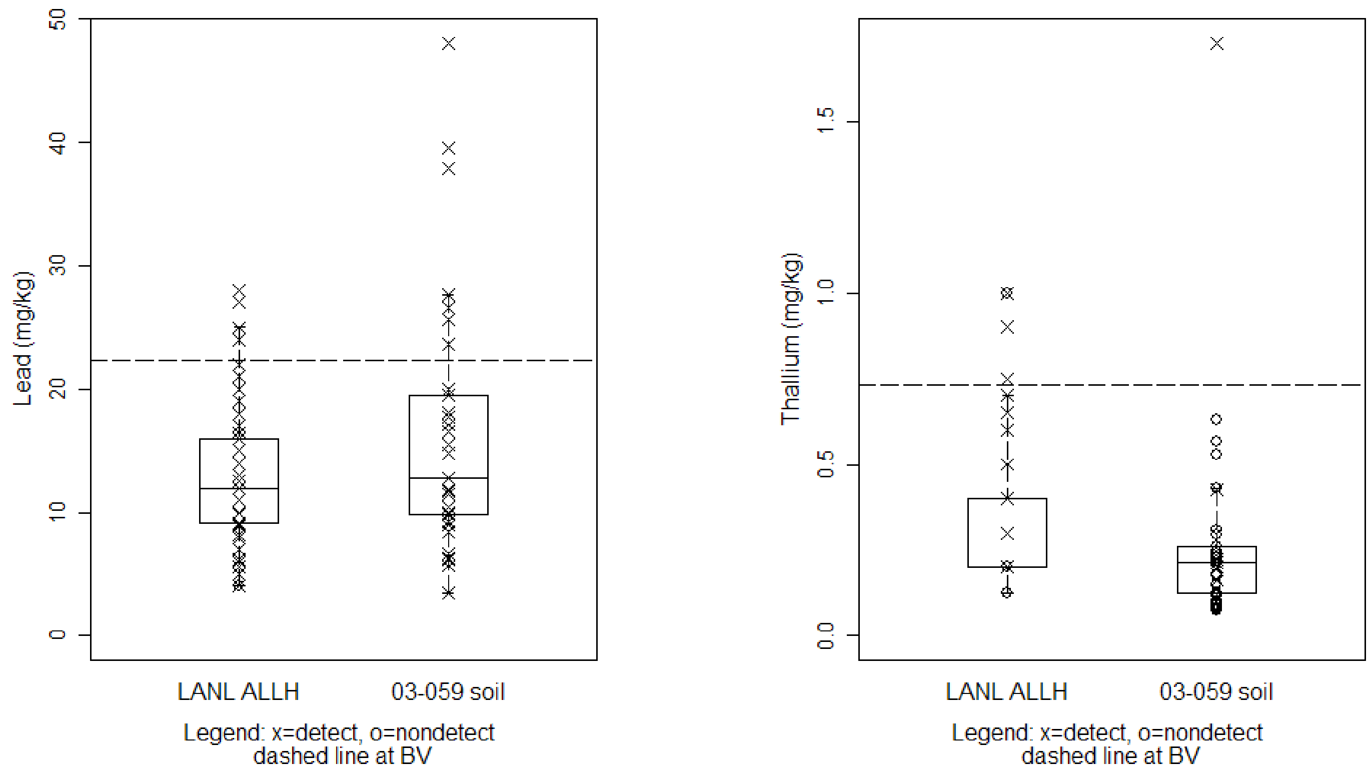
Figure H-56 Box plots for calcium and chromium in soil at SWMU 03-059



Cobalt in soil

Copper in soil

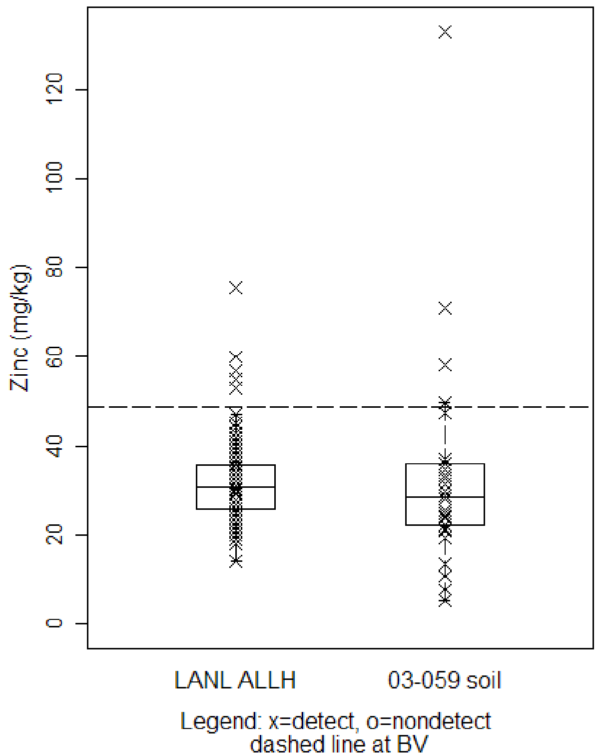
Figure H-57 Box plots for cobalt and copper in soil at SWMU 03-059



Lead in soil

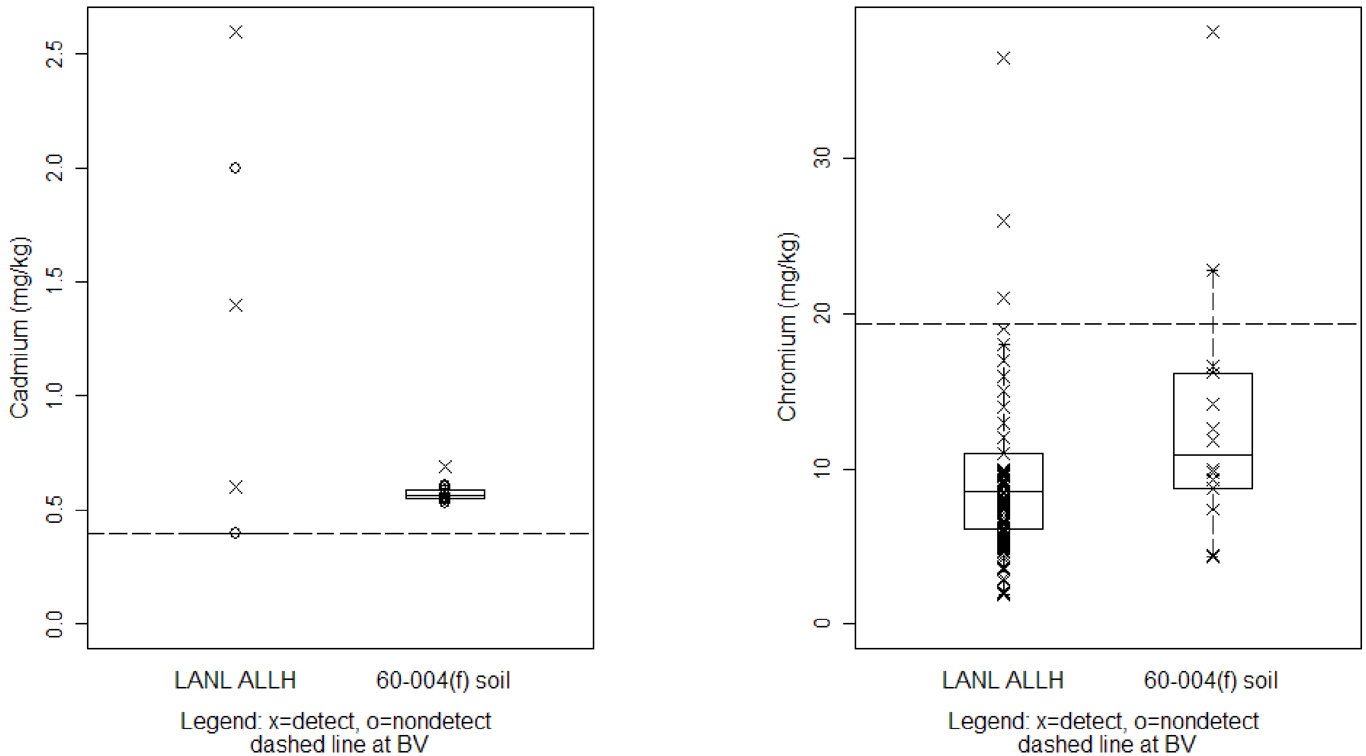
Thallium in soil

Figure H-58 Box plots for lead and thallium in soil at SWMU 03-059



Zinc in soil

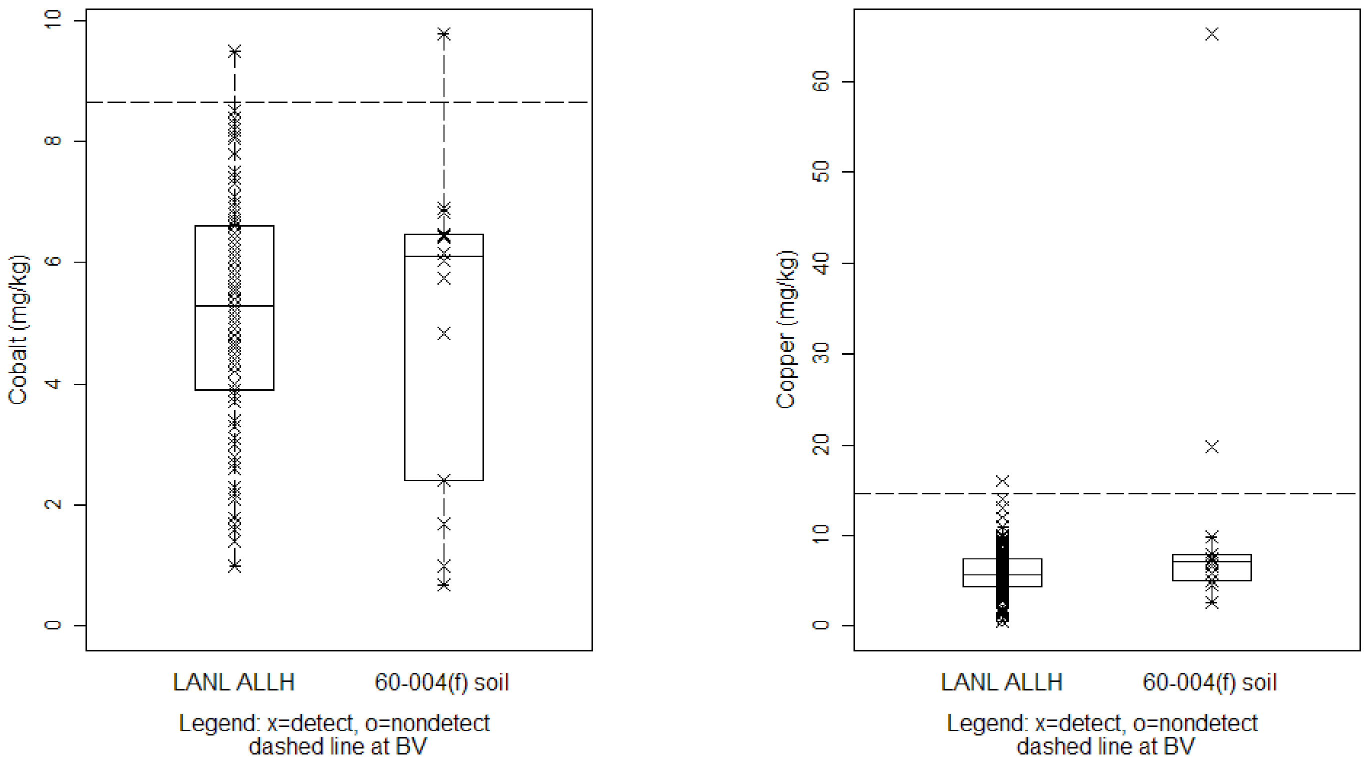
Figure H-59 Box plot for zinc in soil at SWMU 03-059



Cadmium in soil

Chromium in soil

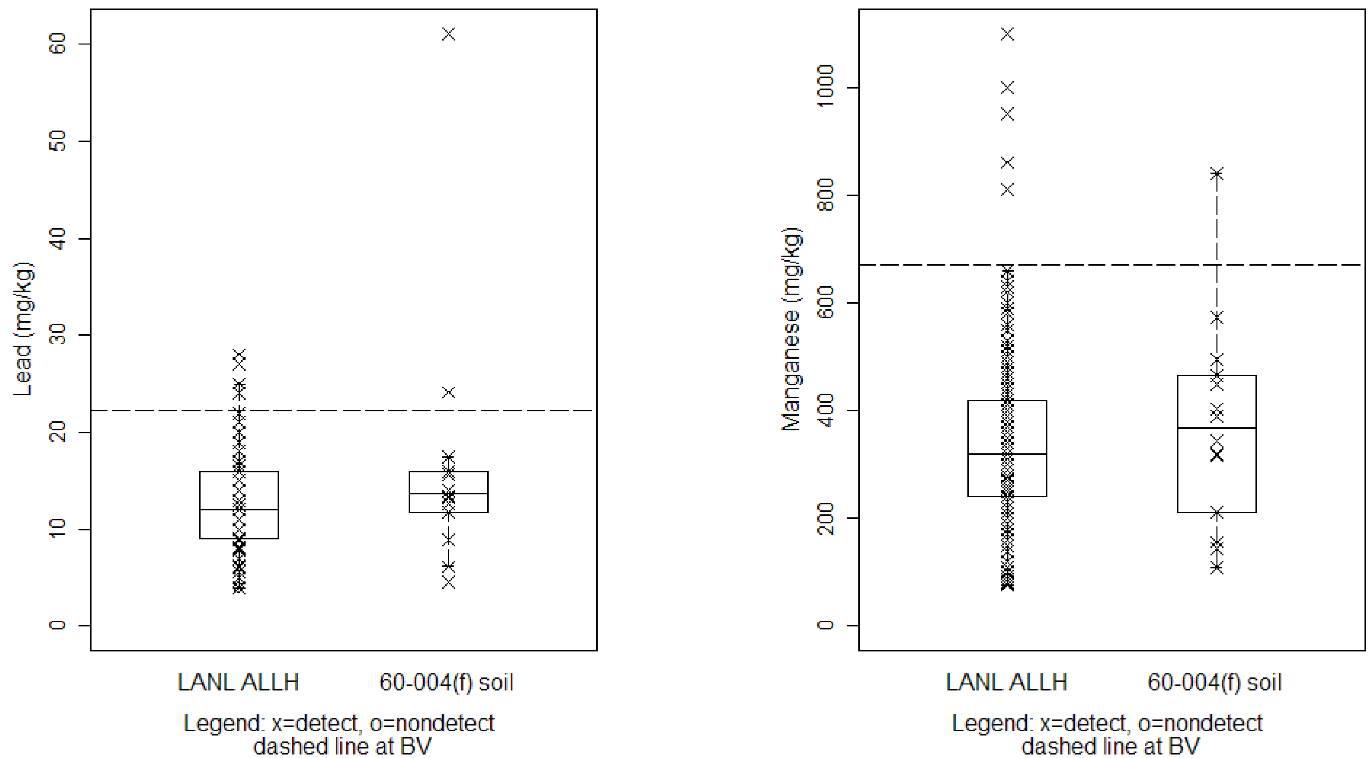
Figure H-60 Box plots for cadmium and chromium in soil at AOC 60-004(f)



Cobalt in soil

Copper in soil

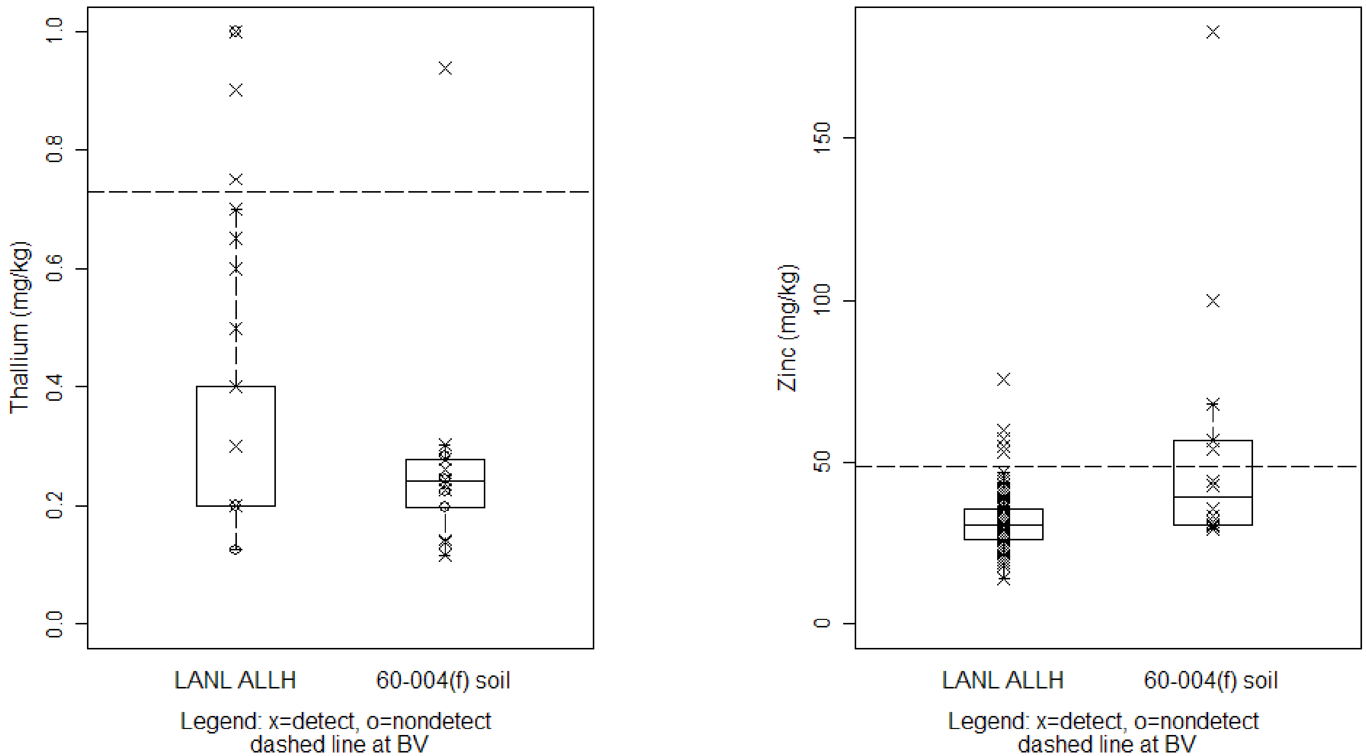
Figure H-61 Box plots for cobalt and copper in soil at AOC 60-004(f)



Lead in soil

Manganese in soil

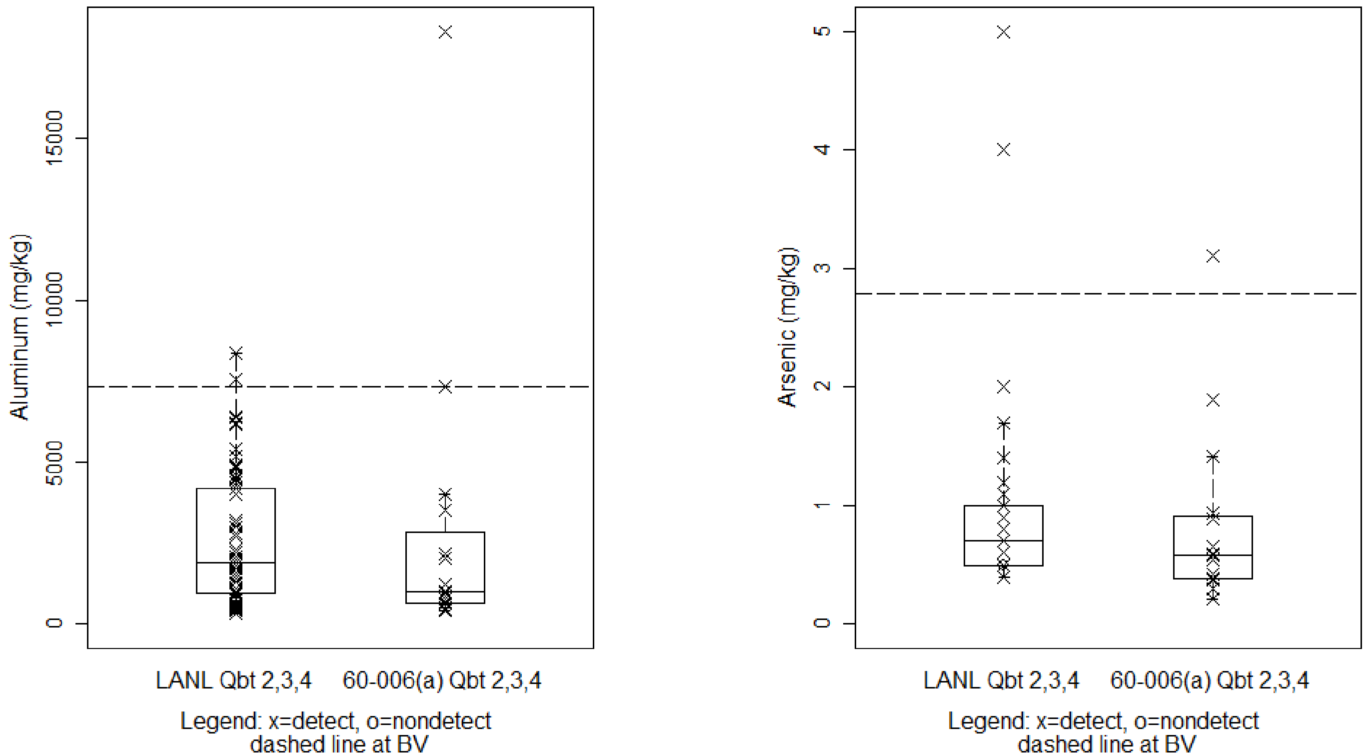
Figure H-62 Box plots for lead and manganese in soil at AOC 60-004(f)



Thallium in soil

Zinc in soil

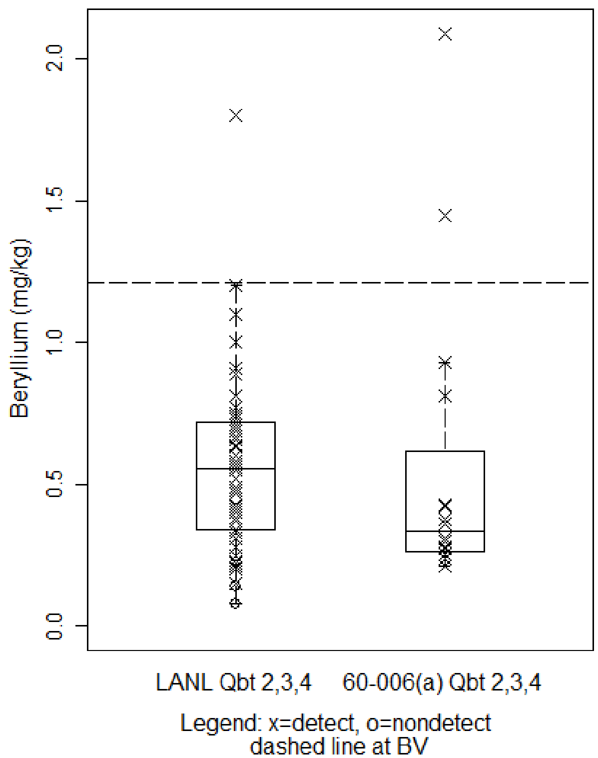
Figure H-63 Box plots for thallium and zinc in soil at AOC 60-004(f)



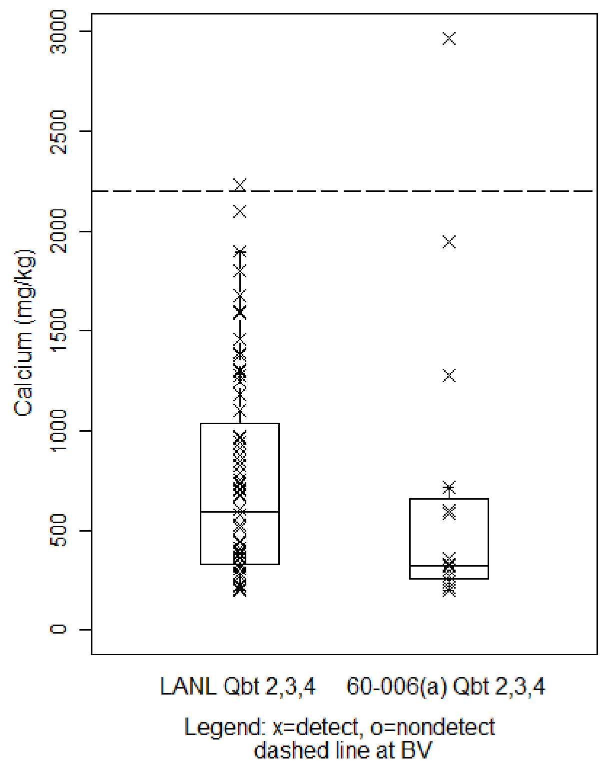
Aluminum in Qbt 2,3,4

Arsenic in Qbt 2,3,4

Figure H-64 Box plots for aluminum and arsenic in tuff at SWMU 60-006(a)

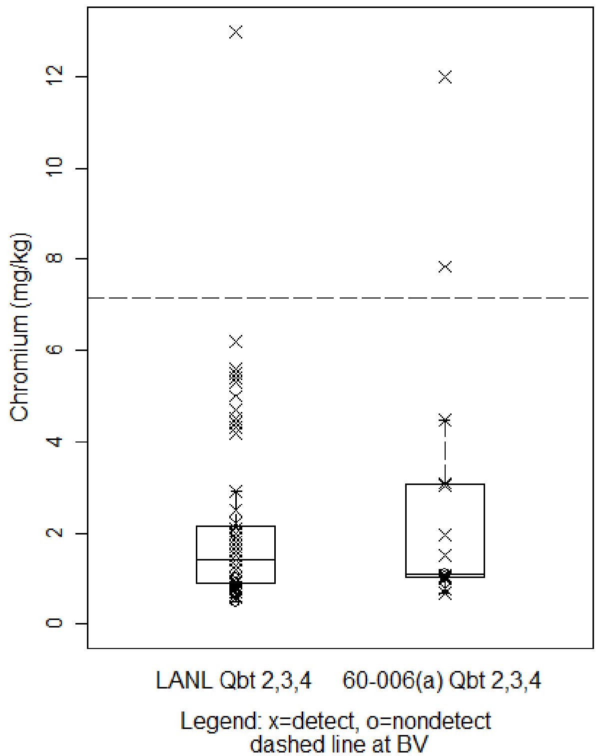


Beryllium in Qbt 2,3,4

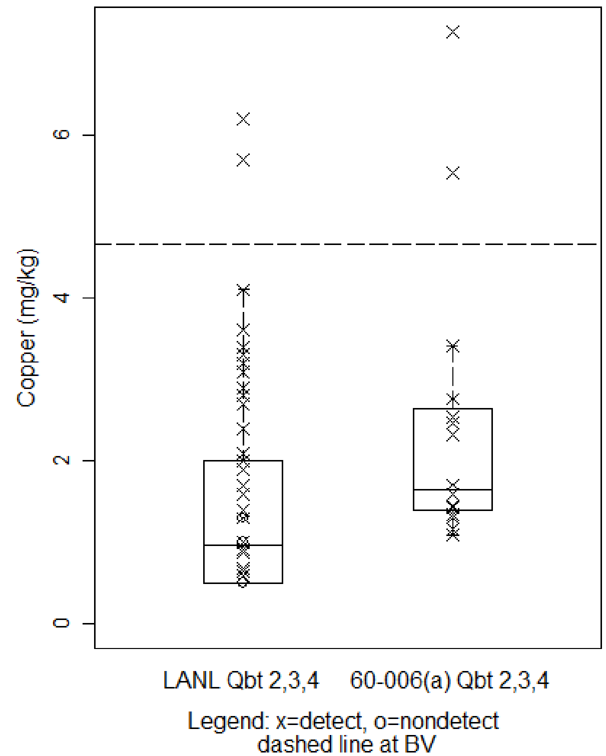


Calcium in Qbt 2,3,4

Figure H-65 Box plots for beryllium and calcium in tuff at SWMU 60-006(a)

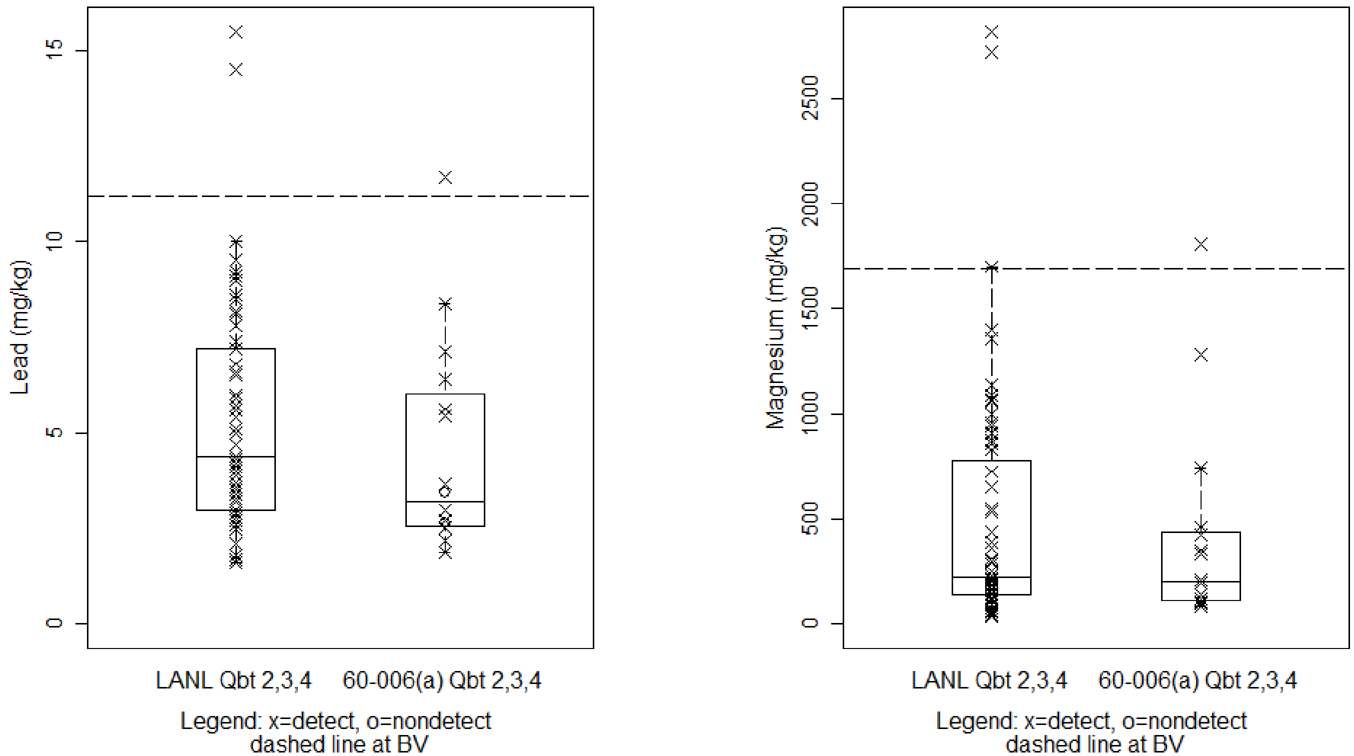


Chromium in Qbt 2,3,4



Copper in Qbt 2,3,4

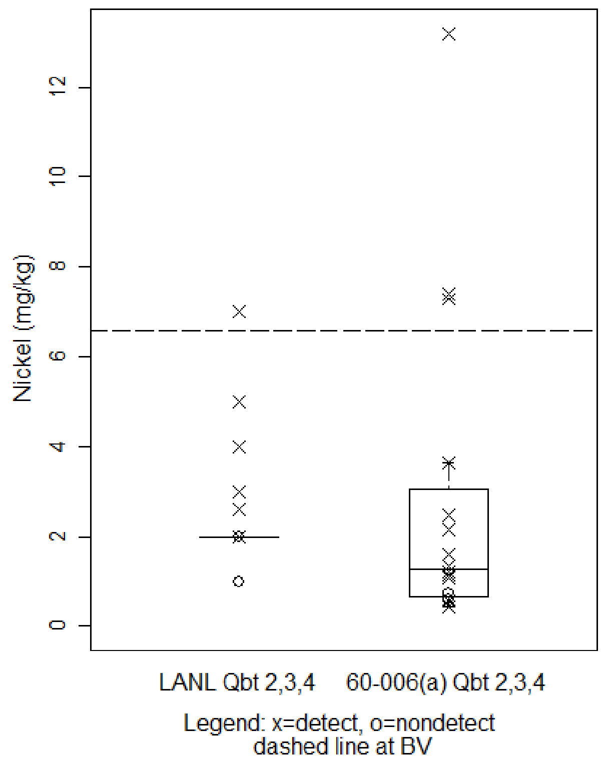
Figure H-66 Box plots for chromium and copper in tuff at SWMU 60-006(a)



Lead in Qbt 2,3,4

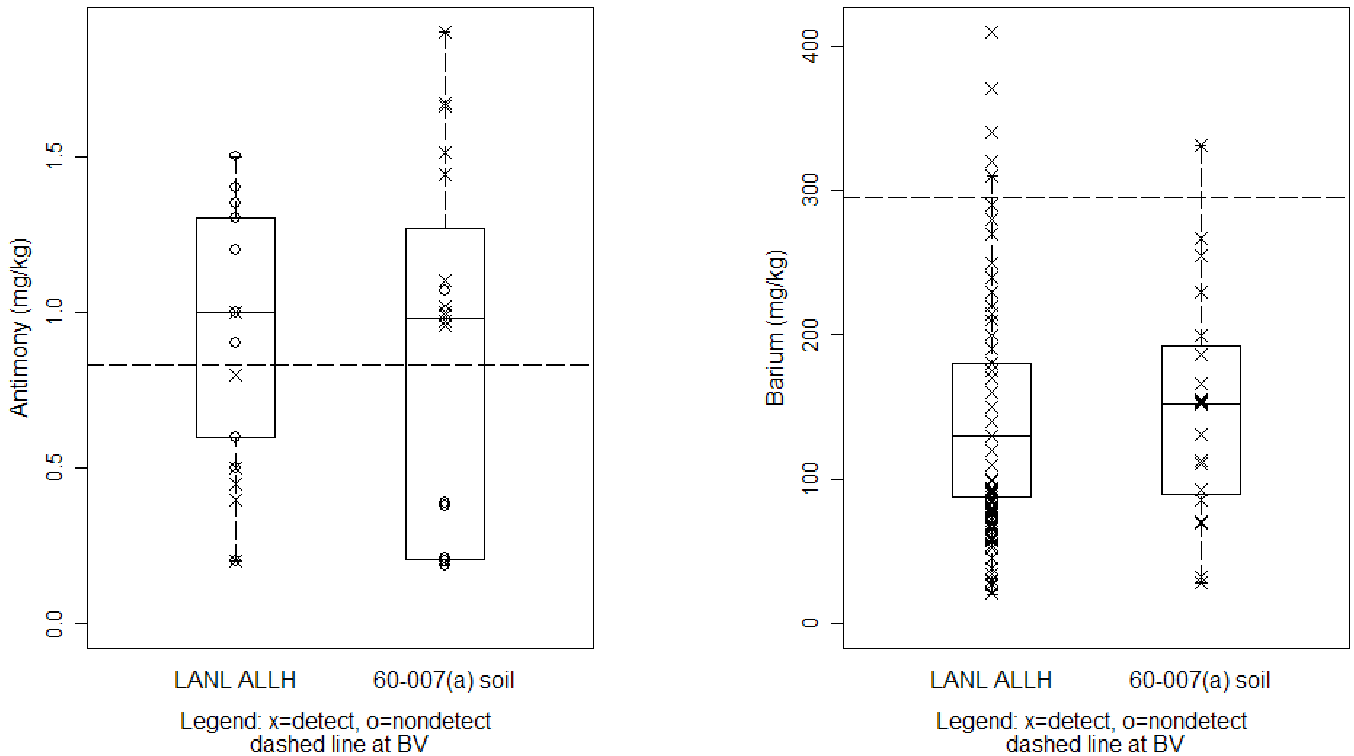
Magnesium in Qbt 2,3,4

Figure H-67 Box plots for lead and magnesium in tuff at SWMU 60-006(a)



Nickel in Qbt 2,3,4

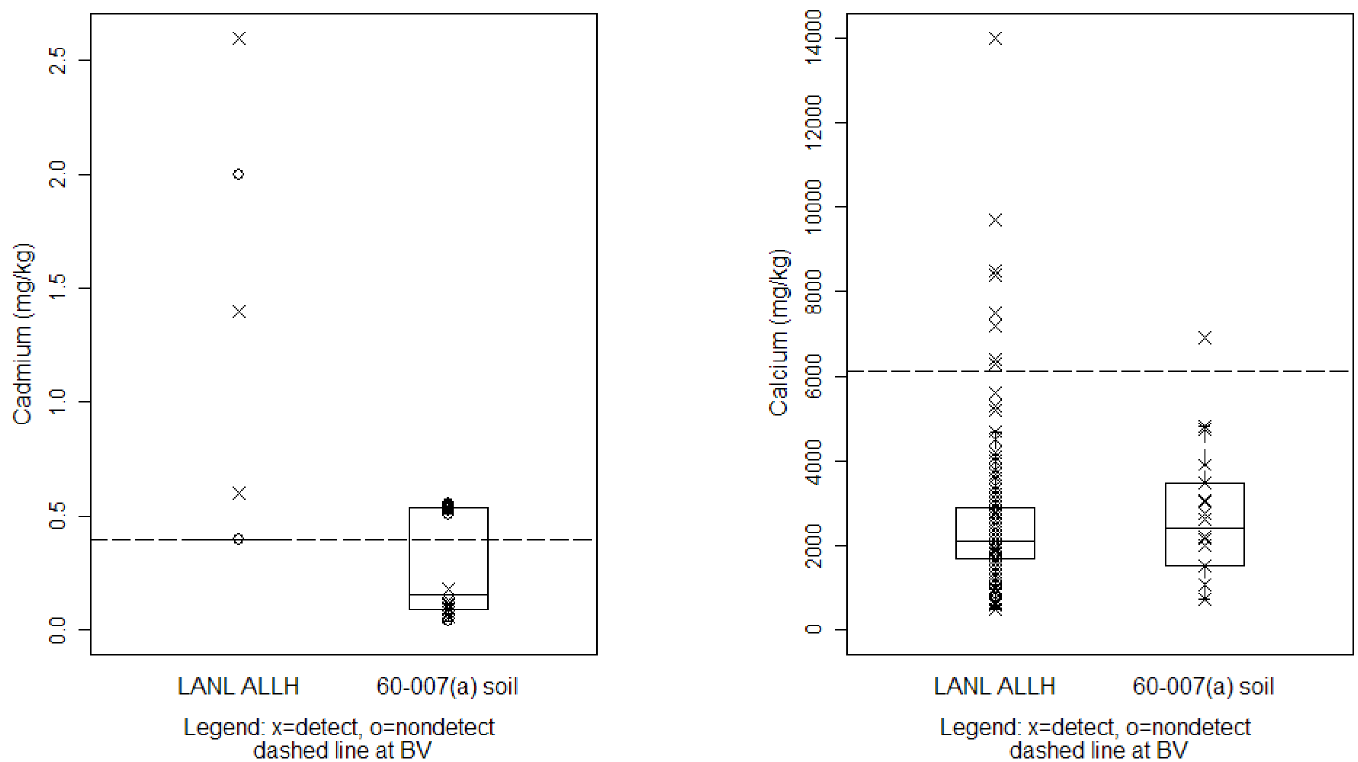
Figure H-68 Box plot for nickel in tuff at SWMU 60-006(a)



Antimony in soil

Barium in soil

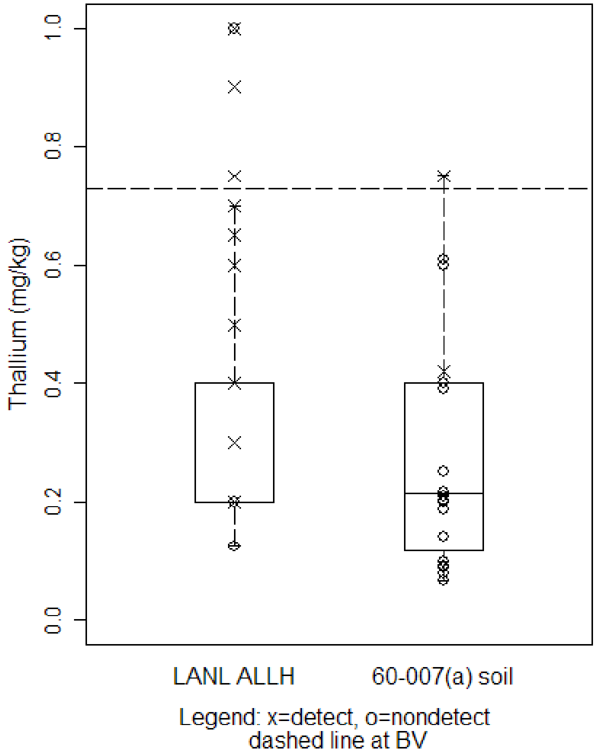
Figure H-69 Box plots for antimony and barium in soil at SWMU 60-007(a)



Cadmium in soil

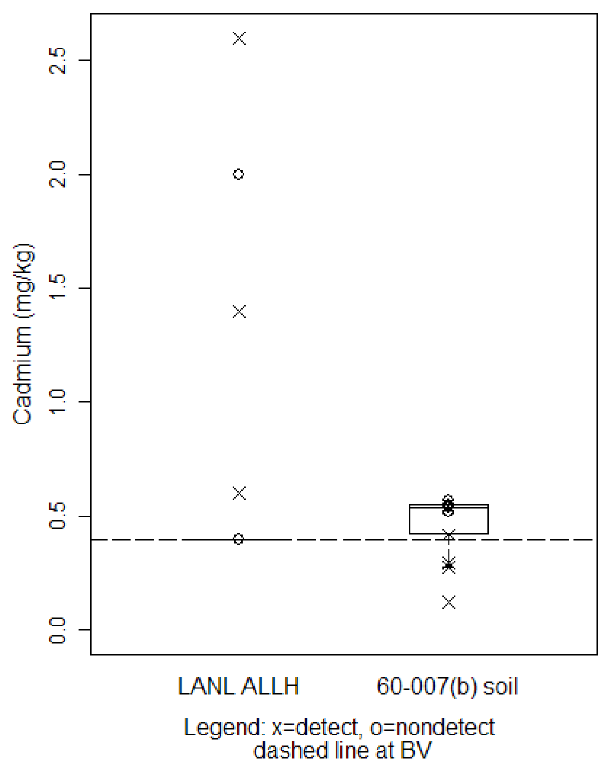
Calcium in soil

Figure H-70 Box plots for cadmium and calcium in soil at SWMU 60-007(a)

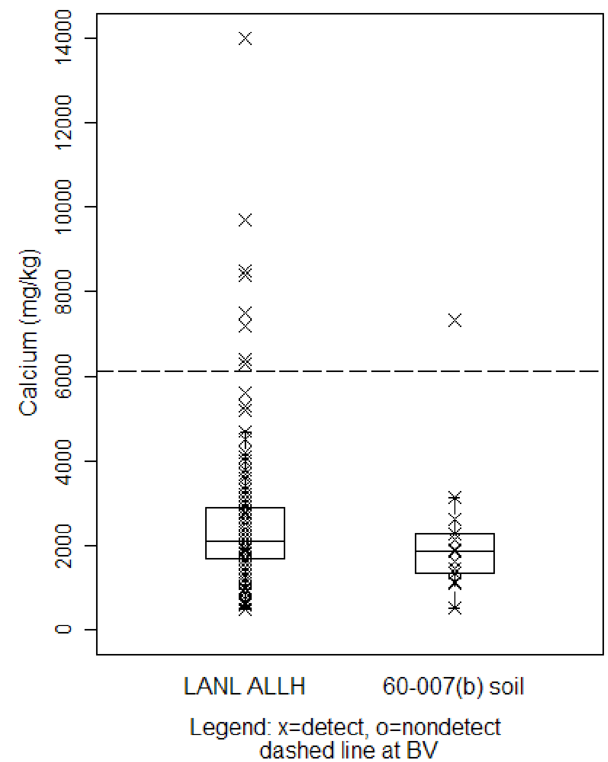


Thallium in soil

Figure H-71 Box plot for thallium in soil at SWMU 60-007(a)

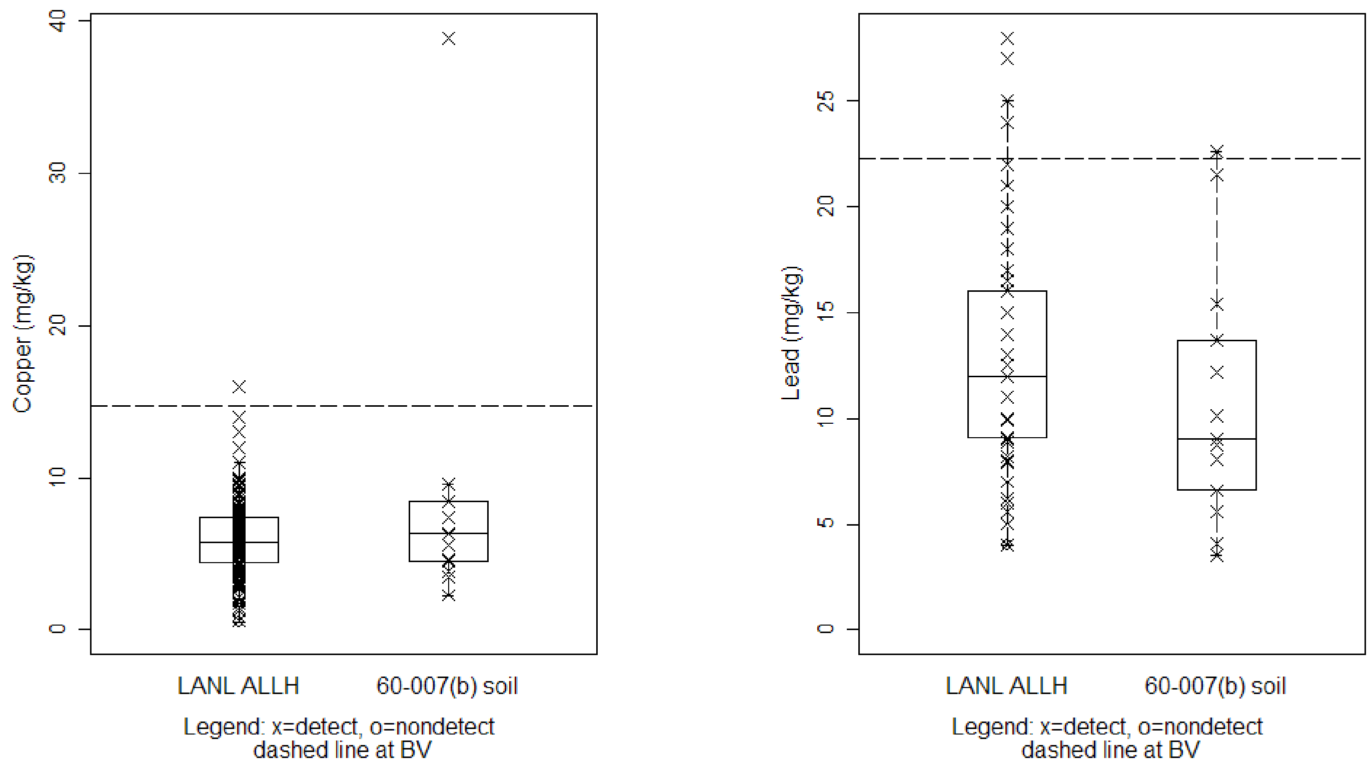


Cadmium in soil



Calcium in soil

Figure H-72 Box plots for cadmium and calcium in soil at SWMU 60-007(b)



Copper in soil

Lead in soil

Figure H-73 Box plots for copper and lead in soil at SWMU 60-007(b)

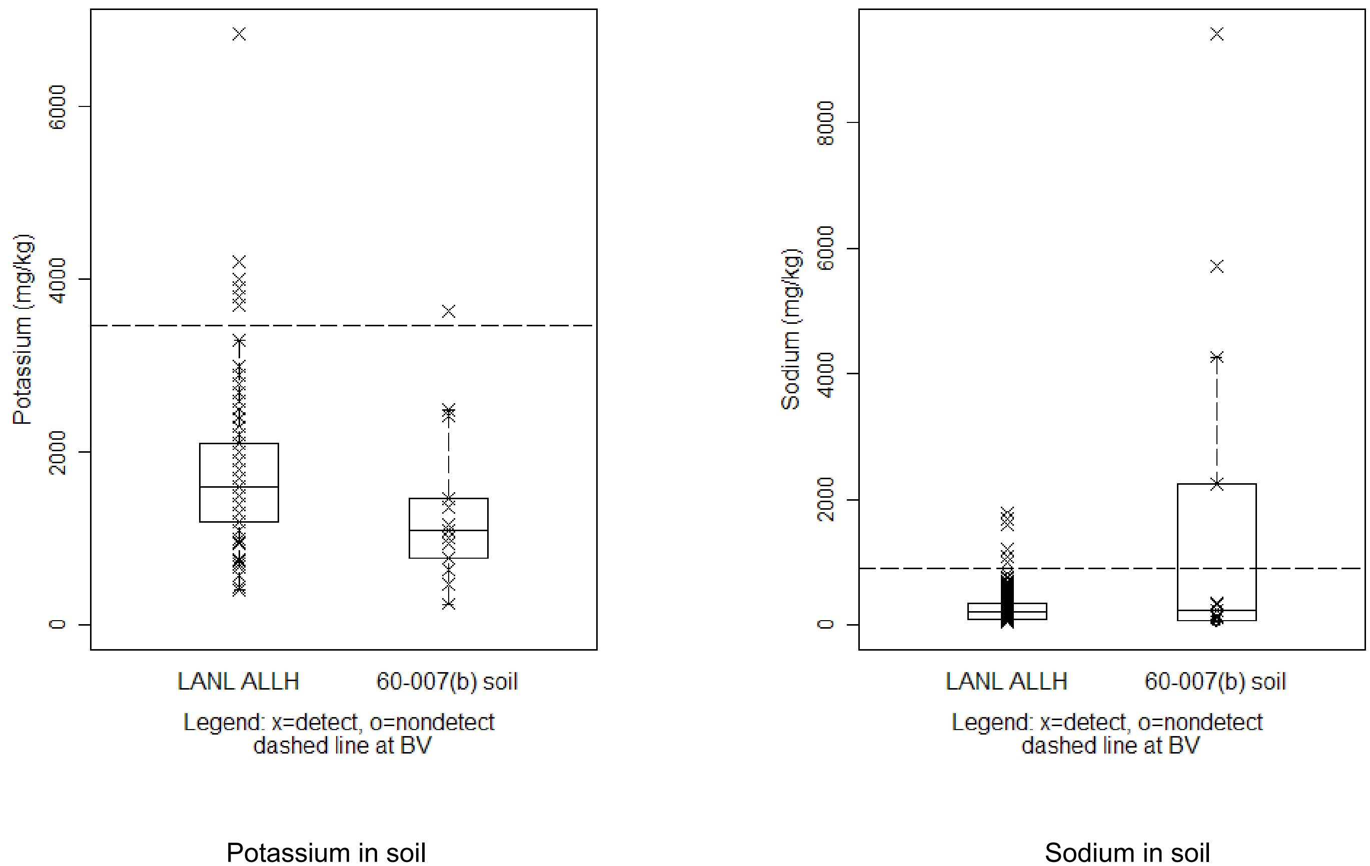
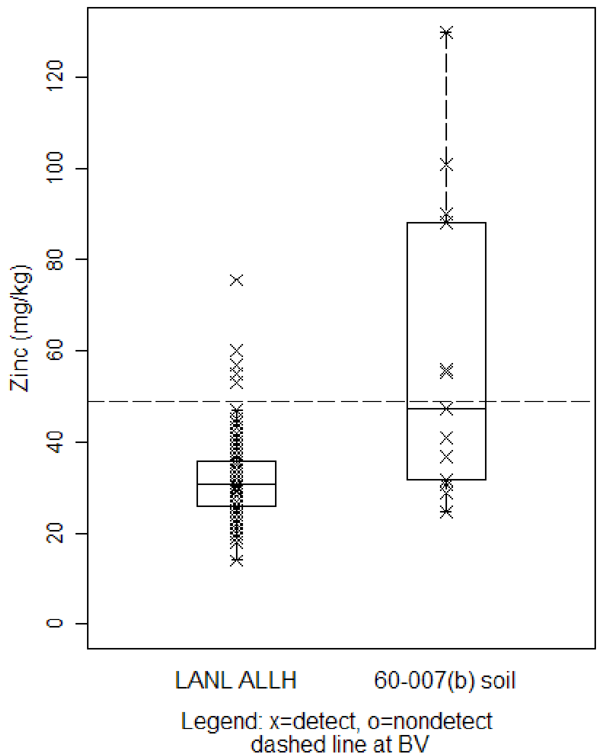


Figure H-74 Box plots for potassium and sodium in soil at SWMU 60-007(b)



Zinc in soil

Figure H-75 Box plot for zinc in soil at SWMU 60-007(b)

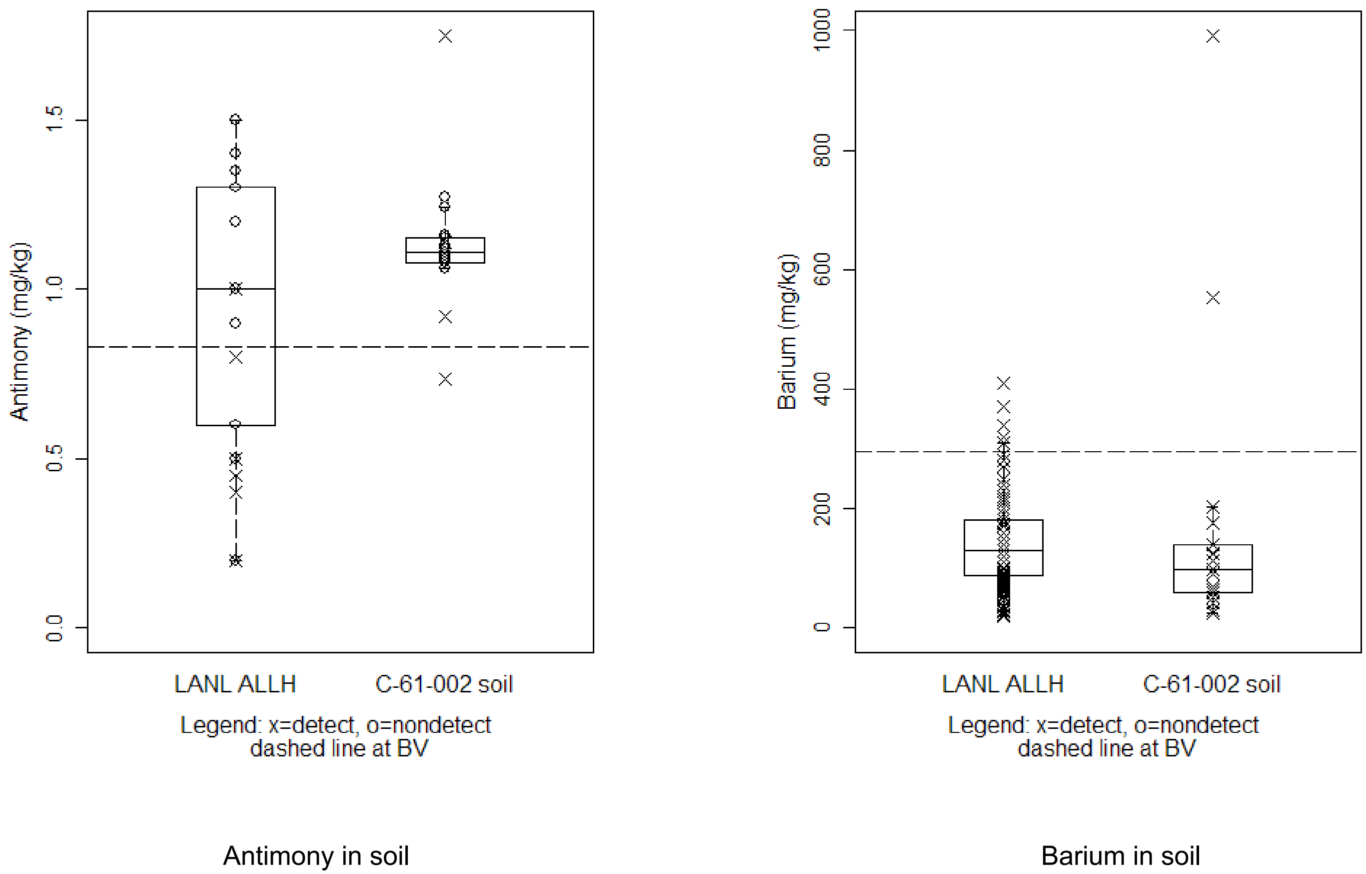
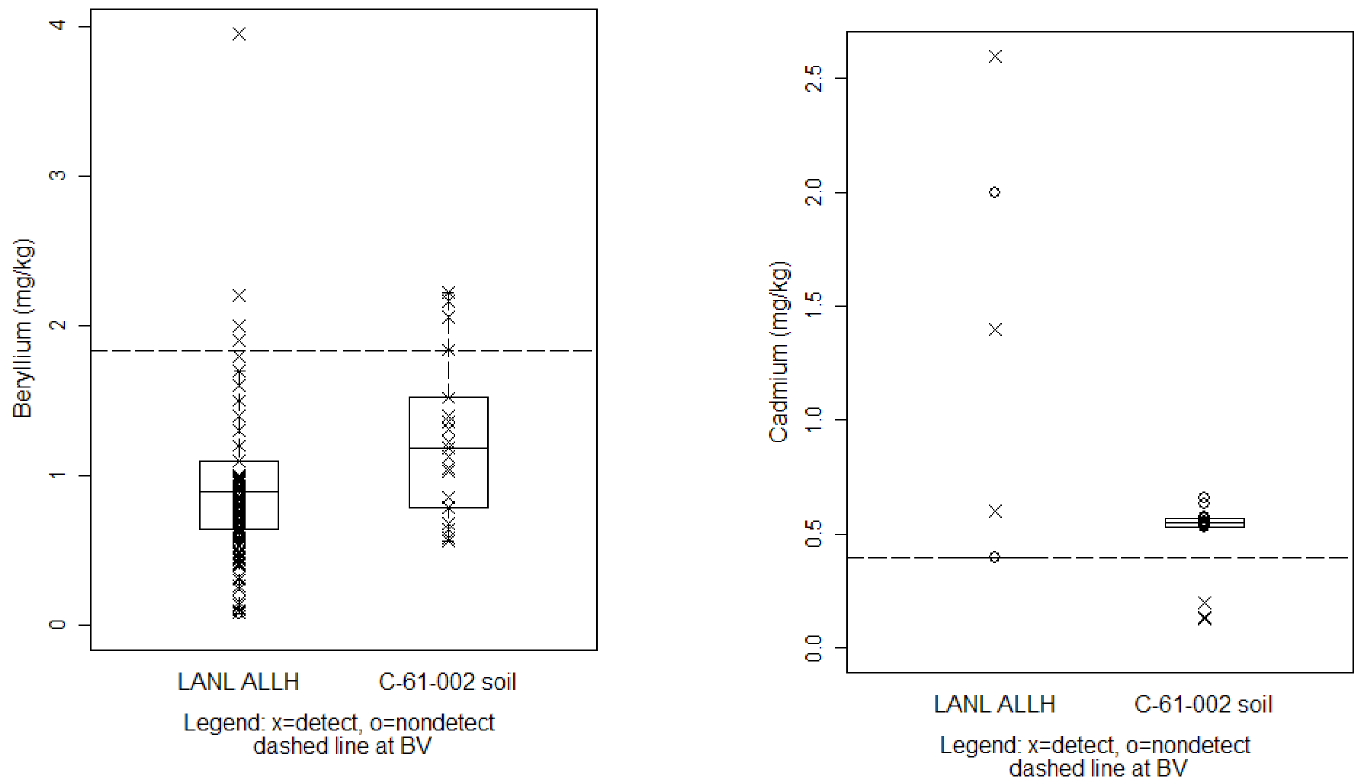


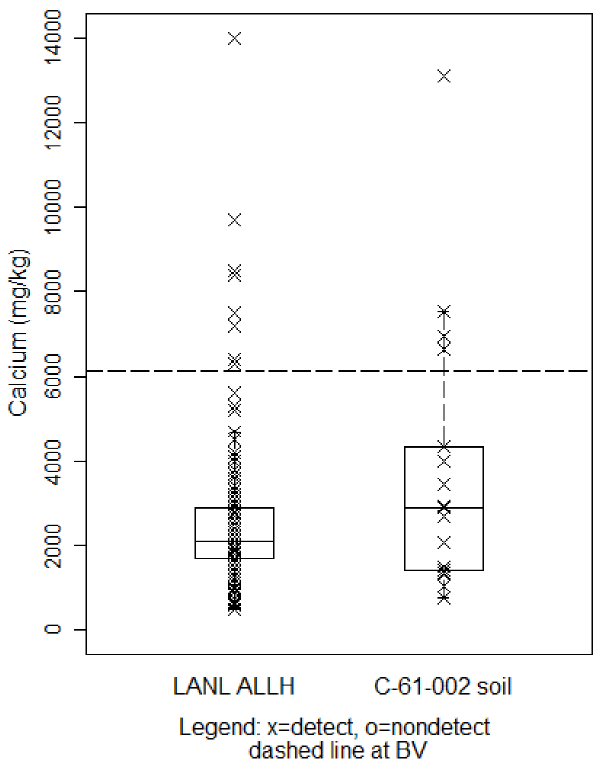
Figure H-76 Box plots for antimony and barium in soil at AOC C-61-002



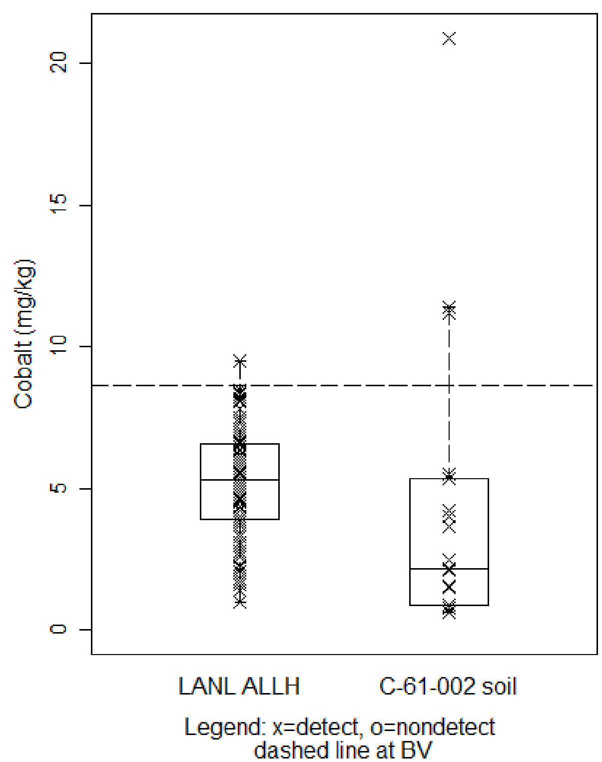
Beryllium in soil

Cadmium in soil

Figure H-77 Box plots for beryllium and cadmium in soil at AOC C-61-002

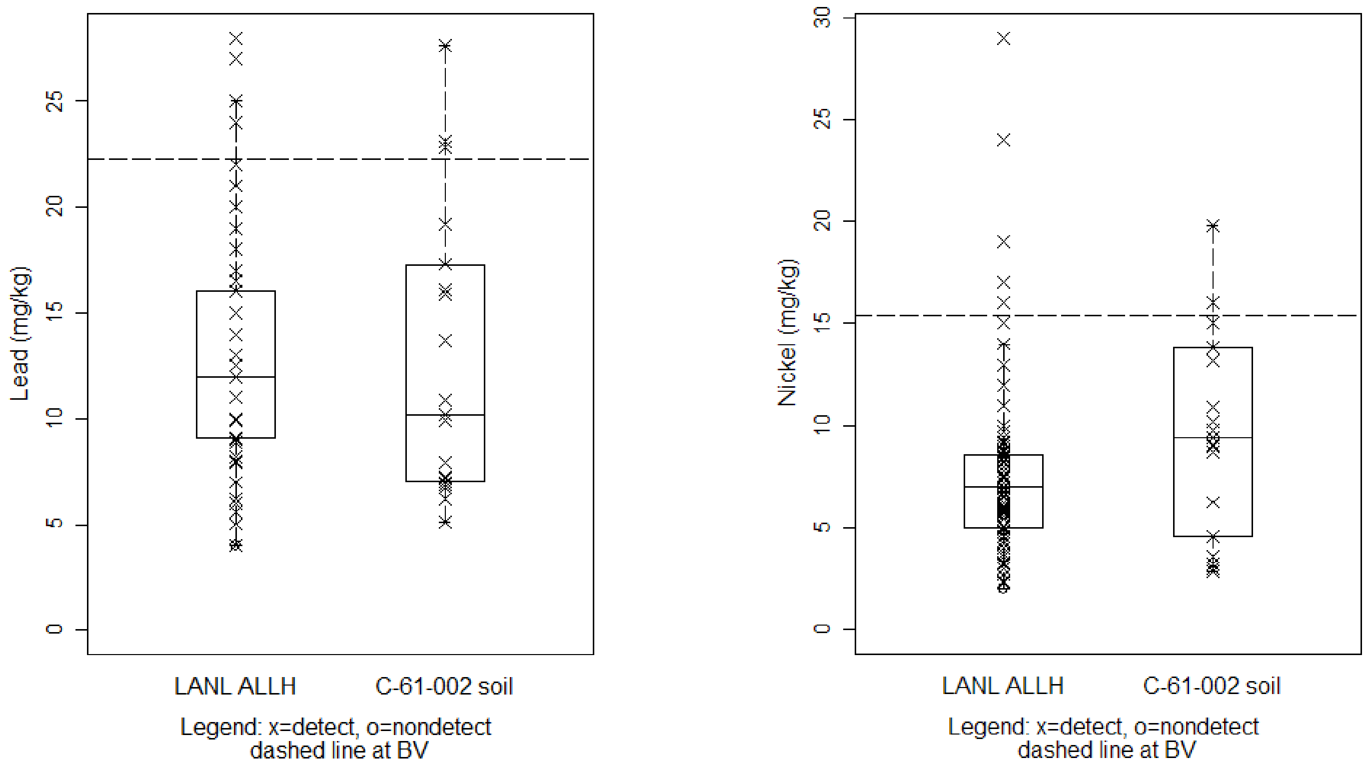


Calcium in soil



Cobalt in soil

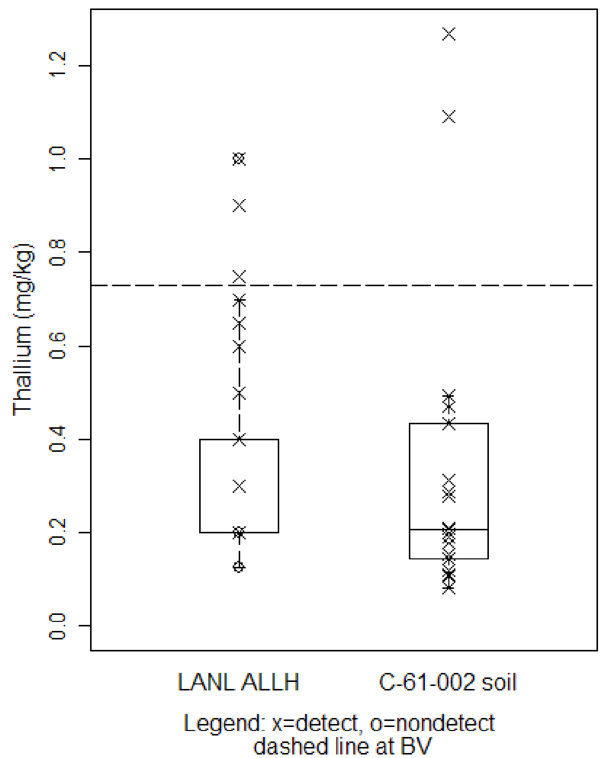
Figure H-78 Box plots for calcium and cobalt in soil at AOC C-61-002



Lead in soil

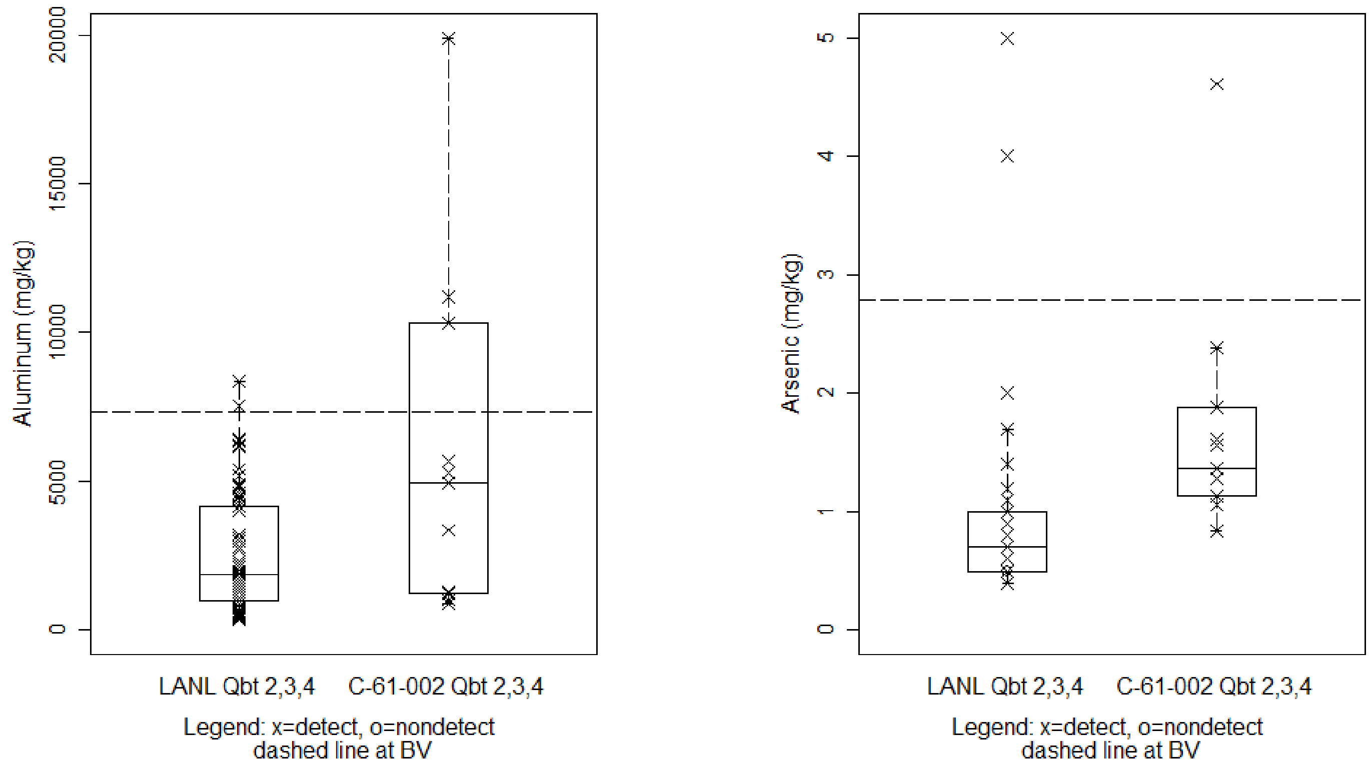
Nickel in soil

Figure H-79 Box plots for lead and nickel in soil at AOC C-61-002



Thallium in soil

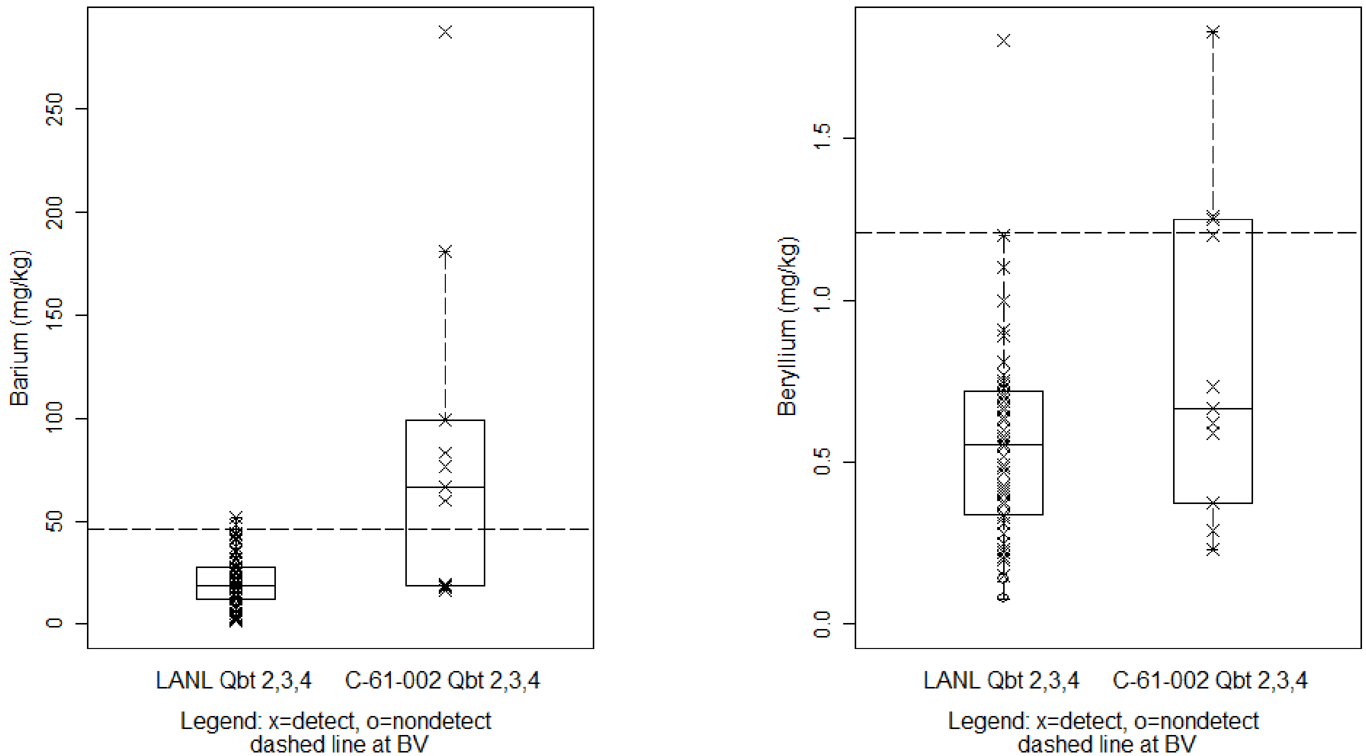
Figure H-80 Box plot for thallium in soil at AOC C-61-002



Aluminum in Qbt 2,3,4

Arsenic in Qbt 2,3,4

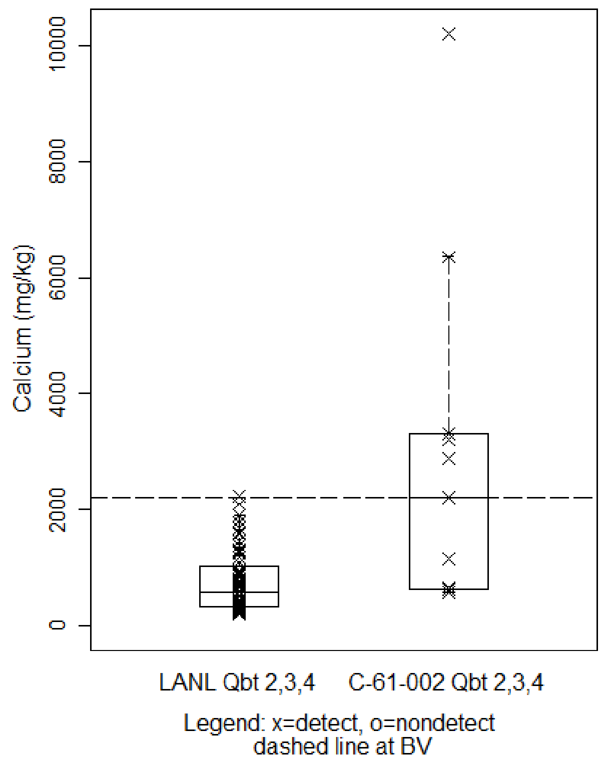
Figure H-81 Box plots for aluminum and arsenic in tuff at AOC C-61-002



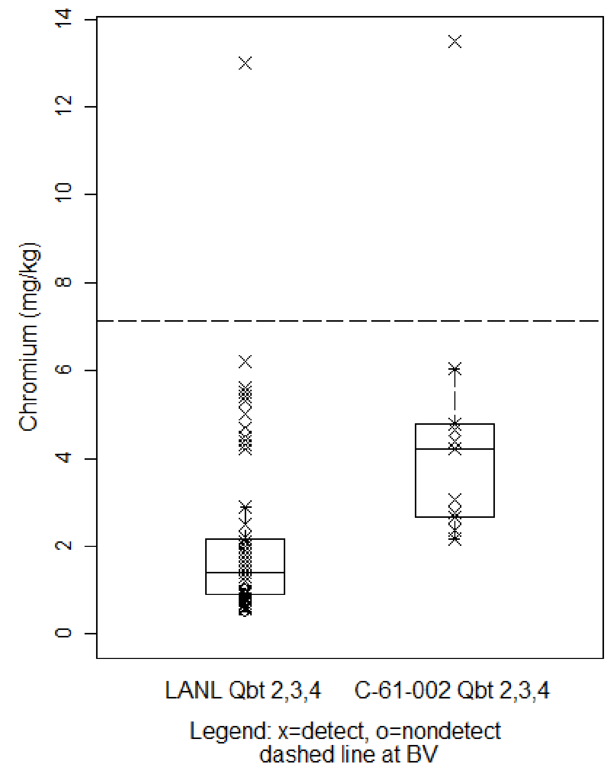
Barium in Qbt 2,3,4

Beryllium in Qbt 2,3,4

Figure H-82 Box plots for barium and beryllium in tuff at AOC C-61-002

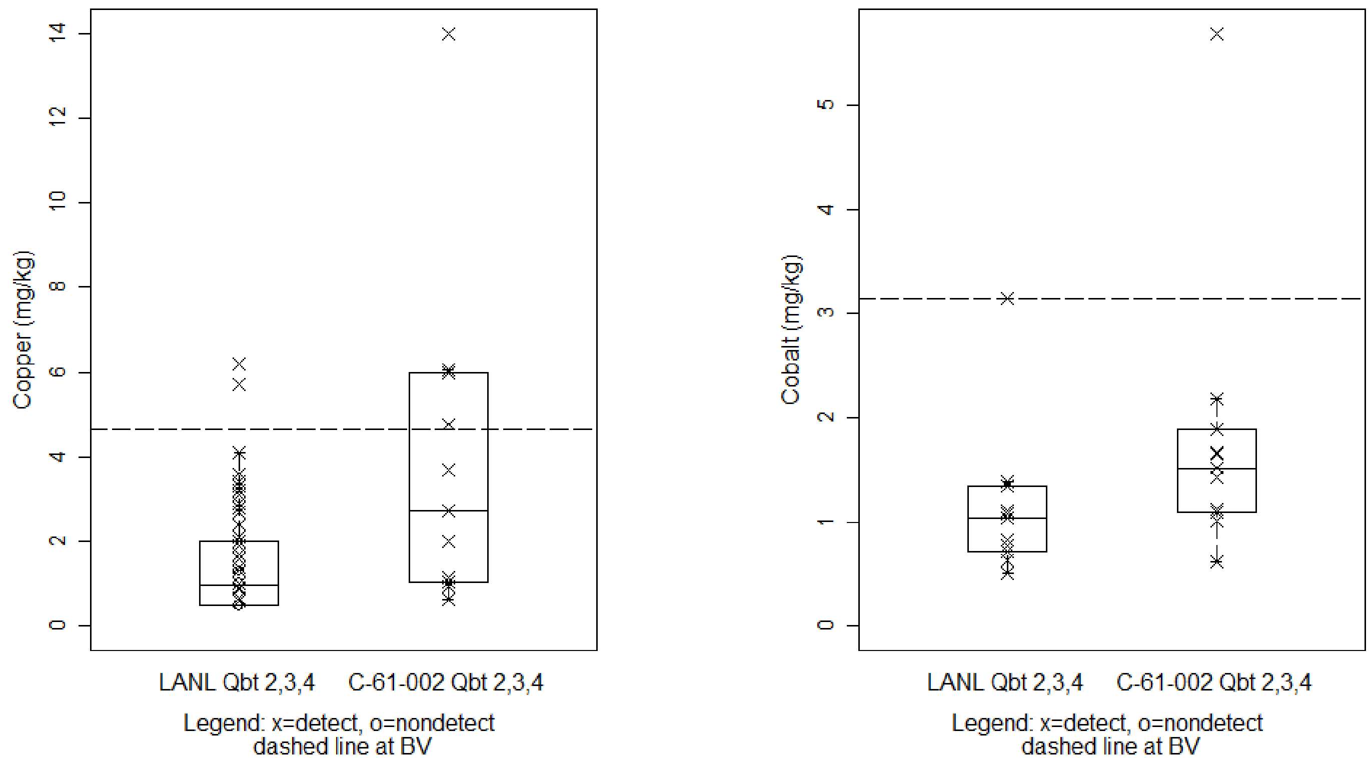


Calcium in Qbt 2,3,4



Chromium in Qbt 2,3,4

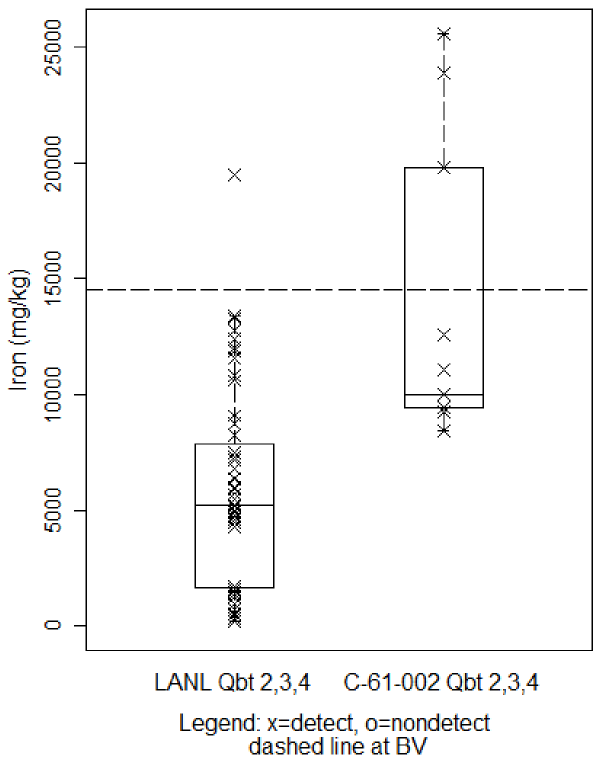
Figure H-83 Box plots for calcium and chromium in tuff at AOC C-61-002



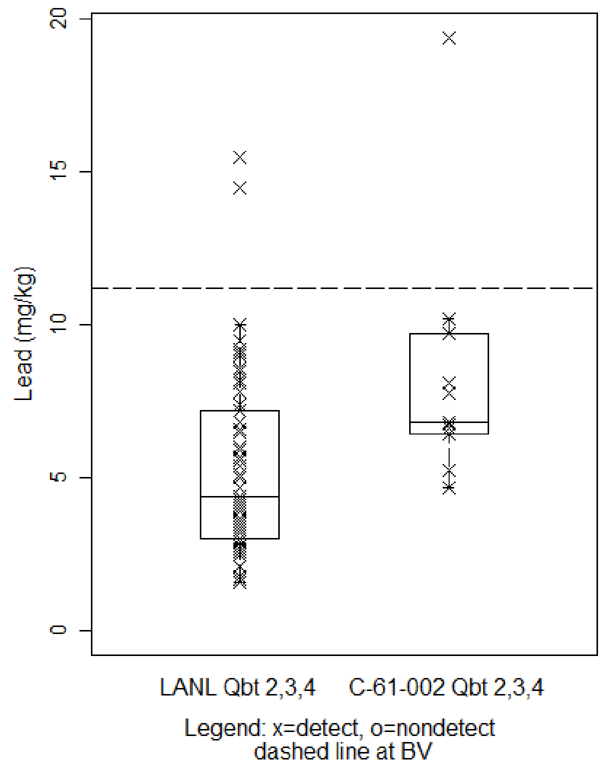
Cobalt in Qbt 2,3,4

Copper in Qbt 2,3,4

Figure H-84 Box plots for cobalt and copper in tuff at AOC C-61-002

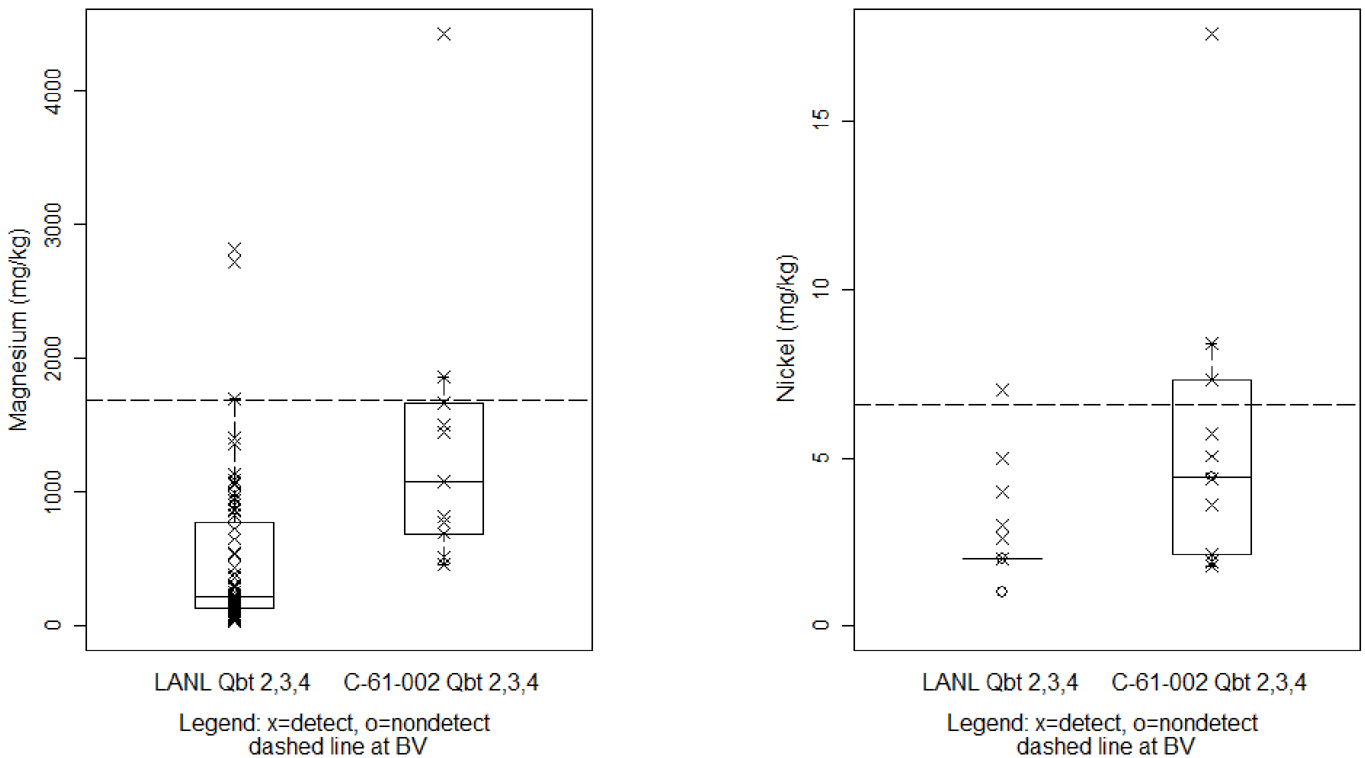


Iron in Qbt 2,3,4



Lead in Qbt 2,3,4

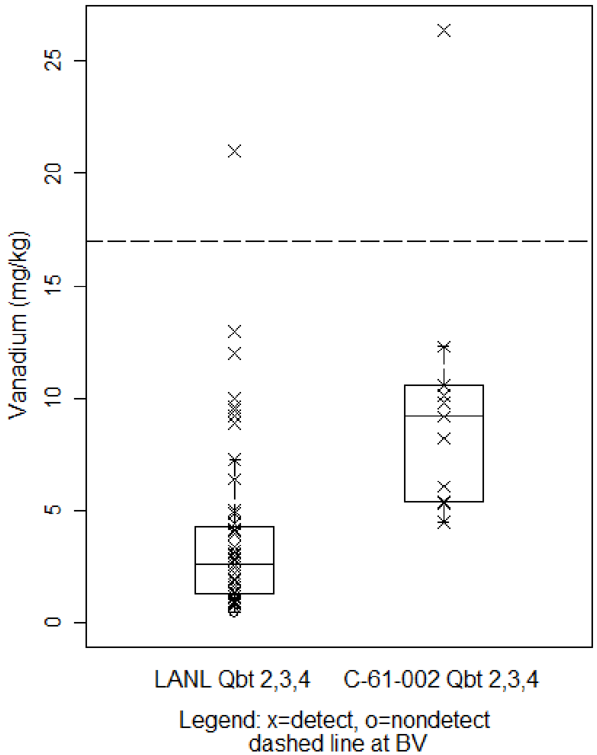
Figure H-85 Box plots for iron and lead in tuff at AOC C-61-002



Magnesium in Qbt 2,3,4

Nickel in Qbt 2,3,4

Figure H-86 Box plots for magnesium and nickel in tuff at AOC C-61-002



Vanadium in Qbt 2,3,4

Figure H-87 Box plot for vanadium in tuff at AOC C-61-002

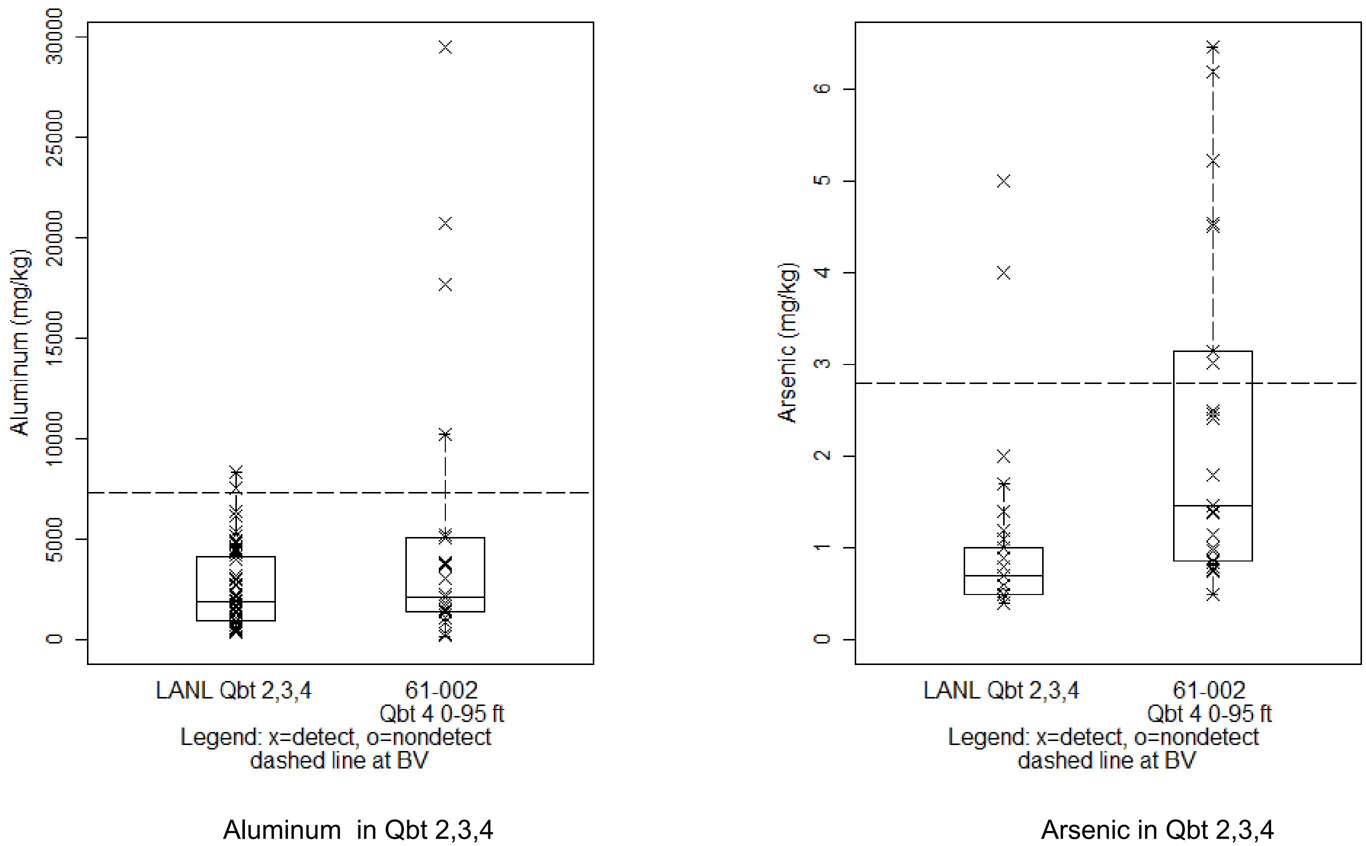


Figure H-88 Box plot for aluminum and arsenic in tuff at SWMU 61-002

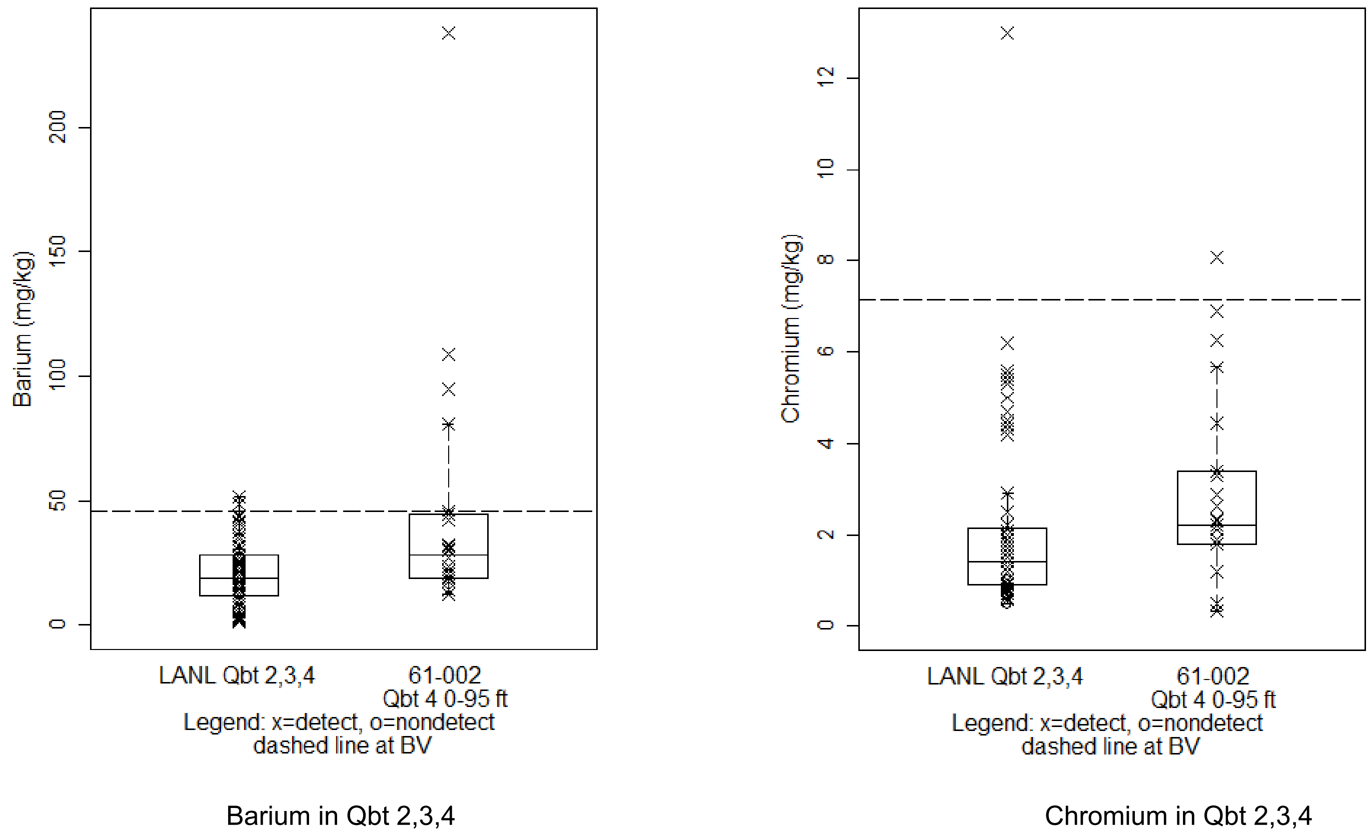
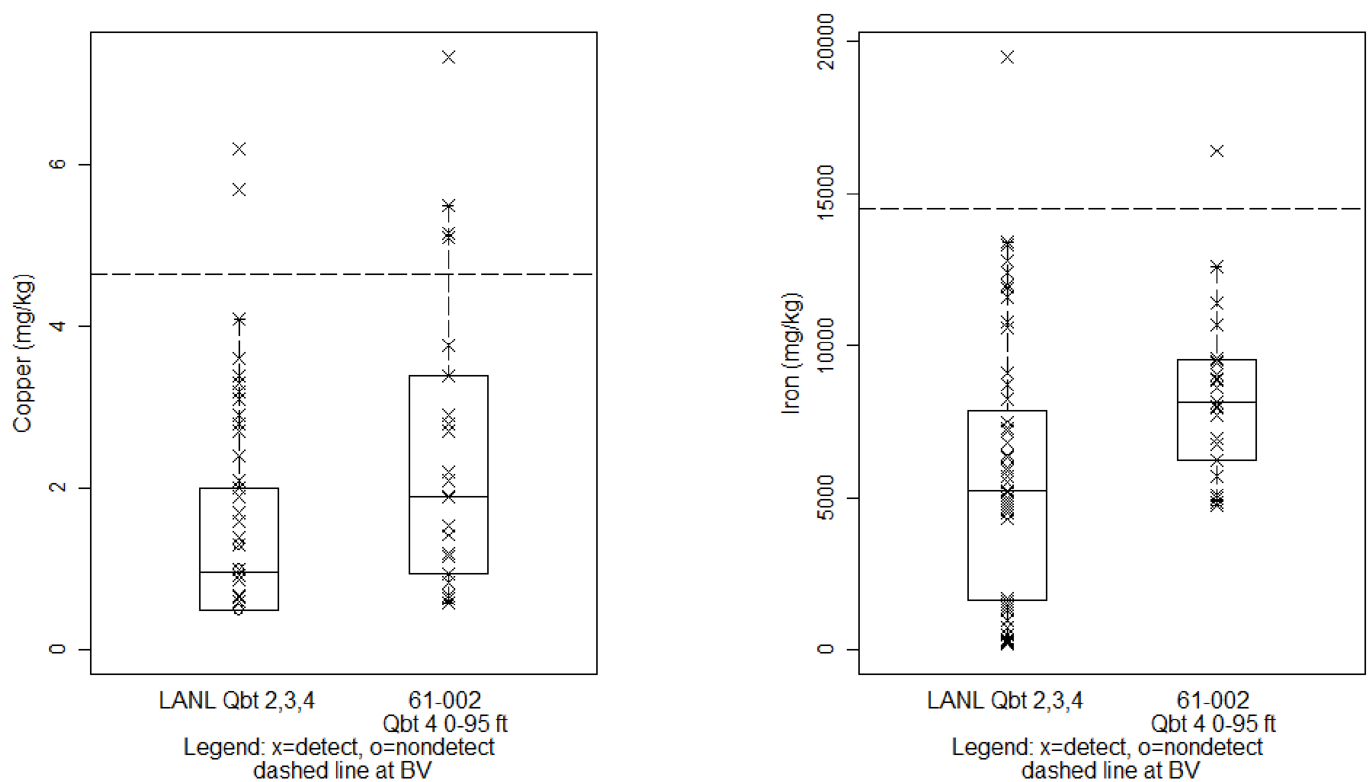


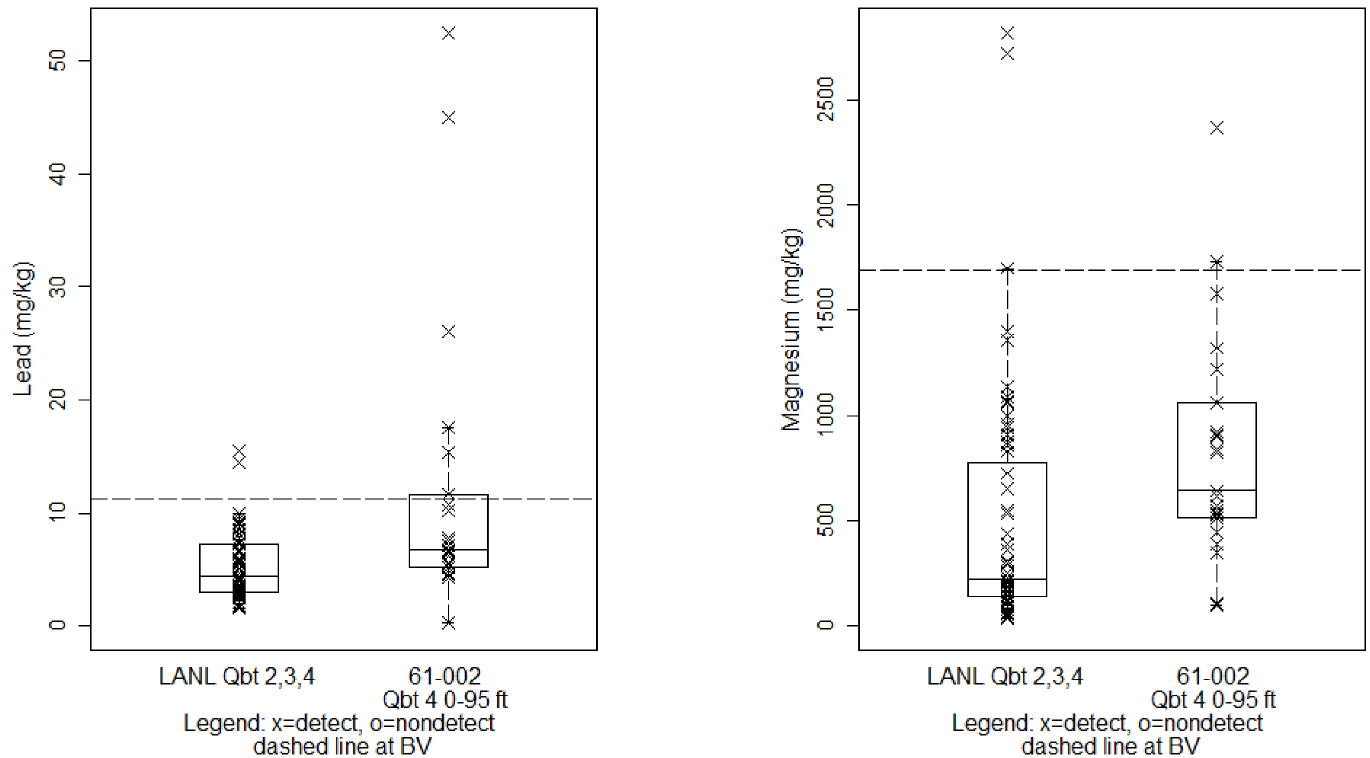
Figure H-89 Box plots for barium and chromium in tuff at SWMU 61-002



Copper in Qbt 2,3,4

Iron in Qbt 2,3,4

Figure H-90 Box plots for copper and iron in tuff at SWMU 61-002



Lead in Qbt 2,3,4

Magnesium in Qbt 2,3,4

Figure H-91 Box plots for lead and magnesium in tuff at SWMU 61-002

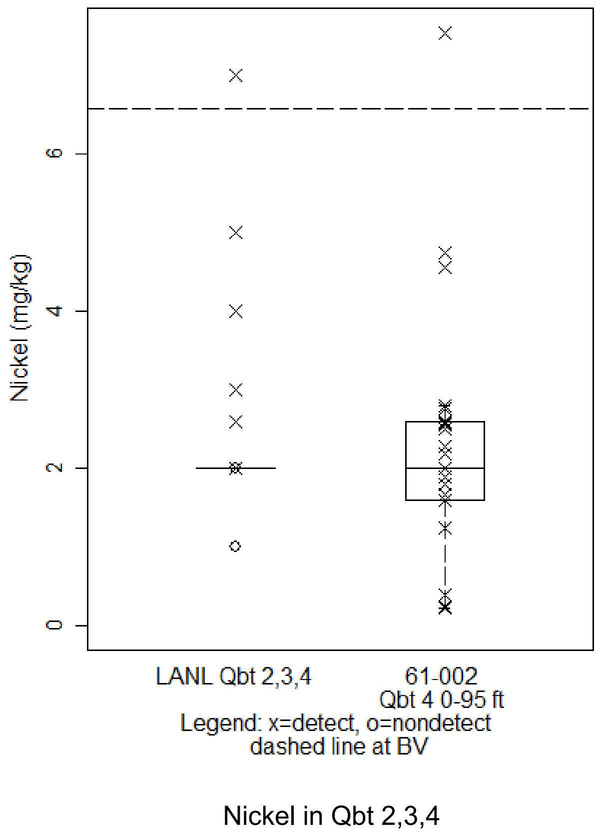
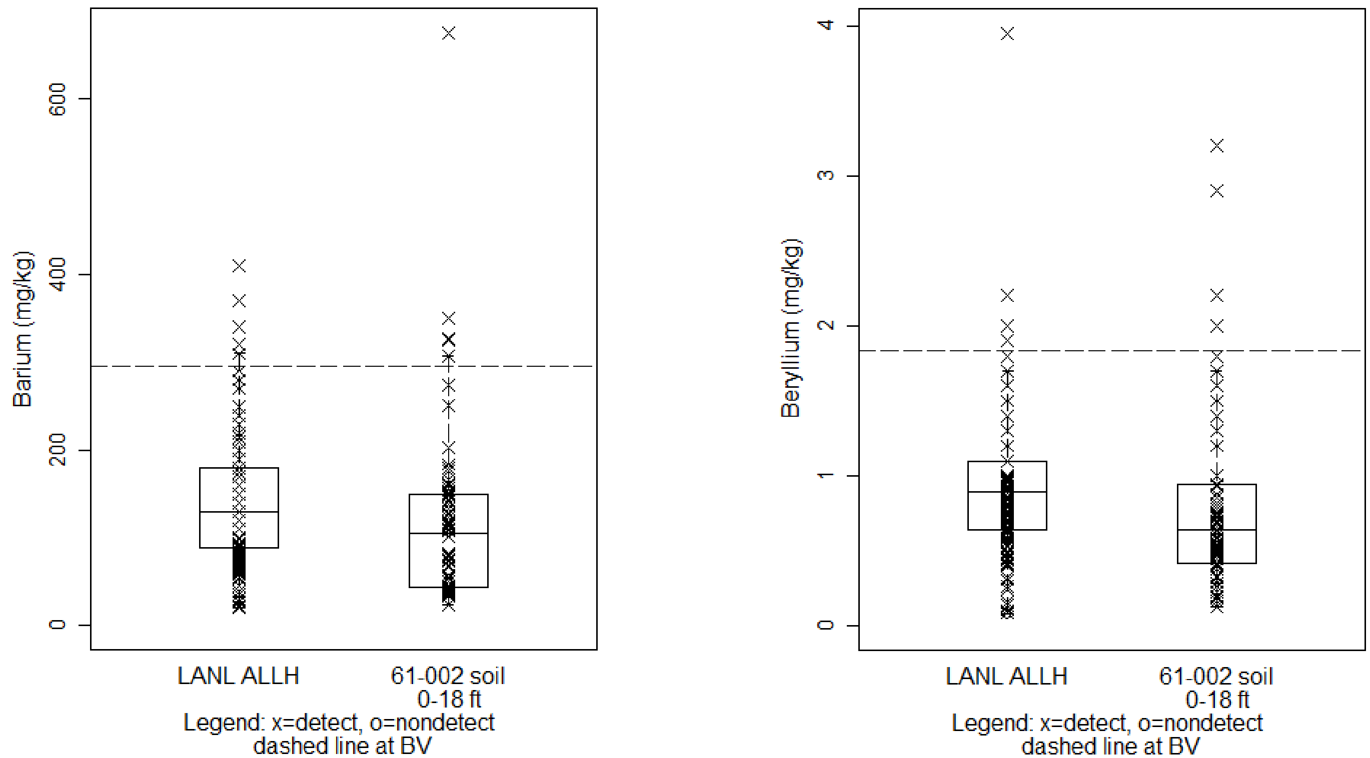


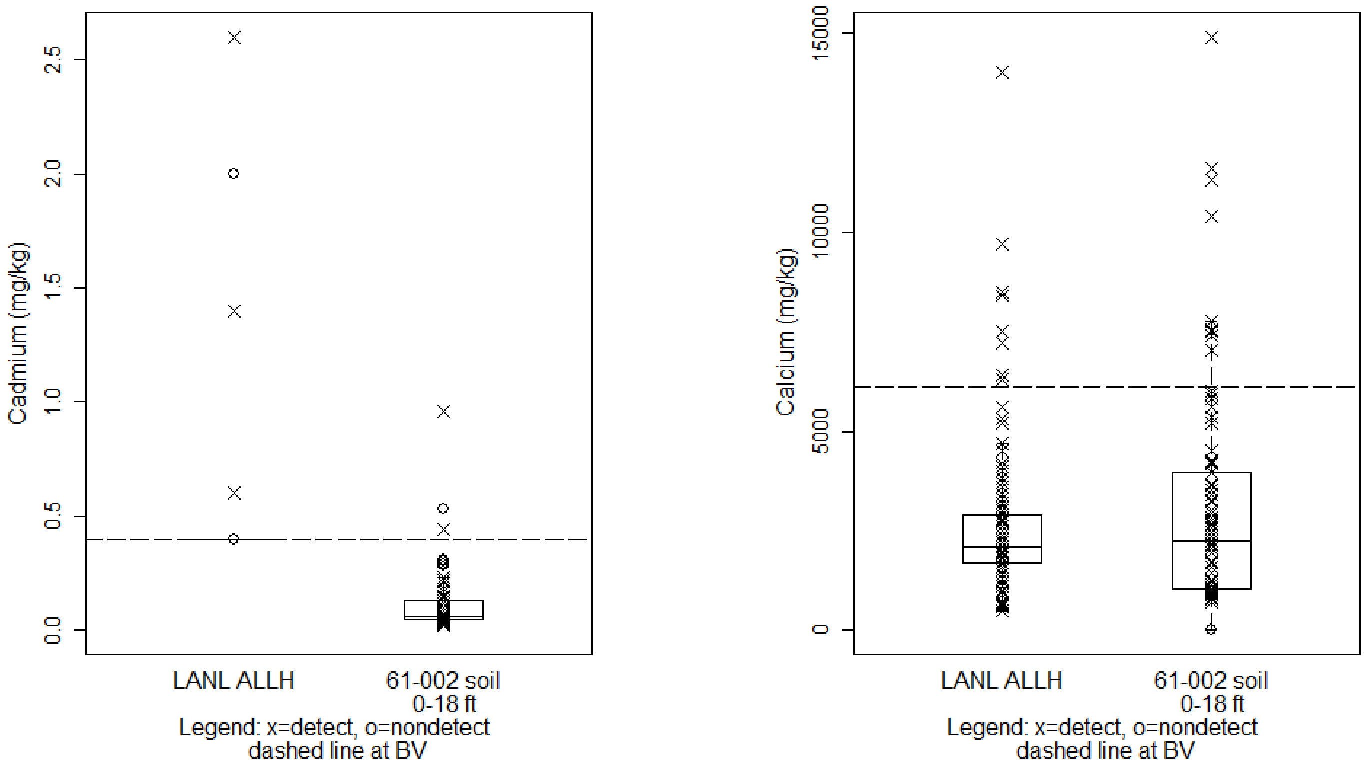
Figure H-92 Box plot for nickel in tuff at SWMU 61-002



Barium in soil

Beryllium in soil

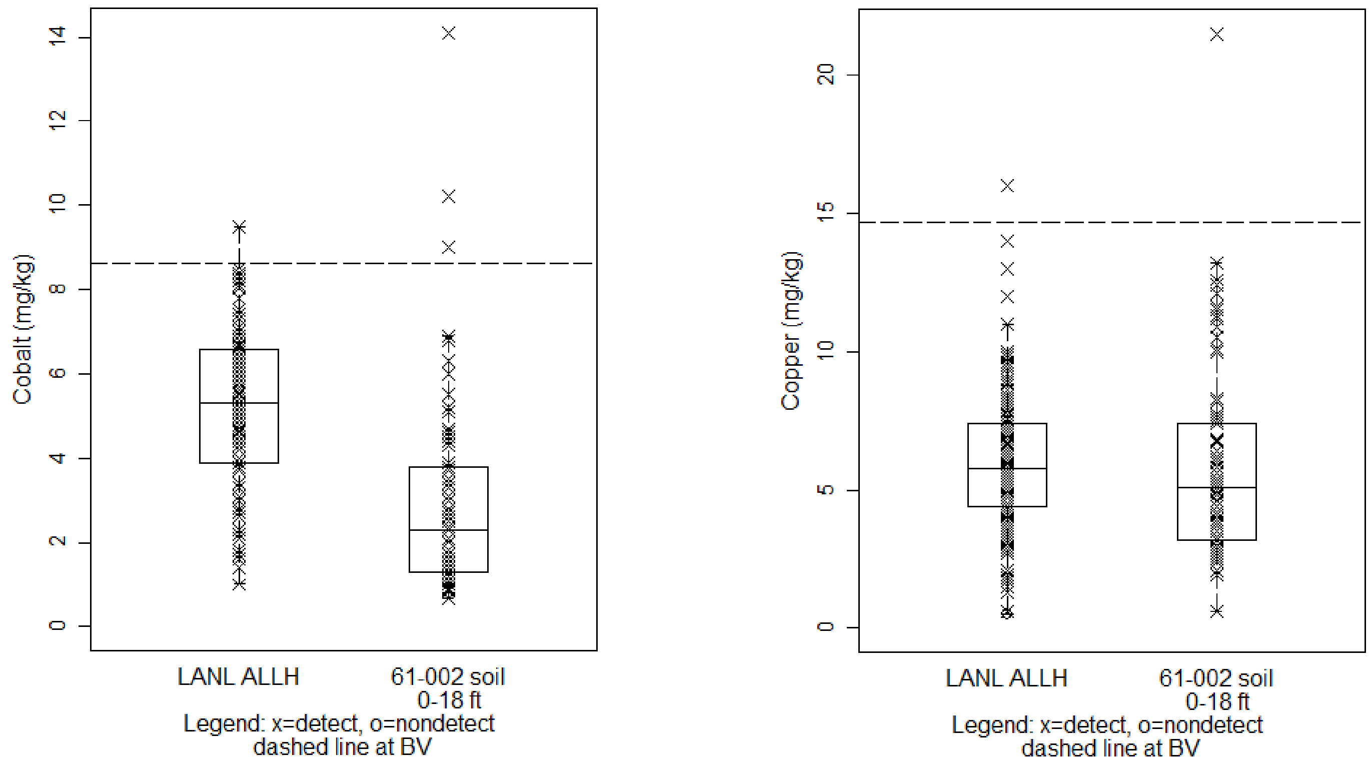
Figure H-93 Box plots for barium and beryllium in soil at SWMU 61-002



Cadmium in soil

Calcium in soil

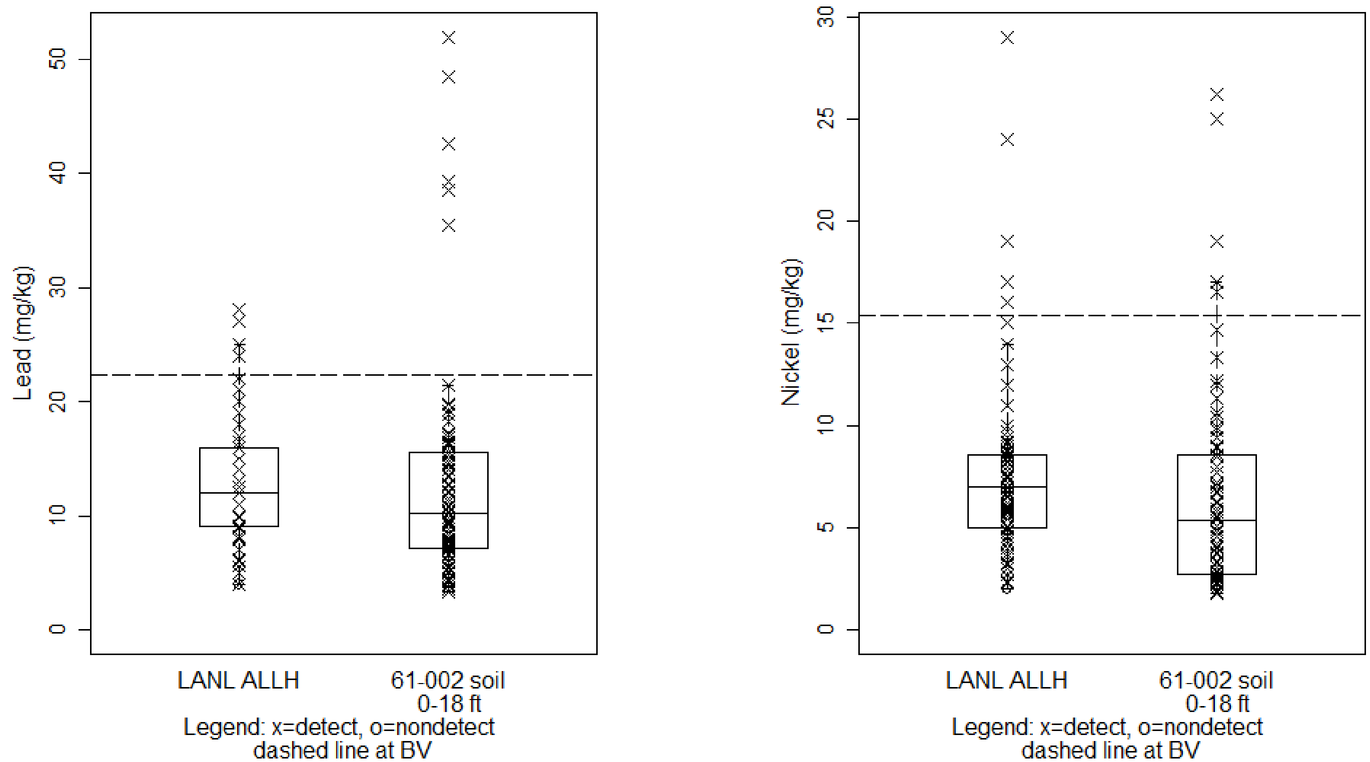
Figure H-94 Box plots for cadmium and calcium in soil at SWMU 61-002



Cobalt in soil

Copper in soil

Figure H-95 Box plots for cobalt and copper in soil at SWMU 61-002



Lead in soil

Nickel in soil

Figure H-96 Box plots for lead and nickel in soil at SWMU 61-002

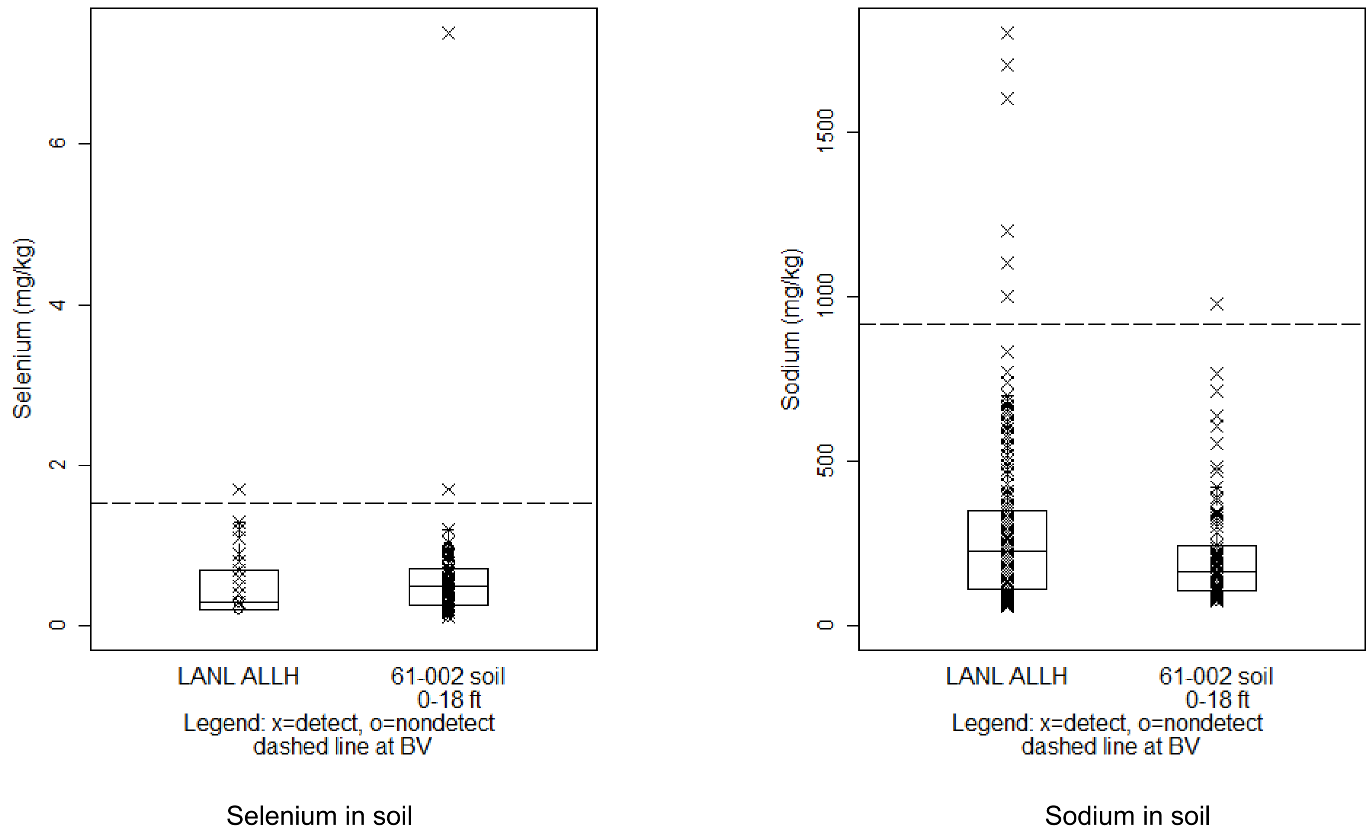


Figure H-97 Box plots for selenium and sodium in soil at SWMU 61-002

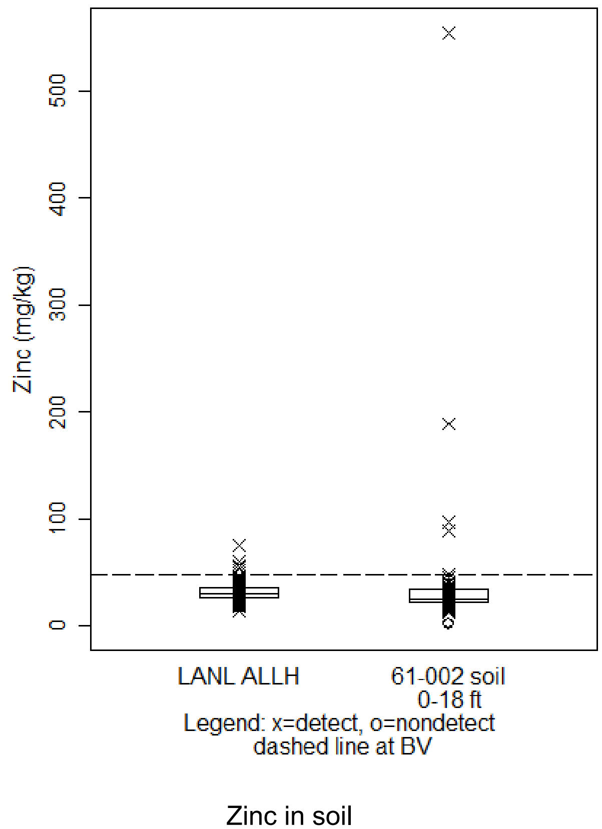


Figure H-98 Box plot for zinc in soil at SWMU 61-002

Table H-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-009(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	0.00011	0.00024	n/a*	Yes
Lead	0.1488	0.2298	n/a	No
Manganese	0.000089	0.09293	1	No

*n/a = Not applicable.

Table H-2
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-012(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	n/a*	0.05139	0.01075	Yes
Copper	0.9997	0.8655	n/a	No
Thallium	n/a	1	1	No
Zinc	0.000000476	0.0000269	n/a	Yes

*n/a = Not applicable.

Table H-3
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-052(f)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	1	1	No
Chromium	0.001345	0.005298	n/a	Yes
Copper	0.0007096	0.000604	n/a	Yes
Lead	0.00000118	0.00000442	n/a	Yes
Zinc	0.00000193	0.00000164	n/a	Yes

*n/a = Not applicable.

Table H-4
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-013(i)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.00000795	0.000000016	Yes
Barium	1	0.9999	n/a	No
Cadmium	n/a	0.4421	0.08742	No
Calcium	1	0.6596	n/a	No
Chromium	0.9511	0.1161	n/a	No
Copper	0.7746	0.02959	n/a	Yes
Lead	0.05754	0.0000126	n/a	Yes
Magnesium	1	0.9817	n/a	No
Nickel	0.7201	0.4318	n/a	No
Zinc	0.03823	0.00000421	n/a	Yes

*n/a = Not applicable.

Table H-5
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-014(c2)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	0.5612	1	No
Calcium	0.1765	0.1994	n/a	No
Chromium	0.03324	0.003322	n/a	Yes
Copper	0.0003282	0.0002681	n/a	Yes
Lead	0.5643	0.3839	n/a	No
Nickel	0.984	0.6993	n/a	No
Zinc	0.002128	0.002885	n/a	Yes

*n/a = Not applicable.

Table H-6
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMUs 03-014(k,l,m,n)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	0.0002963	0.01949	1	No[a]
Barium	0.1985	0.878	n/a[b]	No
Calcium	0.007176	0.7167	0.3469	No
Chromium	0.000000000686	0.0000147	n/a	Yes
Copper	0.0000000116	0.00000549	n/a	Yes
Iron	0.000000647	0.1529	1	No
Lead	0.002512	0.02127	n/a	Yes
Manganese	0.1387	0.8704	n/a	No
Nickel	n/a	0.005405	0.001361	Yes
Zinc	0.00000000347	0.00000112	n/a	Yes

[a] See section 6.9.3.4, Soil, Rock, and Sediment Sampling Analytical Results.
[b] n/a = Not applicable.

Table H-7
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMUs 03-014(k,l,m,n)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	0.9999	0.9218	n/a[a]	No
Cadmium	n/a	0.3951	0.22	Yes[b]
Calcium	0.3222	0.3677	n/a	No
Chromium	0.1445	0.1337	n/a	No
Copper	0.01033	0.008063	n/a	Yes
Lead	0.08976	0.3307	n/a	No
Nickel	0.8684	0.3641	n/a	No
Zinc	0.00000452	0.000000364	n/a	Yes

[a] n/a = Not applicable.
[b] See section 6.9.3.4, Soil, Rock, and Sediment Sampling Analytical Results.

Table H-8
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-014(o)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	0.0000328	0.000000008868	n/a*	Yes
Copper	0.000000771	0.0004979	n/a	Yes
Lead	0.712	0.3983	n/a	No
Nickel	0.001874	0.259	0.07837	No

*n/a = Not applicable.

Table H-9
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-014(u)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	0.504	1	No
Chromium	0.9884	0.8614	n/a	No
Copper	0.682	0.6175	n/a	No
Lead	0.4124	0.277	n/a	No
Zinc	0.000043	0.004676	n/a	Yes

*n/a = Not applicable.

Table H-10
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-015 and AOC 03-053

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.0187	0.0000405	Yes
Cadmium	n/a	1	1	No
Chromium	0.04431	0.2531	n/a	Yes
Cobalt	0.8879	0.9629	n/a	No
Copper	0.006975	0.007967	n/a	Yes
Lead	0.000302	0.009683	n/a	Yes
Manganese	0.8538	0.8077	n/a	No
Nickel	0.3962	0.2866	n/a	No
Sodium	0.06899	0.805	n/a	No
Zinc	0.005513	0.008482	n/a	Yes

*n/a = Not applicable.

Table H-11
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-021

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.0003915	0.1735	Yes
Cadmium	n/a	0.893	1	No
Chromium	0.8299	0.1579	n/a	No
Cobalt	0.9978	0.942	n/a	No
Copper	0.8171	0.5792	n/a	No
Iron	0.8559	0.7606	n/a	No
Lead	0.000227	0.00000133	n/a	Yes
Manganese	0.7446	0.6075	n/a	No
Nickel	0.8368	0.5549	n/a	No
Thallium	n/a	0.9331	0.0009664	Yes
Zinc	0.00000433	0.00000307	n/a	Yes

*n/a = Not applicable.

Table H-12
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-052(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	0.8453	0.9438	n/a*	No
Beryllium	0.01669	0.03581	n/a	Yes
Cadmium	n/a	0.8427	1	No
Chromium	0.1637	0.09385	n/a	No
Cobalt	0.9893	0.7001	n/a	No
Lead	0.04906	0.3712	n/a	Yes
Manganese	0.9681	0.5058	n/a	No
Nickel	0.01749	0.1553	1	No
Sodium	0.4377	0.432	n/a	No
Zinc	0.9333	0.8855	n/a	No

*n/a = Not applicable.

Table H-13
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-056(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.3508	1	No
Cadmium	n/a	1	1	No
Calcium	0.00000109	0.0000168	n/a	Yes
Cobalt	0.9893	0.9419	n/a	No
Lead	0.7644	0.3839	n/a	No
Zinc	0.9158	0.7528	n/a	No

*n/a = Not applicable.

Table H-14
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-056(k)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	0.6118	0.8397	n/a*	No
Beryllium	0.277	0.5597	n/a	No
Cadmium	n/a	0.8313	1	No
Calcium	0.03078	0.2049	1	No
Chromium	0.06251	0.3443	n/a	No
Cobalt	0.2749	0.3366	n/a	No
Copper	0.0000458	0.0004393	n/a	Yes
Lead	0.0008358	0.3443	0.1082	No
Manganese	0.4072	0.2049	n/a	No

*n/a = Not applicable.

Table H-15
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 03-059

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.0000534	0.00000121	Yes
Cadmium	n/a	0.4341	0.4658	No
Calcium	0.205	0.06004	n/a	No
Chromium	0.09331	0.598	n/a	No
Cobalt	1	0.9403	n/a	No
Copper	0.9155	0.5248	n/a	No
Lead	0.1262	0.09933	n/a	No
Thallium	n/a	0.9994	0.1643	No
Zinc	0.8749	0.7415	n/a	No

*n/a = Not applicable.

Table H-16
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 60-004(f)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	0.6099	1	No
Chromium	0.01683	0.03566	n/a	Yes
Cobalt	0.3893	0.6124	n/a	No
Copper	0.04674	0.5458	n/	Yes
Lead	0.1973	0.4856	n/a	No
Manganese	0.2409	0.1168	n/a	No
Thallium	n/a	0.9994	0.1643	No
Zinc	0.0006384	0.008482	n/a	Yes

*n/a = Not applicable.

Table H-17
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 60-006(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.8805	0.8664	n/a*	No
Arsenic	0.7829	0.623	n/a	No
Beryllium	0.8912	0.4013	n/a	No
Calcium	0.9672	0.6742	n/a	No
Chromium	0.3434	0.4013	n/a	No
Copper	0.003416	0.4013	0.2	No
Lead	0.9464	0.8664	n/a	No
Magnesium	0.6476	0.8872	n/a	No
Nickel	0.1737	0.6334	n/a	No

*n/a = Not applicable.

Table H-18
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 60-007(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.0000002085	0.00000315	Yes
Barium	0.3081	0.6305	n/a	No
Cadmium	n/a	0.8193	1	No
Calcium	0.2763	0.2731	n/a	No
Thallium	n/a	0.9824	1	No

*n/a = Not applicable.

Table H-19
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 60-007(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	1	1	No
Calcium	0.9327	0.9451	n/a	No
Copper	0.3422	0.2576	n/a	No
Lead	0.9261	0.7098	n/a	No
Potassium	0.9897	0.5146	n/a	No
Sodium	0.4158	0.2407	n/a	No
Zinc	0.0002962	0.0009485	n/a	Yes

*n/a = Not applicable.

Table H-20
Results of Statistical Tests for Inorganic Chemicals in Tuff at AOC C-61-002

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.02243	0.00435	n/a*	Yes
Arsenic	0.0001248	0.03696	n/a	Yes
Barium	0.00915	0.00043	n/a	Yes
Beryllium	0.04893	0.1159	0.1467	No
Calcium	0.0007672	0.006268	n/a	Yes
Chromium	0.0001239	0.03696	n/a	Yes
Cobalt	0.02089	0.2932	0.5	No
Copper	0.001288	0.03696	n/a	Yes
Iron	0.0000609	0.03696	n/a	Yes
Lead	0.002465	0.3436	n/a	Yes
Magnesium	0.0001249	0.006268	n/a	Yes
Nickel	n/a	0.002668	0.002545	Yes
Vanadium	0.000057	0.03696	n/a	Yes

*n/a = Not applicable.

Table H-21
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC C-61-002

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.004686	0.001681	Yes
Barium	0.9645	0.7875	n/a	No
Beryllium	0.003135	0.001933	n/a	Yes
Cadmium	n/a	0.8061	1	No
Calcium	0.09258	0.1459	n/a	No
Cobalt	0.999	0.8028	n/a	No
Lead	0.7355	0.2695	n/a	No
Nickel	0.008282	0.0007128	n/a	Yes
Thallium	0.4265	0.6252	n/a	No

*n/a = Not applicable.

Table H-22
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 61-002

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.1427	0.2838	n/a*	No
Arsenic	0.00000657	0.001664	n/a	Yes
Barium	0.00158	0.09927	n/a	Yes
Chromium	0.000628	0.4865	1	No
Copper	0.001286	0.1113	n/a	Yes
Iron	0.001688	0.7216	1	No
Lead	0.000454	0.03895	n/a	Yes
Magnesium	0.000709	0.2631	1	No
Nickel	n/a	0.8987	0.2674	No

*n/a = Not applicable.

Table H-23
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 61-002

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	0.9996	0.9955	n/a*	No
Beryllium	0.9995	0.7823	n/a	No
Cadmium	n/a	0.9885	1	No
Calcium	0.546	0.01491	n/a	Yes
Cobalt	1	1	n/a	No
Copper	0.9525	0.4726	n/a	No
Lead	0.9639	0.4477	n/a	No
Nickel	0.9837	0.4306	n/a	No
Selenium	n/a	0.9784	0.4387	No
Sodium	0.9711	0.98	n/a	No
Zinc	0.998	0.7465	n/a	No

*n/a = Not applicable.

Appendix I

Risk Assessments

CONTENTS

Figures

Tables

Attachments

I-1.0 INTRODUCTION

This appendix presents the results of the human health and ecological risk-screening evaluations conducted in support of environmental characterization of Upper Sandia Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The solid waste management units (SWMUs) and areas of concern (AOCs) discussed in this appendix are located in Technical Area 03 (TA-03), TA-60, and TA-61 (Figure 1.1-1 of the supplemental investigation report). This appendix presents the evaluation of potential risk at 41 sites based on decision-level data from historical and 2009 investigations.

I-2.0 BACKGROUND

Descriptions of the SWMUs and AOCs comprising Upper Sandia Canyon Aggregate Area are presented in sections 6.0, 7.0, and 8.0 of the supplemental investigation report and in section 4.0 of the approved investigation work plan (LANL 2008, 103404.43). Brief descriptions of the Upper Sandia Canyon Aggregate Area SWMUs and AOCs assessed for potential risk are presented in this section.

I-2.1 Site Descriptions and Operational History

TA-03 occupies a large area near the western end of South Mesa between Los Alamos Canyon to the north and Twomile Canyon to the south. Sandia and Mortandad Canyons originate within TA-03 and divide the eastern two-thirds of the area into fingerlike projections. The middle mesa where most of TA-03 is located is called Sigma Mesa (LANL 1999, 064617, p. 2-11). TA-03 contains most of the Laboratory's administrative buildings and public and corporate access facilities. In addition, TA-03 houses several Laboratory activities such as experimental sciences, special nuclear materials, theoretical/computations, and physical support operations.

TA-03 was originally used as a firing site before 1945. It contained several wooden structures that served as an administration building, a shop, hutments (10- × 10-ft fiberboard buildings used for storage, minor assembly, and checkout of scientific hardware), and magazines. The area also contained a burn pit for destroying explosives. The site was decommissioned and cleared in 1949.

In the early 1950s, operational facilities from TA-01 (located in the Los Alamos townsite) were relocated to TA-03. Early TA-03 facilities included the Van de Graaff accelerator building, a laboratory and support structures; the communications building; the Chemistry and Metallurgy Research Building; the general and chemical warehouses; the cryogenics laboratory; the administration building; the Sigma Building, a fire house, and the physics building. Additional new building construction continued through the 1960s and 1970s, when storage areas, shops, office buildings, a wastewater treatment plant (WWTP), a cement batch plant, and other transportable structures were added.

The Administration Building was completed in 1956. In addition to offices, it housed laboratory and shop facilities and extensive photographic operations. In 1959, the Sigma Building (building 03-66) was completed at the eastern end of the site. It houses a complex array of equipment and activities concerned with metallurgical and ceramics research and fabrication.

TA-60 was created in 1989 when the Laboratory redefined its TAs. As part of this effort, a portion of TA-03 was redesignated TA-60, a relatively small area that houses physical support and maintenance operations structures. TA-60, also known as Sigma Mesa Site, was created from the eastern portion of TA-03 and lies on the fingerlike mesa, Sigma Mesa, between Sandia and Mortandad Canyons. All buildings at TA-60 are located on the western end of the mesa and contain Laboratory support and maintenance operations and subcontractor-service facilities. The Nevada Test Site (NTS) Test

Fabrication Facility; the NTS test tower (buildings 60-17 and 60-18); several small abandoned experimental areas, including a solar pond, a test drill hole, and storage sites for pesticides, topsoil, and recyclable asphalt, are also located at TA-60 (LANL 1999, 064617, p. 2-25).

The specific SWMUs and AOCs evaluated as part of the 2009 investigation at Upper Sandia Canyon Aggregate Area and assessed for ecological and human health risk include the following sites.

I-2.1.1 SWMU 03-002(c), Former Storage Area

SWMU 03-002(c) is the site of a former 19-ft × 15-ft wooden storage shed (former structure 03-1494) that was located 100 ft west of the former Johnson Controls, Inc., administrative office (former building 03-70). From the early 1960s to 1984, the shed was used to store containers of liquid and powdered pesticides and herbicides. The shed was removed in 1989 and the floor was disposed of as hazardous waste (LANL 1993, 020947). Between 1994 and 1996, the original concrete pad beneath the shed was surrounded by a new concrete pad that covered the site (LANL 1996, 052930, p. 41). The eastern portion of the concrete pad was paved over with asphalt in 2003 as part of the construction of an access road and parking lot (LANL 2008, 099214).

I-2.1.2 AOC 03-003(d), Transformer Pad—Polychlorinated Biphenyl Only Site

AOC 03-003(d) is a concrete pad located east of building 03-141 where two former transformers containing polychlorinated biphenyls (PCBs), structures 03-146 and 03-176, were located. These transformers (PCB identification numbers 5008 and 5009) contained dielectric fluid with PCB concentrations greater than 500 ppm and were removed in 1991 and 1992, respectively, in accordance with the U.S. Department of Energy (DOE)/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (LANL 1995, 057590). Additional concrete was added to extend the existing pad in 1993 (LANL 1995, 057590, p. 6-63).

I-2.1.3 SWMU 03-009(a), Surface Disposal

SWMU 03-009(a) is a 30-ft × 300-ft fill area located on the rim of a small tributary of Sandia Canyon south of the former TA-03 asphalt batch plant (LANL 1993, 020947, p. 6-16). The fill was generated by asphalt plant operations and contained small amounts of concrete, crushed tuff, and asphalt road-construction debris.

I-2.1.4 SWMU 03-009(i), Surface Disposal Site

SWMU 03-009(i) is an inactive surface disposal site located east of the liquid and compressed gas facility (building 03-170). This site consists primarily of clean fill from TA-03 construction sites with construction debris, including crushed tuff, pieces of concrete, and asphalt mixed in with some of the fill material. The Operable Unit (OU) 1114 Resource Conservation and Recovery (RCRA) facility investigation (RFI) work plan (LANL 1993, 057590) incorrectly states that the use of the disposal area ceased in 1980; the 1990 SWMU report did not specify dates of operation (LANL 1990, 007511). Aerial photographs from 1979 and 1986 show the site was not used before 1980 and was still being used for fill placement in 1986.

I-2.1.5 SWMU 03-012(b), Operational Release

SWMU 03-012(b) is soil contamination associated with operational releases from the TA-03 power plant, building 03-22, and associated cooling towers, including cooling tower drift. A gas turbine generator, along with supporting utilities, was installed east of the power plant within the eastern portion of SWMU 03-012(b) in 2007 (LANL 2008, 099214).

I-2.1.6 SWMU 03-013(i), Operational Release

SWMU 03-013(i) is an area of soil and gravel contamination from historical releases of hydraulic oil at former buildings 03-246 and 03-247. These buildings housed operations that involved testing the tensile strength of various steel cables used in conjunction with underground nuclear test assemblies. The facility was constructed before 1967 and operated until the mid-1980s when a replacement facility was constructed on Sigma Mesa. Building 03-246 was constructed on a concrete slab that contained a hydraulic oil compressor and storage tank. Building 03-247 was constructed on a concrete curb surrounding a gravel floor that contained two hydraulic rams used to perform the tensile strength testing. Hydraulic oil was provided to the rams through underground pipes between the buildings (LANL 2005, 091540, pp. 1-2).

Hydraulic oil is likely to have been released to the concrete slab floor inside former building 03-246 and subsequently flowed beneath the building walls and onto the soil surrounding the building. The gravel floor inside former building 03-247 was visibly stained with oil in several locations beneath the hydraulic ram assembly (LANL 2004, 087406, p. 1). Building 03-247 and its contents were demolished and removed in 2005. The contents and the concrete slab of building 03-246 were also demolished and removed in 2005.

I-2.1.7 AOC 03-014(b2), Outfall

AOC 03-014(b2) is a former U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System– (NPDES-) permitted outfall (EPA SSSO1S) for the former TA-03 WWTP. The outfall received treated effluent from a flow-measurement weir north of the WWTP chlorination system [SWMU 03-014(j), section 6.14-12] dosing and contact chamber via a 1.5-ft-diameter × 300-ft-long corrugated metal pipe from 1989 to 1992. The outfall discharged to a rocky outcrop at the edge of Sandia Canyon (LANL 1993, 020947, p. 5-49). AOC 03-014(b2) received treated effluent from the Sanitary Wastewater Systems Consolidation (SWSC) plant at TA-46 from 1992 to 1998, when the effluent was switched to the outfall at the power plant, building 03-22. Outfall SSS01S was permitted for the discharge of wastewater and was removed from the NPDES permit in 1994 (LANL 1999, 064617, p. 2-7).

I-2.1.8 AOC 03-014(c2), Outfall

AOC 03-014(c2) is the inactive overflow outfall that previously received treated effluent from the former TA-03 WWTP from 1975 until the WWTP chlorination system [SWMU 03-014(j)] was constructed in 1985 (LANL 1993, 020947, pp. 5-48–5-49). The outfall was located on the north side of the chlorination system pump pit (structure 03-166). An evaluation of the former WWTP blueprints during the 1994 RFI identified the location of the original treated effluent outfall approximately 20 to 30 ft west of the original AOC 03-014(c2) outfall (LANL 1996, 052930, p. 116). Effluent for this outfall discharged as sheet flow onto a steep slope containing an erosion channel from storm water runoff. The channel eventually trends northeast into Sandia Canyon. Following the construction of the chlorination system, the outfall was rerouted underground from the pump pit to the chlorination dosing and contact chamber where the final effluent discharged into Sandia Canyon. This outfall was abandoned in 1988 or 1989, when the WWTP effluent was routed to a new outfall, AOC 03-014(b2) (LANL 1993, 020947, p. 5-49).

I-2.1.9 SWMUs 03-014(k,l,m,n), Structures Associated with Former WWTP

SWMUs 03-014(k,l,m,n), structures 03-196, 03-197, 03-198, and 03-199, are four unlined sludge-drying beds associated with the former TA-03 WWTP. The drying beds, located north of the Imhoff tanks, received sludge siphoned from the Imhoff tanks. Three of the four beds were used for drying sludge, while the fourth bed, SWMU 03-014(n), was used as a skimmer bed (LANL 1993, 020947, pp. 5-46–5-47).

The SWMUs consist of unlined sludge-drying beds excavated into the tuff. The SWMU 03-014(k) sludge bed measures 35 ft × 10 ft, and the other sludge beds measure 40 ft × 20 ft (LANL 1990, 007511, p. 3-14). A 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil/tuff (LANL 1997, 056660.4, p. 58).

I-2.1.10 SWMU 03-014(o), Structure Associated with Former WWTP

SWMU 03-014(o) consists of three polypropylene-lined sludge-drying beds (structure 03-1871) excavated into tuff at the former TA-03 WWTP. SWMU 03-014(o) is located north and downslope of the four upper sludge-drying beds [SWMUs 03-014(k,l,m,n)]. The drying beds were constructed in 1987, and each bed measures 22 ft × 60 ft and approximately 8000-gal. capacity of liquid sludge (LANL 1993, 020947, pp. 5-46, 5-47). Berms separating the beds are covered with asphalt, and the asphalt has not deteriorated (LANL 1997, 056660.4, p. 58).

I-2.1.11 SWMU 03-014(u), Structure Associated with Former WWTP

SWMU 03-014(u) is the former location of a 1500-gal. holding tank (structure 03-1901) that collected effluent from the former TA-03 WWTP sludge beds [SWMUs 03-014(k,l,m,n,o)]. The holding tank was located approximately 50 ft northeast of the chlorination system dosing and contact chamber. The tank was installed in 1988 (LANL 1990, 007511, p. 3-014). Effluent from the sludge beds flowed through a subsurface drain system to the tank. The contents of the holding tank were recirculated by truck to the head of the plant for additional treatment (LANL 1993, 020947, p. 5-47). The SWMU 03-014(u) holding tank was removed in 1992 following the decommissioning of the TA-03 WWTP (LANL 2008, 099214).

I-2.1.12 SWMUs 03-015 and 03-053, Outfall and Operational Facility

SWMU 03-015 is an outfall located between Eniwetok Drive and the security fence northeast of the building 03-141 (LANL 1996, 052930, p. 121). This SWMU is a formerly NPDES-permitted outfall EPA 04A140 that was removed from the permit in 1995 (LANL 1999, 064617, p. 2-7). The outfall historically received effluent from janitorial sinks as well as from floor and roof drains of building 03-141. From 1962 to 1990, building 03-141 housed electrochemical and depleted uranium– (DU-) processing facilities. Powder characterization, plasma flame spray processing, beryllium processing, and DU-processing operations were also performed. In 1992, the basement floor drains in building 03-141 were rerouted to the TA-50 radioactive liquid waste (RLW) line, and the roof drains were rerouted to an existing storm sewer outfall in Mortandad Canyon. Lines draining to SWMU 03-015 were decommissioned in 1993 (LANL 1995, 057590, p. 5-24-1).

AOC 03-053 consists of floor drains in the basement of building 03-141 at TA-03. The floor drains historically discharged to SWMU 03-015 but were rerouted to the TA-50 RLW line before 1992. From 1962 to 1990, building 03-141 housed electrochemical and DU-processing facilities. Powder characterization, plasma flame spray processing, beryllium processing, and DU-processing operations were also performed (LANL 1995, 057590, p. 5-24-1).

I-2.1.13 SWMU 03-021, Outfall

SWMU 03-021 is an outfall and associated daylight channel located approximately 60 ft north of the north exterior wall of the liquid and compressed gas facility (building 03-170). The outfall is a formerly NPDES-permitted outfall (EPA 04A094) and was removed from the 1997 permit (LANL 1999, 064617, p. 2-7). From 1964 to 1976, the outfall discharged caustic wash and rinse water from compressed-gas-cylinder cleaning operations. A 2-in.-diameter iron outfall pipe in an open exterior ditch carried the caustic wash and rinse water from the pit. The end of the outfall pipe discharged into a northeast-trending surface ditch that continued about 180 ft to the main north-south drainage ditch. This outfall was not used after 1976, when the compressed gas suppliers assumed cylinder washing and painting responsibilities. The outfall was buried when 5 to 10 ft of fill material was placed over the former outfall area and graded during site preparation activities for the construction of building 03-1650, the compressed-gas cylinder storage shed (LANL 1995, 057590, pp. 5-14-1–5-14-3).

I-2.1.14 SWMU 03-029, Landfill

SWMU 03-029 is a 30-ft × 70-ft former landfill located approximately 300 ft south of building 03-271 near the rim of Sandia Canyon. The landfill reportedly received excess asphalt from the batch plant and was subsequently covered with sand. The fill raised and leveled the surface areas at the mesa rim (LANL 1999, 064617, p. 2-17).

In 2004, an accelerated corrective action (ACA) was proposed to complete the investigation and remediation of SWMU 03-029 to accommodate the Laboratory’s security perimeter road project. SWMU 03-029 was situated near the proposed location for the security perimeter road (LANL 2004, 087474, p. 1). In May 2005, ground-penetrating radar and electromagnetic surveys were conducted at SWMU 03-029. The results identified two possible locations for buried asphalt, which were further investigated by trenching. In July 2005, a total of 12 trenches were excavated to the top of bedrock, approximately 2 to 4 ft below ground surface (bgs), and varied in length from 20 ft to greater than 100 ft. Buried asphalt was not encountered in any of the trenches (LANL 2005, 091150, p. 10).

I-2.1.15 SWMU 03-045(a), Outfall

SWMU 03-045(a) is an inactive outfall from the TA-03 power plant (building 03-22). The outfall operated from the 1950s to 1993. The primary outflow from building 03-22 to the SWMU 03-045(a) outfall was noncontact water from steam condensate. In addition, water from floor drains in the building basement, first floor, mezzanine, heater floor, platform, and roof drains previously discharged to this outfall. In 1989, an oil/water separator was installed near the outfall to prevent oil from building operations reaching the outfall. In 1993, the separator was removed and the discharge pipe was capped, causing this outfall to become inactive (LANL 1995, 057590, p. 6-71). In mid-1991, a diesel fuel release of approximately 100 to 200 gal. occurred from the two aboveground diesel-fuel tanks at building 03-22. As the system was being pressurized, a faulty fitting on a fuel line to the diesel tanks caused the release (LANL 1995, 057590, p. 6-79). The release occurred directly above SWMU 03-045(a) and flowed down the slope south of the steam plant into the drainage channel (LANL 1996, 055035, Attachment B, p. 1, Attachment D, p. 1).

I-2.1.16 SWMU 03-045(b), Outfall

SWMU 03-045(b) is the NPDES-permitted outfall (Outfall 001) that receives treated sanitary effluent from the TA-46 SWSC plant and the Sanitary Effluent Reclamation Facility (SERF) as well as power plant cooling tower blowdown. Previously, the outfall received SWSC effluent wastewater from makeup water production and boiler blowdown water from the cogeneration plant and occasional releases of cooling tower blowdown and other discharges from the TA-03 power plant, building 03-22. All wastewater previously discharged from the TA-03 power plant to SWMU 03-045(b) was treated in a neutralization tank (structure 03-1381); the function of the tank was to adjust the pH of wastewater before discharge to meet NPDES requirements. The NPDES permit number for the outfall was previously identified as EPA 01A001 but is currently permitted as 001 on the 2007 NPDES authorization permit (EPA 2007, 099009). The outfall is currently authorized to discharge power plant wastewater from cooling towers, boiler blowdown drains, demineralizer backwash, floor and sink drains, and treated sanitary reuse to Sandia Canyon (EPA 2007, 099009, p. 1). The outfall discharges onto sand and gravel southeast of building 03-22 and into a small tributary of Sandia Canyon. Discharge from another permitted outfall (13S) at the TA-46 SWSC plant is pumped to the holding tank 03-336 [SWMU 03-014(q)]. Most of this water is routed to SERF for additional treatment, and the remainder is discharged to SWMU 03-045(b) after it is mixed with SERF effluent. The outfall previously received effluent from two power plant cooling towers (structures 03-25 and 03-58) and the chlorine building (structure 03-24). The cooling tower (structure 03-25) was demolished in 1990, and a new cooling tower (structure 03-592) was constructed at the same location in 1998 (LANL 2008, 099214); the concrete foundation of structure 03-25 collected storm water that discharged to the outfall (LANL 1996, 052930, p. 56). The two cooling tower structures (03-58 and 03-592) are currently in operation and continue to discharge to SWMU 03-045(b) (LANL 2008, 099214). A sulfuric acid release to the SWMU 03-045(b) outfall from the power plant neutralization tank, structure 03-1381, occurred in May 1990 (LANL 1995, 057590, p. 5-27-1).

I-2.1.17 SWMU 03-045(c), Outfall

SWMU 03-045(c) is an NPDES-permitted outfall (EPA 03A027), located approximately 55 ft east of SWMU 03-045(b) (LANL 1996, 052930, p. 56). SWMU 03-045(c) formerly received effluent from a cooling tower (structure 03-285) that served the generators powering a Laboratory computer system. Cooling tower 03-285 was taken out of service several years ago, and SWMU 03-045(c) now receives blowdown from the cooling towers at the Strategic Computing Complex (building 03-2327), which became operational in 2002. SWMU 03-045(c) may have historically received chromate-treated water (LANL 1996, 052930, pp. 56–57). Outfall 03A027 is currently permitted for the discharge of cooling tower blowdown water and other wastewater from structures 03-285 and 03-2327 (EPA 2007, 099009).

I-2.1.18 SWMU 03-045(e), Outfall

SWMU 03-045(e) is an inactive outfall (Figure 6.2-1) from a floor drain in the oil pump house (structure 03-57) located at the TA-03 power plant, building 03-22. One line from each of two diesel fuel storage tanks (structures 03-26 and 03-27) passes through the pump house to the power plant. The floor drain was in place to prevent the pump house from filling with diesel fuel in the event a valve junction should rupture or leak. The floor drain and associated drainline to the outfall were plugged in 1989. A concrete apron is located at the point where the drainline discharged into Sandia Canyon (LANL 1995, 057590, pp. 6-7–6-8).

I-2.1.19 SWMU 03-045(f), Outfall

SWMU 03-045(f) is an outfall from a sink drain that served the TA-03 utilities control center (building 03-223) from 1950 to the late 1980s. The outfall was located on the north side of the building and discharged to Sandia Canyon. The sink was used as a quench tank for welding and cutting (LANL 1995, 057590, p. 6-8). The sink was removed in the late 1980s.

I-2.1.20 SWMU 03-045(g), Storm Drain

SWMU 03-045(g) consists of a closed and locked storm drain at the former TA-03 asphalt batch plant that is connected to an outfall, formerly permitted under the NPDES as outfall EPA 04A109 (LANL 1993, 020947, p. 6-12). The outfall discharged to a tributary of Sandia Canyon directly south of the former asphalt batch plant. The storm drain has been closed and locked since late 1990. Outfall 04A109 had been permitted for the discharge of noncontact cooling water and was removed from the NPDES permit in 1994 (LANL 1999, 064617, p. 2-7). Since 1987, the only discharges from the asphalt plant to the outfall were scrubber water used to collect dust from batching operations (SWMU 03-028) diverted to wash vehicles and equipment and from storm water from the western portion of the batch plant area. Storm water from parking lots, roads, and roof drains located west of the former asphalt batch plant also discharged to the outfall.

I-2.1.21 SWMU 03-045(h), Outfall

SWMU 03-045(h) is a former NPDES-permitted outfall (EPA 03A024) located in TA-03 at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (structure 03-187). The outfall was formerly permitted for the discharge of treated cooling water and storm water. It served a former cooling tower from 1953 until the late 1980s when the cooling tower became inactive. The cooling tower remained inactive until early 1995, when it was reactivated. In 1997, the cooling tower was removed and the outfall pipe plugged. The outfall was removed from the NPDES permit in 2007 (EPA 2007, 099009). Effluent drained into a corrugated metal storm drainpipe that trended northeast and east of structure 03-187 where it combined with more storm water runoff from surrounding areas. The drainage continued south and joined a channel north of Eniwetok Drive that ultimately drained into Sandia Canyon.

I-2.1.22 AOC 03-047(g), Drum Storage

AOC 03-047(g) is a paved area on the north side of building 03-141 at TA-03 where drums of acetone, vacuum pump oil, and ethylene glycol were stored.

I-2.1.23 AOC 03-051(c), Soil Contamination—Vacuum Pump Leak

AOC 03-051(c) consists of two former areas of stained asphalt at TA-03 attributed to operational leaks of vacuum pump oil (LANL 1995, 057590, p. 6-84). The first area, located on the east side of building 03-141, measured approximately 6 ft × 6 ft. The second area, located at the northeast corner of building 03-141, measured approximately 10 ft × 15 ft (LANL 1996, 053780, p. 15).

I-2.1.24 AOC 03-052(b), Storm Drainage

AOC 03-052(b) consists of five storm water collection areas at TA-03 about 20 ft north and west of the Sigma Building (03-66). Surface runoff flows from the area around the north end of the Sigma Building to three storm water collection areas within the building fence, which channel storm water to two storm water collection areas north of the building 03-66 fence: the area to the northeast of building 03-66 discharges to a storm drain outlet just north of Eniwetok Drive, and the area to the northwest of building 03-66 flows to a single storm drain that discharges to a low-lying grassy area northwest of building 03-66 (LANL 1995, 057590, p. 5-15-1).

I-2.1.25 SWMU 03-052(f), Outfall

SWMU 03-052(f) is a former NPDES-permitted outfall (EPA 03A023), which received wastewater from floor drains [AOC 03-013(b)]; sinks; water fountains; and a storm drain [SWMU 03-013(a)], which served building 03-38 until 1987 when the drains in building 03-38 were rerouted to the TA-03 sanitary sewer system. Stoddard solvents, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains to this outfall. Spent paint solvents and cutting oils contaminated with machined beryllium particles may also have been released to the floor drains during the 1960s and 1970s. In addition, cooling water for welding torches was discharged directly to the drains. The first spill was approximately 200 gal. of water-waste oil mixture that was discharged when an automatic compressor blowdown mechanism failed. A second spill from a ruptured air-compressor oil line resulted in the release of approximately 1 qt of compressor oil to the drain. This spill produced an oily sheen on the surface of the water at the SWMU 03-052(f) outfall (LANL 1995, 057590, p. 5-25-1). A third spill occurred when approximately 15 gal. of diesel fuel was released from a ruptured truck fuel line into the utilities construction trench between buildings 03-1793 and 03-1794. On the same day, a clay sewer pipe in the utility trench broke, releasing approximately 2000 gal. of wastewater into the excavation. A sump was used to remove the wastewater from the excavation, and the wastewater was discharged to SWMU 03-052(f). The diesel-contaminated asphalt and soil was removed and disposed of. Runoff from parking lots and the surrounding areas also discharges to the outfall (LANL 1995, 057590, p. 5-25-2). Outfall 03A023 was removed from the NPDES permit on July 11, 1997.

I-2.1.26 SWMU 03-056(a), Storage Area

SWMU 03-056(a) is an inactive used-oil accumulation facility built in 1986 at TA-03. The 12-ft × 45-ft structure is located approximately 15 ft north of building 03-271. The storage area has a concrete floor that slopes toward a small sump and is surrounded by a concrete berm. The area is roofed, but the sides are open. No spills from the bermed area to the environment have been documented (LANL 1993, 020947, p. 6-36).

I-2.1.27 SWMU 03-056(d), Drum Storage

SWMU 03-056(d) is a drum-storage area located on the northeast side of the inactive Plant 1 trickling filter [SWMU 03-014(c)] associated with the former TA-03 WWTP. Use of the storage area began in 1965. The storage area consists of an asphalt base and two bermed areas that measure 25 ft × 5 ft × 10 in. deep. The berms were constructed in 1989. The asphalt floor of the bermed area was covered with oil-absorbing material (LANL 1995, 057590, p. 6-48). Before 1989, only containers of lubricating oil were stored at this site. Use of the storage area ceased in 1992 when the TA-46 SWSC plant came online, and the TA-03 WWTP was decommissioned.

I-2.1.28 AOC 03-056(k), Container Storage Area

AOC 03-056(k) is a container storage area on the north side of a loading dock at the northwest corner of the Sigma Building (03-66). Waste oil, solvents, and radioactively contaminated graphite were staged in this area (LANL 1990, 007511, p. 3-056). Four documented releases of radiological materials are known to have occurred at this site (LANL 1995, 057590, pp. 5-15-1, 5-15-3–5-15-4).

I-2.1.29 SWMU 03-059, Storage Area—PCB Site

SWMU 03-059 is a former salvage yard at TA-03 consisting of two areas. The first area is about 250 ft × 115 ft and is located next to the south side of building 03-271. The perimeter is fenced, except for the part that abuts building 03-271. With the exception of two small portions of the yard, it is asphalt-paved. The second area is about 100 ft × 60 ft, asphalt-paved, and fenced. Paving over both areas occurred incrementally over a period of years.

I-2.1.30 AOC C-03-022, Kerosene Tanker Trailer

AOC C-03-022 is the former location of a tanker trailer used to store and distribute kerosene for former asphalt batch plant operations. The tanker trailer was located in a bermed materials storage area on a hill directly north of the former TA-03 asphalt batch plant. The tanker was in service for approximately 15 yr and supplied kerosene through a gravity-feed line that had a valve near the oil distributor tank, AOC C-03-016, located approximately 12 ft south (directly below the hill) of the tanker. The tanker and gravity-feed line were removed in 1989, and kerosene was replaced with No. 2 diesel fuel.

I-2.1.31 SWMU 60-002, Storage Areas

SWMU 60-002 consists of three former storage areas (designated as West, Central, and East) on Sigma Mesa at TA-60. The former western storage area measures approximately 150 ft × 300 ft and is located approximately 300 ft southeast of building 60-2, on the north side of the unimproved portion of Eniwetok Drive that traverses the mesa. Historically, piles of concrete blocks, wooden poles, tuff, fill, and cables were stored at this location. A large mound of fill, with pieces of cured asphalt and concrete, was situated in the northern portion of the site. The central storage area was located approximately 50 ft north of the Roads and Grounds salt and sand storage facility (building 60-178) and consisted of a 50-ft-diameter mound of fill approximately 10 ft high with construction debris, including concrete fence post supports, pipe, metal strips, and wood. The eastern storage area is on the south side of the unimproved portion of Eniwetok Drive about 300 ft west of SWMU 60-007(a) near the east end of Sigma Mesa. This area was used to stage piles of broken cured asphalt removed from roadways and parking lots for recycling (LANL 2005, 100704).

I-2.1.32 AOC 60-004(f), Storage Area

AOC 60-004(f) consists of two formerly used unpaved bermed pads, Pad 2 and Pad 3, located at TA-60 southeast of building 60-2. Pad 2 was 12 ft × 65 ft, and Pad 3 was 12 ft × 40 ft. Both pads stored 55-gal. containers that dispensed Stoddard solvent, antifreeze, motor oil, grease, transmission fluid, and window-washing fluid. The pads were constructed in 1978 when the maintenance warehouse (building 60-2) was built. In 1985, 6-in. asphalt berms were built at the open ends of both pads to mitigate rainfall run-on and runoff. In 1990, all containers were removed from the pads (LANL 1993, 020947, pp. 5-15–5-16).

I-2.1.33 SWMU 60-006(a), Septic System

SWMU 60-006(a) is the former location of a decommissioned septic system located at TA-60 on Sigma Mesa near the northeast corner of the fence surrounding buildings 60-17 and 60-19. The septic system consisted of a 1000-gal. septic tank and associated 4-ft-wide × 50-ft-deep seepage pit. No outfall is associated with this system. This septic system formerly served buildings 60-17 (NTS test rack fabrication facility) and 60-19 (NTS test tower). Building 60-17 began operating in 1986 to fabricate equipment for testing activities carried out at NTS. From 1986 to 1989, wastewater generated from facility bathrooms and seven floor drains, including one in a paint booth, discharged to the septic system. In 1989, building 60-17 was connected to the sanitary sewer.

I-2.1.34 SWMU 60-007(a), Release

SWMU 60-007(a) is a 50-ft × 100-ft former storage area located at TA-60 near the east end of Sigma Mesa. This area was used to store equipment for the drilling of a geothermal well. Small spills of oil, hydraulic fluid, and similar materials were released (LANL 1996, 052930, pp. 189–190).

I-2.1.35 SWMU 60-007(b), Release

SWMU 60-007(b) is a storm drainage ditch at TA-60 that starts approximately 600 ft from a paved area directly north of the motor pool building (building 60-1) and extends to the bottom of Sandia Canyon. Two parking lots located east of building 60-1 drain to a ditch that eventually joins the SWMU 60-007(b) drainage ditch. Other former sources of potential contamination to the ditch are a steam-cleaning pad, a used-oil storage tank, and an oil/water separator. In addition, equipment that used PCB-containing oil was stored on an asphalt area east of building 60-1 (LANL 1993, 020947, pp. 5-14–5-15).

I-2.1.36 AOC C-61-002, Subsurface Contamination

AOC C-61-002 is an area of subsurface contamination located in TA-61, approximately 15 ft north of building 61-16, a former storage building. The subsurface contamination was found in 1995 during a drill rig test. During the drilling test, a petroleum odor was noted, and diesel contamination was detected at 7 to 8 ft bgs (LANL 1995, 049550, p. 2).

I-2.1.37 SWMU 61-002, Transformer Storage Area—PCB Site

SWMU 61-002 is located in the western portion of TA-61, which was created during the Laboratory TA redesignations in 1989 and next to the eastern end of the former Radio Repair Shop (former building 61-23) on the south side of East Jemez Road. From the 1970s until 1992, the 81-ft-by-91-ft fenced area was used as a storage area for capacitors, transformers, drums containing PCB-contaminated oil, and oil-filled vessels. Before 1985, the storage area was unpaved and containers of PCB-contaminated oil stored on the unpaved surface were known to have leaked (LANL 1990, 007514). The area was subsequently excavated, backfilled, and paved and used again until 1992 to store oil-filled electrical equipment, some containing PCBs (LANL 1993, 020947). Oil stains were observed on the asphalt within the storage area during a 1992 site inspection (LANL 1993, 020947). The area outside the fenced storage area was used for parking by Los Alamos County landfill employees and for equipment storage by Los Alamos County. The Radio Repair Shop (former building 61-23) was decontaminated and demolished in the spring of 2006 to make way for the security perimeter road project.

I-2.2 Investigation Sampling

The final dataset used to identify chemicals of potential concern (COPCs) for the Upper Sandia 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 both historical sampling activities and the 2009 investigation. Only those data determined to be of decision-level quality following the data quality assessment (Appendix F) are included in the final dataset evaluated in this appendix.

I-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 radionuclides), with detection limits greater than background values (BVs) (inorganic chemicals), and detected (organic chemicals, inorganic chemicals with no BVs, and 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 bgs, respectively. The construction worker and the residential scenarios 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 I-2.3-1 to I-2.3-84 summarize the COPCs evaluated for potential risk for each site in the Upper Sandia 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.

I-3.0 CONCEPTUAL SITE MODEL

The primary mechanisms of release are related to historical contaminant sources described in detail in the Upper Sandia Canyon Aggregate Area historical investigation report (LANL 2008, 100693) and summarized in section 2.3 of the approved investigation work plan (LANL 2008, 103404.43). Releases at sites within the Upper Sandia Canyon Aggregate Area may have occurred as a result of air emissions, subsurface leaks, or effluent discharges. Previous sampling results indicated contamination from inorganic chemicals, organic chemicals, and radionuclides (LANL 2008, 100693).

I-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 (industrial worker, construction worker, and resident) 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 and the construction worker, 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 I-3.1-1).

The sites in the Upper Sandia Canyon Aggregate Area are industrial areas on Laboratory property. The developed sites provide minimal or no potential habitat for ecological receptors, especially where sites are covered with asphalt. The samples at SWMU 60-006(a) (a septic system) are deeper than 10.0 ft bgs (the shallowest sample is from 10.0–11.0 ft bgs); this SWMU is not evaluated for human and ecological risk because no complete exposure pathways to receptors exist. 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 were 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 of the lack of surface water features. Sources, exposure pathways, and receptors are presented in the CSM (Figure I-3.1-1).

I-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.

The New Mexico Environment Department (NMED) guidance (NMED 2012, 219971) 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 the Upper Sandia Canyon Aggregate Area 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 Upper Sandia 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.

I-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 Upper Sandia 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 the redox 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 I-3.2-1 presents the K_d values and water solubility for the inorganic COPCs for the Upper Sandia 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, hexavalent chromium, iron, nitrate, perchlorate, selenium, and silver 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/toxpro2).

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 alkaline soil pH and oxidizing near-surface conditions) present at the Upper Sandia 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 alkaline to neutral, 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.

Chromium is a naturally occurring element found in rocks, animals, plants, and soil and in volcanic dust and gases. Chromium is present in the environment in several different forms. The most common forms are chromium(0); trivalent [or chromium(III)]; and hexavalent [or chromium(VI)]. Chromium(III) occurs naturally in the environment and is an essential nutrient required by the human body to promote the action of insulin in body tissues so that sugar, protein, and fat can be used by the body. Chromium(VI) and chromium(0) are generally produced by industrial processes. Chromium can attach strongly to soil and is therefore not very mobile. The movement of chromium in soil depends on the type and condition of the soil and other environmental factors. Organic matter in soil is expected to convert soluble chromate, chromium (VI) to insoluble chromium (III) oxide. The reduction of chromium (VI) to chromium (III) is facilitated by low pH.

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, well-drained soil at the Upper Sandia Canyon Aggregate Area.

Nitrate (and to a lesser degree perchlorate) is 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 Upper Sandia Canyon Aggregate Area is much lower than 7.5, 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 it may potentially migrate into the subsurface. Site conditions are neutral to slightly alkaline and silver is not expected to be mobile.

I-3.2.2 Organic Chemicals

Table I-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 Upper Sandia Canyon Aggregate Area. The physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following discussion about the physiochemical properties of organic COPCs is presented to illustrate some aspects of the fate and transport tendencies of the COPCs. The information is summarized from Ney (1995, 058210).

Water solubility is perhaps 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 solvents identified for the Upper Sandia Canyon Aggregate Area have water solubilities greater than 1000 mg/L, including acetone, benzoic acid, 2-butanone, chloroethane, chloromethane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, cis-1,2-dichloroethene, cis/trans-1,2-dichloroethene, 2-hexanone, 4-methyl-2-pentanone, and methylene chloride.

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 likely to accumulate or bioaccumulate and persist in the environment, to be slightly prone to biodegradation, and may be metabolized in plants and animals. The COPCs identified as having water solubilities less than 10 mg/L are primarily Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260, gamma-chlordane, 4,4’-dichlorophenyltrichloroethylene (DDT), 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), semivolatile organic compounds (SVOCs), including bis(2-ethylhexyl)phthalate, butylbenzylphthalate, carbazole, and most of the polycyclic aromatic hydrocarbons (PAHs).

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, benzene, 2-butanone, butylbenzenes, carbon disulfide, chlorobenzene, chloroethane, chloromethane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichlorobenzene, 1,4-dichlorobenzene, cis-1,2-dichloroethene, cis/trans-1,2-dichloroethene, ethylbenzene, 2-hexanone, isopropylbenzene, 4-isopropyltoluene, 4-methyl-2-pentanone, methylene chloride, 1-propylbenzene, styrene, tetrachloroethene, toluene, trichloroethene, trimethylbenzenes, and xylenes 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 PAHs, bis(2-ethylhexyl)phthalate, carbazole, gamma-chlordane, 4,4’-DDT, and PAHs detected in the Upper Sandia Canyon Aggregate Area 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). The butylbenzenes, carbazole, gamma-chlordane, 4,4’-DDT, 1,4-dichlorobenzene, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, 2-methyl-4-

chlorophenoxyacetic acid (MCPA), methylchlorophenoxypropionic acid (MCPP),PAHs, PCBs, phthalates, 1-propylbenzene, 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, 2-butanone, chloroethane, chloromethane, 1,2-dibromoethane, cis-1,2-dichloroethene, cis/trans-1,2-dichloroethene, 2-hexanone, 4-methyl-2-pentanone, and methylene chloride 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 2012, 219971). 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, benzene, benzoic acid, 2-butanone, carbon disulfide, chlorobenzene, chloroethane, chloromethane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichlorobenzene, 1,4-dichlorobenzene, cis-1,2-dichloroethene, cis/trans-1,2-dichloroethene, diethylphthalate, di-n-butyl phthalate, 2-hexanone, MCPA, MCPP, 4-methyl-2-pentanone, methylene chloride, tetrachloroethene, toluene, trichloroethene, and xylenes.

I-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 I-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at the Upper Sandia Canyon Aggregate Area sites. Based on K_d values, americium-241, plutonium-238, and plutonium-239 have a very low potential to migrate towards groundwater at the sites within the Upper Sandia 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 concentrations in the subsurface at the area of elevated radioactivity are low (<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.

I-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 I-2.3-1 to I-2.3-84.

The EPCs for the dioxin and furan congeners are the sums of the detected congeners weighted by the World Health Organization toxic equivalency factors (TEFs) (http://www.who.int/ipcs/assessment/tef_update/en/index.html); the sum is expressed as the 2,3,7,8-TCDD equivalent concentration. The TEFs used, the results of the TEF calculations, and the TCDD-equivalent concentrations for SWMU 03-045(h) are presented in Table I-3.3-1.

Calculation of UCLs of the mean concentrations was done using the EPA ProUCL 4.1.00 software (EPA 2010, 109944), 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 dataset for each COPC and calculates the most appropriate UCL based on the distribution of the dataset. 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 there were too few detects to calculate a UCL. Input and output data files for ProUCL calculations are provided on CD as Attachment I-1.

I-4.0 HUMAN HEALTH RISK SCREENING ASSESSMENT RESULTS

The human health risk-screening assessments were conducted for each site where extent is defined within the Upper Sandia Canyon Aggregate Area. All sites were screened for the construction worker and residential scenarios 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. The human health risk-screening assessments compare 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.

I-4.1 Human Health SSLs and SALs

Human health risk-screening assessments for chemicals were conducted using SSLs for the industrial, construction worker, and residential scenarios obtained from NMED guidance (NMED 2012, 219971). The NMED SSLs are based on a target noncarcinogenic hazard quotient (HQ) of 1 and a target cancer risk of 1×10^{-5} (NMED 2012, 219971). If SSLs were not available from NMED guidance, values from the EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) were used. The EPA SSLs 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}. EPA regional screening levels are not available for construction workers; therefore, when regional screening levels were used, the construction worker SSLs were calculated using toxicity values from the EPA regional screening tables (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) and NMED exposure parameters and equation (NMED 2012, 219971). A surrogate SSL is used for some COPCs based on structural similarity or breakdown products. Exposure parameters used to calculate the industrial, construction worker, and residential SSLs are presented in Table I-4.1-1.

Total petroleum hydrocarbon (TPH) diesel range organic (DRO) data were compared with the NMED TPH screening guidelines for diesel No. 2 (NMED 2012, 219971). The New Mexico State TPH screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The TPH toxicity is based only on the weighted sum of the toxicity of the hydrocarbon fractions (NMED 2012, 219971). Because this value is a different toxicity basis than for the other COPCs, the TPH HQs are presented separately from the HQs for the individual COPCs. However, the constituents of the TPH, if detected, are compared with the individual SSLs in the screening tables.

Radionuclide SALs are used for comparison with radionuclide COPC EPCs and were derived using the RESRAD model, Version 6.5 (LANL 2012, 228852). The SALs are based on a 25-mrem/yr dose as authorized by DOE Order 458.1. Exposure parameters used to calculate the SALs are presented in Tables I-4.1-2 and I-4.1-3.

I-4.2 Results of Human Health Risk Screening Evaluation

The EPC of each COPC in soil was compared with the SSLs for the industrial, construction worker, and residential scenarios. For carcinogenic chemicals, the EPCs were divided by the SSL and multiplied by 1×10^{-5}. The sum of the carcinogenic risks was compared with the NMED target cancer risk level of 1×10^{-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 I-4.2-1 to I-4.2-304 and are described below for each SWMU and AOC evaluated.

I-4.2.1 SWMU 03-002(c)

Sodium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's Risk Assessment Guidance for Superfund (RAGS) (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, sodium may be compared with the adequate intake (AI) (the recommended daily allowance [RDA] cannot be calculated) for younger and older adults. The AI is 1500 mg/d of sodium for a younger adult and 1300 mg/d for an older adult (Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate 2005, http://www.nap.edu/catalog.php?record_id=10925#toc). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (2730 mg/kg) at the EPA default child soil ingestion rate of 200 mg/d of soil, a younger adult would ingest approximately 0.9 mg/d of sodium. At the intake level of 0.9 mg/d of sodium, the younger adult's ingestion of sodium is far less than the AI for sodium of 1500 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default older adult soil ingestion rate of 100 mg/d of soil, an older adult would ingest approximately 0.4 mg/d of sodium. At the intake level of 0.4 mg/d of sodium, the older adult's ingestion of sodium is far less than the AI of 1300 mg/d. Therefore, no adverse health effects are expected from sodium at 2730 mg/kg, and sodium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-1 and I-4.2-2. The total excess cancer risk is 8×10^{-8}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.03, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-3 and I-4.2-4. The total excess cancer risk is 9×10^{-9}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.03, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-5 and I-4.2-6. The total excess cancer risk for the residential scenario is approximately 1×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.07, which is less than the NMED target of 1 (NMED 2012, 219971).

I-4.2.2 AOC 03-003(d)

The results of the risk-screening assessment for the industrial scenario are presented in Table I-4.2-7. The total excess cancer risk is 8×10^{-7}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). Noncarcinogenic COPCs were not identified for the industrial scenario.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-8 and I-4.2-9. The total excess cancer risk is 7×10^{-8}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.04, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-10 and I-4.2-11. The total excess cancer risk is 3×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.3 SWMU 03-009(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-12 and I-4.2-13. The total excess cancer risk is 3×10^{-7}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.003, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-14 and I-4.2-15. The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.01, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-16 and I-4.2-17. The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.05, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.01, the construction worker TPH-DRO HQ is 0.05, and the residential TPH-DRO HQ is 0.09 (Tables I-4.2-18, I-4.2-19, and I-4.2-20, respectively).

I-4.2.4 SWMU 03-009(i)

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (9350 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1.3 mg/d of calcium. At the intake level of 1.3 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 3.1 mg/d. At the intake level of 3.1 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 9350 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-21 and I-4.2-22. The total excess cancer risk is 1×10^{-7}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.03, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-23 and I-4.2-24. The total excess cancer risk for the construction worker scenario is 8×10^{-9}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.2, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-25 and I-4.2-26. The total excess cancer risk for the residential scenario is 3×10^{-7}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.3, which is less than the NMED target of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.02, the construction worker TPH-DRO HQ is 0.009, and the residential TPH-DRO HQ is 0.02 (Tables I-4.2-27, I-4.2-28, and I-4.2-29, respectively).

I-4.2.5 SWMU 03-012(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I 4.2-30 and I-4.2-31. The total excess cancer risk is 2×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.005, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-32 and I-4.2-33. The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-34 and I-4.2-35. The total excess cancer risk for the residential scenario is 5×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.6 SWMU 03-013(i)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-36 and I-4.2-37. The total excess cancer risk is 2×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.2, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-38 and I-4.2-39. The total excess cancer risk for the construction worker scenario is 9×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-40 and I-4.2-41. The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The cancer risk was from PAHs. The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO and TPH–gasoline range organics (GRO) were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening guidelines for TPH-GRO. Potential risk from TPH-GRO is based on constituents. PAHs were identified as COPCs at this site, and the potential risks were less than or equivalent to the NMED target risk levels for the industrial, construction worker, and residential scenarios. The industrial TPH-DRO HQ was 0.8, the construction worker TPH-DRO HQ was 0.5, and the residential scenario TPH-DRO HQ was 0.9 (Tables I-4.2-42, I-4.2-43, and I-4.2-44, respectively).

I-4.2.7 AOC 03-014(b2)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-45 and I-4.2-46. The total excess cancer risk is 1×10^{-7}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.05, which is less than the NMED target of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-47 and I-4.2-48. The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.05, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-49 and I-4.2-50. The total excess cancer risk for the residential scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.02, the construction worker TPH-DRO HQ is 0.01, and the residential TPH-DRO HQ is 0.02 (Tables I-4.2-51, I-4.2-52, and I-4.2-53, respectively).

I-4.2.8 AOC 03-014(c2)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-54 and I-4.2-55. The total excess cancer risk is 4×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.04, which is less than the NMED target of 1 (NMED 2012, 219971). No radionuclides were detected in the surface samples.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-56, I-4.2-57, and I-4.2-58. The total excess cancer risk for the construction worker scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.7, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.009 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 I-4.2-59, I-4.2-60, and I-4.2-61. The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs as well as Aroclor-1260. The residential HI is 3, which is above the NMED target HI of 1 (NMED 2012, 219971). The elevated HI was from Aroclor-1254. The total dose is 0.02 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.02, the construction worker TPH-DRO HQ is 0.02, and the residential TPH-DRO HQ is 0.04 (Tables I-4.2-62, I-4.2-63, and I-4.2-64, respectively).

I-4.2.9 SWMUs 03-014(k,l,m,n)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-65, I-4.2-66, and I-4.2-67. The total excess cancer risk is 5×10^{-5}, which is above the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The industrial HI is 0.2, which is less than the NMED target of 1 (NMED 2012, 219971). 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 construction worker scenario are presented in Tables I-4.2-68, I-4.2-69, and I-4.2-70. The total excess cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.4, which is less than the NMED target HI of 1 (NMED 2012, 219971). 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 I-4.2-71, I-4.2-72, and I-4.2-73. The total excess cancer risk for the residential scenario is 8×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs.

The residential HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The HI was in part from Aroclor-1254 and lead. The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 5, construction worker TPH-DRO HQ is 3, and the residential TPH-DRO HQ is 5 (Tables I-4.2-74, I-4.2-75, and I-4.2-76, respectively).

I-4.2.10 SWMU 03-014(o)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-77, I-4.2-78, and I-4.2-79. The total excess cancer risk is 6×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.1, which is less than the NMED target of 1 (NMED 2012, 219971). The total dose is 0.08 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 construction worker scenario are presented in Tables I-4.2-80, I-4.2-81, and I-4.2-82. The total excess cancer risk for the construction worker scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.2 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 I-4.2-83, I-4.2-84, and I-4.2-85. The total excess cancer risk for the residential scenario is 7×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 14 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.002, the construction worker TPH-DRO HQ is 0.002, and the residential TPH-DRO HQ is 0.004 (Tables I-4.2-86, I-4.2-87, and I-4.2-88, respectively).

I-4.2.11 SWMU 03-014(u)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-89, I-4.2-90, and I-4.2-91. The total excess cancer risk is 1×10^{-6}, which is less than the NMED target risk of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.09, which is less than the NMED target of 1 (NMED 2012, 219971). The total dose is 0.0007 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 construction worker scenario are presented in Tables I-4.2-92, I-4.2-93, and I-4.2-94. The total excess cancer risk for the construction worker scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.3, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.005 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 I-4.2-95, I-4.2-96, and I-4.2-97. The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.009 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines do not provide screening levels for the construction worker scenario; therefore, the construction worker scenario was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.1, the construction worker TPH-DRO HQ is 0.07, and the residential TPH-DRO HQ is 0.1 (Tables I-4.2-98, I-4.2-99, and I-4.2-100, respectively).

I-4.2.12 SWMU 03-015 and AOC 03-053

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-101, I-4.2-102, and I-4.2-103. The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.08 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 construction worker scenario are presented in Tables I-4.2-104, I-4.2-105, and I-4.2-106. The total excess cancer risk for the construction worker scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.5, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.07 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 I-4.2-107, I-4.2-108, and I-4.2-109. The total excess cancer risk for the residential scenario is 7×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is approximately 2, which is above the NMED target HI of 1 (NMED 2012, 219971). The elevated HI was primarily from Aroclor-1254. The total dose is 0.2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.05, the construction worker TPH-DRO HQ is 0.03, and the residential TPH-DRO HQ is 0.05 (Tables I-4.2-110, I-4.2-111, and I-4.2-112, respectively).

I-4.2.13 SWMU 03-021

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-113 and I-4.2-114. The total excess cancer risk for the industrial scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.3, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-115 and I-4.2-116. The total excess cancer risk for the construction worker scenario is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.3, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-117 and I-4.2-118. The total excess cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.14 SWMU 03-029

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-119 and I-4.2-120. The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-121 and I-4.2-122. The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.02, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-123 and I-4.2-124. The total excess cancer risk for the residential scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.06, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ was 0.002, the construction worker TPH-DRO HQ was 0.003, and the residential scenario TPH-DRO HQ was 0.005 (Tables I-4.2-125, I-4.2-126, and I-4.2-127, respectively).

I-4.2.15 SWMU 03-045(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-128 and I-4.2-129. The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The industrial HI is 0.5, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-130 and I-4.2-131. The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.5, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-132 and I-4.2-133. The total excess cancer risk for the residential scenario is 3×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The HI was in part from lead.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening guidelines for TPH-GRO. Potential risk from TPH-GRO is based on constituents. PAHs were identified as COPCs at this site and the potential risks were above the NMED target risk level for the industrial and residential scenarios using the maximum detected concentrations as the EPCs. The industrial TPH-DRO HQ was 0.2, the construction worker TPH-DRO HQ was 0.07, and the residential scenario TPH-DRO HQ was 0.1 (Tables I-4.2-134, I-4.2-135, and I-4.2-136, respectively).

I-4.2.16 SWMU 03-045(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-137 and I-4.2-138. The total excess cancer risk for the industrial scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-139 and I-4.2-140. The total excess cancer risk for the construction worker scenario is 5×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.03, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-141 and I-4.2-142. The total excess cancer risk for the residential scenario is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ was 0.005, the construction worker TPH-DRO HQ was 0.005, and the residential TPH-DRO HQ was 0.009 (Tables I-4.2-143, I-4.2-144, and I-4.2-145, respectively).

I-4.2.17 SWMU 03-045(c)

Calcium was retained as a COPC because it was detected above background in soil; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (22,800 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 3.3 mg/d of calcium. At the intake level of 3.3 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 7.6 mg/d. At the intake level of 7.6 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 22,800 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-146 and I-4.2-147. The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-148 and I-4.2-149. The total excess cancer risk for the construction worker scenario is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.2, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-150 and I-4.2-151. The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was primarily from PAHs as well as Aroclor-1260. The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ was 0.002, the construction worker TPH-DRO HQ was 0.03, and the residential TPH-DRO HQ was 0.05 (Tables I-4.2-152, I-4.2-153, and I-4.2-154, respectively).

I-4.2.18 SWMU 03-045(e)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-155 and I-4.2-156. The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.09, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-157 and I-4.2-158. The total excess cancer risk for the construction worker scenario is 4×10^{-9}, which is less than the NMED target risk level of 1 × 10–5 (NMED 2012, 219971). The construction worker HI is 0.1, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-159 and I-4.2-160. The total excess cancer risk for the residential scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.2, the construction worker TPH-DRO HQ is 2, and the residential TPH-DRO HQ is 3 (Tables I-4.2-161, I-4.2-162, and I-4.2-163, respectively).

I-4.2.19 SWMU 03-045(f)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-164 and I-4.2-165. The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-166 and I-4.2-167. The total excess cancer risk for the construction worker scenario is 4×10^{-9}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.01, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-168 and I-4.2-169. The total excess cancer risk for the residential scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.03, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.20 SWMU 03-045(g)

Calcium was retained as a COPC because it was detected above background in soil and sediment; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (66,000 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 9.4 mg/d of calcium. At the intake level of 9.4 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 22 mg/d. At the intake level of 22 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 66000 mg/kg, and calcium is eliminated as a COPC.

Magnesium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, magnesium may be compared with the RDA for adults and children. The RDA is 420 mg/d of magnesium for an adult male, 320 mg/d for an adult female, and 240 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (6310 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.9 mg/d of magnesium. At the intake level of 0.9 mg/d of magnesium, the adult's ingestion of magnesium is far less than the RDA for magnesium of 320 mg/d to 420 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 2.1 mg/d of magnesium. At the intake level of 2.1 mg/d of magnesium, the child's ingestion of magnesium is far less than the RDA for magnesium of 240 mg/d. Therefore, no adverse health effects are expected from magnesium at 6310 mg/kg, and magnesium is eliminated as a COPC.

Potassium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, potassium may be compared with the RDA for adults and children. The RDA ranges from 2000 to 4700 mg/d for an adult and 400 to 4500 mg/d for a child (infant to 13 yr) (http://www.healthsupplementsnutritionalguide.com/recommended-daily-allowances.html). The lowest RDA of 400 mg/d is for an infant (0–6 mo). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (2870 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.4 mg/d of potassium. At the intake level of 0.4 mg/d of potassium, the adult's ingestion of potassium is far less than the RDA for potassium of 2000 mg/d to 4700 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 1 mg/d of potassium. At the intake level of 1 mg/d of potassium, the child's ingestion of potassium is far less than the RDA for potassium of 400 mg/d to 4500 mg/d. Therefore, no adverse health effects are expected from potassium at 2870 mg/kg, and potassium is eliminated as a COPC.

Sodium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, sodium may be compared with the AI (the RDA cannot be calculated) for younger and older adults. The AI is 1500 mg/d of sodium for a younger adult and 1300 mg/d for an older adult (Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate 2005, http://www.nap.edu/catalog.php?record_id=10925#toc). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (2190 mg/kg) at the EPA default child soil ingestion rate of 200 mg/d of soil, a younger adult would ingest approximately 0.7 mg/d of sodium. At the intake level of 0.7 mg/d of sodium, the younger adult's ingestion of sodium is far less than the AI for sodium of 1500 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default older adult soil ingestion rate of 100 mg/d of soil, an older adult would ingest approximately 0.3 mg/d of sodium. At the intake level of 0.3 mg/d of sodium, the older adult's ingestion of sodium is far less than the AI of 1300 mg/d. Therefore, no adverse health effects are expected from sodium at 2190 mg/kg, and sodium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-170 and I-4.2-171. The total excess cancer risk for the industrial scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-172 and I-4.2-173. The total excess cancer risk for the construction worker scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The HI was primarily from manganese.

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-174 and I-4.2-175. The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening guidelines for TPH-GRO. Potential risk from TPH-GRO is based on constituents. PAHs were detected and contribute to the residential cancer risk being slightly above the NMED target risk level. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.03, the construction worker TPH-DRO HQ is 0.02, and the residential TPH-DRO HQ is 0.03 (Tables I-4.2-176, I-4.2-177, and I-4.2-178).

I-4.2.21 SWMU 03-045(h)

Calcium was retained as a COPC because it was detected above background in tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National

Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (2510 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.4 mg/d of calcium. At the intake level of 0.4 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 0.8 mg/d. At the intake level of 0.8 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 2510 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-179 and I-4.2-180. The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.005, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-181 and I-4.2-182. The total excess cancer risk for the construction worker scenario is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.5, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-183 and I-4.2-184. The total excess cancer risk for the residential scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.22 AOC 03-047(g)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-185 and I-4.2-186. The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-187 and I-4.2-188. The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.1, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-189 and I-4.2-190. The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.23 AOC 03-051(c)

No COPCs were detected in the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC 03-051(c).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-191 and I-4.2-192. The total excess cancer risk for the construction worker scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.4, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-193 and I-4.2-194. The total excess cancer risk for the residential scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because no COPCs were detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.05 and the residential TPH-DRO HQ is 0.09 (Tables I-4.2-195 and I-4.2-196, respectively).

I-4.2.24 AOC 03-052(b)

Calcium was retained as a COPC because it was detected above background in tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (4980 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.7 mg/d of calcium. At the intake level of 0.7 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 1.7 mg/d. At the intake level of 1.7 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 4980 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Table I-4.2-197. No carcinogenic COPCs were identified for the industrial scenario. The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-198 and I-4.2-199. The total excess cancer risk for the construction worker scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.6, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-200 and I-4.2-201. The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

I-4.2.25 SWMU 03-052(f)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-202 and I-4.2-203. The total excess cancer risk for the industrial scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-204 and I-4.2-205. The total excess cancer risk for the construction worker scenario is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.1, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-206 and I-4.2-207. The total excess cancer risk for the residential scenario is 7×10^{-4}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.4, the construction worker TPH-DRO HQ is 0.2, and the residential TPH-DRO HQ is 0.3 (Tables I-4.2-208, I-4.2-209, and I-4.2-210, respectively).

I-4.2.26 SWMU 03-056(a)

Calcium was retained as a COPC because it was detected above background in soil; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (11,500 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1.6 mg/d of calcium. At the intake level of 1.6 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 3.8 mg/d. At the intake level of 3.8 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 11,500 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-211 and I-4.2-212. The total excess cancer risk for the industrial scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.0001, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-213 and I-4.2-214. The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.01, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-215 and I-4.2-216. The total excess cancer risk for the residential scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.03, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.06, the construction worker TPH-DRO HQ is 0.07, and the residential TPH-DRO HQ is 0.1 (Tables I-4.2-217, I-4.2-218, and I-4.2-219, respectively).

I-4.2.27 SWMU 03-056(d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-220 and I-4.2-221. The total excess cancer risk for the industrial scenario is 2×10^{-9}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-222 and I-4.2-223. The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.04, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-224 and I-4.2-225. The total excess cancer risk for the residential scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.002 and the residential TPH-DRO HQ is 0.003 (Tables I-4.2-226 and I-4.2-227, respectively).

I-4.2.28 AOC 03-056(k)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-228, I-4.2-229, and I-4.2-230. The total excess cancer risk for the industrial scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.2 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 construction worker scenario are presented in Tables I-4.2-231, I-4.2-232, and I-4.2-233. The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.08, which is less than the NMED target HI of 1 (NMED 2012, 219971). 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 I-4.2-234, I-4.2-235, and I-4.2-236. The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2012, 219971). 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.

I-4.2.29 SWMU 03-059

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-237, I-4.2-238, and I-4.2-239. The total excess cancer risk for the industrial scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00008 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 construction worker scenario are presented in Tables I-4.2-240, I-4.2-241, and I-4.2-242. The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.6, which less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00007 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 I-4.2-243, I-4.2-244, and I-4.2-245. The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The cancer risk was primarily from PAHs. The residential HI is 2, which is above the NMED target HI of 1 (NMED 2012, 219971). The elevated HI was primarily from Aroclor-1254. The total dose i*s* 0.005 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.04, the construction worker TPH-DRO HQ is 0.006, and the residential TPH-DRO HQ is 0.01 (Tables I-4.2-246, I-4.2-247, and I-4.2-248, respectively).

I-4.2.30 AOC C-03-022

Calcium was retained as a COPC because it was detected above soil background; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (34,100 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 4.9 mg/d of calcium. At the intake level of 4.9 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 11.4 mg/d. At the intake level of 11.4 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 34,100 mg/kg, and calcium is eliminated as a COPC.

No COPCs were detected in the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC C-03-022.

The results of the risk-screening assessment for the construction worker scenario are presented in Table I-4.2-249. No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.009, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Table I-4.2-250. No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.04, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 16 and the residential TPH-DRO HQ is 28 (Tables I-4.2-251 and I-4.2-252, respectively). The constituents of the TPH-DRO were not analyzed for at this site.

I-4.2.31 SWMU 60-002

SWMU 60-002 consists of three former storage areas (designated as West, Central, and East) on Sigma Mesa at TA-60. Because the areas are separate and distinct from each other, each area was evaluated separately for potential risk.

SWMU 60-002 (West)

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (11,200 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1.6 mg/d of calcium. At the intake level of 1.6 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 3.7 mg/d. At the intake level of 3.7 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 11,200 mg/kg, and calcium is eliminated as a COPC.

No COPCs were detected in the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for SWMU 60-002 (former western storage area).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-253 and I-4.2-254. The total excess cancer risk for the construction worker scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.6, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-255 and I-4.2-256. The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The cancer risk was from PAHs. The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Potential risk from TPH-GRO is based on constituents. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.01 and the residential TPH-DRO HQ is 0.03 (Tables I-4.2-257 and I-4.2-258, respectively).

SWMU 60-002 (Central)

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-259 and I-4.2-260. The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.0000007, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-261 and I-4.2-262. The total excess cancer risk for the construction worker scenario is 2×10^{-9}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.005, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-263 and I-4.2-264. The total excess cancer risk for the residential scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.02, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-GRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Potential risk from TPH-GRO is based on constituents, but the typical constituents associated with TPH-GRO are not identified as COPCs at this site.

SWMU 60-002 (East)

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (8230 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1.2 mg/d of calcium. At the intake level of 1.2 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 2.7 mg/d. At the intake level of 2.7 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 8230 mg/kg, and calcium is eliminated as a COPC.

Magnesium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, magnesium may be compared with the RDA for adults and children. The RDA is 420 mg/d of magnesium for an adult male, 320 mg/d for an adult female, and 240 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (3520 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.5 mg/d of magnesium. At the intake level of 0.5 mg/d of magnesium, the adult's ingestion of magnesium is far less than the RDA for magnesium of

320 mg/d to 420 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 1.2 mg/d of magnesium. At the intake level of 1.2 mg/d of magnesium, the child's ingestion of magnesium is far less than the RDA for magnesium of 240 mg/d. Therefore, no adverse health effects are expected from magnesium at 3520 mg/kg, and magnesium is eliminated as a COPC.

No COPCs were detected in the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for SWMU 60-002 (the former eastern storage area).

The results of the risk-screening assessment for the construction worker scenario are presented in Table I-4.2-265. No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is approximately 1, which is equivalent to the NMED target HI of 1 (NMED 2012, 219971). The HI was due in part to aluminum and cobalt.

The results of the risk-screening assessment for the residential scenario are presented in Table I-4.2-266. No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.007 and the residential TPH-DRO HQ is 0.01 (Tables I-4.2-267 and I-4.2-268, respectively).

I-4.2.32 AOC 60-004(f)

Calcium was retained as a COPC because it was detected above background in tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (3590 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.5 mg/d of calcium. At the intake level of 0.5 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 1.2 mg/d. At the intake level of 1.2 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 3590 mg/kg, and calcium is eliminated as a COPC.

No COPCs were detected in the depth interval of 0.0–1.0 ft and the industrial scenario was not evaluated for AOC 60-004(f).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-269, I-4.2-270, and I-4.2-271. The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.6, which less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.00006 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 I-4.2-272, I-4.2-273, and I-4.2-274. The total excess cancer risk for the residential scenario is 2 × 10^{-4}, which is slightly above the NMED target risk level of 1 × 10^{-5} (NMED 2012, 219971). The elevated cancer risk was from PAHs. The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.004 and the residential TPH-DRO HQ is 0.07 (Tables I-4.2-275 and I-4.2-276, respectively).

I-4.2.33 SWMU 60-006(a)

All of the samples collected at SWMU 60-006(a) were collected below 10 ft bgs (the shallowest sample was from 10.0–11.0 ft bgs) and as deep as 61 ft bgs. Therefore, no complete exposure pathways to receptors exist at this site, and human health risk was not evaluated.

I-4.2.34 SWMU 60-007(a)

The results of the risk-screening assessment for the industrial worker scenario are presented in Tables I-4.2-277. No carcinogenic COPCs were identified for the industrial scenario. The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-278. No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.01, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-279. No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.04, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.4, the construction worker TPH-DRO HQ is 0.2, and the residential TPH-DRO HQ is 0.4 (Tables I-4.2-280, I-4.2-281, and I-4.2-282, respectively).

I-4.2.35 SWMU 60-007(b)

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (7330 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1 mg/d of calcium. At the intake level of 1 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 2.4 mg/d. At the intake level of 2.4 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 7330 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-283 and I-4.2-284. The total excess cancer risk for the industrial scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-285 and I-4.2-286. The total excess cancer risk for the construction worker scenario is 5×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.2, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-287 and I-4.2-288. The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. The industrial TPH-DRO HQ is 0.04, the construction worker TPH-DRO HQ is 0.03, and the residential TPH-DRO HQ is 0.05 (Tables I-4.2-289, I-4.2-290, and I-4.2-291, respectively).

I-4.2.36 AOC C-61-002

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (13100 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 1.9 mg/d of calcium. At the intake level of 1.9 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 4.4 mg/d. At the intake level of 4.4 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 13100 mg/kg, and calcium is eliminated as a COPC.

Magnesium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, magnesium may be compared with the RDA for adults and children. The RDA is 420 mg/d of magnesium for an adult male, 320 mg/d for an adult female, and 240 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (4430 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.6 mg/d of magnesium. At the intake level of

0.6 mg/d of magnesium, the adult's ingestion of magnesium is far less than the RDA for magnesium of 320 mg/d to 420 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 1.5 mg/d of magnesium. At the intake level of 1.5 mg/d of magnesium, the child's ingestion of magnesium is far less than the RDA for magnesium of 240 mg/d. Therefore, no adverse health effects are expected from magnesium at 4430 mg/kg, and magnesium is eliminated as a COPC.

No COPCs were detected in the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC C-61-002.

The results of the risk-screening assessment for the construction worker scenario are presented in Table I-4.2-292. No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.6, which less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-293 and I-4.2-294. The total excess cancer risk for the residential scenario is 8×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.2 and the residential TPH-DRO HQ is 0.4 (Tables I-4.2-295 and I-4.2-296).

I-4.2-37 SWMU 61-002

Calcium was retained as a COPC because it was detected above background in soil and tuff; however, it does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's RAGS (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared with the RDA for adults and children. The RDA is 1200 mg/d of calcium for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration (14,900 mg/kg) at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 2.1 mg/d of calcium. At the intake level of 2.1 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum detected concentration at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 5 mg/d. At the intake level of 5 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 14,900 mg/kg, and calcium is eliminated as a COPC.

The results of the risk-screening assessment for the industrial scenario are presented in Tables I-4.2-297 and I-4.2-298. The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the construction worker scenario are presented in Tables I-4.2-299 and I-4.2-300. The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2012, 219971).

The results of the risk-screening assessment for the residential scenario are presented in Tables I-4.2-301 and I-4.2-302. The total excess cancer risk for the residential scenario is 5×10^{-5}, which is above the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The cancer risk was from PAHs. The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2012, 219971).

TPH-DRO and TPH-GRO were identified as COPCs. New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Potential risk from TPH-GRO is based on constituents. New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline. An industrial TPH-DRO HQ was not calculated because no COPCs were detected in the depth interval of 0.0–1.0 ft. The construction worker TPH-DRO HQ is 0.04, and the residential TPH-DRO HQ is 0.07 (Tables I-4.2-303 and I-4.2-304).

Although SWMU 61-002 is not regulated as a petroleum storage tank site, a release of a petroleum product apparently occurred. A Tier One evaluation was performed for informational purposes based on the New Mexico Petroleum Storage Tank Bureau (PSTB) corrective action guidelines (Title 20 of the New Mexico Administrative Code, Chapter 5, Part 12, Section 1213) and is presented in the remedy completion report (LANL 2007, 100722, Appendix E, section E-4.0). The Tier One Evaluation is intended to determine whether soil contamination poses a threat to groundwater in the future.

The New Mexico PSTB has developed a risk-based decision making (RBDM) program for evaluating releases of petroleum products from storage tanks. The RBDM includes a methodology for evaluating the risk to on-site and off-site receptors at petroleum release sites. These receptors include residents, commercial (i.e., industrial) workers, and construction workers. Exposure pathways considered include the ingestion of soil, outdoor inhalation of vapors and particulates, dermal contact with soil, leaching and potential ingestion of contaminated groundwater, and indoor inhalation of vapors. The RBDM process includes several tiers of evaluation. The first level (Tier One) is performed using generic exposure and transport parameters. If a site fails the Tier One evaluation, additional evaluations may be performed using more site-specific data.

The RBDM methodology is not strictly applicable to SWMU 61-002 because the release was not from regulated petroleum storage tanks. Also, the human health screening assessment presented in this appendix addressed most of the receptors and exposure routes considered by the RBDM. The RBDM is, however, specifically directed toward petroleum releases, which is one of the types of releases addressed by the ACA at SWMU 61-002. For this reason, a Tier One evaluation based on the PSTB methodology was conducted for SWMU 61-002 for information purposes and to verify that the results of the Tier One evaluation were consistent with the human health screening assessment.

The Tier One evaluation indicates the residual subsurface petroleum hydrocarbon concentrations do not exceed New Mexico PTSB risk-based screening levels for any current or reasonably foreseeable future exposure pathway. The results of the Tier One evaluation for surface and subsurface soil exposure pathways for commercial and construction workers are consistent with the results of the human health screening assessment and show no potential current or future risk by these pathways. As a result, no additional cleanup activities are recommended. The exposure to groundwater pathways was not evaluated in the human health screening assessment. The results of the Tier One evaluation indicate the representative concentration for 1,2-dibromoethane exceeded the risk-based screening level. However, 1,2-dibromoethane was not detected within the source area, and the representative concentration was based solely on detection limits. The Tier One groundwater screening assessment is very conservative and underestimates the risk-based screening levels. As a result, the site is not a potential source of groundwater contamination and no additional cleanup activities are recommended.

I-4.3 Vapor Intrusion Pathway

The potential for vapor intrusion of VOCs into a building was evaluated for the residential scenario. The potential risk was assessed 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 the sites in the Upper Sandia Aggregate Area, 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 each VOC COPC 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 I-2. HQs and HIs were calculated for noncarcinogenic COPCs and total excess cancer risks for carcinogenic COPCs. The NMED target risk level of 1×10^{-5} and NMED target HI of 1 were applied.

No VOCs were detected at SWMUs 03-002(c), 03-029, 03-056(d), 03-045(h), and 60-002 (Central). In addition, no VOC data are available for SWMUs 03-003(d) and 03-012(b) and AOC C-03-022. Therefore, the vapor intrusion pathway was not evaluated for these sites.

SWMUs 03-045(a), 03-045(b), 03-045(c), 03-045(e), 03-045(f), and 03-045(g), AOCs 03-014(b2) and 03-014(c2) are outfalls that discharge to the canyon and are not suitable for placement of a structure. SWMU 60-006(a) is a septic system with a seepage pit located near the mesa edge in an area not suitable for a building. SWMU 61-002 is located immediately next to East Jemez Road within the right of way and is not suitable for placement of a building (Figure I-4.3-1). The potential risk from vapor intrusion was not evaluated at these sites.

Only acetone was detected at SWMUs 03-021, 03-056(a), and 60-002 (West) in one or two samples at concentrations lower than at other sites. Only toluene was detected at SWMU 60-007(a) in one sample at a concentration lower than at other sites. The potential risks from the vapor intrusion pathway were orders of magnitude below the potential risks from soil. These sites were not evaluated for the vapor intrusion pathway.

The vapor intrusion pathway was evaluated as part of the residential scenario for the remaining sites in the Upper Sandia Canyon Aggregate Area.

I-4.3.1 SWMU 03-009(a)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-1 and I-4.3-2. The HI is approximately 0.00001, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 2×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.2 SWMU 03-009(i)

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-3. The HI is approximately 0.00000008, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.3 SWMU 03-013(i)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-4 and I-4.3-5. The HI is approximately 0.0000008, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 3×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.4 SWMUs 03-014(k,l,m,n)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-6 and I-4.3-7. The HI is approximately 0.000002, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 3×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.5 SWMU 03-014(o)

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-8. The HI is approximately 0.0000001, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.6 SWMU 03-014(u)

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-9. The HI is approximately 0.00000002, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.7 SWMU 03-015 and AOC 03-053

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-10 and I-4.3-11. The HI is approximately 0.000000003, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 5×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.8 AOC 03-047(g)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-12 and I-4.3-13. The HI is approximately 0.0000000005, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 2×10^{-12}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.9 AOC 03-051(c)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-14 and I-4.3-15. The HI is approximately 0.0000005, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 2×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.10 AOC 03-052(b)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-16 and I-4.3-17. The HI is approximately 0.00000003, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 2×10^{-10}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.11 SWMU 03-052(f)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-18 and I-4.3-19. The HI is approximately 0.0000002, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 8×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.12 SWMU 03-056(k)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-20 and I-4.3-21. The HI is approximately 0.0002, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 9×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.13 SWMU 03-059

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-22 and I-4.3-23. The HI is approximately 0.0000001, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 4×10^{-10}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.14 SWMU 60-002 (East)

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-24. The HI is approximately 0.000000009, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.15 AOC 60-004(f)

The results of the residential vapor intrusion screening assessments are presented in Tables I-4.3-25 and I-4.3-26. The HI is approximately 0.000002, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total excess cancer risk is approximately 1×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2012, 219971). These results do not change the HI and cancer risk calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.16 SWMU 60-007(b)

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-27. The HI is approximately 0.0000009, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.3.17 AOC C-61-002

The results of the residential vapor intrusion screening assessments are presented in Table I-4.3-28. The HI is approximately 0.000000003, which is less than the NMED target HI of 1 (NMED 2012, 219971). No carcinogenic VOCs were detected. This result does not change the HI calculated as a result of exposure to soil, discussed in section I-4.2.

I-4.4 Uncertainty Analysis

The human health risk-screening evaluations are subject to varying degrees and types of uncertainty. Aspects of data evaluation and COPC identification, exposure evaluation, toxicity evaluation, and the additive approach all contribute to uncertainties in the risk evaluation process.

I-4.4.1 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. All detected organic chemicals were retained for analysis. Inorganic chemicals were appropriately identified as COPCs because those either detected or with detection limits above background were retained for further analysis. However, background concentrations may not be representative of certain subunits of the Bandelier Tuff (e.g., fractured, clay-rich material) because such samples are not included in the background dataset.

Other uncertainties may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening evaluations include those detected less than estimated quantitation limits and nondetects above BVs, data evaluation uncertainties are expected to have little effect on the risk-screening results.

I-4.4.2 Exposure Evaluation

The current and reasonably foreseeable future land use 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 and construction worker 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 2012, 219971), while the construction worker SSLs are based on exposure of 8 h/d, 250 d/yr, and 1 yr (NMED 2012, 219971). The residential SSLs are based on exposure of 24 h/d, 350 d/yr, and 30 yr (NMED 2012, 219971). As a result, the industrial, construction worker, and residential scenarios evaluated at these sites likely overestimate the exposure and risk.

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 2012, 219971). When several upper-bound values (as are found in NMED 2012, 219971) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99th 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 Upper Sandia Canyon Aggregate Area have potential risks that exceed NMED target levels. The potential risks may be overestimated because of uncertainties associated with the EPCs and/or the COPCs at these sites.

SWMUs 03-014(k,l,m,n)

The total excess cancer risks for the industrial and residential scenarios were approximately 5×10^{-5} (5.7×10^{-5}) and 2×10^{-4}, which are above the NMED target risk level of 1×10^{-5}. The risks were primarily from PAHs in one sample. The primary COPCs contributing to the cancer risk were PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] as well as Aroclor-1254. The industrial cancer risk was calculated using the maximum detected concentrations of benzo(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene because there were too few detected concentrations to calculate a UCL. This risk estimate is conservative and is not representative of the exposure because the cancer risk is biased by single elevated detected concentrations of PAHs from a single location (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). The residential cancer risk was also biased by elevated detected concentrations of PAHs from a single location (the same PAHs were the primary contributors). The elevated PAH concentrations were detected only at the surface (0.0–0.17 ft bgs) at this location (03-03266), the PAHs were not detected in the deeper samples (0.75–1.75 ft and deeper), and this location is the only one at which the full suite of PAH analytes was detected. As noted in the site descriptions, a decaying 3-ft-high soil berm covered with 2 in. of weathered asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff and likely resulting in pieces of asphalt falling into the drying beds. The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detections being the result of residual contamination from site operations. Furthermore, the entire site [including Consolidated Unit 03-014(a)-99] was a former sanitary wastewater treatment plant, and it is unlikely PAHs were present in the wastewater other than at trace concentrations. Given the unrelated nature and source of the PAHs, the industrial cancer risk is 4×10^{-6} either without the one location with elevated PAHs or without PAHs at all. The residential cancer risk is 3 × 10^{-6} without the one location with elevated PAHs or 2 × 10^{-6} without PAHs at all.

The residential HI is approximately 1 (HI = 1.3) and includes lead, which has an HQ of 0.12. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC (46.7 mg/kg) is less than the residential SSL (400 mg/kg), and the contribution to the HI is reduced by approximately 0.1. Without lead, the HI is reduced to approximately 1.2. In addition, antimony contributes 0.27 to the HI based on a single detected concentration (8.3 mg/kg). This risk estimate is conservative and is not representative of the exposure across the site. Given this conservative risk estimate and the adjustment of the HI without lead, it is concluded that the residential HI (1.2) is equivalent to the NMED target risk level.

The industrial TPH-DRO HQ is 6, the construction worker TPH-DRO HQ is 4, and the residential TPH-DRO HQ is 6. The TPH-DRO concentrations were influenced by the results at three locations (03-3201, 03-03202, and 03-03265) where concentrations were 3000 mg/kg, 31,000 mg/kg, and 1870 mg/kg at 0.0–1.58 ft, 0.0–0.33 ft, and 10.0–11.0 ft, respectively. TPH-DRO concentrations at other locations were 130 mg/kg or less. At the three locations with elevated TPH-DRO, PAHs were not detected, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. The sludge drying beds were part of a WWTP that operated at TA-03 from 1951 to 1992 so the TPH-DRO is at least 20 yr old and is not the result of a recent spill.

NMED's TPH screening guidelines state that site cleanup decisions cannot be based solely on results of TPH sampling and that the TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants. The NMED screening guidelines are based on ingestion and use of groundwater as a potable water supply. However, because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the TPH detected. Therefore, remediation of the TPH-DRO is not warranted.

SWMU 03-014(u)

The residential HI is approximately 1 (HI = 1.11) and includes lead, which has an HQ of 0.126. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC (50.3 mg/kg) is less than the residential SSL (400 mg/kg), and the contribution to the HI is reduced by approximately 0.1. Without lead, the HI is reduced to approximately 0.99, which is equivalent to the NMED target HI.

SWMU 03-015 and AOC 03-053

The total excess cancer risk for the industrial scenario was approximately 2 × 10^{-5} (1.6 × 10^{-5}), which is slightly above the NMED target risk level of 1 × 10^{-5}. The risk was calculated using the maximum detected concentrations of the COPCs because fewer than eight samples were collected in the depth interval of 0.0–1.0 ft with only one to five detects. The primary COPCs contributing to the cancer risk were PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, and naphthalene] as well as Aroclor-1254 and Aroclor-1260. If 95% UCLs are calculated for the PAHs, the EPCs become 2.41 mg/kg, 2.17 mg/kg, 4.4 mg/kg, 2.62 mg/kg, 0.652 mg/kg, and 0.338 mg/kg, respectively. The Aroclor-1254 EPC remains the same because it was the only detected concentration, and the Aroclor-1260 EPC becomes a 95% UCL of 0.277 mg/kg. Using the 95% UCLs as the EPCs results in a total excess cancer risk of 1.4 × 10^{-5} for the industrial scenario. This risk estimate is still conservative and is not representative of the exposure because the Aroclor-1254 cancer risk is based on a single detected concentration, and the PAH EPCs are biased by one elevated detected concentration for each (other detected concentrations were an order of magnitude or more below the maximum detected concentration). Given this conservative risk estimate, it is concluded that the industrial cancer risk (1.4×10^{-5}) is equivalent to the NMED target risk level.

SWMU 03-045(a)

The total excess cancer risk for the industrial scenario was approximately 2×10^{-5} (1.98×10^{-5}), which is slightly above the NMED target risk level of 1×10^{-5}. The risk was calculated using the maximum detected concentrations of the COPCs because fewer than five detected concentrations were reported. The primary COPCs contributing to the cancer risk were PAHs [primarily benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene]. If 95% UCLs are calculated for these COPCs, the EPCs become 1.36 mg/kg, 1.53 mg/kg, 2.37 mg/kg, and 0.7 mg/kg, respectively. Substituting the 95% UCLs in the cancer risk calculations results in an industrial cancer risk of 8×10^{-6}, which is less than the NMED target risk level. The residential cancer risk is reduced to 1×10^{-4}, which is still above the NMED target risk level.

The residential HI of approximately 1 (HI = 1.05) is primarily from lead, which has an HQ of 0.8. Because the lead SSL is based upon blood lead levels, lead is evaluated separately from the other noncarcinogenic COPCs. The lead EPC (334.3 mg/kg) is less than the residential SSL (400 mg/kg). Without lead, the HI for SWMU 03-045(a) is reduced to approximately 0.2, which is less than the NMED target HI.

SWMU 03-045(e)

The TPH-DRO HQs for the construction worker and residential scenarios were approximately 2 and 3, respectively, based on the maximum detected concentration. The SWMU is an inactive outfall from a floor drain in the oil pump house (structure 03-57), located at the TA-03 power plant, building 03-22. The floor drain and associated drainline to the outfall were plugged in 1989. Therefore, the TPH at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH constituents have degraded, as evidenced by the fact that only three to four PAHs were detected at concentrations below 0.3 mg/kg, and toluene was detected at a concentration below the estimated quantitation limit (EQL). All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft bgs). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons.

NMED's TPH screening guidelines state that site cleanup decisions cannot be based solely on results of TPH sampling and that the TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants. The NMED screening guidelines are based on ingestion and the use of groundwater as a potable water supply. However, because individual petroleum-related contaminants were detected at concentrations below the EQLs and the regional aquifer is over 1000 ft bgs, no potable groundwater issues are related to the TPH detected. Therefore, remediation of the TPH is not warranted. In addition, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

SWMU 03-045(g)

The construction worker HI of approximately 1 (HI = 1.24) is primarily from manganese, which has an HQ of 0.9. Manganese was detected above the sediment BV at two locations (03-22535 and 03-22536) at concentrations of 582 mg/kg and 654 mg/kg, resulting in an EPC of 399.1 mg/kg. There appears to be some uncertainty regarding the environmental medium sampled in that the 2003 samples are identified as sediment, while the 2009 samples from location 03-22536 are identified as soil. In addition, the 2003 chain-of-custody forms (request number 1886S) identify the samples as soil. If the medium sampled was soil, then manganese would not be a COPC because all detected concentrations are below the soil BV (671 mg/kg). In addition, the construction worker SSL (440 mg/kg) is less than the soil and sediment BVs (543 mg/kg and 671 mg/kg), that is, it is comparable with naturally occurring manganese levels. The EPC, which is a 95% UCL, substantially overestimates the exposure and risk of manganese to a construction worker. Based on these uncertainties, the exposure to manganese is overestimated, and the HI is not representative of the potential risk to a construction worker. If manganese is not included, the HI for the construction worker is reduced to 0.3, which is less than the NMED target HI.

The potential cancer risk for the residential scenario is approximately 2×10^{-5} (1.7×10^{-5}), which is slightly above the NMED target risk level in part from arsenic (cancer risk is approximately 7×10^{-6}). Arsenic was detected above the sediment BV (3.98 mg/kg) at a concentration of 4.2 mg/kg. Again, given the uncertainty regarding the medium sampled, as described above, arsenic would not be a COPC if the medium was identified as soil (all concentrations were below the soil BV of 8.17 mg/kg). In addition, the mean exposure to arsenic across the site as represented by the 95% UCL (2.61 mg/kg) is similar to background locations because it falls within the ranges of arsenic background concentrations (0.3 mg/kg to 9.3 mg/kg for soil and 0.25 mg/kg and 3.6 mg/kg for sediment). The residential SSL (3.9 mg/kg) is also within the ranges of background concentrations and/or is less than the BVs. The arsenic data are therefore not a true indicator of an incremental cancer risk, and the site risk from arsenic is not substantially different from the risk from background concentrations. A comparison of the maximum sediment background concentration to the residential SSL results in a cancer risk of approximately 9×10^{-6} compared with approximately 7×10^{-6} when compared with the EPC. Given the infrequent and isolated occurrence of arsenic above the sediment BV and the higher cancer risk from sediment background versus the mean exposure, the potential exposure to, and risk from arsenic are substantially overestimated by the screening-level comparison. Therefore, the total excess cancer risk for the residential scenario is approximately 1×10^{-5}, which is equivalent to the NMED target risk level.

AOCs 03-047(g) and 03-051(c)

The total excess cancer risks for the residential scenario at these sites are 2×10^{-5} and 1×10^{-4} from PAHs. AOC 03-047(g) is a paved area on the north side of building 03-141 at TA-03 where drums of acetone, vacuum pump oil, and ethylene glycol were stored. AOC 03-051(c) consists of two former areas of stained asphalt at TA-03 attributed to operational leaks of vacuum pump oil. Interviews with individuals who worked in building 03-0141 when the vacuum pumps were in use indicated that only basic light non-petroleum mineral oil was used. Therefore, the PAHs are not from the established use of the sites. The PAHs are likely from the asphalt paved areas in and around the AOCs. The total excess cancer risks for the residential scenario at these sites without the PAHs are 3×10^{-6} and 5×10^{-7}, respectively, which are less than the NMED target risk level. The potential cancer risks related to PAHs are not related to site operations but are from facility infrastructure and are not issues for these sites.

SWMU 03-052(f)

The total excess cancer risk for the industrial scenario was approximately 1 × 10^{-4} (1.1 × 10^{-4}), which is above the NMED target risk level of 1 × 10^{-5}. The risk was calculated using the maximum detected concentrations of the COPCs because fewer than eight samples were collected in the depth interval of 0.0–1.0 ft. The primary COPCs contributing to the cancer risk were PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene]. If 95% UCLs are calculated for these PAHs and used in the risk calculations the total excess cancer risk is 8 × 10^{-5} for the industrial scenario. This risk estimate is still conservative and is not representative of the exposure because the EPCs are biased by one elevated detected concentration for each COPC (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). In addition, the concentrations in the deeper sample (1.0–2.0 ft) at the location of the maximum concentrations are 2 orders of magnitude lower. The large difference between the maximum concentrations and the deeper concentrations indicates the presence of a piece(s) of asphalt in the sample, which would not result in a risk to an individual. The total excess cancer risk without the maximum concentrations is 1 × 10^{-5} for the industrial scenario.

SWMU 03-052(f) is a former NPDES-permitted outfall, which received wastewater from floor drains [AOC 03-013(b)], sinks, water fountains, and a storm drain [SWMU 03-013(a)], which served building 03-38 until 1987 when the drains in building 03-38 were rerouted to the TA-03 sanitary sewer system. Stoddard solvents, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains to this outfall. Spent paint solvents and cutting oils contaminated with machined beryllium particles may also have been released to the floor drains during the 1960s and 1970s. Cooling water for welding torches was also discharged directly to the drains. In addition, three minor spills occurred that may have discharged to the outfall: 200 gal. of water-waste oil mixture, approximately 1 qt of compressor oil, and approximately 15 gal. of diesel fuel. The diesel-contaminated asphalt and soil were removed. These spills occurred approximately 25 yr ago, and over time related contaminants have been washed through the outfall and channel. This is supported by the low TPH-DRO HQ of 0.4 for the industrial scenario. Runoff from parking lots and the surrounding areas also discharge to the outfall and, as noted in the RFI report, concentrations of PAHs were attributed to runoff from the adjacent parking lot (LANL 1996, 052930). The area that drains to the outfall has been drastically redone since the RFI. As a result, what remains in the channel below the outfall is not related to site operations but rather related to the runoff from the adjacent infrastructure.

The channel is approximately 365 ft long and runs through an area where paved sidewalks run north and south and parallel to the channel (the sidewalks are at least 50 ft from the channel) so a Laboratory worker would not be exposed to the water and soil, unless they purposefully went off the sidewalk and waded into the channel, which is impracticable. The area is not a used for recreation. The estimated risk is based on exposure to soil for 8 h/d, 225 d/yr, and 25 yr, which is unrealistic given the nature of this site. Another worker exposure is the construction worker scenario, which has a total excess cancer risk of 5 × 10^{-6}. Even though the ingestion rate and exposure frequency are higher for the construction worker, a primary difference between the two scenarios is the exposure duration (1 yr versus 25 yr). Both worker exposures are still unrealistic as the site is off the established walking paths and individuals are not likely to be exposed for any length of time, if at all. The area is not used for recreation. Therefore, the potential risk is primarily from PAHs that are not site related and the exposure and risk are not issues for a Laboratory worker at this site.

SWMU 60-002 (West)

The potential cancer risk for the residential scenario is approximately 1×10^{-5} (1.15×10^{-5}). The cancer risk is based on the maximum detected concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene, which were detected in only one sample. The use of the maximum detected concentrations to represent exposure overestimates the potential risk to a receptor. Given this conservative risk estimate, it is concluded that the residential cancer risk is at least equivalent to the NMED target risk level.

SWMU 60-002 (East)

The construction worker HI is approximately 1 (HI = 1.06) and is based on the maximum detected concentrations of the COPCs because only seven samples were collected. The use of the maximum detected concentrations to represent exposure overestimates the potential risk to a receptor. The HQs for aluminum and cobalt contribute 92% of the HI (0.97). If 95% UCLs are calculated for these COPCs, the resultant aluminum and cobalt HQs are reduced to 0.75 and the construction worker HI is 0.8, which is less than the NMED target level.

I-4.4.3 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 2012, 219971). 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 some chemicals that do not have EPA-approved or provisional toxicity values also contributes to uncertainty in risk assessment. In this assessment, a surrogate was used to establish toxicity values based on structural similarity (NMED 2003, 081172) for acenaphthylene, benzo(g,h,i)perylene, butylbenzene(sec-) and (tert-), and isopropyltoluene(4-). The overall impact of surrogates on the risk assessment is minimal because these COPCs were detected at low concentrations and the HQs were less than 0.1.

Carbazole was detected in one sample at SWMUs 03-014(k,l,m,n) and 03-014(o) but currently does not have a SSL for comparison. The detected concentrations (3.2 mg/kg and 0.037 mg/kg) were in surface samples at both sites. EPA's Provisional Peer Reviewed Toxicity Vales for Superfund web site (http://hhpprtv.ornl.gov/pprtv_user.html) indicates that no toxicity values for carbazole are available because of the lack of suitable oral or inhalation data in both humans and animals. The 2007 EPA Region 6 screening tables (EPA 2007, 099314) had residential and outdoor worker SSLs of 240 mg/kg and 960 mg/kg (corrected to a 10^{-5} risk), respectively. Given the infrequent detection and the low concentrations relative to the old Region 6 SSLs, carbazole does not contribute substantially to the overall total excess cancer risk at either site.

I-4.4.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally not known, 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 and on different target organs but are addressed additively.

I-4.5 Interpretation of Human Health Risk Screening Results

I-4.5.1 SWMU 03-002(c)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.03, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 9×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.03, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.07, which is less than the NMED target HI of 1.

I-4.5.2 AOC 03-003(d)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. Noncarcinogenic COPCs were not identified for the industrial scenario.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.04, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.2, which is less than the NMED target HI of 1.

I-4.5.3 SWMU 03-009(a)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is less than the NMED target risk of 1×10^{-5}. The industrial HI is 0.003, which is less than the NMED target of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.01.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.01, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.05.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.05, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.09.

I-4.5.4 SWMU 03-009(i)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.03, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.02.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 8×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.009.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.3, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.02.

I-4.5.5 SWMU 03-012(b)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk of 1×10^{-5}. The industrial HI is 0.005, which is less than the NMED target of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.1, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer for the residential scenario is approximately 5×10^{-6}, which is below the NMED target risk level of 1×10^{-5}. The residential HI is 0.5, which is less than the NMED target HI of 1.

I-4.5.6 SWMU 03-013(i)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk of 1×10^{-5}. The industrial HI is 0.2, which is less than the NMED target of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the industrial scenario and the industrial HI were less than the NMED target levels, as noted above. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.8.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 9×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The HI is 0.2, which are less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the construction worker scenario and the construction worker HI were less than the NMED target levels, as noted above. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.5.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5}. The HI is 0.5, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the residential scenario was equivalent to the NMED target level and the residential HI was less than the NMED target level, as noted above. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.9.

I-4.5.7 AOC 03-014(b2)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.05, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.02.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.05, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.01.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.2, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.02.

I-4.5.8 AOC 03-014(c2)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.04, which is less than the NMED target HI of 1. No radionuclides were detected in the surface samples.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.02.

Construction Worker Scenario

The total excess cancer risk is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2012, 219971). The HI is 0.7, which is less than the NMED target HI of 1 (NMED 2012, 219971). The total dose is 0.009 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 9×10^{-9}, based on a comparison with EPA's outdoor worker preliminary remediation goals (PRGs) for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.02.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5}. The residential HI is 3, which is above the NMED target HI of 1. The elevated cancer risk is from PAHs and the elevated HI is from Aroclor-1254. The total dose is 0.02 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 3×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.04.

I-4.5.9 SWMU 03-014(k,l,m,n)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 5×10^{-5}, which is above the NMED target risk of 1×10^{-5}. The elevated cancer risk was from PAHs. As discussed in the uncertainty analysis (section I-4.3.2), this risk estimate is conservative and is not representative of the exposure because the cancer risk is based on single elevated detected concentrations of PAHs from a single location (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). The elevated PAH concentrations were detected only at the surface (0.0–0.17 ft bgs) at this location, the PAHs were not detected in the deeper samples (0.75–1.75 ft and deeper), and this location is the only one at which the full suite of PAH analytes was detected. As noted in the site descriptions, a decaying 3-ft-high soil berm covered with 2 in. of weathered asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff and likely resulting in pieces of asphalt falling into the drying beds. The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detection being the result of residual contamination from site operations. Furthermore, the entire site [including Consolidated Unit 03-014(a)-99] was a former sanitary wastewater treatment plant, and it is unlikely PAHs were present in the wastewater other than at trace concentrations. Given the unrelated nature and source of the PAHs, the industrial cancer risk is 4×10^{-6} without the one location with elevated PAHs or without PAHs at all. The industrial HI is 0.2, which is less than the NMED target of 1. The total dose is 0.1 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 5. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.4, which is less than the NMED target HI of 1. The total dose is 0.1 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 5×10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 3. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 6.0–7.0 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk was from PAHs. As discussed in the uncertainty analysis (section I-4.3.2), this risk estimate is conservative and not representative of the exposure because the cancer risk is based on single elevated detected concentrations of PAHs from a single location (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). The elevated PAH concentrations were detected only at the surface (0.0–0.17 ft bgs) at this location, the PAHs were not detected in the deeper samples (0.75–1.75 ft and deeper), and this location is the only one at which the full suite of PAH analytes was detected. As noted in the site descriptions, a decaying 3-ft-high soil berm covered with 2 in. of weathered asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff and likely resulting in pieces of asphalt falling into the drying beds. The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detection being the result of residual contamination from site operations. Furthermore, the entire site [including Consolidated Unit 03-014(a)-99] was a former sanitary wastewater treatment plant and it is unlikely that PAHs were present in the wastewater other than at trace concentrations. Given the unrelated nature and source of the PAHs, the residential cancer risk is 3×10^{-6} without the one location with elevated PAHs or 2×10^{-6} without PAHs at all. The residential HI is approximately 1 (1.3) in part from lead. The residential HI is approximately 1.2 without lead. In addition, the antimony HQ is based on a single detected concentration (all other results are nondetects). This risk estimate is not representative of exposure across the site, and it is concluded that the residential HI is equivalent to the NMED target HI of 1. The lead EPC is below the residential SSL (400 mg/kg). The total dose is 0.2 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 5. As discussed in the uncertainty analysis (section I-4.3.2), PAHs were not detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because no individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at 14.0–15.0 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

I-4.5.10 SWMU 03-014(o)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-6}, which is less than the NMED target risk of 1×10^{-5}. The industrial HI is 0.1, which is less than the NMED target of 1. The total dose is 0.08 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5}. The construction worker HI is 0.1, which is less than the NMED target HI of 1. The total dose is 0.2 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 9 × 10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.002.

Residential Scenario

The total excess cancer risk for the residential scenario is 7 × 10^{-5}, which is above the NMED target risk level of 1 × 10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.4, which is less than the NMED target HI of 1. The total dose is 14 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 3 × 10^{-5}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The potential dose/risk is based on the maximum detected concentration of strontium-90 (8.01 pCi/g). Strontium-90 was detected in 2 samples out of 16 samples collected from the sludge drying beds. The other detected strontium-90 concentration (3.2 pCi/g) results in a dose of 5 mrem/yr and an equivalent total risk of 1 × 10^{-6}. Therefore, the dose and risk are overestimated by the maximum strontium-90 concentration.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.004.

I-4.5.11 SWMU 03-014(u)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1 × 10^{-6}, which is less than the NMED target risk of 1 × 10^{-5}. The industrial HI is 0.09, which is less than the NMED target of 1. The total dose is 0.0007 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2 × 10^{-9}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 7 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5}. The construction worker HI is 0.3, which is less than the NMED target HI of 1. The total dose is 0.005 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2 × 10^{-9}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ is 0.07.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is approximately 1 (0.99) without lead and is equivalent to the NMED target HI of 1. The lead EPC is below the residential SSL (400 mg/kg). The total dose is 0.009 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 1×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ is 0.1.

I-4.5.12 SWMU 03-015 and AOC 03-053

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5}. The elevated cancer risk was primarily from PAHs as well as Aroclor-1254. As discussed in the uncertainty analysis (section I-4.3.2), if 95% UCLs are substituted for the maximum detected concentrations, the total excess cancer risk for the industrial scenario is 1.4×10^{-5}. The Aroclor-1254 EPC remains the same because it was the only detected concentration. This risk estimate is still conservative and is not representative of the exposure because the Aroclor-1254 cancer risk is based on a single detected concentration and the PAH EPCs are biased by one elevated detected concentration for each analyte (other detected concentrations were an order of magnitude or more below the maximum detected concentration). Given this conservative risk estimate, it is concluded that the adjusted industrial cancer risk (1.4×10^{-5}) is equivalent to the NMED target risk level. The industrial HI is 0.06, which is less than the NMED target HI of 1. The total dose is 0.08 mrem/yr, which is less than the DOE target dose of 25 mrem/yr.

The total dose is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ is 0.05.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The HI is 0.5, which is less than the NMED target HI of 1. The total dose is 0.07 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 7×10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No 2/crankcase oil. The construction worker HQ is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-5}, which is above the NMED target risk level of 1×10^{-5}. The residential HI is approximately 2, which is above the NMED target HI of 1. The elevated cancer risk is primarily from PAHs, and the elevated HI is from Aroclor-1254.The total dose is 0.2 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was used to compare with the TPH-DRO EPC. The residential HQ is 0.05.

I-4.5.13 SWMU 03-021

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.3, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.3, which less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The HI is 0.8, which is less than the NMED target HI of 1.

I-4.5.14 SWMU 03-029

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.003, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial HQ was 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.02, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker HQ was 0.003.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.06, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential HQ was 0.005.

I-4.5.15 SWMU 03-045(a)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. As discussed in the uncertainty analysis (section I-4.3.2), if 95% UCLs are substituted for the maximum detected concentrations, the total excess cancer risk for the industrial scenario is 8×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.5, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the industrial scenario was slightly above the NMED target level, and the industrial HI was less than the NMED target level, as noted above. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.2.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.5, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the construction worker scenario and the construction worker HI were less than the NMED target levels, as noted above. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.07.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is primarily from PAHs. The residential HI is approximately 0.2 without lead, which is less than the NMED target HI of 1. The lead EPC is below the residential SSL (400 mg/kg).

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the residential scenario was above the NMED target level and the residential HI was equivalent to the NMED target level, as noted above. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.1.

I-4.5.16 SWMU 03-045(b)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.003, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.005.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 5×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.03, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.005.

Residential Scenario

The total excess cancer risk for the residential scenario is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.009.

I-4.5.17 SWMU 03-045(c)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.002, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.002.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-5}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs as well as Aroclor-1260. The residential HI is 0.8, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.05.

I-4.5.18 SWMU 03-045(e)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.09, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.2.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 4×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 2. As discussed in the uncertainty analysis (section I-4.3.2), the TPH-DRO at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH-DRO constituents have degraded as evidenced by the fact that only four PAHs were detected at concentrations less than 0.3 mg/kg. All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft bgs). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because individual petroleum-related contaminants were detected at concentrations below the EQLs and the regional aquifer is over 1000 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.3, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 3. As discussed in the uncertainty analysis (section I-4.3.2), the TPH at the site is at least 20 yr old, is weathered, and is not the result of a fresh or recent spill. The TPH-DRO constituents have degraded as evidenced by the fact that only four PAHs were detected at concentrations less than 0.3 mg/kg. All that is left are the longer-chained hydrocarbons as residue in a limited area and depth (detected at 0.0–2.0 ft bgs). These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. Because individual petroleum-related contaminants were detected at concentrations below the EQLs and the regional aquifer is over 1000 ft bgs, no potable groundwater issues are related to the TPH detected. However, further sampling to define the extent of the TPH-DRO will be conducted and the data reevaluated to determine if corrective action is warranted.

I-4.5.19 SWMU 03-045(f)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.002, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 4×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.01, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.03, which is less than the NMED target HI of 1.

I-4.5.20 SWMU 03-045(g)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the industrial scenario and the industrial HI were less than the NMED target levels as noted above. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.03.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 1, which is equivalent to the NMED target HI of 1. As discussed in the uncertainty analysis (section I-4.3.2), the exposure to manganese is overestimated, and the HI is not representative of the potential risk to a construction worker. If manganese is not included, the HI for the construction worker is reduced to 0.3, which is less than the NMED target HI.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the construction worker scenario and the construction worker HI were less than the NMED target levels, as noted above. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.02.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs as well as arsenic. As discussed in the uncertainty analysis (section I-4.3.2), the potential exposure to, and risk from, arsenic were substantially overestimated by the screening level comparison. Arsenic does not contribute to the potential incremental cancer risk at the site and the total excess cancer risk for the residential scenario is approximately 1×10^{-5}, which is equivalent to the NMED target risk level. The residential HI is 0.8, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the residential scenario was slightly above the NMED target level and the residential HI was less than the NMED target level, as noted above. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.03.

I-4.5.21 SWMU 03-045(h)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.005, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.5, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.5, which is less than the NMED target HI of 1.

I-4.5.22 AOC 03-047(g)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.02, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.1, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. As discussed in section I-4.3.2, the elevated cancer risk under the residential scenario is not related to site operations but is from facility infrastructure and is not an issue for this site. The residential HI is 0.4, which is less than the NMED target HI of 1.

I-4.5.23 AOC 03-051(c)

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC 03-051(c).

Construction Worker Scenario

The total excess cancer risk for the construction worker is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.4, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.05.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. As discussed in section I-4.3.2, the elevated cancer risk under the residential scenario is not related to site operations but is from facility infrastructure and is not an issue for this site. The residential HI is 0.6, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.09.

I-4.5.24 AOC 03-052(b)

Industrial Scenario

No carcinogenic COPCs were identified for the industrial scenario. The industrial HI is 0.1, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.6, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.8, which is less than the NMED target HI of 1.

I-4.5.25 SWMU 03-052(f)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. As discussed in the uncertainty analysis (section I-4.3.2), if 95% UCLs are substituted for the maximum detected concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, the total excess cancer risk for the industrial scenario is 8×10^{-5}. This risk estimate is still conservative and is not representative of the exposure because the EPCs are biased by one elevated detected concentration for each COPC (other detected concentrations were an order of magnitude or more below the maximum detected concentrations). In addition, the concentrations in the deeper sample at the location of the maximum concentrations are 2 orders of magnitude lower. The large difference between the maximum concentrations and the deeper concentrations indicates the presence of a piece(s) of asphalt in the sample, which would not result in a risk to an individual. The total excess cancer risk without the maximum concentrations is 1×10^{-5}.

SWMU 03-052(f) is a former NPDES-permitted outfall, which received wastewater from floor drains [AOC 03-013(b)], sinks, water fountains, and a storm drain [SWMU 03-013(a)], which served building 03-38 until 1987 when the drains in building 03-38 were rerouted to the TA-03 sanitary sewer system. Stoddard solvents, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains to this outfall. Spent paint solvents and cutting oils contaminated with machined beryllium particles may also have been released to the floor drains during the 1960s and 1970s. Cooling water for welding torches was also discharged directly to the drains. In addition, three minor spills occurred that may have discharged to the outfall; 200 gal of water-waste oil mixture, approximately 1 qt of compressor oil, and approximately 15 gal. of diesel fuel. The diesel-contaminated asphalt and soil were removed. These spills occurred approximately 25 yr ago and related contaminants have been washed through the outfall and channel over time. This is supported by the low TPH-DRO HQ of 0.4 for the industrial scenario. Runoff from parking lots and the surrounding areas also discharge to the outfall and as noted in the RFI report concentrations of PAHs were attributed to runoff from the adjacent parking lot (LANL 1996, 052930). The area that drains to the outfall has been drastically redone since the RFI. As a result, what remains in the channel below the outfall is likely not related to site operations but rather is related to the runoff from the adjacent infrastructure.

The channel is approximately 365 ft long and runs through an area where paved sidewalks run north and south and parallel to the channel (the sidewalks are at least 50 ft from the channel) so a Laboratory worker would not be exposed to the water and soil, unless he or she purposefully walked off the sidewalk and waded into the channel, which is impracticable. The estimated risk is based on exposure to soil for 8 h/d, 225 d/yr, and 25 yr, which is very unrealistic given the nature of this site. Another worker exposure is the construction worker scenario, which has a total excess cancer risk of 5×10^{-6}. Even though the ingestion rate and exposure frequency are higher for the construction worker, a primary difference between the two scenarios is the exposure duration (1 yr versus 25 yr). Both worker exposures are still unrealistic as the site is off the established walking paths, and individuals are unlikely to be exposed for any length of time, if at all. The area is not used for recreation. Therefore, the potential risk is primarily from PAHs that are not site related and the exposure and risk are not issues for a Laboratory worker at this site. TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.4.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.2.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.3, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.3.

I-4.5.26 SWMU 03-056(a)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.0001, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.06.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.01, which less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.07.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.03, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.1.

I-4.5.27 SWMU 03-056(d)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.003, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.04, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.002.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.003.

I-4.5.28 AOC 03-056(k)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5}. The industrial HI is 0.02, which is less than the NMED target HI of 1. The total dose is 0.2 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2 × 10^{-6}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 3 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5}. The construction worker HI is 0.08, which is less than the NMED target HI of 1. The total dose is 0.3 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2 × 10^{-6}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-5}, which is above the NMED target risk level of 1 × 10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.3, which is less than the NMED target HI of 1. The total dose is 0.7 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 6 × 10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

I-4.5.29 SWMU 03-059

Industrial Scenario

The total excess cancer risk for the industrial scenario is 7 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5}. The industrial HI is 0.003, which is less than the NMED target HI of 1. The total dose is 0.00008 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 4 × 10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.04.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5}. The construction worker HI is 0.6, which less than the NMED target HI of 1. The total dose is 0.00007 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 1 × 10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.006.

Residential Scenario

The total excess cancer risk for the residential scenario is 1 × 10^{-5}, which is equivalent to the NMED target risk level of 1 × 10^{-5}. The residential HI is 2, which is above the NMED target HI of 1. The elevated HI is from Aroclor-1254. The total dose is 0.005 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.01.

I-4.5.30 AOC C-03-022

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft and the industrial scenario was not evaluated for AOC C-03-022.

Construction Worker Scenario

No carcinogenic COPCs were identified at the site. The construction worker HI is 0.009, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 16.

Residential Scenario

No carcinogenic COPCs were identified at the site. The residential HI is 0.04, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 28.

I-4.5.31 SWMU 60-002

SWMU 60-002 consists of three former storage areas (designated as West, Central, and East) on Sigma Mesa at TA-60. Because the areas are separate and distinct from each other, each area was evaluated separately for potential risk.

Western Storage Area

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for SWMU 60-002 (former western storage area).

Construction Worker Scenario

The total excess cancer risk for the construction worker is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.6, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the construction worker scenario and the construction worker HI were less than the NMED target levels, as noted above. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.01.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5}. The residential HI is 0.6, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, PAHs were identified as COPCs at this site. The total excess cancer risk for the residential scenario was equivalent to the NMED target level and the residential HI was less than the NMED target level, as noted above. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.03.

Central Storage Area

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.0000007, which is less than the NMED target HI of 1.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 2×10^{-9}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.005, which is less than the NMED target HI of 1.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.02, which is less than the NMED target HI of 1.

TPH-GRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening levels for TPH-GRO. Trace levels of a few PAHs were detected at the site but the total excess cancer risks and the HIs were less than the NMED target levels, as noted above.

Eastern Storage Area

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft and the industrial scenario was not evaluated for SWMU 60-002 (eastern storage area).

Construction Worker Scenario

No carcinogenic COPCs were identified at the site. The construction worker HI is approximately 1, which is equivalent to the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.007.

Residential Scenario

No carcinogenic COPCs were identified at the site. The residential HI is 0.8, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.01.

I-4.5.32 AOC 60-004(f)

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC 60-004(f).

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.6, which less than the NMED target HI of 1. The total dose is 0.00006 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 1×10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.004.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-4}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.8, which is less than the NMED target HI of 1. The total dose is 0.004 mrem/yr, which is less than the DOE target dose of 25 mrem/yr. The total dose is equivalent to a total risk of 2×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.07.

I-4.5.33 SWMU 60-006(a)

All the samples at SWMU 60-006(a) were collected below 10 ft bgs (the shallowest sample was from 10.0–11.0 ft bgs) and as deep as 61 ft bgs. Therefore, no complete exposure pathways to receptors exist at this site, and human health risk was not evaluated.

I-4.5.34 SWMU 60-007(a)

Industrial Scenario

No carcinogenic COPCs were identified for the industrial scenario. The industrial HI is 0.002, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.4.

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.01, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.2.

Residential Scenario

No carcinogenic COPCs were identified for the residential scenario. The residential HI is 0.04, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.4.

I-4.5.35 SWMU 60-007(b)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.01, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State industrial screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The industrial TPH-DRO HQ is 0.04.

Construction Worker Scenario

The total excess cancer risk for the construction worker scenario is 5×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.03.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.1, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.05.

I-4.5.36 AOC C-61-002

Industrial Scenario

No samples were collected from the depth interval of 0.0–1.0 ft, and the industrial scenario was not evaluated for AOC C-61-002.

Construction Worker Scenario

No carcinogenic COPCs were identified for the construction worker scenario. The construction worker HI is 0.6, which less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.2.

Residential Scenario

The total excess cancer risk for the residential scenario is 8×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.6, which is less than the NMED target HI of 1.

TPH-DRO was identified as a COPC. The New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.4.

I-4.5.37 SWMU 61-002

Industrial Scenario

The total excess cancer risk for the industrial scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.01, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, benzene, ethylbenzene, toluene, xylenes, and PAHs were identified as COPCs at this site. The total excess cancer risk for the industrial scenario and the industrial HI were less than the NMED target levels as noted above. An industrial TPH-DRO HQ was not calculated because TPH-DRO was not detected in the depth interval of 0.0–1.0 ft.

Construction Worker Scenario

The total excess cancer risk for the construction worker is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, benzene, ethylbenzene, toluene, xylenes, and PAHs were identified as COPCs at this site. The total excess cancer risk for the construction worker scenario and the construction worker HI were less than the NMED target levels as noted above. New Mexico State screening guidelines (NMED 2012, 219971) do not provide TPH screening guidelines for the construction worker scenario; therefore, the construction worker was evaluated using the industrial screening guideline for diesel No. 2/crankcase oil. The construction worker TPH-DRO HQ is 0.04.

Residential Scenario

The total excess cancer risk for the residential scenario is 5×10^{-5}, which is above the NMED target risk level of 1×10^{-5}. The elevated cancer risk is from PAHs. The residential HI is 0.8, which is less than the NMED target HI of 1.

TPH-DRO and TPH-GRO were identified as COPCs. New Mexico State screening guidelines (NMED 2012, 219971) do not provide screening levels for TPH-GRO. Of the constituents associated with TPH-GRO, benzene, ethylbenzene, toluene, xylenes, and PAHs were identified as COPCs at this site. The total excess cancer risk for the residential scenario was above the NMED target level and the residential HI was less than the NMED target level as noted above. New Mexico State residential screening guideline for diesel No. 2/crankcase oil (NMED 2012, 219971) was compared with the TPH-DRO EPC. The residential TPH-DRO HQ is 0.07.

I-5.0 ECOLOGICAL RISK SCREENING EVALUATIONS

The approach for conducting ecological evaluations is described in the “Screening Level Ecological Risk Evaluation Methods, Revision 3” (LANL 2012, 226715). The evaluation consists of four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

I-5.1 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening evaluation. The ecological scoping checklist (Attachment I-3) is a useful tool for organizing existing ecological information. 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 Upper Sandia Canyon Aggregate Area (Attachment I-3). Most of the area on the mesa top is developed and typically provides minimal potential habitat for ecological receptors. The quality of the habitat varies and, in some cases, includes minimal amounts of native grasses, forbs, and trees that can be 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. 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, external irradiation, and food web transport (Attachment I-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:

- a plant
- 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 3” (LANL 2012, 226715). The Mexican spotted owl is the only T&E species known to frequent the Laboratory area. The owl’s primary habitat is densely forested canyons, and it has not been observed roosting in Sandia Canyon. However, the owl may use the canyons and surrounding areas to forage.

I-5.2 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. These 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 evaluation, assessment endpoints are any adverse effects on ecological receptors, where receptors are populations and communities (EPA 1997, 059370). The purpose of the ecological screening evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species or treaty-protected species (EPA 1999, 070086), because 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.

I-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 Upper Sandia Canyon Aggregate Area are presented in Tables I-2.3-1 through Table I-2.3-84.

An ecological risk-screening assessment was not conducted for SWMU 60-006(a) because samples were collected from depths of 10 ft or greater and no complete exposure pathways to ecological receptors are present.

The ESLs were obtained from the ECORISK Database, Version 3.1 (LANL 2012, 226667) and are presented in Table I-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 3.1 (LANL 2012, 226667).

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. HQs greater than 0.3 are used to identify COPECs requiring additional evaluation (LANL 2012, 226715). 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.

I-5.3.1 SWMU 03-002(c)

The results of the minimum ESL comparisons are presented in Table I-5.3-2. Antimony and lead are retained as COPECs because the HQs were greater than 0.3.

Sodium 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 I-5.3-3. The HI analysis indicates that the robin (all feeding guilds), shrew, and plant have HIs greater than 1, and the deer mouse has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.2 AOC 03-003(d)

The results of the minimum ESL comparisons are presented in Table I-5.3-4. Aroclor-1254 and Aroclor-1260 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 I-5.3-5. The HI analysis indicates that the robin (omnivore and insectivore) and the red fox have HIs greater than 1, and the kestrel (both feeding guilds) has HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.3 SWMU 03-009(a)

The results of the minimum ESL comparisons are presented in Table I-5.3-6. Antimony, chromium, and selenium are retained as COPECs because the HQs were greater than 0.3.

Butylbenzene(sec-), 4-isopropyltoluene, TPH-DRO, 1,2,4-trimethylbenzene, and 1,3,5-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 I-5.3-7. The HI analysis indicates that the shrew and plant have HIs greater than 1, and the robin (insectivore) and deer mouse have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.4 SWMU 03-009(i)

The results of the minimum ESL comparisons are presented in Table I-5.3-8. Antimony, barium, chromium, cobalt, copper, cyanide, lead, nickel, selenium, vanadium, Aroclor-1254, and Aroclor-1260 are retained as COPECs because the HQs were greater than 0.3.

Calcium and TPH-DRO 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 I-5.3-9. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), deer mouse, shrew, and plant have HIs greater than 1, and the kestrel (top carnivore) and cottontail have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.5 SWMU 03-012(b)

The results of the minimum ESL comparisons are presented in Table I-5.3-10. Antimony, chromium, hexavalent chromium, silver, zinc, Aroclor-1254, and Aroclor-1260 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 I-5.3-11. The HI analysis indicates that all the receptors have HIs greater than 1, except the earthworm, which has an HI equivalent to 1, and the robin (herbivore), which has an HI less than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.6 SWMU 03-013(i)

The results of the minimum ESL comparisons are presented in Table I-5.3-12. Antimony, copper, lead, selenium, zinc, acetone, Aroclor-1242, Aroclor-1254, Aroclor-1260, benzoic acid, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Ethylbenzene, 4-isopropyltoluene, TPH-DRO, TPH-GRO, 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 I-5.3-13. The HI analysis indicates that all the receptors have HIs greater than 1, except the earthworm, which has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.7 AOC 03-014(b2)

The results of the minimum ESL comparisons are presented in Table I-5.3-14. Antimony, chromium, cyanide, lead, selenium, zinc, Aroclor-1254, Aroclor-1260, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Perchlorate and TPH-DRO 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 I-5.3-15. The HI analysis indicates that all the receptors have HIs greater than 1, except the cottontail and red fox, which have HIs equivalent to 1, and the earthworm, which has an HI less than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.8 AOC 03-014(c2)

The results of the minimum ESL comparisons are presented in Table I-5.3-16. Antimony, chromium, copper, cyanide, mercury, selenium, silver, zinc, Aroclor-1248, Aroclor-1254, and Aroclor-1260 are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, tert-butylbenzene, 4-isopropyltoluene, and TPH-DRO 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 I-5.3-17. The HI analysis indicates that all the receptors have HIs greater than 1, except the cottontail, which has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.9 SWMU 03-014(k,l,m,n)

The results of the minimum ESL comparisons are presented in Table I-5.3-18. Antimony, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, silver, zinc, acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260 benzo(a)anthracene, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, 1,4-dichlorobenzene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, 4-isopropyltoluene, and TPH-DRO 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 I-5.3-19. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.10 SWMU 03-014(o)

The results of the minimum ESL comparisons are presented in Table I-5.3-20. Antimony, chromium, copper, cyanide, lead, mercury, selenium, silver, zinc, Aroclor-1242, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Isopropyltoluene(4-), MCPA, MCPP, and TPH-DRO 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 I-5.3-21. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.11 SWMU 03-014(u)

The results of the minimum ESL comparisons are presented in Table I-5.3-22. Antimony, chromium, copper, cyanide, lead, mercury, selenium, silver, zinc, Aroclor-1254, Aroclor-1260, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

TPH-DRO 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 I-5.3-23. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.12 SWMU 03-015 and AOC 03-053

The results of the minimum ESL comparisons are presented in Table I-5.3-24. Antimony, barium, chromium, copper, lead, mercury, selenium, zinc, acenaphthene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, and chrysene are retained as COPECs because the HQs were greater than 0.3.

Perchlorate and TPH-DRO 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 I-5.3-25. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.13 SWMU 03-021

The results of the minimum ESL comparisons are presented in Table I-5.3-26. Antimony, barium, chromium, lead, nickel, selenium, thallium, zinc, and Aroclor-1254 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 I-5.3-27. The HI analysis indicates that the robin (all feeding guilds), deer mouse, shrew, and plant have HIs greater than 1, and the kestrel (intermediate carnivore), cottontail, and earthworm have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.14 SWMU 03-029

The results of the minimum ESL comparisons are presented in Table I-5.3-28. Antimony, chromium, copper, selenium, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

TPH-DRO 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 I-5.3-29. The HI analysis indicates that the robin (all feeding guilds), deer mouse, shrew, and plant have HIs greater than 1, and the cottontail has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.15 SWMU 03-045(a)

The results of the minimum ESL comparisons are presented in Table I-5.3-30. Antimony, chromium, copper, lead, mercury, selenium, silver, zinc, acenaphthene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, fluoranthene, naphthalene, phenanthrene, and pyrene are retained as COPECs because the HQs were greater than 0.3.

Isopropyltoluene(4-), TPH-DRO, and TPH-GRO 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 I-5.3-31. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.16 SWMU 03-045(b)

The results of the minimum ESL comparisons are presented in Table I-5.3-32. Antimony, mercury, silver, Aroclor-1254, and Aroclor-1260 are retained as COPECs because the HQs were greater than 0.3.

TPH-DRO 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 I-5.3-33. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), deer mouse, shrew, earthworm, and plant have HIs greater than 1, and the red fox and kestrel (top carnivore) have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.17 SWMU 03-045(c)

The results of the minimum ESL comparisons are presented in Table I-5.3-34. Antimony, Aroclor-1254, Aroclor-1260, and benzo(a)anthracene are retained as COPECs because the HQs were greater than 0.3.

Calcium and TPH-DRO 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 I-5.3-35. The HI analysis indicates that the kestrel (both feeding guilds), robin (omnivore and insectivore), red fox, deer mouse, shrew, and plant have HIs greater than 1, and the robin (herbivore) has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.18 SWMU 03-045(e)

The results of the minimum ESL comparisons are presented in Table I-5.3-36. Antimony and lead are retained as COPECs because the HQs were greater than 0.3.

Isopropyltoluene(4-) and TPH-DRO 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 I-5.3-37. The HI analysis indicates that the robin (all feeding guilds), deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.19 SWMU 03-045(f)

The results of the minimum ESL comparisons are presented in Table I-5.3-38. Antimony is retained as a COPEC because HQs were greater than 0.3.

Isopropyltoluene(4-) and isopropylbenzene 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 I-5.3-39. The HI analysis indicates that the deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.20 SWMU 03-045(g)

The results of the minimum ESL comparisons are presented in Table I-5.3-40. Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, vanadium, zinc, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Calcium, iron, magnesium, potassium, sodium, n-butylbenzene, 4-isopropyltoluene, TPH-DRO, TPH-GRO, 1,2,4-trimethylbenzene, and 1,3,5-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 I-5.3-41. The HI analysis indicates that all receptors have HIs greater than 1, except the red fox and cottontail. The cottontail has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.21 SWMU 03-045(h)

The results of the minimum ESL comparisons are presented in Table I-5.3-42. Antimony, hexavalent chromium, Aroclor-1254, and 2,3,7,8-TCDD 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 I-5.3-43. The HI analysis indicates that the red fox, deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.22 AOC 03-047(g)

The results of the minimum ESL comparisons are presented in Table I-5.3-44. Antimony, lead, Aroclor-1242, Aroclor-1254, and Aroclor-1260 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 I-5.3-45. The HI analysis indicates that all receptors have HIs greater than 1, except the earthworm and cottontail. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.23 AOC 03-051(c)

The results of the minimum ESL comparisons are presented in Table I-5.3-46. Antimony, cobalt, zinc, acenaphthene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, chrysene, and phenanthrene are retained as COPECs because the HQs were greater than 0.3.

TPH-DRO 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 I-5.3-47. The HI analysis indicates that the robin (all feeding guilds), deer mouse, shrew, and plant HIs greater than 1, and the cottontail, red fox, and earthworm have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.24 AOC 03-052(b)

The results of the minimum ESL comparisons are presented in Table I-5.3-48. Antimony, barium, beryllium, cobalt, copper, lead, nickel, selenium, Aroclor-1242, Aroclor-1254, and Aroclor-1260 are retained as COPECs because the HQs were greater than 0.3.

Calcium and 4-isopropyltoluene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

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 mean soil pH for the Sandia Canyon Reach S-1 is 6.6.

The HQs and HIs for each COPEC and receptor combination are presented in Table I-5.3-49. The HI analysis indicates that all the receptors have HIs greater than 1, except the earthworm, which has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.25 SWMU 03-052(f)

The results of the minimum ESL comparisons are presented in Table I-5.3-50. Antimony, barium, chromium, copper, cyanide, lead, selenium, zinc, acenaphthene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene are retained as COPECs because the HQs were greater than 0.3.

Perchlorate, 4-nitroaniline, TPH-DRO, 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 I-5.3-51. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.26 SWMU 03-056(a)

The results of the minimum ESL comparisons are presented in Table I-5.3-52. Aroclor-1254 is retained as a COPEC because the HQ was greater than 0.3.

Calcium and TPH-DRO 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 I-5.3-53. The HI analysis indicates that all the receptors have HIs less than 1.

I-5.3.27 SWMU 03-056(d)

The results of the minimum ESL comparisons are presented in Table I-5.3-54. Antimony, copper, cyanide, mercury, silver, Aroclor-1254, and Aroclor-1260 are retained as COPECs because the HQs were greater than 0.3.

TPH-DRO 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 I-5.3-55. The HI analysis indicates that the kestrel (both feeding guilds), robin (all feeding guilds), deer mouse, shrew, earthworm, and plant have HIs greater than 1, and the red fox has an HI equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.28 AOC 03-056(k)

The results of the minimum ESL comparisons are presented in Table I-5.3-56. Antimony, copper, mercury, acenaphthene, Aroclor-1254, benzo(a)anthracene, naphthalene, and phenanthrene are retained as COPECs because the HQs were greater than 0.3.

Isopropyltoluene(4-), 1,2,4-trimethylbenzene, 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 I-5.3-57. The HI analysis indicates that the robin (all feeding guilds), cottontail, deer mouse, shrew, and plant have HIs greater than 1, and the kestrel (intermediate carnivore) and earthworm have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.29 SWMU 03-059

The results of the minimum ESL comparisons are presented in Table I-5.3-58. Antimony, mercury, Aroclor-1242, Aroclor-1254, Aroclor-1260, benzoic acid, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Perchlorate and TPH-DRO 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 I-5.3-59. The HI analysis indicates that all the receptors have HIs greater than 1, except the cottontail, which has an HI less than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.30 AOC C-03-022

The results of the minimum ESL comparisons are presented in Table I-5.3-60. Antimony is retained as a COPEC because the HQ was greater than 0.3.

Calcium and TPH-DRO 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 I-5.3-61. The HI analysis indicates that the deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.31 SWMU 60-002

Western Storage Area

The results of the minimum ESL comparisons are presented in Table I-5.3-62. Antimony, barium, chromium, cobalt, copper, lead, nickel, selenium, and vanadium are retained as COPECs because the HQ were greater than 0.3.

Calcium, TPH-DRO, and TPH-GRO do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

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 mean soil pH for the Sandia Canyon Reach S-1 is 6.6.

The HQs and HIs for each COPEC and receptor combination are presented in Table I-5.3-63. The HI analysis indicates that the robin (all feeding guilds), deer mouse, shrew, and plant have HIs greater than 1, and the kestrel (intermediate carnivore), cottontail, and earthworm have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

Central Storage Area

The results of the minimum ESL comparisons are presented in Table I-5.3-64. Aroclor-1254 is retained as a COPEC because the HQ were greater than 0.3.

TPH-GRO 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 I-5.3-65. The HI analysis indicates that all receptors have HIs less than 1.

Eastern Storage Area

The results of the minimum ESL comparisons are presented in Table I-5.3-66. Barium, cobalt, nickel, and selenium are retained as COPECs because the HQ were greater than 0.3.

Calcium, magnesium, and TPH-DRO do not have ESLs, are retained as COPEC, and are discussed in the uncertainty section.

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 mean soil pH for the Sandia Canyon Reach S-1 is 6.6.

The HQs and HIs for each COPEC and receptor combination are presented in Table I-5.3-67. The HI analysis indicates that the robin (insectivore and omnivore), shrew, deer mouse, and plant have HIs greater than 1, and the robin (herbivore) and earthworm have HIs equivalent to 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.32 AOC 60-004(f)

The results of the minimum ESL comparisons are presented in Table I-5.3-68. Antimony, barium, chromium, cobalt, copper, lead, mercury, nickel, selenium, vanadium, zinc, acenaphthene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butyl phthalate, fluoranthene, and phenanthrene are retained as COPECs because the HQs were greater than 0.3.

Calcium, cis-1,2-dichloroethene, TPH-DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 1,3-xylene+1,4-xylene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

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 mean soil pH for the Sandia Canyon Reach S-1 is 6.6.

The HQs and HIs for each COPEC and receptor combination are presented in Table I-5.3-69. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.33 SWMU 60-006(a)

All the samples at SWMU 60-006(a) were collected below 10 ft bgs (the shallowest sample was from 10.0–11.0 ft bgs) and as deep as 61 ft bgs. Therefore, no complete exposure pathways to receptors exist at this site and ecological risk was not evaluated.

I-5.3.34 SWMU 60-007(a)

The results of the minimum ESL comparisons are presented in Table I-5.3-70. Antimony is retained as a COPEC because the HQ was greater than 0.3.

TPH-DRO 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 I-5.3-71. The HI analysis indicates that the deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.35 SWMU 60-007(b)

The results of the minimum ESL comparisons are presented in Table I-5.3-72. Antimony, barium, chromium, selenium, zinc, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Calcium, chloromethane, 4-isopropyltoluene, TPH-DRO, and 1,2,4-trimethylbenzene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

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 mean soil pH for the Sandia Canyon Reach S-1 is 6.6.

The HQs and HIs for each COPEC and receptor combination are presented in Table I-5.3-73. The HI analysis indicates that all the receptors have HIs greater than 1, except for cottontail and earthworm, which have HIs equivalent to 1, and the red fox, which has an HI less than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.36 AOC C-61-002

The results of the minimum ESL comparisons are presented in Table I-5.3-74. Antimony, arsenic, beryllium, chromium, copper, lead, mercury, nickel, selenium, and vanadium are retained as COPECs because the HQs were greater than 0.3.

Calcium and TPH-DRO 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 I-5.3-75. The HI analysis indicates that all the receptors have HIs greater than 1, except for the red fox and kestrel (top carnivore), which have HIs less than 1. The COPECs and receptors are discussed in the uncertainty section.

I-5.3.37 SWMU 61-002

The results of the minimum ESL comparisons are presented in Table I-5.3-76. Antimony, lead, mercury, selenium, zinc, acenaphthene, acetone, Aroclor-1254, Arcolor-1260, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, naphthalene, and xylene are retained as COPECs because the HQs were greater than 0.3.

Butylbenzenes, calcium, chloroethane, chloromethane, 1,2-dibromo-3-chloropropane, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, 1-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and TPH-DRO 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 I-5.3-77. The HI analysis indicates that all the receptors have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

I-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 Upper Sandia Canyon Aggregate Area sites.

I-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 2012, 226715), and the values were biased toward overestimating the potential risk to receptors.

I-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 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.

I-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.

I-5.4.4 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUFs) are used to account for the amount of time that a receptor is likely to spend within the contaminated areas based on the size of the receptor's home range (HR). The AUFs for individual organisms were developed 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 based on an HR of 366 ha. The AUFs for the Mexican spotted owl are presented in Table I-5.4-1 for each site. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl.

Twenty-two sites or site aggregates 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) results in adjusted HIs ranging from 0.0000002 to 0.4. Therefore, there are no potential adverse impacts to the Mexican spotted owl at any of the sites.

I-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 Upper Sandia Canyon Aggregate Area 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.

SWMU 03-002(c)

The area of SWMU 03-002(c) is approximately 0.019 ha. The population area use factors (PAUFs) are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-002(c) are less than 1 for all receptors. The plant had an unadjusted HI of 10 (Table I-5.4-3).

SWMU 03-003(d)

The area of SWMU 03-003(d) is approximately 0.01 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-003(d) are less than 1 for all receptors. The plant and earthworm HIs are also less than 1 (Table I-5.4-5).

SWMU 03-009(a)

The area of SWMU 03-009(a) is approximately 0.087 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-009(a) are less than 1 for all receptors. The plant had an unadjusted HI of 4 (Table I-5.4-7).

SWMU 03-009(i)

The area of SWMU 03-009(i) is approximately 0.18 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-009(i) are less than 1 for all receptors. The plant had an unadjusted HI of 822 (Table I-5.4-9).

SWMU 03-012(b)

The area of SWMU 03-012(b) is approximately 0.51 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-012(b) are less than 1 for all receptors, except the deer mouse, which has an adjusted HI of 2. The earthworm and plant have unadjusted HIs of 1 and 112 (Table I-5.4-11).

SWMU 03-013(i)

The area of SWMU 03-013(i) is approximately 0.015 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-013(i) are less than 1 for all receptors. The plant had an unadjusted HI of 29 and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-13).

AOC 03-014(b2)

The area of AOC 03-014(b2) is approximately 0.019 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-014(b2) are less than 1 for all receptors. The plant had an unadjusted HI of 29 (Table I-5.4-15).

AOC 03-014(c2)

The area of AOC 03-014(c2) is approximately 0.15 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-014(c2) are less than 1 for all receptors, except for the robin (insectivore and omnivore), which have adjusted HIs of 2. The earthworm and plant have unadjusted HIs of 12 and 25 (Table I-5.4-17).

SWMUs 03-014(k,l,m,n)

The area of SWMUs 03-014(k,l,m,n) is approximately 0.1 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMUs 03-014(k,l,m,n) are less than 1 for all receptors, except for the robin (insectivore), which has an HI equivalent to 1. The earthworm and plant have unadjusted HIs of 16 and 182 (Table I-5.4-19).

SWMU 03-014(o)

The area of SWMU 03-014(o) is approximately 0.1 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-014(o) are less than 1 for all receptors. The earthworm and plant have unadjusted HIs of 21 and 109 (Table I-5.4-21).

SWMU 03-014(u)

The area of SWMU 03-014(u) is approximately 0.025 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-014(u) are less than 1 for all receptors. The earthworm and plant have unadjusted HIs of 17 and 29 (Table I-5.4-23).

SWMU 03-015 and AOC 03-053

The area of SWMU 03-015 and AOC 03-053 is approximately 0.16 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-015 and AOC 03-053 are less than 1 for all receptors, except for the deer mouse, which had an adjusted HI equivalent to 1. The earthworm and plant have unadjusted HIs of 4 and 153 (Table I-5.4-25).

SWMU 03-021

The area of SWMU 03-021 is approximately 0.011 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-26). 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 03-021 are less than 1 for all receptors. The plant had an unadjusted HI of 24 and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-27).

SWMU 03-029

The area of SWMU 03-029 is approximately 0.08 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-029 are less than 1 for all receptors. The plant had an unadjusted HI of 25 (Table I-5.4-29).

SWMU 03-045(a)

The area of SWMU 03-045(a) is approximately 0.005 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(a) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 12 and 37 (Table I-5.4-31).

SWMU 03-045(b)

The area of SWMU 03-045(b) is approximately 0.000084 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(b) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 3 and 21 (Table I-5.4-33).

SWMU 03-045(c)

The area of SWMU 03-045(c) is approximately 0.000084 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(c) are less than 1 for all receptors. The plant had an unadjusted HI of 23 (Table I-5.4-35).

SWMU 03-045(e)

The area of SWMU 03-045(e) is approximately 0.000084 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 SWMU 03-045(e) are less than 1 for all receptors. The plant had an unadjusted HI of 23 (Table I-5.4-37).

SWMU 03-045(f)

The area of SWMU 03-045(f) is approximately 0.0015 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(f) are less than 1 for all receptors. The plant had an unadjusted HI of 22 (Table I-5.4-39).

SWMU 03-045(g)

The area of SWMU 03-045(g) is approximately 0.0014 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(g) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 3 and 861 (Table I-5.4-41).

SWMU 03-045(h)

The area of SWMU 03-045(h) is approximately 0.00042 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 03-045(h) are less than 1 for all receptors. The plant had an unadjusted HI of 23 (Table I-5.4-43).

AOC 03-047(g)

The area of AOC 03-047(g) is approximately 0.00093 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-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 AOC 03-047(g) are less than 1 for all receptors. The plant had an unadjusted HI of 26 (Table I-5.4-45).

AOC 03-051(c)

The area of AOC 03-051(c) is approximately 0.0019 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-46). 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 03-051(c) are less than or equivalent to 1 for all receptors. The plant had unadjusted HI of 28, and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-47).

AOC 03-052(b)

The area of AOC 03-052(b) is approximately 0.064 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-48). 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 03-052(b) are less than 1 for all receptors. The plant had unadjusted HI of 158 (Table I-5.4-49).

SWMU 03-052(f)

The area of SWMU 03-052(f) is approximately 0.01 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-50). 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 03-052(f) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 11 and 21 (Table I-5.4-51).

SWMU 03-056(d)

The area of SWMU 03-056(d) is approximately 0.0074 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-52). 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 03-056(d) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 3 and 22 (Table I-5.4-53).

AOC 03-056(k)

The area of AOC 03-056(k) is approximately 0.091 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-54). 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 03-056(k) are less than 1 for all receptors. The plant had an unadjusted HI of 154 and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-55).

SWMU 03-059

The area of SWMU 03-059 is approximately 0.55 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-56). 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 03-059 are less than 1 for all receptors, except for the robin (insectivore),which had an adjusted HI of 3, and the robin (omnivore) and deer mouse, which had adjusted HIs equivalent to 1. The earthworm and plant had unadjusted HIs of 3 and 18 (Table I-5.4-57).

AOC C-03-022

The area of AOC C-03-022 is approximately 0.018 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-58). 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-03-022 are less than 1 for all receptors. The plant had an unadjusted HI of 22 (Table I-5.4-59).

SWMU 60-002 (West)

The area of SWMU 60-002 (West) is approximately 0.45 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-60). 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 60-002 (West) are less than or equivalent to 1 for all receptors. The plant had an unadjusted HI of 1183, and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-61).

SWMU 60-002 (East)

The area of SWMU 60-002 (East) is approximately 0.26 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-62). 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 60-002 (East) are less than 1 for all receptors. The plant had an unadjusted HI of 5, and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-63).

AOC 60-004(f)

The area of AOC 60-004(f) is approximately 0.082 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-64). 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 60-004(f) are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 5 and 1075 (Table I-5.4-65).

SWMU 60-007(a)

The area of SWMU 60-007(a) is approximately 0.11 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-66). 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 60-007(a) are less than 1 for all receptors. The plant had an unadjusted HI of 25 (Table I-5.4-67).

SWMU 60-007(b)

The area of SWMU 60-007(b) is approximately 1.38 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-68). 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 60-007(b) are less than 1 for all receptors, except for the robin (insectivore) and deer mouse, which had adjusted HIs of 2, and the robin (omnivore), which had an adjusted Hi equivalent to 1. The plant had an unadjusted HI of 27 and the earthworm had an unadjusted HI equivalent to 1 (Table I-5.4-69).

AOC C-61-002

The area of AOC C-61-002 is approximately 0.042 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-70). 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-61-002 are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 3 and 1274 (Table I-5.4-71).

SWMU 61-002

The area of SWMU 61-002 is approximately 0.13 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table I-5.4-72). 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 61-002 are less than 1 for all receptors. The earthworm and plant had unadjusted HIs of 2 and 9 (Table I-5.4-73).

I-5.4.6 LOAEL Analysis

Several sites have 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 a NOAEL. The LOAEL-based ESLs were calculated based on toxicity information in the ECORISK Database, Release 3.1 (LANL 2012, 226667) and are presented in Table I-5.4-74. 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.

I-5.4.7 Site Discussions

SWMU 03-002(c)

The HI for SWMU 03-002(c) is greater than 1 for the plant, with antimony and lead being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of approximately 1 for the plant (Table I-5.4-75).

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-009(a)

The HI for SWMU 03-009(a) is greater than 1 for the plant, with antimony and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 0.5 for the plant (Table I-5.4-76).

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-009(i)

The HI for SWMU 03-009(i) is greater than 1 for the plant, with antimony, barium, cobalt, selenium, and vanadium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 83 for the plant (Table I-5.4-77).

The plant HI is primarily from antimony and vanadium (HI = 82). The LOAEL-based plant ESL for vanadium (0.25 mg/kg) is 2 orders of magnitude below the soil and Qbt 2,3,4 BVs (39.6 mg/kg and 17 mg/kg) and the maximum background concentrations for each medium (56.5 mg/kg and 21 mg/kg). The ratios of the EPC (19.2 mg/kg) to the maximum background concentrations are 0.3 and 0.9, indicating the potential ecological risk to the plant is overestimated by the ESLs. Antimony was detected in five samples at three locations and the EPC is the maximum concentration (2.44 mg/kg). If a 95% UCL is calculated for antimony the EPC is reduced by one-third to 1.6 mg/kg. In addition, the LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated by the ESLs.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-012(b)

The HIs for SWMU 03-012(b) are greater than 1 for the deer mouse and plant and equivalent to 1 for the earthworm. The primary COPECs for one or several receptors are antimony, hexavalent chromium, and zinc . The HI analysis using LOAEL-based ESLs resulted in HIs of approximately 1 for the deer mouse, 0.1 for the earthworm and 11 for the plant (Table I-5.4-78).

The plant HI is primarily from antimony (HQ = 11.1). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.471 mg/kg to 5.57 mg/kg. All except the maximum detection limit are below the soil BV or are similar to the maximum soil background concentration (1 mg/kg); the majority of the results (31 of 36 results) have detection limits below the soil BV. The absence of detected concentrations indicates antimony is not present above background. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below or similar to the maximum background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with structures, roads, and paved areas, and little habitat is available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-013(i)

The HIs for SWMU 03-013(i) are equivalent to or greater than 1 for the earthworm and plant, with antimony, lead, selenium, and zinc being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.1 for the earthworm and 3 for the plant (Table I-5.4-79).

The plant HI is primarily from antimony (HQ=2.6). Antimony was detected in 24 of 48 samples, was above the soil BV in 13 samples, and was above the maximum soil background concentration in 11 samples, and substantially above (greater than twice) the maximum soil background concentration in 5 samples (the maximum detected concentration was 5.71 mg/kg). Therefore, most of the data and the mean concentration (as represented by the 95% UCL) of 1.31 mg/kg were similar to background. In addition, the LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below or similar to the maximum background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with structures, roads, and paved areas, and little habitat is available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-014(b2)

The HI for AOC 03-014(b2) is greater than 1 for the plant, with antimony, selenium, and zinc being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table I-5.4-80).

The plant HI is primarily from antimony (HQ = 2.6). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The detection limits ranged from 1.02 mg/kg to 1.29 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated an area next to the site is industrially developed, but elsewhere there appears to be a functioning ecological habitat for terrestrial receptors, including plants, invertebrates, birds, and mammals. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-014(c2)

The HIs for SWMU 03-014(c2) are greater than 1 for the robin (insectivore and omnivore), earthworm, and plant, with antimony, cyanide, mercury, selenium, zinc, and Aroclor-1254 being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 19 for the robin (insectivore), 18 for the robin (omnivore), approximately 1 for the earthworm, and 3 for the plant (Table I-5.4-81). The adjusted HI analysis of the robin using LOAEL-based ESLs resulted in HIs of 0.2 for the robin (insectivore and omnivore) (Table I-5.4-82).

The plant HI is primarily from antimony (HQ=2.2). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.999 mg/kg to 1.11 mg/kg, which are similar to the maximum soil background concentration (1 mg/kg). The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from on the plant community COPECs (Attachment I-3). Field observations indicated the area next to the site is industrially developed, but elsewhere there appears to be a functioning ecological habitat for terrestrial receptors, including plants, invertebrates, birds, and mammals. Therefore, the HI does not indicate potential risk to the plants.

SWMUs 03-014(k,l,m,n)

The HIs for SWMUs 03-014(k,l,m,n) are greater than 1 for the robin (insectivore), earthworm, and plant, with antimony, copper, lead, mercury, selenium, zinc, acenaphthene, anthracene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, 1,4-dichlorobenzene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 220 for the robin (insectivore), 3 for the earthworm, and 19 for the plant (Table I-5.4-83). The adjusted HI analysis of the robin (insectivore) using the LOAEL-based ESL resulted in an HI of approximately 1 (Table I-5.4-84).

The earthworm HI is primarily from mercury and pyrene (HI = 2.5). Approximately 67% of the HI (2.3 of 3.4) is from fluoranthene, phenanthrene, and pyrene, which, in turn, is based on the maximum detected concentrations. In total, only two to four detected concentrations were reported for these COPECs. As discussed in section I-4.3.2, this risk estimate is conservative and not representative of the exposure because the risk is based on single elevated detected concentrations of PAHs from a single location, and other detected concentrations were 3 orders of magnitude below the maximum detected concentrations). The elevated PAH concentrations were only at the surface (0.0–0.17 ft bgs) at this location, the PAHs were not detected in the deeper samples (0.75–1.75 ft and deeper), and it is the only location where the full suite of PAH analytes was detected. As noted in the site descriptions, a decaying 3-ft-high soil berm covered with 2 in. of asphalt separates the beds. The asphalt is broken and cracked in various places, exposing the underlying soil-tuff and likely resulting in pieces of asphalt falling into the drying beds. The limited occurrence of elevated PAHs in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detection being the result of residual contamination from site operations. Furthermore, the entire site [including Consolidated Unit 03 014(a)-99] was a former sanitary wastewater treatment plant, and it is unlikely that PAHs were present in the wastewater other than at trace concentrations. Without the one location with elevated PAHs, these chemicals would not be COPECs (HQs are less than 0.3). The earthworm HI without the PAHs is approximately 1, primarily from mercury. The LOAEL-based plant ESL for mercury (0.5 mg/kg) is only 0.4 mg/kg and the EPC is only 0.3 mg/kg above the soil BV (0.1 mg/kg), indicating the potential ecological risk to the earthworm is overestimated.

The plant HI is primarily from antimony (HQ=16.6). Antimony was detected in only one sample at the site, and the EPC is the maximum detected concentration, which overestimates the potential exposure. The antimony detection limits ranged from 0.389 mg/kg to 5.8 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and does not provide good quality habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 03-014(o)

The HIs for SWMU 03-014(o) are equivalent to or greater than 1 for the earthworm and plant, with antimony, copper, and selenium being the primary COPECs for the plant, and copper, mercury and zinc being the primary COPECs for the earthworm. The HI analysis using LOAEL-based ESLs resulted in HIs of 2 for the earthworm and 11 for the plant (Table I-5.4-85).

The earthworm HI is primarily from mercury (HQ=1.98). Mercury was detected in only 5 of 25 samples, with 2 concentrations above 0.2 mg/kg. Therefore, the EPC is biased high by the maximum detected concentration (3.8 mg/kg) and the exposure is overestimated (the LOAEL-based HQ without the maximum concentration is 0.8). In addition, the LOAEL-based earthworm ESL for mercury (0.5 mg/kg) is only 0.4 mg/kg and the EPC is only 0.89 mg/kg above the soil BV (0.1 mg/kg), indicating the potential ecological risk to the earthworm is overestimated.

The plant HI is primarily from antimony (HQ=10.8). Antimony was not detected any samples and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.401 mg/kg to 5.38 mg/kg (22 of 31 results were below or similar to the maximum soil background concentration [1 mg/kg]). Therefore, most of the data were similar to background. In addition, the LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and does not provide good quality habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 04-014(u)

The HIs for SWMU 03-014(u) are greater than 1 for the earthworm and plant, with antimony, copper, lead, mercury, selenium, and zinc being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 2 for the earthworm and 3 for the plant (Table I-5.4-86).

The earthworm HI is primarily from mercury (HQ = 1.5). Mercury was detected in only 4 of 15 samples, with 1 concentration above 0.3 mg/kg. Therefore, the EPC is biased high by the maximum detected concentration (1.99 mg/kg) and the exposure is overestimated (the LOAEL-based HQ for the next highest concentration is 0.5). In addition, the LOAEL-based ESL for mercury (0.5 mg/kg) is only 0.4 mg/kg and the EPC is only 0.66 mg/kg above the soil BV (0.1 mg/kg), indicating the potential ecological risk to the earthworm is overestimated.

The plant HI is primarily from antimony (HQ = 2.4). Antimony was not detected any samples and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.994 mg/kg to 1.21 mg/kg, which were below or similar to the maximum soil background concentration (1 mg/kg). In addition, the LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and does not provide good quality habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 03-015 and AOC 03-053

The HIs for SWMU 03-015 and AOC 03-053 are equivalent to or greater than 1 for the deer mouse, earthworm, and plant, with antimony, barium, lead, mercury, selenium, zinc, and acenaphthene being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 2 for the deer mouse, 0.4 for the earthworm, and 16 for the plant (Table I-5.4-87). The adjusted HI analysis of the deer mouse using LOAEL-based ESLs resulted in HI of 0.08 (Table I-5.4-88).

The plant HI is primarily from antimony (HQ = 14.8). Antimony was detected in three samples at two locations at the site and the EPC is the maximum detected concentration, which overestimates the potential exposure. The antimony detection limits ranged from 0.38 mg/kg to 1.31 mg/kg, which are below or similar to the maximum soil background concentration (1 mg/kg). The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil and sediment BVs (0.83 mg/kg) and below or similar to the maximum soil background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and provides minimal habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 03-021

The HIs for SWMU 03-021 are equivalent to or greater than 1 for the earthworm and plant, with antimony, barium, lead, selenium, thallium, and zinc being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.07 for the earthworm, and 3 for the plant (Table I-5.4-89).

The plant HI is primarily from antimony and thallium (HQs of 1.5 and 1.2). Antimony was detected above the soil BV in four samples at three locations at the site. Three concentrations were below the maximum soil background concentration (1 mg/kg), and the other concentration (1.24 mg/kg) was slightly above this value. The other detected concentrations and detection limits ranged from 0.403 mg/kg to 1.17 mg/kg, which are below or similar to the maximum soil background concentration. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated. Thallium was detected above the soil BV in three samples at two locations. The concentrations above the BV were approximately 2 or less times the maximum soil background concentration (1 mg/kg). The LOAEL-based plant ESL for thallium (0.5 mg/kg) is below the soil and Qbt 2,3,4 BV (0.73 mg/kg and 1.1 mg/kg) and below the maximum background concentrations for each medium (1 mg/kg and 1.7 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and provides minimal habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 03-029

The HI for SWMU 03-029 is greater than 1 for the plant, with antimony, copper, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table I-5.4-90).

The plant HI is primarily from antimony (HQ = 2.2). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The detection limits ranged from 1.07 mg/kg to 1.11 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg and overestimates the potential exposure. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(a)

The HIs for SWMU 03-045(a) are greater than 1 for the earthworm and plant, with antimony, lead, mercury, selenium, zinc, acenaphthene, benzo(b)fluoranthene, fluoranthene, naphthalene, phenanthene, and pyrene being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 2 for the earthworm and 5 for the plant (Table I-5.4-91).

The earthworm HI is primarily from mercury, fluoranthene, phenanthene, and pyrene (HI = 2.3). The EPCs for the earthworm COPECs were the maximum detected concentrations because concentrations were detected only 1 to 4 times at the site. If 95% UCLs are calculated the EPCs are 0.261 mg/kg (mercury), 3.7 mg/kg (fluoranthene), 3.24 mg/kg (phenanthrene), and 3.33 mg/kg (pyrene), which results in an LOAEL-based HI of approximately 1 for the earthworm.

The plant HI is primarily from antimony and acenaphthene (HQ = 4.1). Antimony was not detected at the site and acenaphthene was detected in only one sample (the EPCs are the maximum detection limit and the maximum detected concentration, respectively), which overestimates the potential exposure. The antimony detection limits ranged from 0.449 mg/kg to 1.29 mg/kg, which are below or similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(b)

The HIs for SWMU 03-045(b) are greater than 1 for the earthworm and plant, with antimony and mercury being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.3 for the earthworm and 2 for the plant (Table I-5.4-92).

The plant HI is from antimony (HQ = 2.1). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.06 mg/kg to 1.07 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(c)

The HI for SWMU 03-045(c) is greater than 1 for the plant, with antimony being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table I-5.4-93).

The plant HI is primarily from antimony (HQ = 2.3). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.12 mg/kg to 1.14 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(e)

The HI for SWMU 03-045(e) is greater than 1 for the plant, with antimony and lead being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table I-5.4-94).

The plant HI is primarily from antimony (HQ=2.2). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.04 mg/kg to 1.09 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg and. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(f)

The HI for SWMU 03-045(f) is greater than 1 for the plant, with antimony being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant from antimony (Table I-5.4-95).

The plant HI is primarily from antimony (HQ = 2.2). However, the EPC is the maximum detected concentration (1.08 mg/kg), which is similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site are industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(g)

The HIs for SWMU 03-045(g) are greater than 1 for the earthworm and plant, with antimony, arsenic, barium, cobalt, copper, manganese, nickel, selenium, vanadium, and zinc being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.3 for the earthworm and 87 for the plant (Table I-5.4-96).

The plant HI is primarily from antimony and vanadium (HI=85) with contributions from barium and manganese. The LOAEL-based plant ESL for vanadium (0.25 mg/kg) is 2 orders of magnitude below the soil, sediment, and Qbt 2,3,4 BVs (39.6 mg/kg, 19.7 mg/kg, and 17 mg/kg) and the maximum background concentrations for each medium (56.5 mg/kg, 20 mg/kg, and 21 mg/kg). The ratios of the EPC to the maximum background concentrations are 0.4, 1.1, and 1, indicating the potential ecological risk to the plant is overestimated by the ESL. Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits for soil samples ranged from 1.03 mg/kg to 1.09 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg; the detection limits for sediment samples were below the sediment BV. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area next to the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-045(h)

The HI for SWMU 03-045(h) is greater than 1 for the plant, with antimony and hexavalent chromium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table I-5.4-97).

The plant HI is primarily from antimony (HQ = 2.3). Antimony was not detected at the site and the EPC is the maximum detection limit (1.13 mg/kg), which is similar to the maximum soil background concentration of 1 mg/kg and overestimates the potential exposure. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-047(g)

The HI for AOC 03-047(g) is greater than 1 for the plant, with antimony being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table I-5.4-98).

The plant HI is primarily from antimony (HQ = 2.6). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.07 mg/kg to 1.3 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-051(c)

The HIs for AOC 03-047(g) are greater than 1 for the plant, with antimony, cobalt, zinc, and acenaphthene being the primary COPECs, and equivalent of 1 for the earthworm and zinc and phenanthrene being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.3 for the earthworm 3 for the plant (Table I-5.4-99).

The plant HI is primarily from antimony (HQ = 2.5). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.15 mg/kg to 1.26 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-052(b)

The HIs for AOC 03-052(b) are greater than 1 for the plant, with antimony, barium, beryllium, cobalt, and selenium being the primary COPECs, and equivalent to 1 for the earthworm, with barium being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.07 for the earthworm and 16 for the plant (Table I-5.4-100).

The plant HI is primarily from antimony (HQ = 15.4). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.372 mg/kg to 7.7 mg/kg (36 of 47 results were below or similar to the maximum soil background concentration [1 mg/kg]). Therefore, most of the data were similar to background. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below the maximum background concentrations of each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-052(f)

The HIs for AOC 03-052(f) are greater than 1 for the earthworm and plant, with antimony, barium, lead, selenium, zinc, acenaphthene, benzo(a)anthracene, benzo(b)fluoranthene, fluoranthene, phenanthrene, and pyrene being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 4 for the earthworm and 3 for the plant (Table I-5.4-101).

The earthworm HI is primarily from fluoranthene, phenanthrene, and pyrene (HI = 4). The risk estimate is conservative because the EPC is biased by the maximum detected concentrations, which were an order of magnitude above the next highest detected concentrations. Without the maximum detected concentrations the 95% UCLs become 5.3 mg/kg, 5.5 mg/kg, and 7.6 mg/kg, respectively, and the earthworm HI is approximately 1, indicating the potential ecological risk to the earthworm is overestimated.

The plant HI is primarily from antimony, selenium, and acenaphthene (HI = 1.9). Antimony was not detected above the soil and Qbt 2,3,4 BVs but was detected in one sample below the soil BV. This maximum detected concentration was used as the EPC. The detection limits ranged from 1.04 mg/kg to 1.44 mg/kg, which are similar to the maximum soil background concentration (1 mg/kg). Therefore, the antimony HQ is based on a background concentration and the detection limits are similar to background. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated. Selenium was also not detected above the BVs and the maximum detection limit was used as the EPC. The maximum detection limit (1.42 mg/kg) was below the soil BV (1.52 mg/kg), indicating the potential ecological risk to the plant is overestimated. The acenaphthene EPC is biased by the maximum detected concentration, which was a factor of 2 above the next highest detected concentrations. The plant HQ without the maximum detected concentration is approximately 0.2 (half of the previous HQ), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and provides minimal habitat. Therefore, the HI does not indicate potential risk to an established plant community.

SWMU 03-056(d)

The HIs for SWMU 03-056(d) are greater than 1 for the earthworm and plant, with antimony and copper being the primary COPECs for the plant and mercury being the primary COPEC for the earthworm. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.3 for the earthworm and 2 for the plant (Table I-5.4-102).

The plant HI is from antimony (HQ = 2.1). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits (1.07 mg/kg) are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the site is within an industrially developed area, with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

AOC 03-056(k)

The HIs for SWMU 03-056(k) are equivalent to or greater than 1 for the earthworm and plant, with antimony, acenaphthene, and naphthalene being the primary COPECs for the plant and mercury and phenanthrene being the primary COPECs for the earthworm. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.2 for the earthworm and 15 for the plant (Table I-5.4-103).

The plant HI is from antimony (HQ = 15.2). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.07 mg/kg to 7.6 mg/kg and approximately one-half the antimony detection limits are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony

(0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the site is within an industrially developed area, with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 03-059

The HIs for SWMU 03-059 are equivalent to or greater than 1 for the robin (insectivore and omnivore), deer mouse, earthworm, and plant, with antimony, mercury, Aroclor-1254, and bis(2-ethylhexyl)phthalate being the primary COPECs for one or several receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 9 for the robin (insectivore), 3 for the robin (omnivore), 0.7 for the deer mouse, 0.3 for the earthworm, and 2 for the plant (Table I-5.4-104). The adjusted HI analysis of the robin (insectivore and omnivore) using LOAEL-based ESLs resulted in HIs of 0.3 for the robin (insectivore) and 0.1 for the robin (omnivore) (Table I-5.4-105).

The plant HI is primarily from antimony (HQ = 1.8). Antimony was detected in nine samples at the site and above the soil BV and the maximum background soil concentration (1 mg/kg) in six samples (only one concentration was detected above 1.22 mg/kg). The antimony detection limits ranged from 0.407 mg/kg to 1.28 mg/kg, which are below or similar to the maximum soil background concentration of 1 mg/kg. Therefore, most of the data were similar to background. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and the maximum soil background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and does not provide good quality habitat. Therefore, the HI does not indicate potential risk to an established plant community.

AOC C-03-022

The HI for AOC C-03-022 is greater than 1 for the plant, with antimony being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table I-5.4-106).

The plant HI is primarily from antimony (HQ = 2.2). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.03 mg/kg to 1.12 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background soil concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the site is within an industrially developed area, with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 60-002 (West)

The HIs for SWMU 60-002 (West) are greater than 1 for the plant, with antimony, barium, cobalt, lead, selenium, and vanadium being the primary COPECs, and equivalent to 1 for the earthworm, with barium being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.06 for the earthworm and 119 for the plant (Table I-5.4-107).

The plant HIs are primarily from antimony and vanadium (H1 = 118), with contributions from barium and selenium. Vanadium was not detected above the soil BV (39.6 mg/kg) but was detected above the Qbt 2,3,4 BV (17 mg/kg) in three samples. The concentrations above the Qbt 2,3,4 BV (a maximum of 31.2 mg/kg) are only slightly above the maximum Qbt 2,3,4 background concentration (21 mg/kg). The LOAEL-based plant ESL for vanadium (0.25 mg/kg) is 2 orders of magnitude below the soil and Qbt 2,3,4 BVs (39.6 mg/kg and 17 mg/kg) and the maximum background concentrations for each medium (56.5 mg/kg and 21 mg/kg). The ratios of the EPC to the maximum background concentrations are 0.5 and 1.4, indicating the potential ecological risk to the plant is overestimated by the ESL. Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.03 mg/kg to 1.16 mg/kg, which are similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), further indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area near the site is industrially developed, but elsewhere there appears to be a functioning ecological habitat for terrestrial receptors, including plants, invertebrates, birds, and mammals. Therefore, the HI does not indicate potential risk to the plants.

SWMU 60-002 (East)

The HIs for SWMU 60-002 (East) are greater than 1 for the plant, with barium, cobalt, nickel, and selenium being the primary COPECs, and equivalent to 1 for the earthworm with barium being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.1 for the earthworm and approximately 1 for the plant (Table I-5.4-108).

In addition, field observations made during the site visit found no indication of adverse effects on the plant community from COPECs (Attachment I-3). Field observations indicated the area near the site is industrially developed, but elsewhere there appears to be a functioning ecological habitat for terrestrial receptors, including plants, invertebrates, birds, and mammals. Therefore, the HI does not indicate potential risk to the plants.

AOC 60-004(f)

The HIs for AOC 60-004(f) are greater than 1 for the earthworm and plant, with antimony, barium, cobalt, copper, mercury, selenium, vanadium, zinc, acenaphthene, fluoranthene, and phenanthrene being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.8 for the earthworm and 108 for the plant (Table I-5.4-109).

The plant HI is from vanadium (HQ = 104.4) and antimony (HQ = 2.4). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 0.423 mg/kg to 1.21 mg/kg, which are below or similar to the maximum soil background concentration of 1 mg/kg. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and below the maximum background concentration (1 mg/kg), indicating the potential ecological risk to the plant is overestimated. Vanadium was not detected above the soil BV (39.6 mg/kg) but was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample. The concentration above the Qbt 2,3,4 BV (25.6 mg/kg) is only slightly above the maximum Qbt 2,3,4 background concentration (21 mg/kg) and below the maximum soil background concentration (56.5 mg/kg). The ratios of the EPC (26.1 mg/kg) to the maximum background concentrations are 0.5 and 1.2, indicating the potential ecological risk to the plant is overestimated by the ESL. In addition, the LOAEL-based plant ESL for vanadium (0.25 mg/kg) is 2 orders of magnitude below the BVs and the maximum background concentrations. Therefore, the exposure to vanadium is similar to background at the site and the plant HQ overestimates the risk.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area around the site is within an industrially developed area with numerous buildings, roads, and paved parking lots that provide little habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 60-007(a)

The HI for SWMU 60-007(a) is greater than 1 for the plant, with antimony being the primary COPEC. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table I-5.4-110).

The plant HI is primarily from antimony (HQ=2.5). Antimony was detected in 11 samples at four locations. The detected concentrations were less than 2 times the maximum soil background concentration (1 mg/kg). The antimony detection limits ranged from 0.19 mg/kg to 1.07 mg/kg, which are below or similar to the maximum soil background concentration. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and the maximum soil background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the site is within an industrially developed area, with little habitat available for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 60-007(b)

The HIs for SWMU 60-007(b) are equivalent to or greater than 1 for the robin (insectivore and omnivore), deer mouse, earthworm, and plant, with antimony, barium, selenium, zinc, and bis(2-ethylhexyl)phthalate 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 robin (omnivore), approximately 1 for the deer mouse, 0.07 for the earthworm, and 3 for the plant (Table I-5.4-111). The adjusted HI analysis of the robin (insectivore) using LOAEL-based ESLs resulted in an HI of 0.2 for the robin (insectivore) (Table I-5.4-112).

The plant HI is primarily from antimony (HQ = 2.4). Antimony was not detected at the site and the EPC is the maximum detection limit, which overestimates the potential exposure. The antimony detection limits ranged from 1.03 mg/kg to 1.18 mg/kg, which are similar to the maximum soil background concentration (1 mg/kg). The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg) and the maximum soil background concentration, indicating the potential ecological risk to the plant is overestimated.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is industrially developed with many structures, roads, and other paved areas present and does not provide good quality habitat. Therefore, the HI does not indicate potential risk to an established plant community.

AOC C-61-002

The HIs for AOC C-61-002 are greater than 1 for the earthworm and plant, with antimony, arsenic, beryllium, mercury, nickel, selenium, and vanadium being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.3 for the earthworm and 128 for the plant (Table I-5.4-113).

The plant HI is from vanadium (HQ = 124.4) and antimony (HQ = 2.3). Antimony was detected in 11 samples at three locations, with only three concentrations detected in the depth interval of 0.0−5.0 ft. These three concentrations ranged from 0.737 mg/kg to 1.14 mg/kg and were below or similar to the maximum soil background concentration (1 mg/kg). The detection limits ranged from 1.06 mg/kg to 1.27 mg/kg) and were also similar to the maximum soil background concentration. The LOAEL-based plant ESL for antimony (0.5 mg/kg) is below the soil BV (0.83 mg/kg), equivalent to the Qbt 2,3,4 BV (0.5 mg/kg), and below or similar to the maximum background concentrations for each medium (1 mg/kg and 0.4 mg/kg), indicating the potential ecological risk to the plant is overestimated. Vanadium was not detected above the soil BV (39.6 mg/kg) but was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample. The concentration above the Qbt 2,3,4 BV (26.4 mg/kg) is only slightly above the maximum Qbt 2,3,4 background concentration (21 mg/kg) and below the maximum soil background concentration (56.5 mg/kg). The ratios of the EPC to the maximum background concentrations are 0.6 and 1.5, indicating the potential ecological risk to the plant is overestimated by the ESL. In addition, the LOAEL-based plant ESL for vanadium (0.25 mg/kg) is 2 orders of magnitude below the BVs and the maximum background concentrations. Therefore, the exposure to vanadium is similar to background at the site and the plant HQ overestimates the risk.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the plant community (Attachment I-3). Field observations indicated the area in and around the site is within an industrially developed area with numerous buildings, roads, and paved parking lots that provide little habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

SWMU 61-002

The HIs for SWMU 61-002 are greater than 1 for the earthworm and plant with antimony, mercury, selenium, zinc, acenaphthene, and naphthalene being the primary COPECs for one or both receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 0.1 for the earthworm and 1 for the plant (Table I-5.4-114).

In addition, field observations made during the site visit found no indication of adverse effects on the plant community from COPECs (Attachment I-3). Field observations indicated the area in and around the site is within an industrially developed area with numerous buildings, roads, and paved parking lots that provide little habitat for ecological receptors, including plants. Therefore, the HI does not indicate potential risk to the plants.

I-5.4.8 Chemicals without ESLs

Several COPECs do not have ESLs for any receptor in version 3.1 of the ECORISK Database (LANL 2009, 107524). 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. These COPECs are infrequently detected across the site.

Toxicity data are not available for butylbenzenes, calcium, chloromethane, 1,2-dibromo-3-chlorppropane, cis-1,2-dichloroethene, ethylbenzene, iron, isopropylbenzene, 4-isopropyltoluene, magnesium, MCPA, MCPP, 4-nitroaniline, perchlorate, potassium, 1-propylbenzene, sodium, TPH-GRO, TPH-DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-xylene, and 1,3-xylene+1,4-xylene. For calcium, chloromethane, 1,2-dibromo-3-chlorppropane, iron, magnesium, MCPA, MCPP, perchlorate, potassium, sodium, TPH-DRO, and TPH-GRO no surrogate or other toxicity information is available. For the other COPECs, surrogates are used based on structural similarity to evaluate the potential toxicity.

Butylbenzene(n-) was detected in one sample at SWMU 03-045(g) and in one sample at SWMU 61-002 from 0−5 ft at concentrations of 0.0018 mg/kg and 0.00054 mg/kg, respectively. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the n-butylbenzene concentrations and results in a maximum HQ of 0.00008. Because this HQ is less than 0.3, n-butylbenzene is not retained as a COPEC at either site.

Butylbenzene(sec-) was detected in one sample at SWMU 03-009(a) from 0.0−5.0 ft at a concentration of 0.00033 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the sec-butylbenzene concentration and results in an HQ of 0.00001. Because this HQ is less than 0.3, sec-butylbenzene is not retained as a COPEC.

Butylbenzene(tert-) was detected in one sample at AOC 03-014(c2) from 0.0−5.0 ft at a concentration of 0.000685 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the tert-butylbenzene concentration and results in an HQ of 0.00003. Because this HQ is less than 0.3, tert-butylbenzene is not retained as a COPEC.

Calcium was detected above sediment, soil, and Qbt 2,3,4 BVs (4420 mg/kg, 6120 mg/kg, and 2200 mg/kg) in 4 sediment samples, 20 soil and 15 tuff samples at 12 sites, with a maximum concentration of 66,000 mg/kg. Only 5 results (approximately 10%) all at SWMU 03-045(g) were above the maximum soil background concentration (14,000 mg/kg). As discussed in section I-4.2, calcium at the maximum concentrations is not a health issue for an adult or a child. Therefore, calcium is not retained as a COPEC at any site.

Chloromethane was detected in one sample at SWMU 60-007(b) and in five samples at SWMU 61-002 from 0.0−5.0 ft at maximum concentrations of 0.0418 mg/kg and 0.0049 mg/kg, respectively. The NMED residential SSL for chloromethane is 275 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, chloromethane is not retained as a COPEC at either site.

Dibromo-3-chloropropane(1,2-) was detected in one sample at SWMU 61-002 from 0.0−5.0 ft at a concentration of 0.0015 mg/kg. The NMED residential SSL for 1,2-dibromo-3-chloropropane is 1.86 mg/kg, indicating that potential toxicity is high. Because the detected concentration is three orders of magnitude below the residential SSL and 1,2-dibromo-3-chloropropane was detected only once, 1,2-dibromo-3-chloropropane is not retained as a COPEC.

Dichloroethene(cis-1,2-) was detected in one sample at AOC 60-004(f) from 0.0−5.0 ft at a concentration of 0.000926 mg/kg. The minimum ESL for cis/trans-1,2-dichloroethene (23 mg/kg for the shrew) is used to screen the cis-1,2-dichloroethene concentration and results in an HQ of 0.00005. Because this HQ is less than 0.3, cis-1,2-dichloroethene is not retained as a COPEC.

Ethylbenzene was detected in one sample at SWMU 03-013(i) and in one sample at SWMU 61-002 from 0−5 ft at concentrations of 0.000366 mg/kg and 1.3 mg/kg, respectively. 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 0.05. Because this HQ is less than 0.3, ethylbenzene is not retained as a COPEC at either site.

Iron was detected above the sediment BV (13,800 mg/kg) in two samples at SWMU 03-045(g) from 0.0−5.0 ft, with a maximum concentration of 19,900 mg/kg. The concentrations were below or similar to the maximum Qbt 2,3,4 background concentration (19,500 mg/kg) and below the soil BV (21,500 mg/kg) and 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). Therefore, iron is eliminated as a COPEC.

Isopropylbenzene was detected in one sample at SWMU 03-045(f) and in one sample at SWMU 61-002 from 0−5 ft at concentrations of 0.000427 mg/kg and 0.23 mg/kg, respectively. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the isopropylbenzene concentrations and results in a maximum HQ of 0.01. Because this HQ is less than 0.3, isopropylbenzene is not retained as a COPEC at either site.

Isopropyltoluene(4-) was detected in a total of 19 samples at 13 sites from 0−5 ft with a concentration range of 0.000364 mg/kg to 7.64 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 0.33. Because the HQs are approximately 0.3 or less and 4-isopropyltoluene is infrequently detected at a site (1 to 4 detected concentrations per site), 4-isopropyltoluene is not retained as a COPEC at any site.

Magnesium was detected in four samples above the sediment BV (2370 mg/kg) at SWMU 03-045(g) and in one sample above the Qbt 2,3,4 BV (1690 mg/kg) at SWMU 60-002 (East) from 0.0−5.0 ft. The concentration in tuff was below the maximum Qbt 2,3,4 background concentration (2820 mg/kg), and the sediment concentrations were below the maximum soil background concentration (10,000 mg/kg). As discussed in sections I-4.2.20, I-4.2.31, and I-4.2.36, magnesium at the maximum concentration is not a health issue for an adult or a child. Therefore, magnesium is eliminated as a COPEC.

MCPA was detected in one sample at SWMU 03-014(o) from 0.0−5.0 ft at a concentration of 0.956 mg/kg. The EPA residential regional screening level for MCPA is 31 mg/kg, indicating its potential toxicity is low. Because of the potential low toxicity and the infrequent detection, MCPA is eliminated as a COPEC.

MCPP was detected in one sample at SWMU 03-014(o) from 0.0−5.0 ft at a concentration of 0.993 mg/kg. The EPA residential regional screening level for MCPP is 61 mg/kg, indicating its potential toxicity is low. Because of the potential low toxicity and the infrequent detection, MCPP is eliminated as a COPEC.

Nitroaniline(4-) was detected in one sample at AOC 03-052(f) from 0.0−5.0 ft at a concentration of 0.46 mg/kg. The minimum ESL for 2-nitroaniline (5.4 mg/kg for the deer mouse) is used to screen 4-nitroaniline and results in a maximum HQ of 0.09. Because this HQ is less than 0.3, 4-nitroaniline is eliminated as a COPEC.

Perchlorate was detected in 16 samples at 6 sites from 0.0−5.0 ft with concentrations ranging from 0.000557 mg/kg to 0.00173 mg/kg. The NMED residential SSL for perchlorate is 54.5 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and perchlorate is infrequently detected at a site (2 to 4 detected concentrations per site), perchlorate is eliminated as a COPEC.

Potassium was detected in two samples above the sediment BV (2690 mg/kg) at SWMU 03-045(g) at concentrations of 2850 mg/kg and 2870 mg/kg. The potassium concentrations are similar to the soil BV (3460 mg/kg) and below the maximum soil background concentration (6850 mg/kg). As discussed in section I-4.2.20, potassium at the maximum concentration is not a health issue for an adult or a child. Therefore, potassium is eliminated as a COPEC.

Propylbenzene(1-) was detected in one sample at SWMU 61-002 from 0.0−5.0 ft at a concentration of 0.85 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the 1-propylbenzene concentration and results in an HQ of 0.04. Because this HQ is less than 0.3, 1-propylbenzene is not retained as a COPEC.

Sodium was detected in two samples above the sediment BV (1470 mg/kg) at SWMU 03-045(g) and in four samples above the soil BV (915 mg/kg) at SWMU 03-002(c). On sediment concentration and two soil concentrations were below the maximum sediment and soil background concentrations (1970 mg/kg and 1800 mg/kg). In addition, the sodium concentrations are similar to the maximum sediment and soil background concentrations (within 220 mg/kg and 920 mg/kg), respectively. As discussed in sections I-4.2-1 and I-4.2.20, sodium at the maximum concentrations is not a health issue for an adult or a child. Therefore, sodium is eliminated as a COPEC.

TPH-DRO was detected in 234 samples at 27 sites with a maximum concentration of 31,000 mg/kg. Seven concentrations at six sites are above the NMED screening guidelines (NMED 2012, 219971), but the detected constituents of TPH-DRO (primarily PAHs) do not pose a potential risk to ecological receptors at any of the sites with elevated TPH-DRO. Therefore, TPH-DRO is not retained as a COPEC at any site.

TPH-GRO was detected in 10 samples at SWMU 03-013(i), 2 samples at SWMU 03-045(a), 8 samples at SWMU 03-045(g), 11 samples at SWMU 60-002 (West), and 2 samples at SWMU 60-002 (Central), with a concentration range of 0.0127 mg/kg to 3.15 mg/kg. Of the 33 detected concentrations all but 2 were less than 0.4 mg/kg. The detected constituents of TPH-GRO do not pose a potential ecological risk to receptors. Therefore, TPH-GRO is eliminated as a COPEC at any sites.

Trimethylbenzene(1,2,4-) was detected in 14 samples at 8 sites from 0.0−5.0 ft with a concentration range of 0.000329 mg/kg to 9.5 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 0.4 (SWMU 62-002), with the next highest HQ being 0.0001. The PAUF for the deer mouse at SWMU 61-002 was 0.04, which results in an adjusted HQ of 0.02. Because the HQs and the adjusted HQ are less than 0.3, 1,2,4-trimethylbenzene is not retained as a COPEC at any site.

Trimethylbenzene(1,3,5-) was detected in seven samples at four sites from 0.0−5.0 ft with a concentration range of 0.000396 mg/kg to 3.1 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 0.1. Because the HQs are less than 0.3, 1,3,5-trimethylbenzene is not retained as a COPEC at any site.

Xylene(1,2-) was detected in one sample at SWMU 03-009(a) and one sample at SWMU 03-013(i) from 0−5 ft at concentrations of 0.00071 mg/kg and 0.000548 mg/kg, respectively. 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 0.0005. Because the HQs are less than 0.3, 1,2-xylene is not retained as a COPEC at either site.

Xylene(1,3-)+1,4-xylene was detected in five samples at three sites from 0.0−5.0 ft with a concentration range of 0.000425 mg/kg to 0.00111 mg/kg. The minimum ESL for total xylene (1.4 mg/kg for the shrew) is used to screen 1,3-xylene+1,4-xylene and results in a maximum HQ of 0.0008. Because the HQs are less than 0.3, 1,3-xylene+1,4-xylene is not retained as a COPEC at any site.

I-5.5 Interpretation of Ecological Risk Screening Results

I-5.5.1 Receptor Lines of Evidence

Based on the ecological risk-screening assessments, several COPECs (including COPECs without an ESL) were identified within the Upper Sandia Canyon Aggregate Area. 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 detected concentrations 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 SWMUs 03-003(d), 03-056(a), and 60-002 (Central).
- The HI analyses using the LOAEL-based ESL resulted in HIs less than or equivalent to 1 for SWMUs 03-002(c), 03-009(a), 60-002 (East), and 61-002.
- Field observations made during the site visit found no indication of adverse effects on the plant community from COPECs. In addition, the areas in and/or around the sites are industrially developed with many structures, roads, and other paved areas present and do not provide good quality habitat.
- As discussed in section I-5.4.7, the potential risks to the plant are overestimated and/or are not representative of the sites.

These lines of evidence support the conclusion no potential ecological risk to the plants exists at the Upper Sandia Canyon Aggregate Area.

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 03-002(c), 03-003(d), 03-009(a), 03-009(i), 03-029, 03-045(c), 03-045(e), 03-045(f), 03-045(h), 03-056(a), 60-002 (Central), 60-007(a), and AOCs 03-014(b2), 03-047(g), and C-03-022.

- The HI analyses using the LOAEL-based ESL resulted in HIs less than or equivalent to 1 for SWMUs 03-012(b), 03-013(i), 03-021, 03-045(b), 03-045(g), 03-056(d), 03-059, and 60-007(b), AOCs 03-014(c2), 03-51(c), 03-052(b), 03-056(k), 60-004(f), C-61-002, and 61-002, and SWMU 03-015 and AOC 03-053.
- As discussed in section I-5.4.7, the potential risks to the earthworm at SWMUs 03-014(k,l,m,n), 03-014(o), 03-014(u), and 03-045(a) and AOC 03-052(f) are overestimated and/or are not representative of the sites.

These lines of evidence support the conclusion no potential ecological risk to the earthworm exists at the Upper Sandia Canyon Aggregate Area.

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 SWMUs 03-003(d), 03-056(a), and 60-002 (Central), 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 1 for all sites.

These lines of evidence support the conclusion that no potential ecological risk to the montane shrew exists at the Upper Sandia Canyon Aggregate Area.

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 or equivalent to 1 for the deer mouse at all sites, except at SWMUs 03-003(d), 60-002(Central), and 03-056(a), 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 SWMU 03-015 and AOC 03-053, and SWMU 03-059, which had HIs equivalent to 1, and SWMUs 03-012(b), 03-014(k,l,m,n), and 60-007(b), which had HIs greater than 1.
- The HI analyses using the LOAEL-based ESL resulted in HIs less than or equivalent to 1 for SWMUs 03-012(b), 03-059, and 60-007(b).
- The LOAEL-based ESL analyses adjusted by the PAUF resulted in HIs less than 1 for SWMUs 03-014(k,l,m,n), and SWMU 03-015 and AOC 03-053.

These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists at the Upper Sandia Canyon Aggregate Area.

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 SWMUs 03-009(i), 03-012(b), 03-013(i), 03-014(k,l,m,n), 03-014(o), 03-014(u), 03-021, 03-029, 03-045(a), 03-045(g), 03-052(f), 60-002 (West), 60-007(b), and 61-002 and AOCs 03-014(b2), 03-014(c2), 03-051(c), 03-052(b), 03-056(k), 60-004(f), and C-61-002, and SWMU 03-015 and AOC 03-053.
- 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 Upper Sandia 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 03-003(d), 03-012(b), 03-013(i), 03-014(k,l,m,n), 03-014(o), 03-014(u), 03-045(a), 03-045(b), 03-045(c), 03-045(h), 03-052(f), 03-056(d), 03-059, and 61-002 and AOCs 03-014(b2), 03-014(c2), 03-047(g), 03-052(b), 03-051(c), and 60-004(f), and SWMU 03-015 and AOC 03-053.
- 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 fox exists at the Upper Sandia 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 SWMUs 03-003(d) for the herbivore and 03-009(a) for the herbivore and omnivore, SWMUs 03-045(f), 03-045(h), 03-056(a), 60-002 (Central), and 60-007(a) and AOC C-03-022 for all feeding guilds, 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 03-014(k,l,m,n), 03-059, and 60-007(b) and AOC 03-014(c2) for the insectivore and omnivore feeding guilds.
- The HI analyses using the LOAEL-based ESL resulted in an HI equivalent to 1 for the robin (omnivore) at SWMU 60-007(b).
- The LOAEL-based ESL analyses adjusted by the PAUF resulted in HIs less than or equivalent to 1 for the robin (insectivore and omnivore) at SWMUs 03-014(k,l,m,n), 03-059, and 60-007(b) and AOC 03-014(c2).

These lines of evidence support the conclusion that no potential ecological risk to the robin (all feeding guilds) exists at the Upper Sandia Canyon Aggregate Area.

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 03-002(c), 03-009(a), 03-029, 03-045(e), 03-045(f), 03-045(h), 03-056(a), 60-002 (Central and East), 60-007(a) and AOCs 03-051(c) and C-03-022, 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 Upper Sandia 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 greater than or equivalent to 1 for the kestrel (top carnivore) at all sites, except at SWMUs 03-002(c), 03-009(a), 03-021, 03-029, 03-045(e), 03-045(f), 03-045(h), 03-056(a), 60-002 (West, Central, and East), and 60-007(a) and AOCs 03-051(c), 03-056(k), C-03-022, and C-61-002, 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.
- The kestrel (top carnivore) is a surrogate for the Mexican spotted owl. The HIs were adjusted by the owl's 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 Upper Sandia Canyon Aggregate Area.

I-5.5.2 COPECs with No ESLs

COPECs with no ESLs were not evaluated for each receptor. All COPECs without ESLs were eliminated based on comparisons to surrogate ESLs, human health SSLs, and background concentrations. The analysis of COPECs with no ESLs supports the conclusion that no potential ecological risk to receptors exists at the Upper Sandia Canyon Aggregate Area.

I-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 the relationship of detected concentrations and detection limits to background concentrations, no potential ecological risks to the ecological receptors exist at the sites evaluated within the Upper Sandia Canyon Aggregate Area.

I-6.0 CONCLUSIONS

I-6.1 Human Health Risk

The human health risk-screening assessments found no potential unacceptable risks under the construction worker scenario at any of the sites. SWMUs 03-045(g) and 60-002 (East) had construction worker HIs of approximately 1, with associated potential risk from manganese at SWMU 03-045(g) and aluminum and cobalt at SWMU 60-002 (East). However, the risk was overestimated by the SSLs and/or the EPCs (section I-4.3.2). Overall, no potential unacceptable risks to the construction worker exist at the sites evaluated.

SWMU 60-002 (West and East) and AOCs 03-051(c), C-03-022, 60-004(f), and C-61-002 were not evaluated for the industrial scenario because no COPCs were detected in the depth interval of 0.0–1.0 ft. No unacceptable risks exist for any of the sites evaluated under the industrial scenario. The total excess cancer risks for the industrial scenario at SWMUs 03-014(k,l,m,n), 03-045(a), 03-052(f), and SWMU 03-015 and AOC 03-053 were initially above the 1×10^{-5} target risk level. As discussed in section I-4.3.2, the risks are overestimated and are not representative of the exposure at the sites. Based on further evaluation of the data, potential cancer risks for the industrial scenario at SWMUs 03-014(k,l,m,n), 03-045(a), and 03-015 and AOC 03-053 are below the NMED target level. For SWMU 03-052(f), the exposure that results in potential unacceptable risk to a worker is unrealistic. In addition, the PAHs are not related to site operations but result from runoff from paved infrastructure. Therefore, the exposure and risk are not issues for a Laboratory worker.

For the residential scenario, 13 sites had total excess cancer risks above the 1×10^{-5} target risk level and three sites had HIs above 1. SWMU 03-045(g) also had a total excess cancer risk slightly above the target risk level, which was in part from arsenic. As discussed in section I-4.3.2, the arsenic does not result in an incremental increase in cancer risk above the risk from background, so the cancer risk was overestimated by the EPC and is not representative of the exposure. The risk level without arsenic was less than1 $\times 10^{-5}$. AOCs 03-047(g) and 03-051(c) had elevated cancer risk from PAHs, which were not related to the site but are from the paved areas in and around the sites. Therefore, the cancer risks at these sites are not an issue. SWMUs 03-014(k,l,m,n) had elevated cancer risk from PAHs. The limited occurrence of elevated PAHs at one location and the observation that the asphalt is broken and cracked in various places in the beds supports the hypothesis that the sample contains a piece or pieces of asphalt from the berm rather than the detection being the result of residual contamination from site operations. As a result, the cancer risk at this site is not an issue for any scenario. The remaining sites had total excess cancer risks, HIs, and total doses for the residential scenario below the regulatory target levels.

SWMUs 03-014(k,l,m,n) had potential issues associated with TPH-DRO for all three scenarios, and SWMU 03-045(e) and AOC C-03-022 had potential issues associated with TPH-DRO for the construction worker and residential scenarios. However, as discussed in section I-4.3.2 for SWMUs 03-014(k,l,m,n) and 03-045(e), no or few and low concentrations of PAHs were detected at the locations with elevated TPH-DRO, indicating the TPH constituents have degraded and all that is left are the longer-chained hydrocarbons as residue in a limited area and depth. These longer-chained hydrocarbons are persistent but are less toxic than the shorter-chained hydrocarbons. The TPH-DRO is at least 20 yr old and is not the result of a recent spill. NMED's TPH screening guidelines state that site cleanup cannot be based solely on results of TPH sampling and that the TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants. The NMED screening guidelines are based on ingestion and use of groundwater as a potable water supply. However, because no or few individual petroleum-related contaminants were detected at the locations of the highest TPH-DRO concentrations, the regional aquifer is over 1000 ft bgs, and extent was defined at depths must shallower than the regional aquifer (14.0–15.0 ft bgs), no potable groundwater issues are related to the TPH detected. Therefore, remediation of the TPH-DRO is not warranted.

For AOC C-03-022, additional sampling is needed to characterize the constituents of the TPH-DRO detected in the soil. No VOC or SVOC data are available to determine whether TPH constituents are present and pose a potential unacceptable risk.

The remedy completion report data for SWMU 61-002 were reevaluated based on current approaches (e.g., comparing inorganic chemicals with background using statistics and using SSLs/SALs to determine if additional sampling is warranted) and using standard up-to-date exposure assumptions, including exposure depths for each scenario (NMED 2012, 219971). Based on the reassessment, the residential scenario had a total excess cancer risk above the 1×10^{-5} target risk level, but the industrial and construction worker scenarios had total excess cancer risks below the target risk level. The HIs were below the target HI of 1 and The TPH-DRO HQs were below 1 for all scenarios.

Complete exposure pathways to receptors are not present at SWMU 60-006(a) where the potential contamination is deeper than 10.0 ft. For AOC 03-038(d), samples were collected at the incorrect depths; thus, the data were not representative of the site. Therefore, human health risk-screening assessments were not conducted for these sites.

The total doses were below the DOE target dose limit of 25 mrem/yr for all three scenarios at SWMUs 03-014(k,l,m,n,o,u), 03-015, and 03-059, and AOCs 03-053, 03-056(k), and 60-004(f). The total doses were equivalent to total risks ranging from 2×10^{-9} to 3×10^{-5}, based on a comparison with EPA's PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The maximum potential dose/risk at SWMU 03-014(o) is based on the maximum detected concentration of strontium-90. Strontium-90 was detected in 2 out of 16 samples collected from the sludge drying beds. The other detected strontium-90 concentration (3.2 pCi/g) results in a dose of 5 mrem/yr and an equivalent total risk of 1×10^{-6}. Therefore, the dose and risk at SWMU 03-014(o) are overestimated by the maximum strontium-90 concentration. The next highest equivalent total risk was 6×10^{-6} at AOC 03-056(k).

Sites at TA-03, TA-60, and TA-61 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. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 Code of Federal Regulations 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

I-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 the relationship of detected concentrations and detection limits to background concentrations, 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 the Upper Sandia Canyon Aggregate Area sites.

I-7.0 REFERENCES

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Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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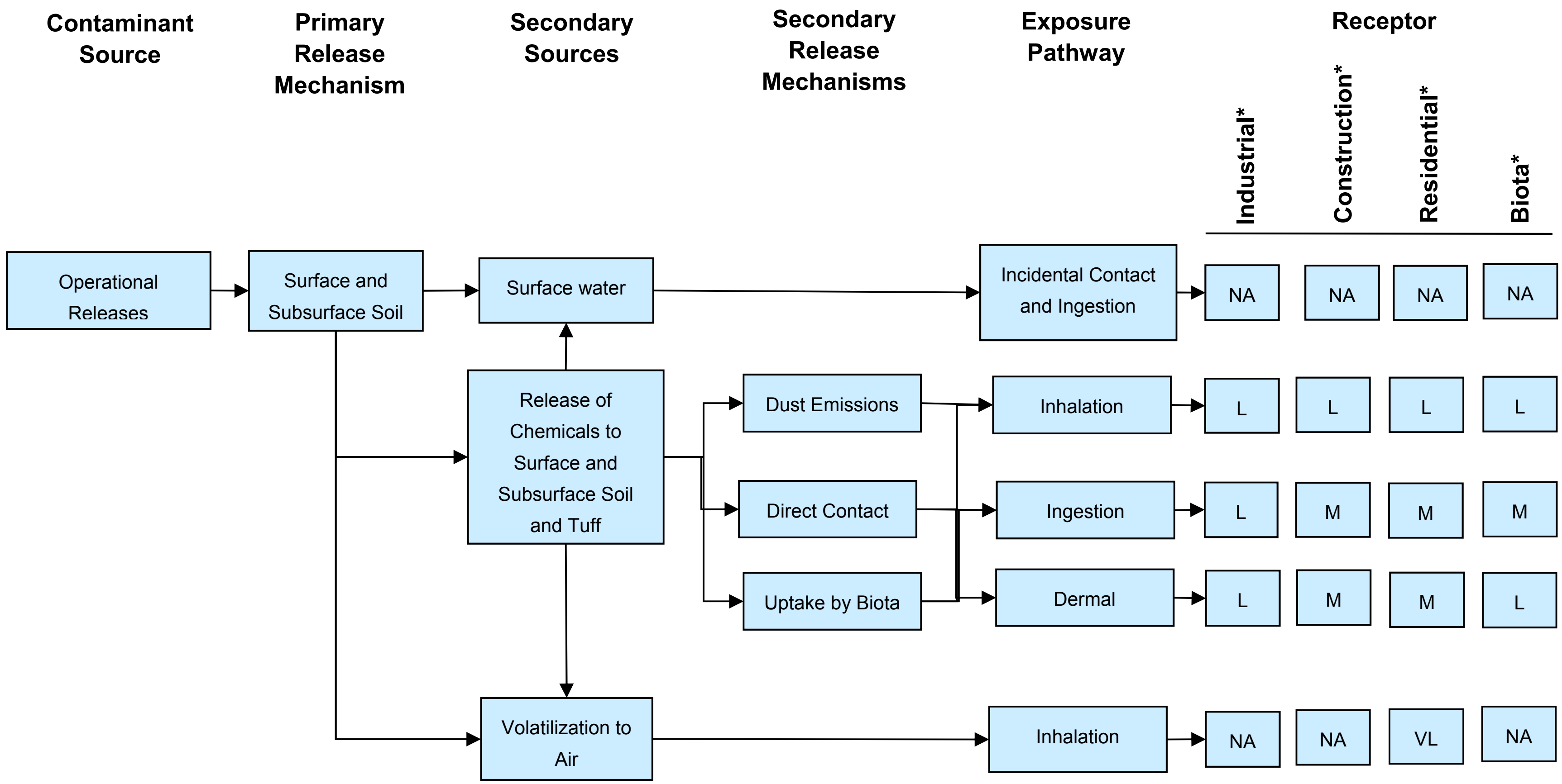


* Very Low (VL), Low (L), and Moderate (M) designations indicate the pathway is a potentially complete pathway and is evaluated in the risk assessments.
Not Applicable (NA) indicates the pathway is incomplete and is not evaluated in the risk assessments.

Figure I-3.1-1 Conceptual site model for Upper Sandia Canyon Aggregate Area

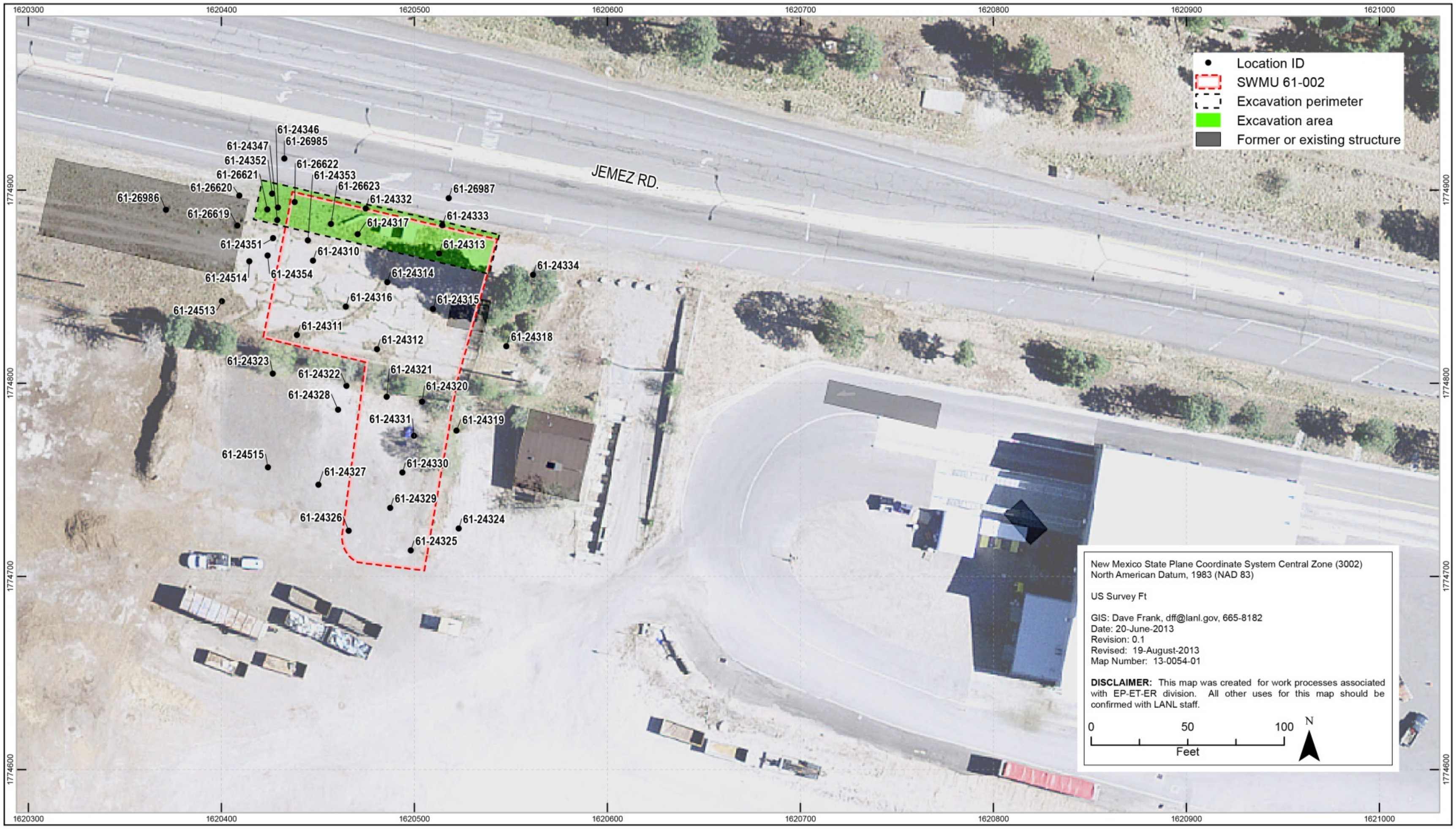


Figure I-4.3-1 Relative position of SWMU 61-002 to East Jemez Road

Table I-2.3-1
EPCs for SWMU 03-002(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	4	1	0.483	1.23(U)	n/a*	0.483	Maximum detected concentration
Lead	4	4	5.77	19.2	n/a	19.2	Maximum detected concentration
Organic Chemicals (mg/kg)							
Benzo(a)anthracene	4	1	0.0199	0.0424(U)	n/a	0.0199	Maximum detected concentration
Benzo(a)pyrene	4	1	0.0153	0.0424(U)	n/a	0.0153	Maximum detected concentration
Benzo(b)fluoranthene	4	1	0.0152	0.0424(U)	n/a	0.0152	Maximum detected concentration
Chlordane[gamma-]	4	1	0.000838(U)	0.00355(U)	n/a	0.000983	Maximum detected concentration
Chrysene	4	1	0.0121	0.0424(U)	n/a	0.0121	Maximum detected concentration
DDT[4,4'-]	4	1	0.00168(UJ)	0.00766(U)	n/a	0.00308	Maximum detected concentration
Fluoranthene	4	1	0.0266	0.0424(U)	n/a	0.0266	Maximum detected concentration
Phenanthrene	4	1	0.0264	0.0424(U)	n/a	0.0264	Maximum detected concentration
Pyrene	4	1	0.0298	0.0424(U)	n/a	0.0298	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-2
EPCs for SWMU 03-002(c) for the Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	1	0.483	1.3(U)	n/a*	0.48	Maximum detected concentration
Lead	7	7	5.77	37.7	n/a	37.7	Maximum detected concentration
Organic Chemicals (mg/kg)							
Benzo(a)anthracene	7	1	0.0199	0.0452(U)	n/a*	0.0199	Maximum detected concentration
Benzo(a)pyrene	7	1	0.0153	0.0452(U)	n/a	0.0153	Maximum detected concentration
Benzo(b)fluoranthene	7	1	0.0152	0.0452(U)	n/a	0.0152	Maximum detected concentration
Chlordane[gamma-]	7	1	0.000838(U)	0.00355(U)	n/a	0.000983	Maximum detected concentration
Chrysene	7	1	0.0121	0.0452(U)	n/a	0.0121	Maximum detected concentration
DDT[4,4'-]	7	1	0.00168(UJ)	0.00766(U)	n/a	0.00308	Maximum detected concentration
Fluoranthene	7	1	0.0266	0.0452(U)	n/a	0.0266	Maximum detected concentration
Phenanthrene	7	1	0.0264	0.0452(U)	n/a	0.0264	Maximum detected concentration
Pyrene	7	1	0.0298	0.0452(U)	n/a	0.0298	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-3
EPCs for SWMU 03-002(c) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	1	0.483	1.3(U)	n/a*	0.483	Maximum detected concentration
Lead	8	8	5.77	37.7	Normal	22.7	95% Student's t
Organic Chemicals (mg/kg)							
Benzo(a)anthracene	8	1	0.0199	0.0452(U)	n/a*	0.0199	Maximum detected concentration
Benzo(a)pyrene	8	1	0.0153	0.0452(U)	n/a	0.0153	Maximum detected concentration
Benzo(b)fluoranthene	8	1	0.0152	0.0452(U)	n/a	0.0152	Maximum detected concentration
Chlordane[gamma-]	8	1	0.000838(U)	0.00405(U)	n/a	0.000983	Maximum detected concentration
Chrysene	8	1	0.0121	0.0452(U)	n/a	0.0121	Maximum detected concentration
DDT[4,4'-]	8	1	0.00168(UJ)	0.00811(U)	n/a	0.00308	Maximum detected concentration
Fluoranthene	8	1	0.0266	0.0452(U)	n/a	0.0266	Maximum detected concentration
Phenanthrene	8	1	0.0264	0.0452(U)	n/a	0.0264	Maximum detected concentration
Pyrene	8	1	0.0298	0.0452(U)	n/a	0.0298	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-4
EPCs for SWMU 03-003(d) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Aroclor-1254	6	1	0.00349(U)	0.19	n/a*	0.19	Maximum detected concentration
Aroclor-1260	6	6	0.0048	0.489	n/a	0.489	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-5
EPCs for SWMU 03-003(d) for the Ecological Risk and Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Aroclor-1254	11	1	0.00349(U)	0.19	n/a*	0.19	Maximum detected concentration
Aroclor-1260	11	11	0.0048	0.965	Lognormal	0.555	95% Chebyshev (MVUE)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-6
EPCs for SWMU 03-009(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	2	0	1.04(U)	1.05(U)	n/a*	1.05(U)	Maximum detection limit
Chromium	2	2	3.45	15.4	n/a	15.4	Maximum detected concentration
Selenium	2	0	1.03(U)	1.05(U)	n/a	1.05(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Acenaphthene	2	1	0.0119	0.0353(U)	n/a	0.0119	Maximum detected concentration
Anthracene	2	1	0.0219	0.0353(U)	n/a	0.0219	Maximum detected concentration
Aroclor-1260	2	1	0.0069	0.0177(U)	n/a	0.0069	Maximum detected concentration
Benzo(a)anthracene	2	1	0.0353(U)	0.0557	n/a	0.0557	Maximum detected concentration
Benzo(a)pyrene	2	1	0.0353(U)	0.0511	n/a	0.0511	Maximum detected concentration
Benzo(b)fluoranthene	2	2	0.0168	0.0854	n/a	0.0854	Maximum detected concentration
Benzo(g,h,i)perylene	2	1	0.0299	0.0353(U)	n/a	0.0299	Maximum detected concentration
Chrysene	2	1	0.0353(U)	0.0505	n/a	0.0505	Maximum detected concentration
Fluoranthene	2	2	0.0195	0.138	n/a	0.138	Maximum detected concentration
Fluorene	2	1	0.0117	0.0353(U)	n/a	0.0117	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	2	1	0.0249	0.0353(U)	n/a	0.0249	Maximum detected concentration
Phenanthrene	2	1	0.0353(U)	0.0913	n/a	0.0913	Maximum detected concentration
Pyrene	2	1	0.0173	0.126	n/a	0.126	Maximum detected concentration
TPH-DRO	2	2	3.91	23.7	n/a	23.7	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-7
EPCs for SWMU 03-009(a) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	6	1	0.18	1.08(U)	n/a*	0.18	Maximum detected concentration
Chromium	6	6	0.46	16.7	n/a	16.7	Maximum detected concentration
Selenium	6	2	0.3	1.08(U)	n/a	0.43	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	6	2	0.0119	0.4(U)	n/a	0.0272	Maximum detected concentration
Anthracene	6	2	0.0219	0.4(U)	n/a	0.0639	Maximum detected concentration
Aroclor-1260	4	2	0.0016	0.0182(U)	n/a	0.0069	Maximum detected concentration
Benzo(a)anthracene	6	2	0.0353(U)	0.4(U)	n/a	0.179	Maximum detected concentration
Benzo(a)pyrene	6	3	0.0187	0.4(U)	n/a	0.166	Maximum detected concentration
Benzo(b)fluoranthene	6	4	0.0168	0.4(U)	n/a	0.27	Maximum detected concentration
Benzo(g,h,i)perylene	6	3	0.0168	0.4(U)	n/a	0.0996	Maximum detected concentration
Chrysene	6	2	0.0353(U)	0.4(U)	n/a	0.16	Maximum detected concentration
Fluoranthene	6	4	0.0195	0.437	n/a	0.437	Maximum detected concentration
Fluorene	6	2	0.0117	0.4(U)	n/a	0.0329	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	6	2	0.0249	0.4(U)	n/a	0.0928	Maximum detected concentration
Methylene chloride	6	1	0.00532(U)	0.023	n/a	0.023	Maximum detected concentration
Phenanthrene	6	3	0.0279	0.4(U)	n/a	0.279	Maximum detected concentration
Pyrene	6	4	0.0173	0.373	n/a	0.373	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-8
EPCs for SWMU 03-009(a) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	9	1	0.18	1.78(U)	n/a*	0.18	Maximum detected concentration
Chromium	9	9	0.46	16.7	Normal	12.7	95% Student's t
Selenium	9	2	0.3	1.17(UJ)	n/a	0.43	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	9	3	0.0119	0.4(U)	n/a	0.108	Maximum detected concentration
Anthracene	9	4	0.0104	0.4(U)	n/a	0.293	Maximum detected concentration
Aroclor-1254	7	1	0.00363(U)	0.0396	n/a	0.0396	Maximum detected concentration
Aroclor-1260	7	3	0.0016	0.0382	n/a	0.0382	Maximum detected concentration
Benzo(a)anthracene	9	5	0.0243	0.857	Gamma	0.33	95% KM (BCA)
Benzo(a)pyrene	9	5	0.0187	0.944	Gamma	0.387	95% KM (BCA)
Benzo(b)fluoranthene	9	6	0.0168	1.62	Approximate Gamma	1.03	95% KM (Chebyshev)
Benzo(g,h,i)perylene	9	5	0.015	0.469	Gamma	0.179	95% KM (BCA)
Benzo(k)fluoranthene	9	1	0.0148	0.4(U)	n/a	0.0148	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	9	1	0.148	0.4(U)	n/a	0.148	Maximum detected concentration
Butylbenzene[sec-]	9	2	0.00033	0.006(U)	n/a	0.000825	Maximum detected concentration
Chrysene	9	5	0.022	0.894	Gamma	0.337	95% KM (BCA)
Ethylbenzene	9	1	0.000756	0.006(U)	n/a	0.000756	Maximum detected concentration
Fluoranthene	9	7	0.0195	1.83	Gamma	1.17	95% KM (Chebyshev)
Fluorene	9	2	0.0117	0.4(U)	n/a	0.0329	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	9	4	0.0169	0.408	n/a	0.408	Maximum detected concentration
Isopropylbenzene	9	1	0.000412	0.006(U)	n/a	0.000412	Maximum detected concentration
Isopropyltoluene[4-]	9	2	0.000373	0.006(U)	n/a	0.00183	Maximum detected concentration
Methylene chloride	9	2	0.00238	0.023	n/a	0.023	Maximum detected concentration
Methylnaphthalene[2-]	9	1	0.0352(U)	0.915	n/a	0.915	Maximum detected concentration
Naphthalene	9	1	0.0352(U)	0.4(U)	n/a	0.24	Maximum detected concentration

Table I-2.3-8 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Phenanthrene	9	6	0.0242	0.941	Gamma	0.359	95% KM (BCA)
Propylbenzene[1-]	9	1	0.000744	0.006(U)	n/a	0.000744	Maximum detected concentration
Pyrene	9	7	0.0173	1.86	Gamma	1.18	95% KM (Chebyshev)
TPH-DRO	9	6	3.91	226	Gamma	87.8	95% KM (BCA)
Trimethylbenzene[1,2,4-]	9	2	0.000741	0.006(U)	n/a	0.00206	Maximum detected concentration
Trimethylbenzene[1,3,5-]	9	2	0.000575	0.006(U)	n/a	0.00111	Maximum detected concentration
Xylene[1,2-]	7	1	0.00071	0.0011(U)	n/a	0.00071	Maximum detected concentration
Xylene[1,3-]+1,4-Xylene	7	1	0.000687	0.00213(U)	n/a	0.000687	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-9
EPCs for SWMU 03-009(i) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	1	2.07(U)	2.44	n/a*	2.44	Maximum detected concentration
Barium	2	2	78.2	85.7	n/a	85.7	Maximum detected concentration
Chromium	2	2	6.98	7.23	n/a	7.23	Maximum detected concentration
Cobalt	2	2	2.71	3.26	n/a	3.26	Maximum detected concentration
Copper	2	2	6.19	7.07	n/a	7.07	Maximum detected concentration
Lead	2	2	9.37	10.8	n/a	10.8	Maximum detected concentration
Nickel	2	2	6.11	6.37	n/a	6.37	Maximum detected concentration
Selenium	2	0	1.02(U)	1.03(U)	n/a	1.03(U)	Maximum detection limit
Vanadium	2	2	15.3	16.7	n/a	16.7	Maximum detected concentration

Table I-2.3-9 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Anthracene	2	1	0.0364	0.139(U)	n/a	0.0364	Maximum detected concentration
Aroclor-1254	2	1	0.0297	0.087(U)	n/a	0.0297	Maximum detected concentration
Aroclor-1260	2	1	0.0589	0.087(U)	n/a	0.0589	Maximum detected concentration
Fluoranthene	2	1	0.0526	0.139(U)	n/a	0.0526	Maximum detected concentration
Pyrene	2	1	0.0536	0.139(U)	n/a	0.0536	Maximum detected concentration
TPH-DRO	2	2	28.6	36.4	n/a	36.4	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-10
EPCs for SWMU 03-009(i) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	3	0.589	2.44	n/a*	2.44	Maximum detected concentration
Barium	8	8	18.5	136	Normal	97.6	95% Student's t
Chromium	8	8	1.62	14	Normal	9.26	95% Student's t
Cobalt	8	8	0.732	6.06	Normal	4.09	95% Student's t
Copper	8	8	0.696	10.2	Normal	7.3	95% Student's t
Cyanide	8	1	0.241(U)	0.631	n/a	0.63	Maximum detected concentration
Lead	8	8	4.93	12.8	Normal	11.3	95% Student's t
Nickel	8	8	2.24	9.55	Normal	7.25	95% Student's t
Selenium	8	0	1(U)	1.07(U)	n/a	1.07(U)	Maximum detection limit
Vanadium	8	8	4.76	24.6	Normal	19.2	95% Student's t

Table I-2.3-10 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Anthracene	8	2	0.0343(U)	0.139(U)	n/a	0.0367	Maximum detected concentration
Aroclor-1254	8	1	0.00347(U)	0.087(U)	n/a	0.0297	Maximum detected concentration
Aroclor-1260	8	2	0.00347(U)	0.087(U)	n/a	0.0589	Maximum detected concentration
Fluoranthene	8	3	0.0161	0.139(U)	n/a	0.0526	Maximum detected concentration
Hexanone[2-]	8	1	0.00228	0.00548(UJ)	n/a	0.00228	Maximum detected concentration
Pyrene	8	2	0.0151	0.143(U)	n/a	0.0536	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-11
EPCs for SWMU 03-009(i) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	12	5	0.589	2.44	Normal	1.26	95% KM (t)
Barium	12	12	14.8	136	Gamma	82.8	95% Approximate Gamma
Chromium	12	12	0.605	14	Gamma	8.08	95% Approximate Gamma
Cobalt	12	12	0.356	6.06	Gamma	3.49	95% Approximate Gamma
Copper	12	12	0.696	10.2	Lognormal	8.73	95% Chebyshev (MVUE)
Cyanide (total)	12	1	0.241(U)	0.631	n/a*	0.631	Maximum detected concentration
Lead	12	12	4.91	17	Normal	11.2	95% Student's t
Nickel	12	12	1.57	9.55	Normal	5.84	95% Student's t
Selenium	12	0	1(U)	1.09(U)	n/a	1.09(U)	Maximum detection limit
Vanadium	12	12	2.26	24.6	Normal	15	95% Student's t

Table I-2.3-11 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Anthracene	12	2	0.0343(U)	0.139(U)	n/a	0.0367	Maximum detected concentration
Aroclor-1254	12	1	0.00347(U)	0.087(U)	n/a	0.0297	Maximum detected concentration
Aroclor-1260	12	2	0.00347(U)	0.087(U)	n/a	0.0589	Maximum detected concentration
Fluoranthene	12	3	0.0161	0.139(U)	n/a	0.0526	Maximum detected concentration
Hexanone[2-]	12	1	0.00228	0.00551(U)	n/a	0.00228	Maximum detected concentration
Methylene chloride	12	4	0.00219	0.00551(U)	n/a	0.00234	Maximum detected concentration
Pyrene	12	2	0.0151	0.143(U)	n/a	0.0536	Maximum detected concentration
TPH-DRO	12	8	2.86	71.2(U)	Gamma	16.9	95% KM (BCA)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-12
EPCs for SWMU 03-012(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	14	0	0.471(U)	0.582(U)	n/a*	0.582(U)	Maximum detection limit
Chromium	22	22	3.22	156.64	Lognormal	52.3	95% Chebyshev (Mean, Sd)
Chromium hexavalent ion	8	3	0.0952	0.241	n/a	0.241	Maximum detected concentration
Silver	22	15	0.0433	6.45	Gamma	1.59	95% KM (BCA)
Zinc	22	22	25.85	145.16	Nonparametric	64.7	95% Student's t
Organic Chemicals (mg/kg)							
Aroclor-1254	4	3	0.0038(UJ)	0.336	n/a	0.336	Maximum detected concentration
Aroclor-1260	4	3	0.0038(UJ)	0.925	n/a	0.925	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-13
EPCs for SWMU 03-012(b) for Ecological Risk and Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	32	0	0.471(U)	5.57(U)	n/a*	5.57(U)	Maximum detection limit
Chromium	50	50	0.779	156.64	Lognormal	20.8	95% Chebyshev (MVUE)
Chromium hexavalent ion	18	5	0.0952	0.241	n/a	0.241	Maximum detected concentration
Silver	50	29	0.0398	6.447	Gamma	0.807	95% KM (BCA)
Zinc	50	50	17.8	145.16	Nonparametric	51	95% Student's t
Organic Chemicals (mg/kg)							
Aroclor-1254	5	3	0.0038(UJ)	0336	n/a	0.336	Maximum detected concentration
Aroclor-1260	5	4	0.0038(UJ)	0.925	n/a	0.925	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-14
EPCs for SWMU 03-013(i) 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	19	0.181	5.71	Gamma	2.078	95% KM (BCA)
Copper	24	24	3.05	21.8	Normal	10.9	95% Students't
Lead	24	24	7.76	238	Lognormal	120.7	95% Chebyshev (Mean, Sd)
Selenium	24	1	0.874	1.79(U)	n/a*	0.874	Maximum detected concentration
Zinc	22	22	34.8	482	Nonparametric	175.7	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Acenaphthene	24	6	0.0155	0.159(U)	Normal	0.0378	95% KM (t)
Acenaphthylene	24	2	0.0186	0.159(U)	n/a	0.0421	Maximum detected concentration
Anthracene	24	9	0.00797	0.162	Approximate Gamma	0.0456	95% KM (t)

Table I-2.3-14 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Aroclor-1242	24	1	0.00371(U)	0.156(U)	n/a	0.0297	Maximum detected concentration
Aroclor-1254	24	18	0.0025	2.81	Lognormal	0.668	95% KM (Chebyshev)
Aroclor-1260	24	17	0.0013	2.26	Nonparametric	0.522	95% KM (Chebyshev)
Benzo(a)anthracene	24	11	0.0183	0.303	Gamma	0.0839	95% KM (t)
Benzo(a)pyrene	24	10	0.0157	0.392	Gamma	0.0979	95% KM (t)
Benzo(b)fluoranthene	24	8	0.0254	0.506	Normal	0.129	95% KM (t)
Benzo(g,h,i)perylene	24	8	0.0134	0.287	Normal	0.0687	95% KM (t)
Benzo(k)fluoranthene	24	6	0.0141	0.212	Normal	0.0541	95% KM (t)
Benzoic acid	24	2	0.666	3.17(U)	n/a	0.689	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	24	3	0.111	1.59(U)	n/a	0.146	Maximum detected concentration
Chrysene	24	11	0.0147	0.351	Gamma	0.0965	95% KM (t)
Dibenz(a,h)anthracene	24	3	0.0279	0.159(U)	n/a	0.0668	Maximum detected concentration
Dibenzofuran	24	1	0.0797	1.59(U)	n/a	0.0797	Maximum detected concentration
Ethylbenzene	16	1	0.000366	0.00116(U)	n/a	0.000366	Maximum detected concentration
Fluoranthene	24	15	0.0225	1.32	Gamma	0.301	95% KM (BCA)
Fluorene	24	5	0.013	0.159(U)	Normal	0.0343	95% KM (t)
Indeno(1,2,3-cd)pyrene	24	9	0.0117	0.245	Normal	0.0654	95% KM (t)
Methylene chloride	16	5	0.00227	0.00579(U)	Normal	0.00267	95% KM (t)
Methylnaphthalene[2-]	24	4	0.0105	0.159(U)	n/a	0.0783	Maximum detected concentration
Naphthalene	24	1	0.0362(U)	0.192	n/a	0.192	Maximum detected concentration
Phenanthrene	24	16	0.0149	1.09	Approximate Gamma	0.249	95% KM (BCA)
Pyrene	24	15	0.159(U)	1.36	Gamma	0.31	95% KM (BCA)
Toluene	16	10	0.000457	0.0104	Approximate Gamma	0.00282	95% KM (BCA)
TPH-DRO	24	24	3.53	5370	Lognormal	1512	95% Chebyshev (Mean, Sd)
Xylene[1,2-]	16	1	0.000548	0.00116(U)	n/a	0.000548	Maximum detected concentration
Xylene[1,3-] +1,4-Xylene	16	1	0.00111	0.00231(U)	n/a	0.00111	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-15
EPCs for SWMU 03-013(i) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	44	24	0.128	5.71	Gamma	1.31	95% KM (BCA)
Copper	48	48	2.16	21.8	Nonparametric	9.49	95% Chebyshev (Mean, Sd)
Lead	48	48	3.75	238	Nonparametric	73.4	95% Chebyshev (Mean, Sd)
Selenium	48	1	0.874	1.97(U)	n/a*	0.874	Maximum detected concentration
Zinc	44	44	14.7	482	Nonparametric	109.8	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Acenaphthene	48	6	0.0155	0.159(U)	Normal	0.0275	95% KM (t)
Acenaphthylene	48	2	0.0186	0.159(U)	n/a	0.0421	Maximum detected concentration
Acetone	48	4	0.00366(U)	0.376	n/a	0.376	Maximum detected concentration
Anthracene	48	9	0.00797	0.162	Approximate Gamma	0.0343	95% KM (t)
Aroclor-1242	48	1	0.00371(U)	0.156(U)	n/a	0.0297	Maximum detected concentration
Aroclor-1254	48	24	0.0018	2.81	Lognormal	0.339	95% KM (Chebyshev)
Aroclor-1260	48	22	0.0013	2.26	Nonparametric	0.153	95% KM (BCA)
Benzo(a)anthracene	48	12	0.0183	0.303	Gamma	0.0554	95% KM (t)
Benzo(a)pyrene	48	11	0.0157	0.392	Gamma	0.0623	95% KM (t)
Benzo(b)fluoranthene	48	9	0.0254	0.506	Normal	0.0804	95% KM (t)
Benzo(g,h,i)perylene	48	9	0.0134	0.287	Normal	0.0463	95% KM (t)
Benzo(k)fluoranthene	48	7	0.0141	0.212	Normal	0.0351	95% KM (t)
Benzoic acid	48	4	0.214	3.17(U)	n/a	0.689	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	48	6	0.111	1.59(U)	Gamma	0.269	95% KM (t)
Butanone[2-]	48	1	0.00544(UJ)	0.0174	n/a	0.0174	Maximum detected concentration
Chrysene	48	12	0.0147	0.351	Gamma	0.0629	95% KM (t)
Dibenz(a,h)anthracene	48	3	0.0279	0.159(U)	n/a	0.0668	Maximum detected concentration
Dibenzofuran	48	1	0.0797	1.59(U)	n/a	0.0797	Maximum detected concentration

Table I-2.3-15 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Ethylbenzene	40	1	0.000366	0.0015(U)	n/a	0.000366	Maximum detected concentration
Fluoranthene	48	17	0.0225	1.32	Gamma	0.164	95% KM (t)
Fluorene	48	5	0.013	0.159(U)	Normal	0.0247	95% KM (t)
Indeno(1,2,3-cd)pyrene	48	10	0.0117	0.245	Normal	0.0436	95% KM (t)
Isopropyltoluene[4-]	40	2	0.00109(U)	0.0017	n/a	0.0017	Maximum detected concentration
Methylene chloride	40	11	0.00227	0.0077(U)	Normal	0.0027	95% KM (t)
Methylnaphthalene[2-]	48	4	0.0105	0.159(U)	n/a	0.0783	Maximum detected concentration
Naphthalene	48	1	0.0362(U)	0.192	n/a	0.192	Maximum detected concentration
Phenanthrene	48	17	0.0149	1.09	Lognormal	0.143	95% KM (BCA)
Pyrene	48	16	0.0267	1.36	Gamma	0.168	95% KM (t)
Toluene	40	11	0.000457	0.0104	Approximate Gamma	0.00147	95% KM (t)
TPH-DRO	48	39	2.92	5370	Lognormal	943.1	95% KM (Chebyshev)
Trimethylbenzene[1,2,4-]	40	1	0.00035	0.0015(U)	n/a	0.00035	Maximum detected concentration
Xylene[1,2-]	40	1	0.000548	0.0015(U)	n/a	0.000548	Maximum detected concentration
Xylene[1,3-] +1,4-Xylene	40	2	0.000429	0.0031(U)	n/a	0.00111	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-16
EPCs for AOC 03-014(b2) 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	1.06(U)	1.29(U)	n/a*	1.29(U)	Maximum detection limit
Cyanide (total)	5	2	0.256(U)	1.54	n/a	1.54	Maximum detected concentration
Lead	5	5	4.02	37.3	n/a	37.3	Maximum detected concentration
Perchlorate	5	1	0.0009	0.00259(U)	n/a	0.0009	Maximum detected concentration
Selenium	5	0	1.05(U)	1.29(U)	n/a	1.29(U)	Maximum detection limit
Zinc	5	5	30	82.4	n/a	82.4	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	5	2	0.00433	0.00952	n/a	0.00952	Maximum detected concentration
Aroclor-1254	5	3	0.0149	0.0388(U)	n/a	0.021	Maximum detected concentration
Aroclor-1260	5	3	0.0177	0.0388(U)	n/a	0.0214	Maximum detected concentration
Benzo(a)pyrene	5	2	0.0151	0.0393(U)	n/a	0.0191	Maximum detected concentration
Benzo(b)fluoranthene	5	1	0.0224	0.043(U)	n/a	0.0224	Maximum detected concentration
Benzo(k)fluoranthene	5	1	0.0155	0.043(U)	n/a	0.0155	Maximum detected concentration
Chrysene	5	2	0.0159	0.0393(U)	n/a	0.0188	Maximum detected concentration
Fluoranthene	5	2	0.02	0.0393(U)	n/a	0.037	Maximum detected concentration
Phenanthrene	5	2	0.014	0.0393(U)	n/a	0.0186	Maximum detected concentration
Pyrene	5	2	0.0326	0.0393(U)	n/a	0.0329	Maximum detected concentration
TPH-DRO	5	5	3.91	32.1	n/a	32.1	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-17
EPCs for AOC 03-014(b2) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	10	0	1.02(U)	1.29U)	n/a*	1.29(U)	Maximum detection limit
Chromium	10	1	1.73(U)	14.9	n/a	14.9	Maximum detected concentration
Cyanide (total)	10	4	0.254(U)	1.61	n/a	1.61	Maximum detected concentration
Lead	10	10	4.02	37.3	Gamma	18.2	95% Approximate Gamma
Perchlorate	10	2	0.0009	0.00259(U)	n/a	0.00173	Maximum detected concentration
Selenium	10	0	0.999(U)	1.29(U)	n/a	1.29(U)	Maximum detection limit
Zinc	10	10	24.7	82.4	Gamma	52.6	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acetone	10	3	0.00433	0.0144	n/a	0.0144	Maximum detected concentration
Aroclor-1254	10	5	0.0026	0.0693	n/a	0.0693	Maximum detected concentration
Aroclor-1260	10	5	0.0033	0.0514	n/a	0.0514	Maximum detected concentration
Benzo(a)pyrene	10	2	0.0151	0.0401(U)	n/a	0.0191	Maximum detected concentration
Benzo(b)fluoranthene	10	1	0.0224	0.043(U)	n/a	0.0224	Maximum detected concentration
Benzo(k)fluoranthene	10	1	0.0155	0.043(U)	n/a	0.0155	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	10	1	0.1	0.43(U)	n/a	0.1	Maximum detected concentration
Chrysene	10	2	0.0159	0.0401(U)	n/a	0.0188	Maximum detected concentration
Fluoranthene	10	2	0.02	0.0401(U)	n/a	0.037	Maximum detected concentration
Phenanthrene	10	2	0.014	0.0401(U)	n/a	0.0186	Maximum detected concentration
Pyrene	10	2	0.0326	0.0401(U)	n/a	0.0329	Maximum detected concentration
TPH-DRO	10	10	2.94	32.1	Gamma	20.8	95% Approximate Gamma

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-18
EPCs for AOC 03-014(c2) 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	1.03(U)	1.11(U)	n/a*	1.11(U)	Maximum detection limit
Chromium	8	8	4.92	34.4	Normal	21.5	95% Student's t
Copper	8	8	5.43	32.3	Normal	22	95% Student's t
Cyanide	8	7	0.0886	30.2	Gamma	21.3	95% KM (Chebyshev)
Mercury	8	8	0.00621	0.847	Normal	0.583	95% Student's t
Perchlorate	8	1	0.000557	0.00227(U)	n/a	0.000557	Maximum detected concentration
Selenium	8	0	1.02(U)	1.13(U)	n/a	1.13(U)	Maximum detection limit
Silver	8	8	0.138	10.9	Normal	8.22	95% Student's t
Zinc	8	8	26	89.4	Normal	58.8	95% Student's t
Organic Chemicals (mg/kg)							
Acetone	8	1	0.00196	0.00566(UJ)	n/a	0.00196	Maximum detected concentration
Anthracene	8	2	0.0101	0.368(U)	n/a	0.0353	Maximum detected concentration
Aroclor-1254	8	7	0.0182(U)	1.65	Gamma	1.34	95% KM (Chebyshev)
Aroclor-1260	8	7	0.0182(U)	1.22	Gamma	1.08	95% KM (Chebyshev)
Benzo(a)anthracene	8	3	0.0118	0.368(U)	n/a	0.146	Maximum detected concentration
Benzo(a)pyrene	8	4	0.0337	0.368(U)	n/a	0.173	Maximum detected concentration
Benzo(b)fluoranthene	8	6	0.0109	0.368(U)	Gamma	0.188	95% KM (Chebyshev)
Benzo(g,h,i)perylene	8	5	0.0126	0.368(U)	Lognormal	0.0575	95% KM (BCA)
Benzo(k)fluoranthene	8	3	0.0203	0.368(U)	n/a	0.0889	Maximum detected concentration
Chrysene	8	6	0.0132	0.368(U)	Gamma	0.138	95% KM (Chebyshev)
Fluoranthene	8	6	0.0292	0.368(U)	Approximate Gamma	0.257	95% KM (Chebyshev)
Indeno(1,2,3-cd)pyrene	8	5	0.0203	0.368(U)	Normal	0.0975	95% KM (t)
Phenanthrene	8	5	0.015	0.368(U)	Gamma	0.0832	95% KM (BCA)
Pyrene	8	6	0.0238	0.373	Gamma	0.274	95% KM (Chebyshev)
TPH-DRO	8	8	11.9	69.1	Normal	42.7	95% Student's t

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-19
EPCs for AOC 03-014(c2) for the Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	16	0	0.999(U)	1.11(U)	n/a*	1.11(U)	Maximum detection limit
Chromium	16	16	4.92	34.4	Gamma	17.4	95% Approximate Gamma
Copper	16	16	1.7	32.3	Normal	17.2	95% Student's t
Cyanide	16	13	0.0886	30.2	Approximate Gamma	11.3	95% KM (Chebyshev)
Mercury	16	16	0.00621	0.847	Gamma	0.543	95% Approximate Gamma
Perchlorate	16	3	0.000557	0.00228(U)	n/a	0.000989	Maximum detected concentration
Selenium	16	0	1(U)	1.14(U)	n/a	1.14(U)	Maximum detection limit
Silver	16	15	0.138	10.9	Normal	6.06	95% KM (t)
Zinc	16	16	18.1	89.4	Gamma	55.4	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acetone	16	3	0.00196	0.0511	n/a	0.0511	Maximum detected concentration
Anthracene	16	2	0.0101	0.368(U)	n/a	0.0353	Maximum detected concentration
Aroclor-1248	16	1	0.00349(U)	0.379(U)	n/a	0.0141	Maximum detected concentration
Aroclor-1254	16	14	0.0127	6.78	Lognormal	2.54	95% KM (Chebyshev)
Aroclor-1260	16	14	0.0063	6.03	Lognormal	2.24	95% KM (Chebyshev)
Benzo(a)anthracene	16	4	0.0118	0.368(U)	n/a	0.146	Maximum detected concentration
Benzo(a)pyrene	16	4	0.0337	0.368(U)	n/a	0.173	Maximum detected concentration
Benzo(b)fluoranthene	16	6	0.0109	0.368(U)	Gamma	0.0666	95% KM (t)
Benzo(g,h,i)perylene	16	5	0.0126	0.368(U)	Lognormal	0.0358	95% KM (t)
Benzo(k)fluoranthene	16	3	0.0203	0.368(U)	n/a	0.0889	Maximum detected concentration
Butylbenzene[tert-]	16	1	0.000685	0.001144(U)	n/a	0.000685	Maximum detected concentration
Chrysene	16	6	0.0132	0.368(U)	Gamma	0.0521	95% KM (t)
Fluoranthene	16	8	0.0113	0.368(U)	Gamma	0.0854	95% KM (t)
Indeno(1,2,3-cd)pyrene	16	5	0.0203	0.368(U)	Normal	0.0587	95% KM (t)

Table I-2.3-19 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Isopropyltoluene[4-]	16	1	0.00103(U)	0.0333	n/a	0.0333	Maximum detected concentration
Phenanthrene	16	5	0.015	0.368(U)	Gamma	0.05	95% KM (t)
Pyrene	16	9	0.0117	0.373	Gamma	0.0952	95% KM (BCA)
Toluene	16	1	0.00103(U)	0.00156	n/a	0.00156	Maximum detected concentration
TPH-DRO	16	16	3.27	69.1	Gamma	35.1	95% Approximate Gamma
Radionuclides (pCi/g)							
Americium-241	16	2	-0.00419(U)	0.0498	n/a	0.0498	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-20
EPCs for SWMU 03-014 (k,l,m,n) 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	1	0.389(U)	8.3	n/a*	8.3	Maximum detected concentration
Cadmium	10	5	0.119	15.5	Gamma	4.8	95% KM (t)
Chromium	10	10	3.32	51.9	Gamma	28.5	95% Approximate Gamma
Copper	10	10	1.82	231	Gamma	95.3	95% Approximate Gamma
Cyanide	5	2	0.0778(U)	9.48	n/a	9.48	Maximum detected concentration
Lead	10	10	4.7	217	Lognormal	141.9	95% Chebyshev (Mean, Sd)
Mercury	10	10	0.0213	0.92	Gamma	0.784	95% Approximate Gamma
Nickel	10	10	2.54	30.7	Approximate Gamma	13.4	95% Approximate Gamma
Selenium	10	1	0.18(U)	1.12(U)	n/a	0.96	Maximum detected concentration
Silver	10	10	0.446	18.3	Gamma	8.72	95% Approximate Gamma
Zinc	10	10	21.5	638	Nonparametric	370.7	95% Chebyshev (Mean, Sd)

Table I-2.3-20 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	12	2	0.0176	3.8(U)	n/a	2.3	Maximum detected concentration
Acetone	6	1	0.00519(UJ)	2.2	n/a	2.2	Maximum detected concentration
Anthracene	12	3	0.00827	3.9	n/a	3.9	Maximum detected concentration
Aroclor-1254	12	7	0.0041	6.5	Lognormal	3	95% KM (Chebyshev)
Aroclor-1260	12	7	0.0044	3.8(U)	Normal	0.099	95% KM (t)
Benzo(a)anthracene	12	3	0.0152	11	n/a	11	Maximum detected concentration
Benzo(a)pyrene	12	4	0.012	8.3	n/a	8.3	Maximum detected concentration
Benzo(b)fluoranthene	12	5	0.0154	15	Nonparametric	7.09	95% KM (Chebyshev)
Benzo(g,h,i)perylene	12	3	0.0107	5.6	n/a	5.6	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	12	2	0.34(U)	44	n/a	44	Maximum detected concentration
Butylbenzylphthalate	12	1	0.34(U)	30	n/a	30	Maximum detected concentration
Carbon disulfide	7	1	0.00281	0.0057(U)	n/a	0.00281	Maximum detected concentration
Chrysene	12	4	0.0122	9.3	n/a	9.3	Maximum detected concentration
Dibenz(a,h)anthracene	12	1	0.0345(U)	3.8(U)	n/a	1.1	Maximum detected concentration
Dibenzofuran	12	1	0.34(U)	3.8(U)	n/a	1.2	Maximum detected concentration
Dichlorobenzene[1,4-]	12	1	0.34(U)	3.8(U)	n/a	1.4	Maximum detected concentration
Fluoranthene	12	5	0.0151	24	Nonparametric	11.35	95% KM (Chebyshev)
Fluorene	12	1	0.0345(U)	3.8(U)	n/a	2	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	12	2	0.0319	4.6	n/a	4.6	Maximum detected concentration
Isopropyltoluene[4-]	7	1	0.00104(U)	0.0057(U)	n/a	0.00157	Maximum detected concentration
Naphthalene	12	1	0.0345(U)	3.8(U)	n/a	0.94	Maximum detected concentration
Phenanthrene	12	3	0.0116	22	n/a	22	Maximum detected concentration
Pyrene	12	5	0.0144	32	Nonparametric	15.1	95% KM (Chebyshev)
TPH-DRO	10	7	3.58	31000	Gamma	9356	95% KM (BCA)

Table I-2.3-20 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Tritium	9	1	0.000973(U)	1.59(U)	n/a	0.0567	Maximum detected concentration
Uranium-234	9	9	0.429	4.72	Lognormal	2.31	95% Chebyshev (MVUE)
Uranium-235/236	9	2	0.0151(U)	0.237	n/a	0.237	Maximum detected concentration
Uranium-238	9	9	0.56	2.94	Nonparametric	2.08	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-21
EPCs for SWMU 03-014(k,l,m,n) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	28	1	0.389(U)	8.3	n/a*	8.3	Maximum detected concentration
Cadmium	28	11	0.113	15.5	Nonparametric	1.89	95% KM (BCA)
Chromium	28	27	1.67	51.9	Gamma	20.7	95% KM (Chebyshev)
Copper	28	27	1.82	231	Nonparametric	52.1	95% Chebyshev (Mean, Sd)
Cyanide	15	6	0.0778(U)	9.48	Normal	2.47	95% KM (t)
Lead	28	27	3.4(U)	217	Nonparametric	60.5	95% KM (Chebyshev)
Mercury	28	21	0.00108	0.92	Lognormal	0.355	95% KM (Chebyshev)
Nickel	28	26	1.94	30.7	Gamma	8.36	95% KM (BCA)
Selenium	28	1	0.18(U)	1.18(U)	n/a	0.96	Maximum detected concentration
Silver	28	23	0.241	18.3	Lognormal	4.97	95% KM (Chebyshev)
Zinc	28	27	21.5	638	Nonparametric	175	95% Chebyshev (Mean, Sd)

Table I-2.3-21 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	35	2	0.012(U)	7.4(U)	n/a	2.3	Maximum detected concentration
Acetone	21	3	0.005(U)	2.2	n/a	2.2	Maximum detected concentration
Anthracene	35	4	0.00827	7.4(U)	n/a	3.9	Maximum detected concentration
Aroclor-1254	35	13	0.0025	6.5	Lognormal	1.06	95% KM (Chebyshev)
Aroclor-1260	35	15	0.0017	3.8(U)	Gamma	0.0439	95% KM (t)
Benzo(a)anthracene	35	4	0.012(U)	11	n/a	11	Maximum detected concentration
Benzo(a)pyrene	35	5	0.012(U)	8.3	Nonparametric	1.39	95% KM (Chebyshev)
Benzo(b)fluoranthene	35	6	0.012(U)	15	Nonparametric	2.46	95% KM (Chebyshev)
Benzo(g,h,i)perylene	35	3	0.0107	7.4(UJ)	n/a	5.6	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	35	3	0.012(U)	44	n/a	44	Maximum detected concentration
Butylbenzylphthalate	35	1	0.012(U)	30	n/a	30	Maximum detected concentration
Carbon disulfide	22	2	0.00281	0.00978	n/a	0.00978	Maximum detected concentration
Chrysene	35	5	0.012(U)	9.3	Nonparametric	1.56	95% KM (Chebyshev)
Dibenz(a,h)anthracene	35	1	0.012(U)	7.4(UJ)	n/a	1.1	Maximum detected concentration
Dibenzofuran	35	1	0.012(U)	7.4(U)	n/a	1.2	Maximum detected concentration
Dichlorobenzene[1,4-]	35	1	0.012(U)	7.4(U)	n/a	1.4	Maximum detected concentration
Fluoranthene	35	6	0.012(U)	24	Nonparametric	3.93	95% KM (Chebyshev)
Fluorene	35	1	0.012(U)	7.4(U)	n/a	2	Maximum detected concentration
Hexanone[2-]	22	1	0.00519(UJ)	0.024(U)	n/a	0.02	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	35	2	0.012(U)	7.4(UJ)	n/a	4.6	Maximum detected concentration
Naphthalene	35	1	0.006(U)	7.4(U)	n/a	0.94	Maximum detected concentration
Phenanthrene	35	4	0.0116	22	n/a	22	Maximum detected concentration
Pyrene	35	6	0.012(U)	32	Nonparametric	5.24	95% KM (Chebyshev)
TPH-DRO	22	16	3.04	31000	Nonparametric	7781	95% KM (Chebyshev)
Toluene	22	1	0.00104(U)	0.006(U)	n/a	0.004	Maximum detected concentration

Table I-2.3-21 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Tritium	27	6	0.000559(U)	1.59(U)	Normal	0.0276	95% KM (t)
Uranium-234	27	27	0.358	4.72	Nonparametric	1.44	95% Chebyshev (Mean, Sd)
Uranium-235/236	27	5	0.00367(U)	0.237	Approximate Gamma	0.0438	95% KM (t)
Uranium-238	27	27	0.335	2.94	Nonparametric	0.806	95% Student's t

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-22
EPCs for SWMU 03-014(k,l,m,n) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	38	1	0.389(U)	8.3	n/a*	8.3	Maximum detected concentration
Cadmium	38	15	0.113	15.5	Nonparametric	1.49	95% KM (BCA)
Chromium	38	37	1.42	51.9	Approximate Gamma	16.9	95% KM (Chebyshev)
Copper	38	37	0.971	231	Nonparametric	39.4	95% KM (Chebyshev)
Cyanide	25	8	0.0778(U)	9.48	Gamma	1.62	95% KM (t)
Lead	38	37	3	217	Nonparametric	46.7	95% KM (Chebyshev)
Mercury	38	29	0.00425	0.92	Lognormal	0.269	95% KM (Chebyshev)
Nickel	38	34	1.41(U)	30.7	Lognormal	9.07	95% KM (Chebyshev)
Perchlorate	25	3	0.000595	0.00355	n/a	0.00355	Maximum detected concentration
Selenium	38	1	0.18(U)	1.23(U)	n/a	0.96	Maximum detected concentration
Silver	38	28	0.145	18.3	Lognormal	3.85	95% KM (Chebyshev)
Zinc	38	37	21.5	638	Nonparametric	144.8	95% KM (Chebyshev)

Table I-2.3-22 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	45	3	0.012(U)	7.4(U)	n/a	2.3	Maximum detected concentration
Acetone	31	4	0.00213	2.2	n/a	2.2	Maximum detected concentration
Anthracene	45	5	0.00827	7.4(U)	Approximate Gamma	0.264	95% KM (t)
Aroclor-1242	45	1	0.00345(U)	3.8(U)	n/a	0.0141	Maximum detected concentration
Aroclor-1254	45	19	0.0021	6.5	Nonparametric	0.823	95% KM (Chebyshev)
Aroclor-1260	45	18	0.0015	3.8(U)	Lognormal	0.0349	95% KM (BCA)
Benzo(a)anthracene	45	5	0.012(U)	11	Nonparametric	1.44	95% KM (Chebyshev)
Benzo(a)pyrene	45	6	0.012(U)	8.3	Nonparametric	1.07	95% KM (Chebyshev)
Benzo(b)fluoranthene	45	7	0.012(U)	15	Nonparametric	1.91	95% KM (Chebyshev)
Benzo(g,h,i)perylene	45	2	0.0107	7.4(UJ)	n/a	5.6	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	45	3	0.012(U)	44	n/a	44	Maximum detected concentration
Butylbenzylphthalate	45	1	0.012(U)	30	n/a	30	Maximum detected concentration
Carbon disulfide	32	3	0.00281	0.00978	n/a	0.00978	Maximum detected concentration
Chrysene	45	6	0.012(U)	9.3	Nonparametric	1.2	95% KM (Chebyshev)
Dibenz(a,h)anthracene	45	1	0.012(U)	7.4(UJ)	n/a	1.1	Maximum detected concentration
Dibenzofuran	45	1	0.012(U)	7.4(U)	n/a	1.2	Maximum detected concentration
Dichlorobenzene[1,4-]	45	1	0.012(U)	7.4(U)	n/a	1.4	Maximum detected concentration
Fluoranthene	45	7	0.012(U)	24	Nonparametric	3.04	95% KM (Chebyshev)
Fluorene	45	2	0.012(U)	7.4(U)	n/a	2	Maximum detected concentration
Hexanone[2-]	32	1	0.00519(UJ)	0.024(U)	n/a	0.02	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	45	3	0.012(U)	7.4(UJ)	n/a	4.6	Maximum detected concentration
Isopropyltoluene[4-]	32	4	0.000762	0.0061	n/a	0.0061	Maximum detected concentration
Methylnaphthalene[2-]	45	1	0.012(U)	7.4(U)	n/a	0.0268	Maximum detected concentration
Naphthalene	48	2	0.012(U)	7.4(U)	n/a	0.94	Maximum detected concentration
Phenanthrene	45	5	0.0116	22	Lognormal	2.87	95% KM (Chebyshev)
Pyrene	45	7	0.012(U)	32	Nonparametric	4.05	95% KM (Chebyshev)

Table I-2.3-22 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
TPH-DRO	32	21	3.02	31000	Nonparametric	5375	95% KM (Chebyshev)
Toluene	32	1	0.00104(U)	0.006(U)	n/a	0.004	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	37	9	0.000559(U)	1.59(U)	Gamma	0.0353	95% KM (t)
Uranium-234	37	37	0.358	4.72	Nonparametric	0.871	95% Student's t
Uranium-235/236	37	5	0.00367(U)	0.237	Approximate Gamma	0.037	95% KM (t)
Uranium-238	37	37	0.335	2.94	Nonparametric	0.705	95% Student's t

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-23
EPCs for SWMU 03-014(o) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	0	0.401(U)	5.38(U)	n/a*	5.38(U)	Maximum detection limit
Chromium	7	7	3.86	136	n/a	136	Maximum detected concentration
Copper	7	7	5.72	122	n/a	122	Maximum detected concentration
Cyanide	4	1	0.1(U)	2.7	n/a	2.7	Maximum detected concentration
Lead	7	7	5.96	45.1	n/a	45.1	Maximum detected concentration
Mercury	7	7	0.0415	3.8	n/a	3.8	Maximum detected concentration
Selenium	7	1	0.185(U)	1.14(U)	n/a	0.339	Maximum detected concentration
Silver	7	7	1.55	71.3	n/a	71.3	Maximum detected concentration
Zinc	7	7	29	131	n/a	131	Maximum detected concentration

Table I-2.3-23 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthylene	7	1	0.0358(U)	0.34(U)	n/a	0.036	Maximum detected concentration
Anthracene	7	1	0.0358(U)	0.34(U)	n/a	0.057	Maximum detected concentration
Aroclor-1254	7	4	0.0119	0.0353	n/a	0.0353	Maximum detected concentration
Aroclor-1260	7	5	0.0216	1.22	n/a	1.22	Maximum detected concentration
Benzo(a)anthracene	7	2	0.0358(U)	0.48	n/a	0.48	Maximum detected concentration
Benzo(a)pyrene	7	2	0.0358(U)	0.65	n/a	0.65	Maximum detected concentration
Benzo(b)fluoranthene	7	3	0.0152	1.2	n/a	1.2	Maximum detected concentration
Benzo(g,h,i)perylene	7	2	0.0358(U)	0.34(U)	n/a	0.29	Maximum detected concentration
Benzo(k)fluoranthene	7	2	0.0358(U)	0.46	n/a	0.46	Maximum detected concentration
Benzoic acid	7	1	0.12	3.4(U)	n/a	0.12	Maximum detected concentration
Chrysene	7	2	0.0358(U)	0.69	n/a	0.69	Maximum detected concentration
Dibenz(a,h)anthracene	7	2	0.0358(U)	0.34(U)	n/a	0.084	Maximum detected concentration
Fluoranthene	7	3	0.014	0.81	n/a	0.81	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	7	2	0.0358(U)	0.34(U)	n/a	0.31	Maximum detected concentration
Isopropyltoluene[4-]	4	1	0.00037	0.00117(U)	n/a	0.00037	Maximum detected concentration
MCPA	3	1	0.411(U)	0.956	n/a	0.956	Maximum detected concentration
MCPP	3	1	0.408(U)	0.993	n/a	0.993	Maximum detected concentration
Methylene chloride	4	4	0.0027	0.00349	n/a	0.00349	Maximum detected concentration
Phenanthrene	7	2	0.0358(U)	0.34(U)	n/a	0.29	Maximum detected concentration
Pyrene	7	2	0.0358(U)	0.74	n/a	0.74	Maximum detected concentration
TPH-DRO	4	3	3.39	7.21(U)	n/a	3.42	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	7	3	-0.00124(U)	0.131	n/a	0.131	Maximum detected concentration
Strontium-90	7	1	-0.13(U)	8.01	n/a	8.01	Maximum detected concentration
Uranium-234	3	3	0.391	2.68	n/a	2.68	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-24
EPCs for for SWMU 03-014(o) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	24	0	0.401(U)	5.38(U)	n/a*	5.38(U)	Maximum detection limit
Chromium	24	21	0.97(U)	136	Lognormal	39.3	95% KM (Chebyshev)
Copper	24	24	0.768	122	Lognormal	34.1	95% KM (Chebyshev)
Cyanide	15	5	0.0996(U)	2.7	Lognormal	1.14	95% KM (Chebyshev)
Lead	24	24	1.26	45.1	Approximate Gamma	10.3	95% Approximate Gamma
Mercury	24	19	0.00723	3.8	Nonparametric	0.989	95% KM (Chebyshev)
Selenium	24	1	0.185(U)	1.14(U)	n/a	0.339	Maximum detected concentration
Silver	24	20	0.168	71.3	Nonparametric	18	95% KM (Chebyshev)
Zinc	24	24	14.8	131	Nonparametric	47.5	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthylene	21	1	0.0341(U)	0.37(U)	n/a	0.036	Maximum detected concentration
Acetone	15	1	0.002	0.022(U)	n/a	0.002	Maximum detected concentration
Anthracene	21	1	0.0341(U)	0.37(U)	n/a	0.057	Maximum detected concentration
Aroclor-1242	24	2	0.00343(U)	0.0918	n/a	0.0918	Maximum detected concentration
Aroclor-1254	24	13	0.00343(U)	0.551	Lognormal	0.136	95% KM (Chebyshev)
Aroclor-1260	24	15	0.002	1.22	Lognormal	0.344	95% KM (Chebyshev)
Benzo(a)anthracene	21	2	0.0341(U)	0.48	n/a	0.48	Maximum detected concentration
Benzo(a)pyrene	21	2	0.0341(U)	0.65	n/a	0.65	Maximum detected concentration
Benzo(b)fluoranthene	21	3	0.0152	1.2	n/a	1.2	Maximum detected concentration
Benzo(g,h,i)perylene	21	2	0.0341(U)	0.37(U)	n/a	0.29	Maximum detected concentration
Benzo(k)fluoranthene	21	2	0.0341(U)	0.46	n/a	0.46	Maximum detected concentration
Benzoic acid	21	1	0.12	3.7(U)	n/a	0.12	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	21	1	0.0746	0.86(U)	n/a	0.0746	Maximum detected concentration

Table I-2.3-24 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Carbazole	9	1	0.037	0.37(U)	n/a	0.037	Maximum detected concentration
Chrysene	21	2	0.0341(U)	0.69	n/a	0.69	Maximum detected concentration
Dibenz(a,h)anthracene	21	2	0.0341(U)	0.37(U)	n/a	0.084	Maximum detected concentration
Fluoranthene	21	3	0.014	0.81	n/a	0.81	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	21	2	0.0341(U)	0.37(U)	n/a	0.31	Maximum detected concentration
Methylene chloride	15	12	0.00251	0.01(U)	Normal	0.00325	95% KM (t)
Phenanthrene	21	2	0.0341(U)	0.37(U)	n/a	0.29	Maximum detected concentration
Pyrene	21	2	0.0341(U)	0.74	n/a	0.74	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	21	4	-0.0053(U)	0.186	n/a	0.186	Maximum detected concentration
Strontium-90	21	2	-0.25(U)	8.01	n/a	8.01	Maximum detected concentration
Tritium	12	4	0.002148(U)	0.019969	n/a	0.01997	Maximum detected concentration
Uranium-234	9	9	0.391	2.68	Nonparametric	1.84	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-25
EPCs for for SWMU 03-014(o) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	31	0	0.401(U)	5.38(U)	n/a*	5.38(U)	Maximum detection limit
Chromium	31	25	0.97(U)	136	Lognormal	32.2	95% KM (Chebyshev)
Copper	31	31	0.768	122	Nonparametric	27.3	95% KM (Chebyshev)
Cyanide	22	6	0.0996(U)	2.7	Nonparametric	0.63	95% KM (BCA)
Lead	31	31	1.26	45.1	Lognormal	10.7	95% Chebyshev (MVUE)
Mercury	31	25	0.00517	3.8	Nonparametric	0.772	95% KM (Chebyshev)
Selenium	31	1	0.185(U)	1.14(U)	n/a	0.339	Maximum detected concentration
Silver	31	27	0.168	71.3	Nonparametric	14.2	95% KM (Chebyshev)
Zinc	31	31	14.8	131	Nonparametric	47	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	25	1	0.0341(U)	0.37(U)	n/a	0.1	Maximum detected concentration
Acenaphthylene	25	1	0.0341(U)	0.37(U)	n/a	0.036	Maximum detected concentration
Acetone	19	3	0.002	0.022(U)	n/a	0.00257	Maximum detected concentration
Anthracene	25	1	0.0341(U)	0.37(U)	n/a	0.057	Maximum detected concentration
Aroclor-1242	31	2	0.00343(U)	0.0918	n/a	0.0918	Maximum detected concentration
Aroclor-1254	31	17	0.0024	0.551	Lognormal	0.109	95% KM (Chebyshev)
Aroclor-1260	31	20	0.016	1.22	Lognormal	0.271	95% KM (Chebyshev)
Benzo(a)anthracene	25	2	0.0341(U)	0.48	n/a	0.48	Maximum detected concentration
Benzo(a)pyrene	25	2	0.0341(U)	0.65	n/a	0.65	Maximum detected concentration
Benzo(b)fluoranthene	25	3	0.0152	1.2	n/a	1.2	Maximum detected concentration
Benzo(g,h,i)perylene	25	2	0.0341(U)	0.37(U)	n/a	0.29	Maximum detected concentration
Benzo(k)fluoranthene	25	2	0.0341(U)	0.46	n/a	0.46	Maximum detected concentration
Benzoic acid	25	1	0.12	3.7(U)	n/a	0.12	Maximum detected concentration

Table I-2.3-25 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Bis(2-ethylhexyl)phthalate	25	2	0.0746	0.86(U)	n/a	0.0877	Maximum detected concentration
Chrysene	25	2	0.0341(U)	0.69	n/a	0.69	Maximum detected concentration
Dibenz(a,h)anthracene	25	2	0.0341(U)	0.37(U)	n/a	0.084	Maximum detected concentration
Fluoranthene	25	3	0.014	0.81	n/a	0.81	Maximum detected concentration
Hexanone[2-]	19	1	0.00392	0.022(U)	n/a	0.00392	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	25	2	0.0341(U)	0.37(U)	n/a	0.31	Maximum detected concentration
Isopropyltoluene[4-]	19	1	0.00037	0.006(U)	n/a	0.00037	Maximum detected concentration
MCPA	9	1	0.411(U)	0.956	n/a	0.956	Maximum detected concentration
MCPP	9	1	0.408(U)	0.993	n/a	0.993	Maximum detected concentration
Methylene chloride	19	13	0.00251	0.01(U)	Normal	0.00324	95% KM (t)
Phenanthrene	25	2	0.0341(U)	0.37(U)	n/a	0.29	Maximum detected concentration
Pyrene	25	2	0.0341(U)	0.74	n/a	0.74	Maximum detected concentration
TPH-DRO	16	7	2.8	7.79	Nonparametric	4.12	95% KM (t)
Radionuclides (pCi/g)							
Plutonium-239/240	25	4	-0.0053(U)	0.186	n/a	0.186	Maximum detected concentration
Strontium-90	25	2	-0.25(U)	8.01	n/a	8.01	Maximum detected concentration
Tritium	16	5	-0.00495(U)	0.019969	Normal	0.00955	95% KM (t)
Uranium-234	9	9	0.391	2.68	Nonparametric	1.84	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-26
EPCs for SWMU 03-014(u) 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	1.06(U)	1.21(U)	n/a*	1.21(U)	Maximum detection limit
Chromium	8	8	2.55	168	Nonparametric	14.6	95% Chebyshev (Mean, Sd)
Copper	8	8	3.34	224	Nonparametric	152.1	95% Chebyshev (Mean, Sd)
Lead	8	8	4.97	116	Lognormal	56.8	95% Chebyshev (MVUE)
Mercury	8	8	0.0104	1.99	Approximate Gamma	1.83	95% Adjusted Gamma
Selenium	8	0	1.05(U)	1.21(U)	n/a	1.21(U)	Maximum detection limit
Silver	8	8	0.177	66.7	Lognormal	45	95% Chebyshev (Mean, Sd)
Zinc	8	8	33.1	110	Normal	77.8	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	8	1	0.036(U)	0.0408(U)	n/a	0.0377	Maximum detected concentration
Anthracene	8	2	0.00842	0.0408(U)	n/a	0.01	Maximum detected concentration
Aroclor-1254	8	8	0.0106	0.581	Normal	0.303	95% Student's t
Aroclor-1260	8	8	0.0108	0.417	Normal	0.233	95% Student's t
Benzo(a)anthracene	8	3	0.0191	0.0774	n/a	0.0774	Maximum detected concentration
Benzo(a)pyrene	8	6	0.0116	0.114	Approximate Gamma	0.0578	95% KM (Percentile Bootstrap)
Benzo(b)fluoranthene	8	6	0.0244	0.257	Gamma	0.198	95% KM (Chebyshev)
Benzo(g,h,i)perylene	8	5	0.0129	0.0968	Normal	0.0531	95% KM (t)
Bis(2-ethylhexyl)phthalate	8	1	0.341	0.408(U)	n/a	0.341	Maximum detected concentration
Chrysene	8	6	0.0141	0.121	Normal	0.0681	95% KM (t)
Dibenz(a,h)anthracene	8	1	0.0276	0.0408(U)	n/a	0.0276	Maximum detected concentration
Diethylphthalate	8	1	0.0916	0.0408(U)	n/a	0.0916	Maximum detected concentration
Fluoranthene	8	6	0.016	0.159	Normal	0.092	95% KM (t)
Indeno(1,2,3-cd)pyrene	8	5	0.0118	0.0882	Normal	0.0478	95% KM (t)
Methylene chloride	8	2	0.00241	0.00613(U)	n/a	0.00344	Maximum detected concentration
Phenanthrene	8	5	0.0221	0.0728	Normal	0.0457	95% KM (t)

Table I-2.3-26 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Pyrene	8	6	0.0207	0.179	Normal	0.0956	95% KM (t)
TPH-DRO	8	8	2.75	270	Gamma	191.7	95% Approximate Gamma
Radionuclides (pCi/g)							
Plutonium-238	8	1	-0.00978(U)	0.0285	n/a	0.0285	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-27
EPCs for for SWMU 03-014(u) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	15	0	0.994(U)	1.21(U)	n/a*	1.21(U)	Maximum detection limit
Chromium	15	15	2.55	168	Nonparametric	64.6	95% Chebyshev (Mean, Sd)
Copper	15	15	2.55	224	Nonparametric	85.1	95% Chebyshev (Mean, Sd)
Cyanide	15	2	0.149(U)	27.7	n/a	27.7	Maximum detected concentration
Lead	15	15	4.97	116	Nonparametric	50.3	95% Chebyshev (Mean, Sd)
Mercury	15	14	0.0104	1.99	Nonparametric	0.76	95% KM (Chebyshev)
Selenium	15	0	0.992(U)	1.21(U)	n/a	1.21(U)	Maximum detection limit
Silver	15	13	0.177	66.7	Nonparametric	24.9	95% KM (Chebyshev)
Zinc	15	15	33.1	110	Gamma	63.7	95% Approximate Gamma

Table I-2.3-27 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	15	1	0.0347(U)	0.0408(U)	n/a	0.0377	Maximum detected concentration
Anthracene	15	2	0.00842	0.0408(U)	n/a	0.01	Maximum detected concentration
Aroclor-1254	15	15	0.00196	0.581	Gamma	0.254	95% Approximate Gamma
Aroclor-1260	15	15	0.0019	0.417	Gamma	0.199	95% Approximate Gamma
Benzo(a)anthracene	15	6	0.013	0.0774	Gamma	0.0335	95% KM (t)
Benzo(a)pyrene	15	9	0.0114	0.114	Gamma	0.0417	95% KM (t)
Benzo(b)fluoranthene	15	10	0.0202	0.257	Gamma	0.0817	95% KM (Percentile Bootstrap)
Benzo(g,h,i)perylene	15	6	0.0129	0.0968	Gamma	0.0396	95% KM (t)
Bis(2-ethylhexyl)phthalate	15	2	0.0754	0.408(U)	n/a	0.341	Maximum detected concentration
Chrysene	15	9	0.0123	0.121	Gamma	0.0448	95% KM (t)
Dibenz(a,h)anthracene	15	1	0.0276	0.0408(U)	n/a	0.0276	Maximum detected concentration
Diethylphthalate	15	1	0.0916	0.0408(U)	n/a	0.0916	Maximum detected concentration
Fluoranthene	15	11	0.0132	0.159	Gamma	0.0596	95% KM (Percentile Bootstrap)
Indeno(1,2,3-cd)pyrene	15	6	0.0118	0.0882	Gamma	0.0357	95% KM (t)
Methylene chloride	15	4	0.00241	0.00613(U)	n/a	0.0035	Maximum detected concentration
Phenanthrene	15	8	0.0108	0.0728	Normal	0.0337	95% KM (t)
Pyrene	15	11	0.0118	0.179	Gamma	0.0602	95% KM (Percentile Bootstrap)
TPH-DRO	15	15	2.75	270	Lognormal	117.6	95% Chebyshev (Mean, Sd)
Radionuclides (pCi/g)							
Plutonium-238	15	1	-0.00978(U)	0.0285	n/a	0.0285	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-28
EPCs for SWMU 03-015 and AOC 03-053 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	2	0.38(UJ)	7.39	n/a*	7.39	Maximum detected concentration
Barium	7	7	78.9	181	n/a	181	Maximum detected concentration
Chromium	7	7	5.1	10.5	n/a	10.5	Maximum detected concentration
Copper	6	6	5.21	18.8	n/a	18.8	Maximum detected concentration
Lead	7	7	7.85	35.5	n/a	35.5	Maximum detected concentration
Mercury	6	5	0.0118(UJ)	0.211	n/a	0.211	Maximum detected concentration
Perchlorate	6	2	0.000709	0.00235(U)	n/a	0.00119	Maximum detected concentration
Selenium	7	0	0.61(UJ)	1.17(U)	n/a	1.17(U)	Maximum detection limit
Silver	7	6	0.06(UJ)	1.36	n/a	1.36	Maximum detected concentration
Zinc	6	6	19.4	129	n/a	129	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthalene	6	4	0.0298	0.539	n/a	0.539	Maximum detected concentration
Anthracene	6	5	0.00998	0.892	n/a	0.892	Maximum detected concentration
Aroclor-1254	6	1	0.00387(U)	1.28	n/a	1.28	Maximum detected concentration
Aroclor-1260	6	3	0.0174	0.487	n/a	0.487	Maximum detected concentration
Benzo(a)anthracene	6	5	0.0365(U)	2.61	n/a	2.61	Maximum detected concentration
Benzo(a)pyrene	6	5	0.0365(U)	2.36	n/a	2.36	Maximum detected concentration
Benzo(b)fluoranthene	6	5	0.0365(U)	4.79	n/a	4.79	Maximum detected concentration
Benzo(g,h,i)perylene	6	4	0.0293	1.58	n/a	1.58	Maximum detected concentration
Chrysene	6	5	0.0365(U)	2.85	n/a	2.85	Maximum detected concentration
Fluoranthene	6	5	0.0365(U)	6.75	n/a	6.75	Maximum detected concentration
Fluorene	6	4	0.0262	0.508	n/a	0.508	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	6	4	0.0365(U)	1.22	n/a	1.22	Maximum detected concentration
Methylnaphthalene[2-]	6	3	0.0132	0.111	n/a	0.111	Maximum detected concentration
Naphthalene	6	3	0.0308	0.344	n/a	0.344	Maximum detected concentration

Table I-2.3-28 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Phenanthrene	6	5	0.0365(U)	4.55	n/a	4.55	Maximum detected concentration
Pyrene	6	5	0.0365(U)	5.56	n/a	5.56	Maximum detected concentration
TPH-DRO	6	5	3.39	146(U)	n/a	89.8	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-238	6	6	0.646	2.36	n/a	2.36	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-29
EPCs for for SWMU 03-015 and AOC 03-053 for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	14	3	0.38(U)	7.39	n/a*	7.39	Maximum detected concentration
Barium	13	13	55.8	217	Nonparametric	116.1	95% Student's t
Chromium	13	13	6.06	45.2	Nonparametric	30.7	95% Chebyshev (Mean, Sd)
Copper	13	13	2.76	18.8	Normal	11.2	95% Student's t
Lead	13	13	7.85	197	Nonparametric	94.5	95% Chebyshev (Mean, Sd)
Mercury	13	12	0.0118(UJ)	0.211	Nonparametric	0.125	95% KM (Chebyshev)
Selenium	14	0	0.61(UJ)	1.35(UJ)	n/a	1.35(UJ)	Maximum detection limit
Silver	13	13	0.247	1.36	Approximate Gamma	0.591	95% Approximate Gamma
Zinc	13	13	19.4	129	Gamma	70.3	95% Approximate Gamma

Table I-2.3-29 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthalene	13	6	0.0201	0.539	Approximate Gamma	0.145	95% KM (t)
Acetone	13	1	0.00479	0.0063(UJ)	n/a	0.00479	Maximum detected concentration
Anthracene	13	8	0.00998	0.892	Gamma	0.242	95% KM (BCA)
Aroclor-1254	13	4	0.00364(U)	1.28	n/a	1.28	Maximum detected concentration
Aroclor-1260	13	7	0.00364(U)	0.487	Gamma	0.138	95% KM (BCA)
Benzo(a)anthracene	13	8	0.0347	2.61	Lognormal	1.17	95% KM (Chebyshev)
Benzo(a)pyrene	13	8	0.0215	2.36	Approximate Gamma	0.636	95% KM (BCA)
Benzo(b)fluoranthene	13	9	0.0365(U)	4.79	Lognormal	2.15	95% KM (Chebyshev)
Benzo(g,h,i)perylene	13	7	0.0184	1.58	Lognormal	0.7	95% KM (Chebyshev)
Benzo(k)fluoranthene	13	1	0.0364(U)	0.386(U)	n/a	0.11	Maximum detected concentration
Chrysene	13	8	0.0318	2.85	Lognormal	1.28	95% KM (Chebyshev)
Fluoranthene	13	9	0.0127	6.75	Gamma	1.83	95% KM (BCA)
Fluorene	13	6	0.0175	0.508	Approximate Gamma	0.136	95% KM (t)
Indeno(1,2,3-cd)pyrene	13	6	0.0354	1.22	Gamma	0.32	95% KM (t)
Methylnaphthalene[2-]	13	3	0.0132	0.111	n/a	0.111	Maximum detected concentration
Naphthalene	13	5	0.0144	0.344	Lognormal	0.101	95% KM (BCA)
Phenanthrene	13	8	0.0364(U)	4.55	Approximate Gamma	1.22	95% KM (BCA)
Pyrene	13	9	0.0132	5.56	Gamma	1.55	95% KM (BCA)
Radionuclides (pCi/g)							
Uranium-238	13	13	0.435	2.36	Approximate Gamma	1.18	95% Approximate Gamma

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-30
EPCs for for SWMU 03-015 and AOC 03-053 for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	15	3	0.38(UJ)	7.39	n/a*	7.39	Maximum detected concentration
Barium	15	15	55.8	217	Lognormal	123.7	95% Student's t
Chromium	15	15	5.1	45.2	Nonparametric	28.4	95% Chebyshev (Mean, Sd)
Copper	14	14	2.76	18.8	Normal	11.1	95% Student's t
Lead	15	15	7.85	197	Nonparametric	84.8	95% Chebyshev (Mean, Sd)
Mercury	14	13	0.0118(UJ)	0.211	Nonparametric	0.118	95% KM (Chebyshev)
Perchlorate	14	2	0.000709	0.00269(U)	n/a	0.00119	Maximum detected concentration
Selenium	15	0	0.61(UJ)	1.35(UJ)	n/a	1.35(UJ)	Maximum detection limit
Silver	15	1	0.06(UJ)	1.36	Approximate Gamma	0.578	95% KM (BCA)
Zinc	14	14	19.4	129	Gamma	67	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthalene	14	6	0.0201	0.539	Approximate Gamma	0.137	95% KM (t)
Acetone	14	2	0.00479	0.0063(UJ)	n/a	0.00479	Maximum detected concentration
Anthracene	14	8	0.00998	0.892	Gamma	0.242	95% KM (BCA)
Aroclor-1254	14	4	0.00364(U)	1.28	n/a	1.28	Maximum detected concentration
Aroclor-1260	14	7	0.00364(U)	0.487	Gamma	0.118	95% KM (t)
Benzo(a)anthracene	14	8	0.0347	2.61	Lognormal	1.1	95% KM (Chebyshev)
Benzo(a)pyrene	14	8	0.0215	2.36	Approximate Gamma	0.622	95% KM (BCA)
Benzo(b)fluoranthene	14	9	0.0365(U)	4.79	Lognormal	2.01	95% KM (Chebyshev)
Benzo(g,h,i)perylene	14	7	0.0184	1.58	Lognormal	0.385	95% KM (BCA)
Benzo(k)fluoranthene	14	1	0.0364(U)	0.386(U)	n/a	0.11	Maximum detected concentration
Chrysene	14	8	0.0318	2.85	Lognormal	1.2	95% KM (Chebyshev)
Fluoranthene	14	9	0.0127	6.75	Gamma	1.7	95% KM (BCA)
Fluorene	14	6	0.0175	0.508	Approximate Gamma	0.128	95% KM (t)
Indeno(1,2,3-cd)pyrene	14	6	0.0354	1.22	Gamma	0.3	95% KM (t)

Table I-2.3-30 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Methylnaphthalene[2-]	14	3	0.0132	0.111	n/a	0.111	Maximum detected concentration
Naphthalene	14	5	0.0144	0.344	Lognormal	0.0929	95% KM (BCA)
Phenanthrene	14	8	0.0364(U)	4.55	Approximate Gamma	1.14	95% KM (BCA)
Pyrene	14	9	0.0132	5.56	Gamma	1.4	95% KM (BCA)
TPH-DRO	14	10	3.21	146(U)	Nonparametric	47.2	95% KM (Chebyshev)
Radionuclides (pCi/g)							
Uranium-238	14	14	0.435	2.36	Lognormal	1.14	95% Student's t

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-31
EPCs for SWMU 03-021 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	5	0.53	1.24	n/a*	1.24	Maximum detected concentration
Barium	7	7	16.5	76.4	n/a	76.4	Maximum detected concentration
Chromium	7	7	1.88	13.1	n/a	13.1	Maximum detected concentration
Lead	7	7	5.29	53.8	n/a	53.8	Maximum detected concentration
Nickel	7	7	1.1	24.5	n/a	24.5	Maximum detected concentration
Selenium	7	1	0.98	1.19(UJ)	n/a	0.98	Maximum detected concentration
Thallium	7	1	0.108(U)	2.1	n/a	2.1	Maximum detected concentration
Zinc	7	7	27.8	53	n/a	53	Maximum detected concentration
Organic Chemicals (mg/kg)							
Anthracene	7	1	0.0154	0.37(U)	n/a	0.0154	Maximum detected concentration
Aroclor-1254	7	3	0.0035	0.0256	n/a	0.0256	Maximum detected concentration
Aroclor-1260	6	3	0.00387(U)	0.0192(U)	n/a	0.0178	Maximum detected concentration

Table I-2.3-31 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(a)anthracene	7	1	0.0375(U)	0.37(U)	n/a	0.044	Maximum detected concentration
Benzo(a)pyrene	7	1	0.0276	0.37(U)	n/a	0.0276	Maximum detected concentration
Benzo(b)fluoranthene	7	2	0.0164	0.37(U)	n/a	0.0431	Maximum detected concentration
Benzo(k)fluoranthene	7	1	0.0183	0.37(U)	n/a	0.0183	Maximum detected concentration
Chrysene	7	1	0.0375(U)	0.37(U)	n/a	0.0421	Maximum detected concentration
Fluoranthene	7	3	0.0142	0.37(U)	n/a	0.13	Maximum detected concentration
Phenanthrene	7	1	0.0375(U)	0.37(U)	n/a	0.0806	Maximum detected concentration
Pyrene	7	4	0.0149	0.37(U)	n/a	0.125	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-32
EPCs for for SWMU 03-021 for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	25	8	0.403	1.24	Normal	0.732	95% KM (t)
Barium	25	25	16.5	166	Gamma	79	95% Approximate Gamma
Chromium	25	25	1.88	101	Lognormal	24.8	95% Chebyshev (MVUE)
Lead	25	25	4.07	358	Approximate Gamma	63.1	95% Approximate Gamma
Nickel	25	25	1.1	24.5	Gamma	8.38	95% Approximate Gamma
Selenium	25	6	0.59(U)	1.19(UJ)	Normal	0.786	95% KM (t)
Thallium	25	5	0.0753(U)	2.1	Normal	0.597	95% KM (t)
Zinc	25	25	19.5	193	Nonparametric	61.6	95% Student's t

Table I-2.3-32 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acetone	13	1	0.00555(U)	0.025(UJ)	n/a*	0.0144	Maximum detected concentration
Anthracene	23	1	0.0154	0.44(U)	n/a	0.0154	Maximum detected concentration
Aroclor-1254	14	5	0.0035	0.0492	Normal	0.018	95% KM (t)
Aroclor-1260	14	5	0.0036(U)	0.0344	Normal	0.0152	95% KM (t)
Benzo(a)anthracene	23	1	0.0371(U)	0.44(U)	n/a	0.044	Maximum detected concentration
Benzo(a)pyrene	23	1	0.0276	0.44(U)	n/a	0.0276	Maximum detected concentration
Benzo(b)fluoranthene	23	2	0.0164	0.44(U)	n/a	0.0431	Maximum detected concentration
Benzo(k)fluoranthene	23	1	0.0183	0.44(U)	n/a	0.0183	Maximum detected concentration
Chrysene	23	1	0.0371(U)	0.44(U)	n/a	0.0421	Maximum detected concentration
Fluoranthene	23	4	0.0142	0.44(U)	n/a	0.13	Maximum detected concentration
Phenanthrene	23	2	0.0121	0.44(U)	n/a	0.0806	Maximum detected concentration
Pyrene	23	4	0.0149	0.44(U)	n/a	0.125	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-33
EPCs for for SWMU 03-021 for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	27	8	0.403	1.24	Normal	0.729	95% KM (t)
Barium	27	27	16.5	166	Gamma	75.2	95% Approximate Gamma
Chromium	27	27	1.88	101	Lognormal	22.6	95% Chebyshev (MVUE)
Lead	27	27	4.03	358	Approximate Gamma	59.5	95% Approximate Gamma
Nickel	27	27	1.1	24.5	Gamma	8.02	95% Approximate Gamma
Selenium	27	6	0.59(U)	1.19(UJ)	Normal	0.786	95% KM (t)
Thallium	27	6	0.0753(U)	2.1	Normal	0.49	95% KM (t)
Zinc	27	27	19.5	193	Nonparametric	61.1	95% Student's t
Organic Chemicals (mg/kg)							
Acetone	13	1	0.00555(U)	0.025(UJ)	n/a*	0.0144	Maximum detected concentration
Anthracene	23	1	0.0154	0.44(U)	n/a	0.0154	Maximum detected concentration
Aroclor-1254	16	5	0.0035	0.0492	Normal	0.0162	95% KM (t)
Aroclor-1260	16	5	0.0036(U)	0.0344	Normal	0.014	95% KM (t)
Benzo(a)anthracene	23	1	0.0371(U)	0.44(U)	n/a	0.044	Maximum detected concentration
Benzo(a)pyrene	23	1	0.0276	0.44(U)	n/a	0.0276	Maximum detected concentration
Benzo(b)fluoranthene	23	2	0.0164	0.44(U)	n/a	0.0431	Maximum detected concentration
Benzo(k)fluoranthene	23	1	0.0183	0.44(U)	n/a	0.0183	Maximum detected concentration
Chrysene	23	1	0.0371(U)	0.44(U)	n/a	0.0421	Maximum detected concentration
Fluoranthene	23	4	0.0142	0.44(U)	n/a	0.13	Maximum detected concentration
Phenanthrene	23	2	0.0121	0.44(U)	n/a	0.0806	Maximum detected concentration
Pyrene	23	4	0.0149	0.44(U)	n/a	0.125	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-34
EPCs for SWMU 03-029 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	0	1.07(U)	1.1(U)	n/a*	1.1(U)	Maximum detection limit
Chromium	2	2	11.2	13.8	n/a	13.8	Maximum detected concentration
Copper	2	2	2.67	18.9	n/a	18.9	Maximum detected concentration
Selenium	2	0	1.08(U)	1.12(U)	n/a	1.12(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Aroclor-1254	2	2	0.0065	0.0203	n/a	0.0203	Maximum detected concentration
Aroclor-1260	2	2	0.0051	0.0117	n/a	0.0117	Maximum detected concentration
TPH-DRO	2	1	2.86	7.56(U)	n/a	2.86	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-35
EPCs for SWMU 03-029 for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	0	1.06(U)	1.11(U)	n/a*	1.1(U)	Maximum detection limit
Chromium	8	8	6.86	22	Normal	15.6	95% Student's t
Copper	8	8	0.656	40.5	Gamma	27.3	95% Approximate Gamma
Selenium	8	0	1.04(U)	1.14(U)	n/a	1.14(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Aroclor-1254	8	6	0.0015	0.0296	Normal	0.0192	95% KM (t)
Aroclor-1260	8	5	0.00363(U)	0.0261	Normal	0.0161	95% KM (t)
Benzo(a)anthracene	8	1	0.0225	0.0383(U)	n/a	0.0225	Maximum detected concentration
Benzo(a)pyrene	8	1	0.0184	0.0383(U)	n/a	0.0184	Maximum detected concentration
Benzo(b)fluoranthene	8	1	0.0286	0.0383(U)	n/a	0.0286	Maximum detected concentration

Table I-2.3-35 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Chrysene	8	1	0.0185	0.0383(U)	n/a	0.0185	Maximum detected concentration
Fluoranthene	8	1	0.032	0.0383(U)	n/a	0.032	Maximum detected concentration
Phenanthrene	8	1	0.0126	0.0383(U)	n/a	0.0126	Maximum detected concentration
Pyrene	8	1	0.0327	0.0383(U)	n/a	0.032	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-36
EPCs for SWMU 03-029 for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	10	0	1.06(U)	1.11(U)	n/a*	1.1(U)	Maximum detection limit
Chromium	10	10	6.86	22	Normal	16.3	95% Student's t
Copper	10	10	0.656	40.5	Lognormal	25.3	95% Chebyshev (Mean, Sd)
Selenium	10	0	1.04(U)	1.14(U)	n/a	1.14(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Aroclor-1254	10	6	0.0015	0.0296	Normal	0.0159	95% KM (t)
Aroclor-1260	10	5	0.00362(U)	0.0261	Normal	0.0141	95% KM (t)
Benzo(a)anthracene	10	1	0.0225	0.0383(U)	n/a	0.0225	Maximum detected concentration
Benzo(a)pyrene	10	1	0.0184	0.0383(U)	n/a	0.0184	Maximum detected concentration
Benzo(b)fluoranthene	10	1	0.0286	0.0383(U)	n/a	0.0286	Maximum detected concentration
Chrysene	10	1	0.0185	0.0383(U)	n/a	0.0185	Maximum detected concentration
Fluoranthene	10	1	0.032	0.0383(U)	n/a	0.032	Maximum detected concentration
Phenanthrene	10	1	0.0126	0.0383(U)	n/a	0.0126	Maximum detected concentration
Pyrene	10	1	0.0327	0.0383(U)	n/a	0.032	Maximum detected concentration
TPH-DRO	10	5	2.86	7.56(U)	Nonparametric	4.6	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-37
EPCs for SWMU 03-045(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	4	0	0.449(U)	1.22(U)	n/a*	1.22(U)	Maximum detection limit
Chromium	4	4	6.42	88.2	n/a	88.2	Maximum detected concentration
Copper	4	4	2.64	34	n/a	34	Maximum detected concentration
Lead	4	4	3.26	365	n/a	365	Maximum detected concentration
Mercury	4	4	0.014	0.374	n/a	0.374	Maximum detected concentration
Selenium	4	0	1.13(U)	1.27(U)	n/a	1.27(U)	Maximum detection limit
Silver	4	4	0.225	1.76	n/a	1.76	Maximum detected concentration
Zinc	4	4	47.1	161	n/a	161	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	4	1	0.0377(U)	0.954	n/a	0.954	Maximum detected concentration
Acetone	4	1	0.00224	0.00641(U)	n/a	0.00224	Maximum detected concentration
Anthracene	4	2	0.0377(U)	1.99	n/a	1.99	Maximum detected concentration
Aroclor-1254	4	2	0.00376(U)	0.137	n/a	0.137	Maximum detected concentration
Aroclor-1260	4	2	0.00376(U)	0.366	n/a	0.366	Maximum detected concentration
Benzo(a)anthracene	4	2	0.0377(U)	3.8	n/a	3.8	Maximum detected concentration
Benzo(a)pyrene	4	2	0.0377(U)	3.35	n/a	3.35	Maximum detected concentration
Benzo(b)fluoranthene	4	2	0.0377(U)	5.85	n/a	5.85	Maximum detected concentration
Benzo(g,h,i)perylene	4	2	0.0377(U)	1.63	n/a	1.63	Maximum detected concentration
Chrysene	4	2	0.0377(U)	3.56	n/a	3.56	Maximum detected concentration
Fluoranthene	4	2	0.0377(U)	9.3	n/a	9.3	Maximum detected concentration
Fluorene	4	1	0.0377(U)	1.05	n/a	1.05	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	2	0.0377(U)	1.65	n/a	1.65	Maximum detected concentration
Isopropyltoluene[4-]	3	1	0.00113(U)	0.023	n/a	0.023	Maximum detected concentration
Methylnaphthalene[2-]	4	1	0.0377(U)	0.414(U)	n/a	0.173	Maximum detected concentration

Table I-2.3-37 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Naphthalene	4	1	0.0377(U)	0.72	n/a	0.72	Maximum detected concentration
Phenanthrene	4	2	0.0377(U)	8.26	n/a	8.26	Maximum detected concentration
Pyrene	4	2	0.0377(U)	8.32	n/a	8.32	Maximum detected concentration
TPH-DRO	4	2	7.53(U)	273	n/a	273	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-38
EPCs for SWMU 03-045(a) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	0	0.449(U)	1.29(U)	n/a*	1.29(U)	Maximum detection limit
Chromium	8	8	6.42	88.2	Gamma	49	95% Approximate Gamma
Copper	8	8	2.03	34	Gamma	20.1	95% Approximate Gamma
Lead	8	8	2.45	365	Gamma	334.3	95% Adjusted Gamma
Mercury	8	8	0.014	0.374	n/a	0.374	Maximum detected concentration
Selenium	8	0	1.12(U)	1.32(U)	n/a	1.32(U)	Maximum detection limit
Silver	8	8	0.225	1.76	Nonparametric	1.32	95% Chebyshev (Mean, Sd)
Zinc	8	8	47.1	161	Lognormal	99.5	95% Student's t

Table I-2.3-38 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	8	1	0.0377(U)	0.954	n/a	0.954	Maximum detected concentration
Acetone	8	1	0.00224	0.00662(U)	n/a	0.00224	Maximum detected concentration
Anthracene	8	3	0.0324	1.99	n/a	1.99	Maximum detected concentration
Aroclor-1254	8	4	0.00376(U)	0.137	n/a	0.137	Maximum detected concentration
Aroclor-1260	8	6	0.0018	0.366	Gamma	0.258	95% KM (Chebyshev)
Benzo(a)anthracene	8	4	0.0377(U)	3.8	n/a	3.8	Maximum detected concentration
Benzo(a)pyrene	8	4	0.0377(U)	3.35	n/a	3.35	Maximum detected concentration
Benzo(b)fluoranthene	8	4	0.0377(U)	5.85	n/a	5.85	Maximum detected concentration
Benzo(g,h,i)perylene	8	3	0.0377(U)	1.63	n/a	1.63	Maximum detected concentration
Chrysene	8	3	0.0377(U)	3.56	n/a	3.56	Maximum detected concentration
Fluoranthene	8	4	0.0377(U)	9.3	n/a	9.3	Maximum detected concentration
Fluorene	8	2	0.0178	1.05	n/a	1.05	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	8	3	0.0377(U)	1.65	n/a	1.65	Maximum detected concentration
Isopropyltoluene[4-]	8	1	0.00113(U)	0.023	n/a	0.023	Maximum detected concentration
Methylnaphthalene[2-]	8	1	0.0377(U)	0.414(U)	n/a	0.173	Maximum detected concentration
Naphthalene	8	1	0.0377(U)	0.72	n/a	0.72	Maximum detected concentration
Phenanthrene	8	4	0.0377(U)	8.26	n/a	8.26	Maximum detected concentration
Pyrene	8	4	0.0377(U)	8.32	n/a	8.32	Maximum detected concentration
TPH-DRO	8	5	6.58	273	Gamma	120.5	95% KM (BCA)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-39
EPCs for SWMU 03-045(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	1	0	1.06(U)	1.06(U)	n/a*	1.06(U)	Maximum detection limit
Mercury	1	1	0.159	0.159	n/a	0.159	Maximum detected concentration
Silver	1	1	1.17	1.17	n/a	1.17	Maximum detected concentration
Organic Chemicals (mg/kg)							
Anthracene	1	1	0.00901	0.00901	n/a	0.00901	Maximum detected concentration
Aroclor-1254	1	1	0.0803	0.0803	n/a	0.0803	Maximum detected concentration
Aroclor-1260	1	1	0.117	0.117	n/a	0.117	Maximum detected concentration
Benzo(a)pyrene	1	1	0.0562	0.0562	n/a	0.0562	Maximum detected concentration
Benzo(b)fluoranthene	1	1	0.111	0.111	n/a	0.111	Maximum detected concentration
Benzo(g,h,i)perylene	1	1	0.03	0.03	n/a	0.03	Maximum detected concentration
Chrysene	1	1	0.0493	0.0493	n/a	0.0493	Maximum detected concentration
Fluoranthene	1	1	0.102	0.102	n/a	0.102	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	1	1	0.0297	0.0297	n/a	0.0297	Maximum detected concentration
Phenanthrene	1	1	0.0362	0.0362	n/a	0.0362	Maximum detected concentration
Pyrene	1	1	0.0845	0.0845	n/a	0.0845	Maximum detected concentration
TPH-DRO	1	1	8.88	8.88	n/a	8.88	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-40
EPCs for SWMU 03-045(b) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	0	1.06(U)	1.07(U)	n/a*	1.07(U)	Maximum detection limit
Mercury	2	2	0.0626	0.159	n/a	0.159	Maximum detected concentration
Silver	2	2	0.662	1.17	n/a	1.17	Maximum detected concentration
Organic Chemicals (mg/kg)							
Anthracene	2	1	0.00901	0.0358(U)	n/a	0.00901	Maximum detected concentration
Aroclor-1254	2	2	0.021	0.0803	n/a	0.0803	Maximum detected concentration
Aroclor-1260	2	2	0.0905	0.117	n/a	0.117	Maximum detected concentration
Benzo(a)pyrene	2	1	0.0358(U)	0.0562	n/a	0.0562	Maximum detected concentration
Benzo(b)fluoranthene	2	2	0.0492	0.111	n/a	0.111	Maximum detected concentration
Benzo(g,h,i)perylene	2	2	0.015	0.03	n/a	0.03	Maximum detected concentration
Chrysene	2	1	0.0358(U)	0.0493	n/a	0.0493	Maximum detected concentration
Fluoranthene	2	1	0.0389	0.102	n/a	0.102	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	2	2	0.0141	0.0297	n/a	0.0297	Maximum detected concentration
Methylene chloride	2	1	0.00225	0.00536(U)	n/a	0.00225	Maximum detected concentration
Phenanthrene	2	1	0.0358(U)	0.0362	n/a	0.0362	Maximum detected concentration
Pyrene	2	2	0.0324	0.0845	n/a	0.0845	Maximum detected concentration
TPH-DRO	2	2	4.03	8.88	n/a	8.88	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-41
EPCs for SWMU 03-045(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	1	0	1.14(U)	1.14(U)	n/a*	1.14(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.235	0.235	n/a	0.235	Maximum detected concentration
Aroclor-1260	1	1	0.862	0.862	n/a	0.862	Maximum detected concentration
Benzo(b)fluoranthene	1	1	0.0451	0.0451	n/a	0.0451	Maximum detected concentration
Chrysene	1	1	0.0233	0.0233	n/a	0.0233	Maximum detected concentration
Fluoranthene	1	1	0.0468	0.0468	n/a	0.0468	Maximum detected concentration
Methylene chloride	1	1	0.00256	0.00256	n/a	0.00256	Maximum detected concentration
Phenanthrene	1	1	0.0615	0.0615	n/a	0.0615	Maximum detected concentration
Pyrene	1	1	0.0475	0.0475	n/a	0.0475	Maximum detected concentration
TPH-DRO	1	1	2.98	2.98	n/a	2.98	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-42
EPCs for SWMU 03-045(c) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	0	1.12(U)	1.14(U)	n/a*	1.14(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Acenaphthene	2	1	0.0397(U)	0.0542	n/a	0.0542	Maximum detected concentration
Anthracene	2	1	0.0397(U)	0.139	n/a	0.139	Maximum detected concentration
Aroclor-1254	2	2	0.235	0.812	n/a	0.812	Maximum detected concentration
Aroclor-1260	2	2	0.862	3.19	n/a	3.19	Maximum detected concentration
Benzo(a)anthracene	2	1	0.0397(U)	0.287	n/a	0.287	Maximum detected concentration
Benzo(a)pyrene	2	1	0.0397(U)	0.242	n/a	0.242	Maximum detected concentration
Benzo(b)fluoranthene	2	2	0.0451	0.451	n/a	0.451	Maximum detected concentration
Benzo(g,h,i)perylene	2	1	0.0397(U)	0.12	n/a	0.12	Maximum detected concentration
Chrysene	2	2	0.0233	0.232	n/a	0.232	Maximum detected concentration
Fluoranthene	2	2	0.0468	0.548	n/a	0.548	Maximum detected concentration
Fluorene	2	1	0.0397(U)	0.0624	n/a	0.0624	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	2	1	0.0397(U)	0.111	n/a	0.111	Maximum detected concentration
Methylene chloride	2	2	0.00241	0.00256	n/a	0.00256	Maximum detected concentration
Methylnaphthalene[2-]	2	1	0.00868	0.0397(U)	n/a	0.00868	Maximum detected concentration
Naphthalene	2	1	0.025	0.0397(U)	n/a	0.025	Maximum detected concentration
Phenanthrene	2	2	0.0615	0.447	n/a	0.447	Maximum detected concentration
Pyrene	2	2	0.0475	0.534	n/a	0.534	Maximum detected concentration
TPH-DRO	2	2	2.98	53.8	n/a	53.8	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-43
EPCs for SWMU 03-045(e) 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	1.09(U)	1.09(U)	n/a*	1.09(U)	Maximum detection limit
Lead	1	1	70.7	70.7	n/a	70.7	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.0024	0.0024	n/a	0.0024	Maximum detected concentration
Aroclor-1260	1	1	0.0058	0.0058	n/a	0.0058	Maximum detected concentration
Benzo(b)fluoranthene	1	1	0.0599	0.0599	n/a	0.0599	Maximum detected concentration
Fluoranthene	1	1	0.0814	0.0814	n/a	0.0814	Maximum detected concentration
Phenanthrene	1	1	0.0589	0.0589	n/a	0.0589	Maximum detected concentration
Pyrene	1	1	0.0796	0.0796	n/a	0.0796	Maximum detected concentration
TPH-DRO	1	1	300	300	n/a	300	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-44
EPCs for SWMU 03-045(e) for Ecological Risk and for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	0	1.04(U)	1.09(U)	n/a*	1.09(U)	Maximum detection limit
Lead	2	2	70.7	99.6	n/a	99.6	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.0024	0.00363(U)	n/a	0.0024	Maximum detected concentration
Aroclor-1260	2	1	0.00363(U)	0.0058	n/a	0.0058	Maximum detected concentration
Benzo(b)fluoranthene	2	1	0.0599	0.725(U)	n/a	0.0599	Maximum detected concentration
Fluoranthene	2	2	0.0814	0.239	n/a	0.239	Maximum detected concentration

Table I-2.3-44 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Isopropyltoluene[4-]	2	1	0.00109(U)	0.00173	n/a	0.00173	Maximum detected concentration
Phenanthrene	2	2	0.0589	0.251	n/a	0.251	Maximum detected concentration
Pyrene	2	2	0.0796	0.288	n/a	0.288	Maximum detected concentration
TPH-DRO	2	2	300	3250	n/a	3250	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-45
EPCs for SWMU 03-045(f) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	2	0.561	0.984	n/a*	0.984	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	2	1	0.00474	0.00562(UJ)	n/a	0.00474	Maximum detected concentration
Aroclor-1260	2	2	0.0022	0.0314	n/a	0.0314	Maximum detected concentration
Fluoranthene	2	1	0.0257	0.0374(U)	n/a	0.0257	Maximum detected concentration
Isopropyltoluene[4-]	2	1	0.000364	0.00112(U)	n/a	0.000364	Maximum detected concentration
Phenanthrene	2	1	0.0125	0.0374(U)	n/a	0.0125	Maximum detected concentration
Pyrene	2	1	0.0175	0.0374(U)	n/a	0.0175	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-46
EPCs for SWMU 03-045(f) for Ecological Risk and for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	4	3	0.561	1.08	n/a*	1.08	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	4	1	0.00474	0.00562(UJ)	n/a	0.00474	Maximum detected concentration
Aroclor-1260	4	4	0.0022	0.0314	n/a	0.0314	Maximum detected concentration
Fluoranthene	4	1	0.0257	0.0374(U)	n/a	0.0257	Maximum detected concentration
Isopropylbenzene	4	1	0.000427	0.00112(U)	n/a	0.000427	Maximum detected concentration
Isopropyltoluene[4-]	4	1	0.000364	0.00112(U)	n/a	0.000364	Maximum detected concentration
Phenanthrene	4	1	0.0125	0.0374(U)	n/a	0.0125	Maximum detected concentration
Pyrene	4	1	0.0175	0.0374(U)	n/a	0.0175	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-47
EPCs for SWMU 03-045(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	2	0.23	1.08(U)	n/a*	0.49	Maximum detected concentration
Arsenic	4	4	1.25	4.2	n/a	4.2	Maximum detected concentration
Barium	4	4	27.1	262	n/a	262	Maximum detected concentration
Cadmium	4	2	0.28	0.93	n/a	0.93	Maximum detected concentration
Chromium	4	4	5.25	27.7	n/a	27.7	Maximum detected concentration
Cobalt	4	4	1.26	7.9	n/a	7.9	Maximum detected concentration
Copper	4	4	3.53	39.2	n/a	39.2	Maximum detected concentration
Iron	4	4	7370	19900	n/a	19900	Maximum detected concentration

Table I-2.3-47 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Lead	4	4	8.36	27.3	n/a	27.3	Maximum detected concentration
Manganese	4	4	65.5	582	n/a	582	Maximum detected concentration
Nickel	4	4	3.31	19.3	n/a	19.3	Maximum detected concentration
Selenium	4	2	0.27	1.08(U)	n/a	0.831	Maximum detected concentration
Vanadium	4	4	8.08	32	n/a	32	Maximum detected concentration
Zinc	4	4	27.3	141	n/a	141	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	2	0.002	0.0052	n/a	0.0052	Maximum detected concentration
Aroclor-1260	2	2	0.0026	0.0153	n/a	0.0153	Maximum detected concentration
Benzo(a)anthracene	4	2	0.0358(U)	0.16	n/a	0.16	Maximum detected concentration
Benzo(a)pyrene	4	3	0.0177	0.22	n/a	0.22	Maximum detected concentration
Benzo(b)fluoranthene	4	3	0.0226	0.19	n/a	0.19	Maximum detected concentration
Benzo(g,h,i)perylene	4	1	0.0358(U)	0.44(U)	n/a	0.2	Maximum detected concentration
Benzo(k)fluoranthene	4	2	0.0358(U)	0.2	n/a	0.2	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	4	2	0.358(U)	0.77	n/a	0.77	Maximum detected concentration
Chrysene	4	3	0.0148	0.21	n/a	0.21	Maximum detected concentration
Fluoranthene	4	3	0.0371(U)	0.37	n/a	0.37	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	3	0.0371(U)	0.18	n/a	0.18	Maximum detected concentration
Methylene chloride	4	2	0.00509(U)	0.018	n/a	0.018	Maximum detected concentration
Phenanthrene	4	3	0.0157	0.14	n/a	0.14	Maximum detected concentration
Pyrene	4	3	0.0305	0.38	n/a	0.38	Maximum detected concentration
TPH-DRO	4	2	13.1	350(UJ)	n/a	48.5	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-48
EPCs for SWMU 03-045(g) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	12	3	0.22(U)	1.09(U)	n/a*	0.49	Maximum detected concentration
Arsenic	12	12	0.814	4.2	Normal	2.61	95% Student's t
Barium	12	12	27.1	262	Gamma	145.1	95% Approximate Gamma
Cadmium	12	5	0.16	0.93	Normal	0.445	95% KM (t)
Chromium	12	12	3.69	58.7	Normal	31.6	95% Student's t
Cobalt	12	12	0.966	7.9	Normal	4.72	95% Student's t
Copper	12	12	1.59	39.2	Gamma	23.1	95% Approximate Gamma
Iron	12	12	7370	19900	Gamma	14211	95% Approximate Gamma
Lead	12	12	3.24	27.3	Gamma	15	95% Approximate Gamma
Manganese	12	12	61	654	Normal	399.1	95% Student's t
Nickel	12	12	2.82	19.3	Gamma	11.7	95% Approximate Gamma
Selenium	12	3	0.22	1.08(U)	n/a	0.831	Maximum detected concentration
Vanadium	12	12	6.45	32	Normal	21.1	95% Student's t
Zinc	12	12	22.8	141	Lognormal	77.9	95% Chebyshev (MVUE)
Organic Chemicals (mg/kg)							
Aroclor-1254	8	2	0.002	0.0734(U)	n/a	0.0052	Maximum detected concentration
Aroclor-1260	8	2	0.0026	0.0734(U)	n/a	0.0153	Maximum detected concentration
Benzo(a)anthracene	12	5	0.0197	0.367(U)	Normal	0.104	95% KM (t)
Benzo(a)pyrene	12	6	0.0177	0.367(U)	Normal	0.122	95% KM (t)
Benzo(b)fluoranthene	12	6	0.0226	0.367(U)	Normal	0.116	95% KM (t)
Benzo(g,h,i)perylene	12	3	0.0304	0.44(U)	n/a	0.2	Maximum detected concentration
Benzo(k)fluoranthene	12	5	0.0115	0.367(U)	Normal	0.106	95% KM (t)
Benzoic acid	12	1	0.174	7.34(UJ)	n/a	0.174	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	12	4	0.28	3.67(U)	n/a	0.77	Maximum detected concentration

Table I-2.3-48 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Butylbenzene[n-]	12	1	0.000968(U)	0.007(U)	n/a	0.0018	Maximum detected concentration
Chrysene	12	6	0.0148	0.367(U)	Normal	0.123	95% KM (t)
Fluoranthene	12	7	0.0341(U)	0.42	Normal	0.224	95% KM (t)
Indeno(1,2,3-cd)pyrene	12	6	0.0341(U)	0.367(U)	Nonparametric	0.139	95% KM (t)
Isopropyltoluene[4-]	12	1	0.000968(U)	0.014	n/a	0.014	Maximum detected concentration
Methylene chloride	12	4	0.00484(U)	0.018	n/a	0.018	Maximum detected concentration
Phenanthrene	12	6	0.0148	0.367(U)	Normal	0.106	95% KM (t)
Pyrene	12	7	0.0305	0.38	Normal	0.206	95% KM (t)
TPH-DRO	12	5	3.66	367(U)	Normal	28.5	95% KM (t)
Trichloroethene	12	1	0.000968(U)	0.007(U)	n/a	0.0019	Maximum detected concentration
Trimethylbenzene[1,2,4-]	12	2	0.000329	0.007(U)	n/a	0.0029	Maximum detected concentration
Trimethylbenzene[1,3,5-]	12	1	0.000968(U)	0.007(U)	n/a	0.0011	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-49
EPCs for SWMU 03-045(h) for Ecological Risk and/or for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	1	1	4930	4930	n/a*	4930	Maximum detected concentration
Antimony	1	0	1.13(UJ)	1.13(UJ)	n/a	1.13(UJ)	Maximum detection limit
Barium	1	1	64	64	n/a	64	Maximum detected concentration
Chromium	1	1	8.72	8.72	n/a	8.72	Maximum detected concentration
Chromium hexavalent ion	1	1	0.142	0.142	n/a	0.142	Maximum detected concentration
Cobalt	1	1	2.38	2.38	n/a	2.38	Maximum detected concentration
Copper	1	1	5.6	5.6	n/a	5.6	Maximum detected concentration
Nickel	1	1	6.25	6.25	n/a	6.25	Maximum detected concentration
Selenium	1	1	1.12(U)	1.12(U)	n/a	1.12(U)	Maximum detection limit
Vanadium	1	1	13.2	13.2	n/a	13.2	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.0193	0.0193	n/a	0.0193	Maximum detected concentration
Aroclor-1260	1	1	0.0196	0.0196	n/a	0.0196	Maximum detected concentration
Benzo(b)fluoranthene	1	1	0.0155	0.0155	n/a	0.0155	Maximum detected concentration
Fluoranthene	1	1	0.0236	0.0236	n/a	0.0236	Maximum detected concentration
Phenanthrene	1	1	0.0148	0.0148	n/a	0.0148	Maximum detected concentration
Pyrene	1	1	0.0187	0.0187	n/a	0.0187	Maximum detected concentration
TCDD[2,3,7,8-]	1	1	1.95E-06	1.95E-06	n/a	1.95E-06	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.2-50
EPCs for SWMU 03-045(h) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	2	2	4930	10500	n/a*	10500	Maximum detected concentration
Antimony	2	0	1.12(UJ)	1.13(UJ)	n/a	1.13(UJ)	Maximum detection limit
Barium	2	2	64	112	n/a	112	Maximum detected concentration
Chromium	2	2	8.72	15.7	n/a	15.7	Maximum detected concentration
Chromium hexavalent ion	2	1	0.142	0.456(U)	n/a	0.142	Maximum detected concentration
Cobalt	2	2	2.38	4.46	n/a	4.46	Maximum detected concentration
Copper	2	2	5.6	10.5	n/a	10.5	Maximum detected concentration
Nickel	2	2	6.25	11.4	n/a	11.4	Maximum detected concentration
Selenium	2	0	1.12(U)	1.14(U)	n/a	1.14(U)	Maximum detection limit
Vanadium	2	2	13.2	21.4	n/a	21.4	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.00393(U)	0.0193	n/a	0.0193	Maximum detected concentration
Aroclor-1260	2	1	0.00393(U)	0.0196	n/a	0.0196	Maximum detected concentration
Benzo(b)fluoranthene	2	1	0.0155	0.0393(U)	n/a	0.0155	Maximum detected concentration
Fluoranthene	2	1	0.0236	0.0393(U)	n/a	0.0236	Maximum detected concentration
Phenanthrene	2	1	0.0148	0.0393(U)	n/a	0.0148	Maximum detected concentration
Pyrene	2	1	0.0187	0.0393(U)	n/a	0.0187	Maximum detected concentration
TCDD[2,3,7,8-]	2	2	9.14E-08	1.95E-06	n/a	1.95E-06	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-51
EPCs for AOC 03-047(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	0	1.07(U)	1.12(U)	n/a*	1.12(U)	Maximum detection limit
Lead	4	4	7.72	15.5	n/a	15.5	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	4	1	0.0241	0.0393(U)	n/a	0.0241	Maximum detected concentration
Acetone	4	1	0.00208	0.0059(UJ)	n/a	0.00208	Maximum detected concentration
Anthracene	4	1	0.0372(U)	0.0448	n/a	0.0448	Maximum detected concentration
Aroclor-1242	4	1	0.0182(U)	0.0674	n/a	0.0674	Maximum detected concentration
Aroclor-1254	4	1	0.0182(U)	0.126	n/a	0.126	Maximum detected concentration
Aroclor-1260	4	1	0.0182(U)	0.241	n/a	0.241	Maximum detected concentration
Benzo(a)anthracene	4	2	0.0142	0.198	n/a	0.198	Maximum detected concentration
Benzo(a)pyrene	4	1	0.0372(U)	0.191	n/a	0.191	Maximum detected concentration
Benzo(b)fluoranthene	4	2	0.0372(U)	0.405	n/a	0.405	Maximum detected concentration
Benzo(g,h,i)perylene	4	1	0.0372(UJ)	0.112	n/a	0.112	Maximum detected concentration
Chrysene	4	2	0.0118	0.207	n/a	0.207	Maximum detected concentration
Fluoranthene	4	2	0.0148	0.437	n/a	0.437	Maximum detected concentration
Fluorene	4	1	0.0185	0.0393(U)	n/a	0.0185	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	1	0.0372(UJ)	0.0821	n/a	0.0821	Maximum detected concentration
Phenanthrene	4	2	0.0173	0.231	n/a	0.231	Maximum detected concentration
Pyrene	4	3	0.0141	0.522	n/a	0.522	Maximum detected concentration
Tetrachloroethene	4	1	0.000572	0.00118(U)	n/a	0.000572	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-52
EPCs for AOC 03-047(g) for Ecological Risk and for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	0	1.07(U)	1.3(U)	n/a*	1.3(U)	Maximum detection limit
Lead	8	8	7.72	37.4	Normal	27.8	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	8	1	0.0241	0.0442(U)	n/a	0.0241	Maximum detected concentration
Acetone	8	3	0.00208	0.00663(UJ)	n/a	0.00486	Maximum detected concentration
Anthracene	8	1	0.0372(U)	0.0448	n/a	0.0448	Maximum detected concentration
Aroclor-1242	8	2	0.00425(U)	0.364	n/a	0.364	Maximum detected concentration
Aroclor-1254	8	2	0.00425(U)	0.313	n/a	0.313	Maximum detected concentration
Aroclor-1260	8	3	0.0036(U)	0.241	n/a	0.241	Maximum detected concentration
Benzo(a)anthracene	8	2	0.0142	0.198	n/a	0.198	Maximum detected concentration
Benzo(a)pyrene	8	1	0.0372(U)	0.191	n/a	0.191	Maximum detected concentration
Benzo(b)fluoranthene	8	2	0.0372(U)	0.405	n/a	0.405	Maximum detected concentration
Benzo(g,h,i)perylene	8	1	0.0372(UJ)	0.112	n/a	0.112	Maximum detected concentration
Chrysene	8	2	0.0118	0.207	n/a	0.207	Maximum detected concentration
Fluoranthene	8	2	0.0148	0.437	n/a	0.437	Maximum detected concentration
Fluorene	8	1	0.0185	0.0442(U)	n/a	0.0185	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	8	1	0.0372(UJ)	0.0821	n/a	0.0821	Maximum detected concentration
Phenanthrene	8	2	0.0173	0.231	n/a	0.231	Maximum detected concentration
Pyrene	8	3	0.0141	0.522	n/a	0.522	Maximum detected concentration
Tetrachloroethene	8	1	0.000572	0.00133(U)	n/a	0.000572	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-53
EPCs for AOC 03-051(c) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	4	0	1.15(U)	1.26(U)	n/a*	1.26(U)	Maximum detection limit
Cobalt	4	4	1.36	11.2	n/a	11.2	Maximum detected concentration
Zinc	4	4	26.2	114	n/a	114	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	4	2	0.0393(U)	0.227	n/a	0.227	Maximum detected concentration
Anthracene	4	2	0.0393(U)	0.534	n/a	0.534	Maximum detected concentration
Aroclor-1242	4	1	0.00399(U)	0.0218(U)	n/a	0.0091	Maximum detected concentration
Aroclor-1254	4	2	0.00399(U)	0.038	n/a	0.038	Maximum detected concentration
Aroclor-1260	4	3	0.0028	0.109	n/a	0.109	Maximum detected concentration
Benzo(a)anthracene	4	2	0.0393(U)	1.36	n/a	1.36	Maximum detected concentration
Benzo(a)pyrene	4	2	0.0393(U)	1.21	n/a	1.21	Maximum detected concentration
Benzo(b)fluoranthene	4	2	0.0393(U)	1.92	n/a	1.92	Maximum detected concentration
Benzo(g,h,i)perylene	4	2	0.0393(UJ)	0.63	n/a	0.63	Maximum detected concentration
Chrysene	4	2	0.0393(U)	1.3	n/a	1.3	Maximum detected concentration
Dibenz(a,h)anthracene	4	1	0.0389(U)	0.168	n/a	0.168	Maximum detected concentration
Dibenzofuran	4	2	0.0837	0.436(U)	n/a	0.115	Maximum detected concentration
Fluoranthene	4	2	0.0393(U)	3.03	n/a	3.03	Maximum detected concentration
Fluorene	4	2	0.0393(U)	0.229	n/a	0.229	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	2	0.0393(U)	0.545	n/a	0.545	Maximum detected concentration
Methylnaphthalene[2-]	4	2	0.0378	0.0625	n/a	0.0625	Maximum detected concentration
Naphthalene	4	2	0.0393(U)	0.133	n/a	0.133	Maximum detected concentration
Phenanthrene	4	2	0.0393(U)	2.12	n/a	2.12	Maximum detected concentration
Pyrene	4	2	0.0393(U)	2.56	n/a	2.56	Maximum detected concentration
TPH-DRO	4	4	2.84	87	n/a	87	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-54
EPCs for AOC 03-052(b) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	6	6	4790	19800	n/a*	19800	Maximum detected concentration
Antimony	6	0	5.9(UJ)	7.7(UJ)	n/a	7.7(UJ)	Maximum detection limit
Barium	6	6	56.2	144	n/a	144	Maximum detected concentration
Beryllium	6	6	0.42	1.1	n/a	1.1	Maximum detected concentration
Cobalt	6	6	2	21.5	n/a	21.5	Maximum detected concentration
Copper	6	6	3.5	10.9	n/a	10.9	Maximum detected concentration
Lead	6	6	16.4	19.6	n/a	19.6	Maximum detected concentration
Nickel	6	6	2.5	14.5	n/a	14.5	Maximum detected concentration
Selenium	6	1	0.21	0.46(U)	n/a	0.21	Maximum detected concentration
Silver	6	0	1.7(U)	2.2(U)	n/a	2.2(U)	Maximum detection limit

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-55
EPCs for AOC 03-052(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	41	0	0.372(U)	7.7(UJ)	n/a*	7.7(UJ)	Maximum detection limit
Barium	41	41	24.7	811	Lognormal	209.8	95% Chebyshev (MVUE)
Beryllium	41	41	0.279	3.17	Gamma	1.22	95% Approximate Gamma
Cobalt	41	41	0.59	21.5	Gamma	6.16	95% Approximate Gamma
Copper	41	41	1.24	11.3	Normal	7.72	95% Student’s t
Lead	41	41	2.81	64	Nonparametric	18.3	95% Student’s t

Table I-2.3-55 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Nickel	41	29	1.96(U)	20	Gamma	9.17	95% KM (Percentile Bootstrap)
Selenium	41	1	0.21	1.37 (U)	n/a	0.21	Maximum detected concentration
Silver	41	28	0.183	2.2 (U)	Gamma	0.406	95% KM (Percentile Bootstrap)
Organic Chemicals (mg/kg)							
Acenaphthene	30	1	0.0345	0.0457(U)	n/a	0.0345	Maximum detected concentration
Acetone	31	15	0.00206	0.0417	Gamma	0.00853	95% KM (t)
Anthracene	30	4	0.00853	0.0538	n/a	0.0538	Maximum detected concentration
Aroclor-1242	30	1	0.0036(U)	0.36	n/a	0.36	Maximum detected concentration
Aroclor-1254	30	11	0.0018	0.581	Approximate Gamma	0.075	95% KM (t)
Aroclor-1260	30	16	0.0018	1.13	Nonparametric	0.218	95% KM (Chebyshev)
Benzo(a)anthracene	30	3	0.036(U)	0.0977	n/a	0.0977	Maximum detected concentration
Benzo(a)pyrene	30	4	0.021	0.0719	n/a	0.0719	Maximum detected concentration
Benzo(b)fluoranthene	30	5	0.036(U)	0.231	Normal	0.0737	95% KM (t)
Benzo(g,h,i)perylene	30	3	0.0143	0.0457(UJ)	n/a	0.0248	Maximum detected concentration
Butanone[2-]	31	1	0.00541(UJ)	0.026(U)	n/a	0.00798	Maximum detected concentration
Chrysene	30	5	0.013	0.101	Normal	0.0332	95% KM (t)
Fluoranthene	30	7	0.0144	0.249	Normal	0.0493	95% KM (t)
Fluorene	30	1	0.03	0.0457(U)	n/a	0.03	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	30	1	0.0155	0.0457(U)	n/a	0.0155	Maximum detected concentration
Naphthalene	31	1	0.006(U)	0.0457(U)	n/a	0.0171	Maximum detected concentration
Phenanthrene	30	4	0.0339	0.207	n/a	0.207	Maximum detected concentration
Pyrene	30	6	0.0136	0.242	Normal	0.0443	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-56
EPCs for AOC 03-052(b) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	45	45	1480	20600	Normal	11626	95% Student's t
Antimony	45	0	0.372(U)	7.7(UJ)	n/a*	7.7(UJ)	Maximum detection limit
Barium	45	45	23.7	811	Lognormal	202.6	95% Chebyshev (MVUE)
Beryllium	45	45	0.267	3.17	Gamma	1.19	95% Approximate Gamma
Cobalt	45	45	0.532	21.5	Gamma	5.86	95% Approximate Gamma
Copper	45	45	1.04	11.3	Normal	7.53	95% Student's t
Lead	45	45	2.71	64	Nonparametric	21.6	95% Chebyshev (Mean, Sd)
Nickel	45	31	1.81(U)	20	Gamma	9.03	95% KM (Percentile Bootstrap)
Selenium	45	1	0.21	1.37(U)	n/a	0.21	Maximum detected concentration
Silver	45	31	0.183	2.2(U)	Gamma	0.404	95% KM (Percentile Bootstrap)
Organic Chemicals (mg/kg)							
Acenaphthene	34	1	0.0345	0.0457(U)	n/a	0.0345	Maximum detected concentration
Acetone	35	17	0.00206	0.0417	Gamma	0.00828	95% KM (t)
Anthracene	34	5	0.00853	0.0538	Nonparametric	0.0144	95% KM (t)
Aroclor-1242	34	1	0.0036(U)	0.36	n/a	0.36	Maximum detected concentration
Aroclor-1254	34	12	0.0018	0.581	Lognormal	0.119	95% KM (Chebyshev)
Aroclor-1260	34	17	0.0018	1.13	Nonparametric	0.193	95% KM (Chebyshev)
Benzo(a)anthracene	34	4	0.0178	0.0977	n/a	0.0977	Maximum detected concentration
Benzo(a)pyrene	34	6	0.021	0.0719	Normal	0.0383	95% KM (t)
Benzo(b)fluoranthene	34	7	0.036(U)	0.231	Normal	0.0709	95% KM (t)
Benzo(g,h,i)perylene	34	5	0.0143	0.0457(UJ)	Normal	0.0281	95% KM (t)
Benzo(k)fluoranthene	34	2	0.0133	0.0457(U)	n/a	0.041	Maximum detected concentration
Butanone[2-]	35	1	0.00541(UJ)	0.026(U)	n/a	0.00798	Maximum detected concentration
Chrysene	34	7	0.013	0.101	Normal	0.0385	95% KM (t)
Fluoranthene	34	9	0.0144	0.249	Normal	0.0536	95% KM (t)

Table I-2.3-56 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Fluorene	34	1	0.03	0.0457(U)	n/a	0.03	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	34	3	0.0155	0.15	n/a	0.15	Maximum detected concentration
Isopropyltoluene[4-]	35	1	0.000817	0.006 (U)	n/a	0.000817	Maximum detected concentration
Naphthalene	35	1	0.006(U)	0.0457(U)	n/a	0.0171	Maximum detected concentration
Phenanthrene	34	6	0.0171	0.207	Gamma	0.048	95% KM (t)
Pyrene	34	8	0.0136	0.242	Normal	0.0468	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-57
EPCs for SWMU 03-052(f) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	1	0.544	1.33(U)	n/a*	0.544	Maximum detected concentration
Barium	7	7	36.5	102	n/a	102	Maximum detected concentration
Chromium	7	7	8.03	16.4	n/a	16.4	Maximum detected concentration
Copper	7	7	2.58	20.9	n/a	20.9	Maximum detected concentration
Cyanide	7	4	0.117	12.8	n/a	12.8	Maximum detected concentration
Lead	7	7	13.4	54.1	n/a	54.1	Maximum detected concentration
Perchlorate	7	1	0.000821	0.00276(U)	n/a	0.000821	Maximum detected concentration
Selenium	7	0	1.08(U)	1.37(U)	n/a	1.37(U)	Maximum detection limit
Zinc	7	7	32.8	200	n/a	200	Maximum detected concentration

Table I-2.3-57 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	7	5	0.0377(U)	3.35	n/a	3.35	Maximum detected concentration
Acenaphthylene	7	1	0.0377(U)	0.0863(U)	n/a	0.0448	Maximum detected concentration
Acetone	7	2	0.00539(UJ)	0.0226	n/a	0.0226	Maximum detected concentration
Anthracene	7	6	0.0102	3.86	n/a	3.86	Maximum detected concentration
Aroclor-1254	7	5	0.00375(U)	0.128	n/a	0.128	Maximum detected concentration
Aroclor-1260	7	6	0.008	0.14	n/a	0.14	Maximum detected concentration
Benzo(a)anthracene	7	6	0.0327	19.9	n/a	19.9	Maximum detected concentration
Benzo(a)pyrene	7	6	0.0305	18.7	n/a	18.7	Maximum detected concentration
Benzo(b)fluoranthene	7	7	0.0118	24.2	n/a	24.2	Maximum detected concentration
Benzo(g,h,i)perylene	7	6	0.0287	3.49	n/a	3.49	Maximum detected concentration
Benzo(k)fluoranthene	7	6	0.0172	4.86	n/a	4.86	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	7	5	0.0911	0.863(U)	n/a	0.29	Maximum detected concentration
Chrysene	7	6	0.0327	22.9	n/a	22.9	Maximum detected concentration
Dibenz(a,h)anthracene	7	3	0.0377(U)	1.17	n/a	1.17	Maximum detected concentration
Dibenzofuran	7	4	0.153	1.23	n/a	1.23	Maximum detected concentration
Fluoranthene	7	7	0.0134	49.6	n/a	49.6	Maximum detected concentration
Fluorene	7	5	0.0377(U)	2.24	n/a	2.24	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	7	6	0.0194	3.62	n/a	3.62	Maximum detected concentration
Methylnaphthalene[2-]	7	4	0.0377(U)	0.299	n/a	0.299	Maximum detected concentration
Naphthalene	7	4	0.0377(U)	0.607	n/a	0.607	Maximum detected concentration
Nitroaniline[4-]	7	1	0.377(UJ)	0.863(UJ)	n/a	0.46	Maximum detected concentration
Phenanthrene	7	6	0.0363	50.8	n/a	50.8	Maximum detected concentration
Pyrene	7	7	0.0211	64.3	n/a	64.3	Maximum detected concentration
TPH-DRO	7	7	14.5	693	n/a	693	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-58
EPCs for SWMU 03-052(f) for the Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	14	1	0.544	1.44(U)	n/a*	0.544	Maximum detected concentration
Barium	14	14	27.9	102	Normal	73.2	95% Student's t
Chromium	14	14	6.98	67.3	Nonparametric	35.1	95% Chebyshev (Mean, Sd)
Copper	14	14	1.65	27.2	Normal	16.3	95% Student's t
Cyanide	14	6	0.117	12.8	Gamma	2.89	95% KM (t)
Lead	14	14	6.34	56.7	Normal	37	95% Student's t
Perchlorate	14	4	0.000769	0.00294(U)	n/a	0.00085	Maximum detected concentration
Selenium	14	0	1.05(U)	1.42(U)	n/a	1.42(U)	Maximum detection limit
Zinc	14	14	30.1	200	Normal	139.7	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	14	8	0.0348(U)	3.35	Gamma	0.992	95% KM (BCA)
Acenaphthylene	14	1	0.0348(U)	0.0863 (U)	n/a	0.0448	Maximum detected concentration
Acetone	14	3	0.00484(UJ)	0.0226	n/a	0.0226	Maximum detected concentration
Anthracene	14	12	0.00779	3.86	Gamma	1.85	95% KM (Chebyshev)
Aroclor-1254	14	10	0.00348(U)	0.128	Normal	0.0792	95% KM (t)
Aroclor-1260	14	11	0.00348(U)	0.14	Nonparametric	0.0915	95% KM (BCA)
Benzo(a)anthracene	14	12	0.0274	19.9	Gamma	8.27	95% KM (Chebyshev)
Benzo(a)pyrene	14	12	0.0236	18.7	Gamma	7.8	95% KM (Chebyshev)
Benzo(b)fluoranthene	14	13	0.0118	24.2	Gamma	10.1	95% KM (Chebyshev)
Benzo(g,h,i)perylene	14	12	0.0193	3.49	Gamma	1.7	95% KM (Chebyshev)
Benzo(k)fluoranthene	14	11	0.0172	4.86	Gamma	2.26	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	14	7	0.0911	0.863 (U)	Normal	0.237	95% KM (t)
Chrysene	14	12	0.024	22.9	Gamma	9.51	95% KM (Chebyshev)
Dibenz(a,h)anthracene	14	3	0.0348(U)	1.17	n/a	1.17	Maximum detected concentration
Dibenzofuran	14	6	0.104	1.23	Gamma	0.441	95% KM (t)

Table I-2.3-58 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Fluoranthene	14	13	0.0134	49.6	Gamma	20.6	95% KM (Chebyshev)
Fluorene	14	8	0.034	2.24	Gamma	0.696	95% KM (BCA)
Indeno(1,2,3-cd)pyrene	14	12	0.0158	3.62	Gamma	1.72	95% KM (Chebyshev)
Methylnaphthalene[2-]	14	6	0.0348(U)	0.299	Lognormal	0.135	95% KM (t)
Naphthalene	14	6	0.0348(U)	0.607	Normal	0.28	95% KM (t)
Nitroaniline[4-]	14	1	0.348(UJ)	0.863(UJ)	n/a	0.46	Maximum detected concentration
Phenanthrene	14	12	0.0348(U)	50.8	Gamma	21.1	95% KM (Chebyshev)
Pyrene	14	13	0.0211	64.3	Gamma	27	95% KM (Chebyshev)
Toluene	14	1	0.000507	0.00135(U)	n/a	0.000507	Maximum detected concentration
TPH-DRO	14	14	5.81	693	Gamma	296.7	95% Approximate Gamma
Trimethylbenzene[1,2,4-]	14	1	0.000435	0.00135(U)	n/a	0.000435	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-59
EPCs for SWMU 03-056(a) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Silver	4	4	0.177	0.394	n/a*	0.394	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	4	1	0.00241	0.00585(U)	n/a	0.00241	Maximum detected concentration
Anthracene	4	1	0.0111	0.039(U)	n/a	0.0111	Maximum detected concentration
Aroclor-1254	4	1	0.003	0.0179(U)	n/a	0.003	Maximum detected concentration
Aroclor-1260	4	2	0.00347(U)	0.0179(U)	n/a	0.0046	Maximum detected concentration
Benzo(a)anthracene	4	1	0.0218	0.039(U)	n/a	0.0218	Maximum detected concentration
Benzo(a)pyrene	4	1	0.0138	0.039(U)	n/a	0.0138	Maximum detected concentration
Benzo(b)fluoranthene	4	1	0.0163	0.039(U)	n/a	0.0163	Maximum detected concentration

Table I-2.3-59 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Chrysene	4	1	0.0175	0.039(U)	n/a	0.0175	Maximum detected concentration
Fluoranthene	4	3	0.0117	0.0378	n/a	0.0378	Maximum detected concentration
Phenanthrene	4	1	0.0348(U)	0.039(U)	n/a	0.0387	Maximum detected concentration
Pyrene	4	3	0.0118	0.0398	n/a	0.0398	Maximum detected concentration
TPH-DRO	4	3	3.08	104	n/a	104	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-60
EPCs for SWMU 03-056(a) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Silver	12	9	0.1(U)	1.6	Lognormal	0.667	95% KM (BCA)
Organic Chemicals (mg/kg)							
Acetone	8	2	0.00196	0.00586(U)	n/a*	0.00241	Maximum detected concentration
Anthracene	8	1	0.0111	0.0391(U)	n/a	0.0111	Maximum detected concentration
Aroclor-1254	8	2	0.003	0.0366	n/a	0.0366	Maximum detected concentration
Aroclor-1260	8	6	0.00347(U)	0.0279	Gamma	0.0133	95% KM (Percentile Bootstrap)
Benzo(a)anthracene	8	1	0.0218	0.0391(U)	n/a	0.0218	Maximum detected concentration
Benzo(a)pyrene	8	1	0.0138	0.0391(U)	n/a	0.0138	Maximum detected concentration
Benzo(b)fluoranthene	8	1	0.0163	0.0391(U)	n/a	0.0163	Maximum detected concentration
Chrysene	8	1	0.0175	0.0391(U)	n/a	0.0175	Maximum detected concentration
Fluoranthene	8	3	0.0117	0.0391(U)	n/a	0.0378	Maximum detected concentration
Phenanthrene	8	1	0.0348(U)	0.0391(U)	n/a	0.0387	Maximum detected concentration
Pyrene	8	4	0.0113	0.0398	n/a	0.0398	Maximum detected concentration
TPH-DRO	12	6	3.08	598(U)	Gamma	119.2	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-61
EPCs for SWMU 03-056(d) 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	1.07(U)	1.07(U)	n/a*	1.07(U)	Maximum detection limit
Copper	1	1	2.38	2.38	n/a	2.38	Maximum detected concentration
Mercury	1	1	0.00721	0.00721	n/a	0.00721	Maximum detected concentration
Silver	1	1	0.454	0.454	n/a	0.454	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	1	1	0.0014	0.0014	n/a	0.0014	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-62
EPCs for SWMU 03-056(d) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	2	0	1.07(U)	1.07(U)	n/a*	1.07(U)	Maximum detection limit
Copper	2	2	2.38	21.8	n/a	21.8	Maximum detected concentration
Cyanide	2	1	0.257(U)	0.554	n/a	0.554	Maximum detected concentration
Mercury	2	2	0.00721	0.161	n/a	0.161	Maximum detected concentration
Silver	2	2	0.454	12	n/a	12	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.0037(U)	0.0539	n/a	0.0539	Maximum detected concentration
Aroclor-1260	2	2	0.0014	0.0769	n/a	0.0769	Maximum detected concentration
TPH-DRO	2	1	3.19	7.36(U)	n/a	3.19	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-63
EPCs for AOC 03-056(k) 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	1.07(U)	6.6(UJ)	n/a*	6.6 (UJ)	Maximum detection limit
Copper	5	5	4	20.1	n/a	20.1	Maximum detected concentration
Mercury	5	4	0.0369	0.113	n/a	0.113	Maximum detected concentration
Silver	5	3	0.407	2.2(U)	n/a	0.493	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	3	3	0.017	0.975	n/a	0.975	Maximum detected concentration
Anthracene	3	3	0.0315	1.65	n/a	1.65	Maximum detected concentration
Aroclor-1254	3	3	0.009	0.0349	n/a	0.0349	Maximum detected concentration
Aroclor-1260	3	3	0.0073	0.0362	n/a	0.0362	Maximum detected concentration
Benzo(a)anthracene	3	3	0.0834	2.08	n/a	2.08	Maximum detected concentration
Benzo(a)pyrene	3	3	0.0698	1.63	n/a	1.63	Maximum detected concentration
Benzo(b)fluoranthene	3	3	0.114	2.59	n/a	2.59	Maximum detected concentration
Benzo(g,h,i)perylene	3	3	0.0478	0.949	n/a	0.949	Maximum detected concentration
Chrysene	3	3	0.0731	1.78	n/a	1.78	Maximum detected concentration
Dibenz(a,h)anthracene	3	1	0.0395(UJ)	0.0912	n/a	0.0912	Maximum detected concentration
Dibenzofuran	3	1	0.395(U)	0.409	n/a	0.409	Maximum detected concentration
Fluoranthene	3	3	0.184	5.22	n/a	5.22	Maximum detected concentration
Fluorene	3	3	0.0143	0.876	n/a	0.876	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	3	3	0.0408	0.896	n/a	0.896	Maximum detected concentration
Methylnaphthalene[2-]	3	1	0.0395(U)	0.236	n/a	0.236	Maximum detected concentration
Naphthalene	3	1	0.0395(U)	0.705	n/a	0.705	Maximum detected concentration
Phenanthrene	3	3	0.118	5.05	n/a	5.05	Maximum detected concentration
Pyrene	3	3	0.152	4.56	n/a	4.56	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-235/236	9	6	0.0421(U)	0.182	Normal	0.133	95% KM (t)
Uranium-238	9	9	0.848	10.07	Gamma	5.74	95% Approximate Gamma

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-64
EPCs for AOC 03-056(k) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	17	0	1.07(U)	7.6(UJ)	n/a*	7.6(UJ)	Maximum detection limit
Copper	17	17	4	28.2	Nonparametric	11.8	95% Student's t
Mercury	17	8	0.0126	0.113	Normal	0.0462	95% KM (t)
Silver	17	7	0.384	2.2(U)	Normal	0.486	95% KM (t)
Organic Chemicals (mg/kg)							
Acenaphthene	16	10	0.017	0.975	Nonparametric	0.352	95% KM (Chebyshev)
Acetone	17	11	0.00243	0.386	Gamma	0.117	95% KM (BCA)
Anthracene	16	10	0.0105	1.65	Nonparametric	0.586	95% KM (Chebyshev
Aroclor-1254	16	8	0.0021	0.0403	Normal	0.0194	95% KM (t)
Aroclor-1260	16	12	0.0015	0.0535	Gamma	0.0343	95% KM (Chebyshev)
Benzo(a)anthracene	16	10	0.0172	2.08	Gamma	0.558	95% KM (BCA)
Benzo(a)pyrene	16	10	0.0143	1.63	Gamma	0.503	95% KM (BCA)
Benzo(b)fluoranthene	16	11	0.0161	2.59	Gamma	0.757	95% KM (BCA)
Benzo(g,h,i)perylene	16	8	0.0333	0.949	Gamma	0.317	95% KM (t)
Butanone[2-]	17	10	0.00199	0.0213	Gamma	0.00816	95% KM (t)
Carbon disulfide	17	2	0.00203	0.00648(U)	n/a	0.004	Maximum detected concentration
Chrysene	16	10	0.0147	1.78	Gamma	0.498	95% KM (BCA)
Dibenz(a,h)anthracene	16	1	0.0385(UJ)	0.0912	n/a	0.0912	Maximum detected concentration
Dibenzofuran	16	1	0.385(U)	0.43(U)	n/a	0.409	Maximum detected concentration
Fluoranthene	16	14	0.0176	5.22	Gamma	2.09	95% KM (Chebyshev)
Fluorene	16	8	0.0143	0.876	Nonparametric	0.184	95% KM (BCA)
Indeno(1,2,3-cd)pyrene	16	9	0.0292	0.896	Gamma	0.306	95% KM (BCA)
Methyl-2-pentanone[4-]	17	1	0.00274	0.024(U)	n/a	0.00274	Maximum detected concentration
Methylnaphthalene[2-]	16	2	0.0099	0.236	n/a	0.236	Maximum detected concentration

Table I-2.3-64 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Naphthalene	17	2	0.006(U)	0.705	n/a	0.705	Maximum detected concentration
Phenanthrene	16	14	0.0187	5.05	Nonparametric	1.76	95% KM (Chebyshev)
Pyrene	16	14	0.0126	4.56	Gamma	1.81	95% KM (Chebyshev)
Toluene	17	9	0.000474	0.006(U)	Gamma	0.00119	95% KM (t)
Radionuclides (pCi/g)							
Uranium-235/236	21	7	0.022(U)	0.203	Normal	0.108	95% KM (t)
Uranium-238	21	21	0.407	10.07	Nonparametric	4.49	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-65
EPCs for AOC 03-056(k) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	21	0	1.07(U)	7.6(UJ)	n/a*	7.6(UJ)	Maximum detection limit
Copper	21	21	4	28.2	Gamma	11.6	95% Approximate Gamma
Mercury	21	12	0.0126	0.113	Gamma	0.0429	95% KM (t)
Silver	21	11	0.278	2.2(U)	Normal	0.466	95% KM (t)
Organic Chemicals (mg/kg)							
Acenaphthene	21	11	0.0144	0.975	Nonparametric	0.274	95% KM (Chebyshev)
Acetone	22	13	0.00243	0.386	Gamma	0.0878	95% KM (BCA)
Anthracene	21	11	0.0105	1.65	Nonparametric	0.454	95% KM (Chebyshev)
Aroclor-1254	21	9	0.0021	0.0403	Normal	0.016	95% KM (t)
Aroclor-1260	21	14	0.0015	0.0535	Gamma	0.0183	95% KM (BCA)

Table I-2.3-65 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(a)anthracene	21	12	0.0172	2.08	Lognormal	0.707	95% KM (Chebyshev)
Benzo(a)pyrene	21	12	0.0143	1.63	Gamma	0.374	95% KM (BCA)
Benzo(b)fluoranthene	21	13	0.0161	2.59	Lognormal	0.973	95% KM (Chebyshev)
Benzo(g,h,i)perylene	21	9	0.0161	0.949	Gamma	0.245	95% KM (t)
Butanone[2-]	22	10	0.00199	0.0213	Gamma	0.00715	95% KM (t)
Carbon disulfide	22	2	0.00203	0.00648(U)	n/a	0.004	Maximum detected concentration
Chrysene	21	12	0.0147	1.78	Gamma	0.391	95% KM (BCA)
Dibenz(a,h)anthracene	21	1	0.0385(UJ)	0.0912	n/a	0.0912	Maximum detected concentration
Dibenzofuran	21	1	0.385(U)	0.43(U)	n/a	0.409	Maximum detected concentration
Fluoranthene	21	16	0.0176	5.22	Lognormal	1.62	95% KM (Chebyshev)
Fluorene	21	9	0.0121	0.876	Nonparametric	0.144	95% KM (BCA)
Indeno(1,2,3-cd)pyrene	21	10	0.0154	0.896	Gamma	0.229	95% KM (t)
Isopropyltoluene[4-]	22	4	0.000402	7.64	n/a	7.64	Maximum detected concentration
Methyl-2-pentanone[4-]	22	1	0.00274	0.024(U)	n/a	0.00274	Maximum detected concentration
Methylnaphthalene[2-]	21	2	0.0099	0.236	n/a	0.236	Maximum detected concentration
Naphthalene	22	3	0.006(U)	0.705	n/a	0.705	Maximum detected concentration
Phenanthrene	21	16	0.0187	5.05	Nonparametric	1.36	95% KM (Chebyshev)
Pyrene	21	16	0.0126	4.56	Lognormal	1.4	95% KM (Chebyshev)
Toluene	22	9	0.000474	0.006(U)	Gamma	0.00109	95% KM (t)
Trimethylbenzene[1,2,4-]	22	1	0.000581	0.006(U)	n/a	0.000581	Maximum detected concentration
Xylene[1,3-] +1,4-Xylene	21	2	0.000425	0.00259(U)	n/a	0.000561	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-235/236	25	7	0.0195(U)	0.203	Normal	0.102	95% KM (t)
Uranium-238	25	25	0.407	10.07	Nonparametric	3.94	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-66
EPCs for SWMU 03-059 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	7	0.397	2.23	Normal	1.12	95% KM (t)
Mercury	17	15	0.00464	0.653	Lognormal	0.265	95% KM (Chebyshev)
Perchlorate	17	1	0.00104	0.00256(U)	n/a*	0.00104	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	17	2	0.0208	0.0427(U)	n/a	0.0411	Maximum detected concentration
Acenaphthylene	17	1	0.0228	0.0427(U)	n/a	0.0228	Maximum detected concentration
Acetone	17	1	0.004	0.0064 (U)	n/a	0.004	Maximum detected concentration
Anthracene	17	4	0.00877	0.0573	n/a	0.0573	Maximum detected concentration
Aroclor-1242	17	1	0.00355(U)	0.891(U)	n/a	0.0182	Maximum detected concentration
Aroclor-1254	17	9	0.0024	12.3	Lognormal	3.99	95% KM (Chebyshev)
Aroclor-1260	17	12	0.0033	5.25	Lognormal	1.7	95% KM (Chebyshev)
Benzo(a)anthracene	17	9	0.0124	0.23	Gamma	0.0672	95% KM (BCA)
Benzo(a)pyrene	17	7	0.0149	0.239	Gamma	0.0648	95% KM (t)
Benzo(b)fluoranthene	17	7	0.0243	0.309	Gamma	0.0953	95% KM (t)
Benzo(g,h,i)perylene	17	7	0.0129	0.0957	Normal	0.0397	95% KM (t)
Benzo(k)fluoranthene	17	3	0.0273	0.139	n/a	0.139	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	17	5	0.078	1.13	Nonparametric	0.289	95% KM (BCA)
Butylbenzylphthalate	17	1	0.346(U)	1.83	n/a	1.83	Maximum detected concentration
Chrysene	17	8	0.0138	0.272	Gamma	0.0788	95% KM (t)
Dibenz(a,h)anthracene	17	1	0.028	0.0427(UJ)	n/a	0.028	Maximum detected concentration
Fluoranthene	17	10	0.0129	0.468	Gamma	0.133	95% KM (BCA)
Fluorene	17	1	0.0346(U)	0.0427(U)	n/a	0.0359	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	17	6	0.0104	0.0982	Normal	0.0398	95% KM (t)
Methylene chloride	17	1	0.00246	0.0064(U)	n/a	0.00246	Maximum detected concentration
Methylnaphthalene[2-]	17	1	0.0138	0.0427(U)	n/a	0.0138	Maximum detected concentration

Table I-2.3-66 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Naphthalene	17	1	0.0291	0.0427(U)	n/a	0.0291	Maximum detected concentration
Phenanthrene	17	8	0.0144	0.209	Gamma	0.0654	95% KM (t)
Pyrene	17	10	0.0127	0.424	Gamma	0.121	95% KM (BCA)
TPH-DRO	17	4	3.04(U)	146(U)	n/a	70.1	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	17	4	-0.0029(U)	0.625	n/a	0.625	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-67
EPCs for SWMU 03-059 for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	34	9	0.397	2.23	Normal	0.891	95% KM (t)
Mercury	34	29	0.00464	0.653	Nonparametric	0.157	95% KM (Chebyshev)
Perchlorate	34	3	0.000602	0.00256(U)	n/a*	0.00171	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	34	4	0.0168	0.37(U)	n/a	0.0411	Maximum detected concentration
Acenaphthylene	34	1	0.0228	0.37(U)	n/a	0.0228	Maximum detected concentration
Acetone	34	1	0.00361(U)	0.0064(U)	n/a	0.004	Maximum detected concentration
Anthracene	34	6	0.00877	0.37(U)	Normal	0.0308	95% KM (t)
Aroclor-1242	34	1	0.00355(U)	0.891(U)	n/a	0.0182	Maximum detected concentration
Aroclor-1254	34	16	0.0021	12.3	Nonparametric	2.63	95% KM (Chebyshev)
Aroclor-1260	34	22	0.0017	5.25	Nonparametric	1.03	95% KM (Chebyshev)
Benzo(a)anthracene	34	12	0.0124	0.37(U)	Gamma	0.0489	95% KM (t)
Benzo(a)pyrene	34	10	0.0144	0.37(U)	Gamma	0.0469	95% KM (t)

Table I-2.3-67 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(b)fluoranthene	34	10	0.0243	0.37(U)	Normal	0.0701	95% KM (t)
Benzo(g,h,i)perylene	34	10	0.0129	0.37(UJ)	Normal	0.0328	95% KM (t)
Benzo(k)fluoranthene	34	5	0.0127	0.37(U)	Normal	0.0385	95% KM (t)
Benzoic acid	34	1	0.496	7.39(UJ)	n/a	0.496	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	34	10	0.078	3.7(U)	Nonparametric	0.194	95% KM (t)
Butylbenzylphthalate	34	1	0.346(U)	3.7(U)	n/a	1.83	Maximum detected concentration
Chrysene	34	11	0.0138	0.37(U)	Gamma	0.0584	95% KM (t)
Dibenz(a,h)anthracene	34	2	0.0109	0.37(UJ)	n/a	0.028	Maximum detected concentration
Fluoranthene	34	14	0.011	0.468	Gamma	0.0928	95% KM (t)
Fluorene	34	2	0.0346(U)	0.37(U)	n/a	0.0484	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	34	9	0.0104	0.37(UJ)	Gamma	0.033	95% KM (t)
Methylene chloride	34	1	0.00246	0.0064(U)	n/a	0.00246	Maximum detected concentration
Methylnaphthalene[2-]	34	2	0.00839	0.37(U)	n/a	0.0138	Maximum detected concentration
Naphthalene	34	2	0.015	0.37(U)	n/a	0.0291	Maximum detected concentration
Phenanthrene	34	10	0.0144	0.37(U)	Gamma	0.06	95% KM (t)
Pyrene	34	13	0.0127	0.424	Gamma	0.0879	95% KM (t)
TPH-DRO	34	10	2.92(U)	148(U)	Approximate Gamma	10.8	95% KM (t)
Radionuclides (pCi/g)							
Tritium	34	10	-0.0029(U)	1.364	Gamma	0.179	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-68
EPCs for AOC C-03-022 for Ecological Risk and for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	8	0	1.03(U)	1.12(U)	n/a*	1.12(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
TPH-DRO	3	3	9.54	27900	n/a	27900	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-69
EPCs for SWMU 60-002 (West) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	12	12	8770	19800	Lognormal	14192	95% Student's t
Antimony	12	0	1.03(U)	1.16(U)	n/a*	1.16(U)	Maximum detection limit
Barium	12	12	65.5	331	Gamma	182.8	95% Approximate Gamma
Chromium	12	12	6.08	14.6	Normal	11.3	95% Student's t
Cobalt	12	12	1.57	7.24	Normal	5.37	95% Student's t
Copper	12	12	3.87	12.3	Normal	8.29	95% Student's t
Lead	12	12	9.24	69.3	Nonparametric	38.5	95% Chebyshev (Mean, Sd)
Nickel	12	12	6.78	10.3	Normal	9.09	95% Student's t
Selenium	12	0	1.05(UJ)	1.13(UJ)	n/a	1.13(UJ)	Maximum detection limit
Vanadium	12	12	12.6	31.6	Normal	26.9	95% Student's t

Table I-2.3-69 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acetone	12	1	0.00209(U)	0.48(U)	n/a	0.0189	Maximum detected concentration
Anthracene	12	1	0.0354(U)	0.0541	n/a	0.0541	Maximum detected concentration
Benzo(a)anthracene	12	1	0.0354(U)	0.154	n/a	0.154	Maximum detected concentration
Benzo(a)pyrene	12	1	0.0354(U)	0.119	n/a	0.119	Maximum detected concentration
Benzo(b)fluoranthene	12	1	0.0354(U)	0.139	n/a	0.139	Maximum detected concentration
Benzo(g,h,i)perylene	12	1	0.0354(U)	0.0715	n/a	0.0715	Maximum detected concentration
Chrysene	12	1	0.0354(U)	0.132	n/a	0.132	Maximum detected concentration
Fluoranthene	12	2	0.0197	0.297	n/a	0.297	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	12	1	0.0354(U)	0.221	n/a	0.221	Maximum detected concentration
Phenanthrene	12	2	0.0132	0.22	n/a	0.22	Maximum detected concentration
Pyrene	12	2	0.0163	0.297	n/a	0.297	Maximum detected concentration
TPH-DRO	12	5	2.93	90.5	Gamma	25.9	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-70
EPCs for SWMU 60-002 (Central) for Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Selenium	3	0	0.175(U)	0.19(U)	n/a	0.19(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Acenaphthene	3	2	0.0198	0.0396(U)	n/a	0.0244	Maximum detected concentration
Aroclor-1254	3	1	0.0112(U)	0.0202	n/a	0.0202	Maximum detected concentration
Aroclor-1260	3	1	0.0112(U)	0.0162	n/a	0.0162	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-71
EPCs for SWMU 60-002 (Central) for Ecological Risk and for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Selenium	5	1	0.175(U)	0.346	n/a*	0.346	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	5	2	0.0198	0.0396(U)	n/a	0.0244	Maximum detected concentration
Aroclor-1254	5	2	0.0025	0.0202	n/a	0.0202	Maximum detected concentration
Aroclor-1260	5	2	0.0042	0.0162	n/a	0.0162	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-72
EPCs for SWMU 60-002 (East) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	5	5	52.5	310	n/a*	310	Maximum detected concentration
Cobalt	5	5	2.88	10	n/a	10	Maximum detected concentration
Nickel	5	5	7.73	17.1	n/a	17.1	Maximum detected concentration
Selenium	5	1	0.533(U)	0.579	n/a	0.579	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	5	1	0.0055(UJ)	0.0062	n/a	0.0062	Maximum detected concentration
Fluoranthene	5	1	0.0357	0.0396(U)	n/a	0.0357	Maximum detected concentration
Fluorene	5	1	0.0056	0.0396(U)	n/a	0.0056	Maximum detected concentration
Pyrene	5	1	0.036(U)	0.0443	n/a	0.0443	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-73
EPCs for SWMU 60-002 (East) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	7	7	2530	27840	n/a*	27840	Maximum detected concentration
Barium	7	7	25	375	n/a	375	Maximum detected concentration
Cobalt	7	7	0.632	10	n/a	10	Maximum detected concentration
Nickel	7	7	3.36	17.1	n/a	17.1	Maximum detected concentration
Selenium	7	1	0.533(U)	0.579	n/a	0.579	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	7	2	0.0044	0.0062	n/a	0.0062	Maximum detected concentration
Fluoranthene	7	1	0.0357	0.0396(U)	n/a	0.0357	Maximum detected concentration
Fluorene	7	1	0.0056	0.0396(U)	n/a	0.0056	Maximum detected concentration
Pyrene	7	1	0.036(U)	0.0443	n/a	0.0443	Maximum detected concentration
TPH-DRO	7	7	1.1	12.9	n/a	12.9	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-74
EPCs for AOC 60-004(f) for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	15	0	0.423(U)	1.21(UJ)	n/a*	1.21(UJ)	Maximum detection limit
Barium	15	15	78.4	221	Normal	172.4	95% Student's t
Chromium	15	15	7.39	38.2	Gamma	20.3	95% Approximate Gamma
Cobalt	15	15	1.5	9.79	Normal	6.63	95% Student's t
Copper	15	15	2.93	65.3	Nonparametric	28.8	95% Chebyshev (Mean, Sd)
Lead	15	15	6.16	61.1	Gamma	23.7	95% Approximate Gamma
Mercury	15	5	0.00759(U)	0.583	Gamma	0.127	95% KM (t)
Nickel	15	15	5.29	12.2	Normal	9.23	95% Student's t
Selenium	15	0	1.07(U)	1.2(UJ)	n/a	1.2(UJ)	Maximum detection limit
Silver	15	12	0.348	1.21	Gamma	0.675	95% KM (BCA)
Vanadium	15	15	8.58	30.9	Normal	26.1	95% Student's t
Zinc	15	15	29.4	183	Gamma	78	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	15	1	0.0368(U)	0.217	n/a	0.217	Maximum detected concentration
Acetone	15	3	0.00203(U)	0.00714(U)	n/a	0.00703	Maximum detected concentration
Anthracene	15	1	0.0368(U)	0.69	n/a	0.69	Maximum detected concentration
Aroclor-1254	15	3	0.0021	0.116	n/a	0.116	Maximum detected concentration
Aroclor-1260	15	4	0.0028	0.153	n/a	0.153	Maximum detected concentration
Benzene	15	1	0.000707	0.00124(U)	n/a	0.000707	Maximum detected concentration
Benzo(a)anthracene	15	1	0.0368(U)	2.33	n/a	2.33	Maximum detected concentration
Benzo(a)pyrene	15	1	0.0368(U)	2.18	n/a	2.18	Maximum detected concentration
Benzo(b)fluoranthene	15	1	0.0368(U)	3.06	n/a	3.06	Maximum detected concentration
Benzo(g,h,i)perylene	15	1	0.0368(U)	0.973	n/a	0.973	Maximum detected concentration
Benzo(k)fluoranthene	15	1	0.0368(U)	0.975	n/a	0.975	Maximum detected concentration

Table I-2.3-74 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Bis(2-ethylhexyl)phthalate	15	1	0.091	0.413(U)	n/a	0.091	Maximum detected concentration
Chrysene	15	1	0.0368(U)	2.29	n/a	2.29	Maximum detected concentration
Dibenz(a,h)anthracene	15	1	0.0368(U)	0.401	n/a	0.401	Maximum detected concentration
Dibenzofuran	15	1	0.15	0.413(U)	n/a	0.15	Maximum detected concentration
Di-n-butylphthalate	15	1	0.118	0.413(U)	n/a	0.118	Maximum detected concentration
Fluoranthene	15	1	0.0368(U)	3.99	n/a	3.99	Maximum detected concentration
Fluorene	15	1	0.0368(U)	0.252	n/a	0.252	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	15	1	0.0368(UJ)	1.05	n/a	1.05	Maximum detected concentration
Methylene chloride	15	5	0.00255	0.00621(U)	Normal	0.00283	95% KM (t)
Methylnaphthalene[2-]	15	3	0.0104	0.0403(U)	n/a	0.0372	Maximum detected concentration
Naphthalene	15	1	0.0368(U)	0.106	n/a	0.106	Maximum detected concentration
Phenanthrene	15	1	0.0368(U)	2.35	n/a	2.35	Maximum detected concentration
Pyrene	15	1	0.0368(U)	2.99	n/a	2.99	Maximum detected concentration
Toluene	15	1	0.000767	0.00124(U)	n/a	0.000767	Maximum detected concentration
Trichloroethene	15	1	0.000446	0.00124(U)	n/a	0.000446	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	15	10	-0.00373(U)	0.3011	Normal	0.158	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-75
EPCs for AOC 60-004(f) for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	20	20	3990	13500	Normal	10452	95% Student's t
Antimony	20	0	0.423(U)	1.21(UJ)	n/a*	1.21(UJ)	Maximum detection limit
Barium	20	20	24.5	221	Normal	149.8	95% Student's t
Chromium	20	19	3.64	38.2	Gamma	17.6	95% KM (BCA)
Cobalt	20	20	0.525	9.79	Nonparametric	7.24	95% Chebyshev (Mean, Sd)
Copper	20	20	2.56	65.3	Nonparametric	22.8	95% Chebyshev (Mean, Sd)
Lead	20	20	4.5	61.1	Gamma	20.1	95% Approximate Gamma
Mercury	20	6	0.00494(U)	0.583	Gamma	0.0937	95% KM (t)
Nickel	20	20	4.66	12.2	Normal	8.58	95% Student's t
Selenium	20	0	1.07(U)	1.2(UJ)	n/a	1.2(UJ)	Maximum detection limit
Silver	20	16	0.322	1.21	Gamma	0.614	95% KM (BCA)
Vanadium	20	20	5.71	30.9	Nonparametric	28	95% Chebyshev (Mean, Sd)
Zinc	20	20	20.7	183	Gamma	67.5	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	20	1	0.0368(U)	0.217	n/a	0.217	Maximum detected concentration
Acetone	20	5	0.00203(U)	0.00714(U)	Normal	0.00488	95% KM (t)
Anthracene	20	1	0.0368(U)	0.69	n/a	0.69	Maximum detected concentration
Aroclor-1254	20	3	0.0021	0.116	n/a	0.116	Maximum detected concentration
Aroclor-1260	20	4	0.0028	0.153	n/a	0.153	Maximum detected concentration
Benzene	20	1	0.000707	0.00124(U)	n/a	0.000707	Maximum detected concentration
Benzo(a)anthracene	20	1	0.0368(U)	2.33	n/a	2.33	Maximum detected concentration
Benzo(a)pyrene	20	1	0.0368(U)	2.18	n/a	2.18	Maximum detected concentration
Benzo(b)fluoranthene	20	1	0.0368(U)	3.06	n/a	3.06	Maximum detected concentration
Benzo(g,h,i)perylene	20	1	0.0368(U)	0.973	n/a	0.973	Maximum detected concentration
Benzo(k)fluoranthene	20	1	0.0368(U)	0.975	n/a	0.975	Maximum detected concentration

Table I-2.3-75 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Bis(2-ethylhexyl)phthalate	20	2	0.091	0.413(U)	n/a	0.0949	Maximum detected concentration
Chrysene	20	1	0.0368(U)	2.29	n/a	2.29	Maximum detected concentration
Dibenz(a,h)anthracene	20	1	0.0368(U)	0.401	n/a	0.401	Maximum detected concentration
Dibenzofuran	20	1	0.15	0.413(U)	n/a	0.15	Maximum detected concentration
Dichloroethene[cis-1,2-]	20	1	0.000926	0.00124(U)	n/a	0.000926	Maximum detected concentration
Di-n-butyl phthalate	20	1	0.118	0.413(U)	n/a	0.118	Maximum detected concentration
Fluoranthene	20	1	0.0368(U)	3.99	n/a	3.99	Maximum detected concentration
Fluorene	20	1	0.0368(U)	0.252	n/a	0.252	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	20	1	0.0368(UJ)	1.05	n/a	1.05	Maximum detected concentration
Methylene chloride	20	7	0.00234	0.00621(U)	Normal	0.00283	95% KM (t)
Methylnaphthalene[2-]	20	3	0.0104	0.0403(U)	n/a	0.0372	Maximum detected concentration
Naphthalene	20	1	0.0368(U)	0.106	n/a	0.106	Maximum detected concentration
Phenanthrene	20	1	0.0368(U)	2.35	n/a	2.35	Maximum detected concentration
Pyrene	20	1	0.0368(U)	2.99	n/a	2.99	Maximum detected concentration
Toluene	20	1	0.000767	0.00124(U)	n/a	0.000767	Maximum detected concentration
TPH-DRO	20	11	2.82	20.1	Lognormal	7.17	95% KM (t)
Trichloroethene	20	1	0.000446	0.00124(U)	n/a	0.000446	Maximum detected concentration
Trimethylbenzene[1,2,4-]	20	3	0.000662	0.00124(U)	n/a	0.00102	Maximum detected concentration
Trimethylbenzene[1,3,5-]	20	2	0.000396	0.00124(U)	n/a	0.000621	Maximum detected concentration
Xylene[1,3-]+1,4-Xylene	20	1	0.000565	0.00248(U)	n/a	0.000565	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	20	14	-0.00373(U)	0.3011	Normal	0.148	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-76
EPCs for SWMU 60-007(a) for Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	12	4	0.19(UJ)	1.02	n/a*	1.02	Maximum detected concentration
Organic Chemicals (mg/kg)							
Toluene	9	1	0.001	0.012(U)	n/a	0.001	Maximum detected concentration
TPH-DRO	10	6	3.99	1100	Nonparametric	652.2	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-77
EPCs for SWMU 60-007(a) for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	20	11	0.19(UJ)	1.9	Gamma	1.26	95% KM (t)
Organic Chemicals (mg/kg)							
Toluene	17	1	0.001	0.012(U)	n/a*	0.001	Maximum detected concentration
TPH-DRO	18	13	2.58	1100	Nonparametric	360.7	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-78
EPCs for SWMU 60-007(b) for Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	12	12	912	8590	Gamma	5812	95% Approximate Gamma
Antimony	12	0	1.08(U)	1.21(U)	n/a*	1.21(U)	Maximum detection limit
Barium	12	12	12.1	125	Gamma	72.3	95% Approximate Gamma
Chromium	12	12	2.28	10.8	Normal	7.42	95% Student's t
Selenium	12	0	1.06(U)	1.18(UJ)	n/a	1.18(UJ)	Maximum detection limit
Zinc	12	12	28.7	130	Normal	78.8	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	12	1	0.0319	0.158(U)	n/a	0.0319	Maximum detected concentration
Acetone	12	2	0.0053(UJ)	0.00966	n/a	0.00966	Maximum detected concentration
Anthracene	12	3	0.0162	0.153(U)	n/a	0.0707	Maximum detected concentration
Aroclor-1254	12	1	0.0033	0.0397(U)	n/a	0.0033	Maximum detected concentration
Aroclor-1260	12	2	0.0029	0.0397(U)	n/a	0.0038	Maximum detected concentration
Benzo(a)anthracene	12	5	0.021	0.247	Normal	0.11	95% KM (t)
Benzo(a)pyrene	12	5	0.0221	0.216	Normal	0.0996	95% KM (t)
Benzo(b)fluoranthene	12	6	0.0214	0.352	Normal	0.153	95% KM (t)
Benzo(g,h,i)perylene	12	4	0.0341	0.153(U)	n/a	0.096	Maximum detected concentration
Benzo(k)fluoranthene	12	4	0.0116	0.153(U)	n/a	0.131	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	12	3	0.0812	1.53 (U)	n/a	0.389	Maximum detected concentration
Chloromethane	12	1	0.00104(U)	0.0418	n/a	0.0418	Maximum detected concentration
Chrysene	12	5	0.0287	0.258	Normal	0.124	95% KM (t)
Fluoranthene	12	6	0.0188	0.537	Normal	0.236	95% KM (t)
Fluorene	12	1	0.0315	0.158(U)	n/a	0.0315	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	12	4	0.0269	0.254	n/a	0.254	Maximum detected concentration

Table I-2.3-78 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Isopropyltoluene[4-]	12	1	0.000537	0.00116(U)	n/a	0.000537	Maximum detected concentration
Phenanthrene	12	5	0.0118	0.393	Normal	0.167	95% KM (t)
Pyrene	12	6	0.0228	0.591	Normal	0.239	95% KM (t)
Toluene	12	1	0.00103	0.00116(U)	n/a	0.00103	Maximum detected concentration
TPH-DRO	12	11	3.79	136	Normal	71	95% KM (t)
Trimethylbenzene[1,2,4-]	12	1	0.000413	0.00119(U)	n/a	0.000413	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-79
EPCs for SWMU 60-007(b) for for Ecological Risk and/or for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	20	20	438	8960	Gamma	5671	95% Approximate Gamma
Antimony	20	0	1.03(U)	1.21(U)	n/a	1.21(U)	Maximum detection limit
Barium	20	20	9.2	125	Gamma	66.4	95% Approximate Gamma
Chromium	20	20	2.26	23.5	Gamma	8.62	95% Approximate Gamma
Selenium	20	0	1.02(U)	1.18(UJ)	n/a*	1.18(UJ)	Maximum detection limit
Zinc	20	20	24.7	130	Gamma	64	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	20	2	0.0319	0.158(U)	n/a	0.0394	Maximum detected concentration
Acetone	20	2	0.00194(U)	0.00966	n/a	0.00966	Maximum detected concentration
Anthracene	20	5	0.0162	0.153(U)	Normal	0.034	95% KM (t)
Aroclor-1254	20	1	0.0033	0.0397(U)	n/a	0.0033	Maximum detected concentration
Aroclor-1260	20	2	0.0029	0.0397(U)	n/a	0.0038	Maximum detected concentration
Benzo(a)anthracene	20	8	0.0187	0.247	Normal	0.0846	95% KM (t)

Table I-2.3-79 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(a)pyrene	20	8	0.0126	0.216	Normal	0.0769	95% KM (t)
Benzo(b)fluoranthene	20	9	0.0198	0.352	Normal	0.115	95% KM (t)
Benzo(g,h,i)perylene	20	6	0.0286	0.153(U)	Normal	0.0503	95% KM (t)
Benzo(k)fluoranthene	20	6	0.0116	0.153(U)	Normal	0.0557	95% KM (t)
Bis(2-ethylhexyl)phthalate	20	4	0.0812	1.53(U)	n/a	0.389	Maximum detected concentration
Chloromethane	20	1	0.001(UJ)	0.0418	n/a	0.0418	Maximum detected concentration
Chrysene	20	8	0.0128	0.258	Normal	0.0923	95% KM (t)
Fluoranthene	20	9	0.0188	0.537	Gamma	0.181	95% KM (t)
Fluorene	20	3	0.0122	0.158 (U)	n/a	0.0426	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	20	7	0.0269	0.254	Gamma	0.0723	95% KM (t)
Isopropyltoluene[4-]	20	1	0.000537	0.00116(U)	n/a	0.000537	Maximum detected concentration
Phenanthrene	20	7	0.0118	0.393	Normal	0.138	95% KM (t)
Pyrene	20	9	0.0228	0.591	Normal	0.185	95% KM (t)
Toluene	20	2	0.000425	0.00116(U)	n/a	0.00103	Maximum detected concentration
TPH-DRO	20	16	3.19	136	Normal	48.9	95% KM (t)
Trimethylbenzene[1,2,4-]	20	1	0.000413	0.00119(U)	n/a	0.000413	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-80
EPCs for AOC C-61-002 for Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	5	3	0.737	1.15(U)	n/a	1.14	Maximum detected concentration
Arsenic	5	5	2.37	5.2	n/a	5.2	Maximum detected concentration
Beryllium	5	5	0.853	2.06	n/a	2.06	Maximum detected concentration
Chromium	5	5	12.2	13.3	n/a	13.3	Maximum detected concentration
Copper	5	5	8.32	11.5	n/a	11.5	Maximum detected concentration
Lead	5	5	15.9	27.6	n/a	27.6	Maximum detected concentration
Mercury	5	5	0.00776	0.061	n/a	0.061	Maximum detected concentration
Nickel	5	5	9.04	16	n/a	16	Maximum detected concentration
Selenium	5	0	1.08(U)	2.56(UJ)	n/a	2.56(UJ)	Maximum detection limit
Vanadium	5	5	22.3	31.1	n/a	31.1	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	5	2	0.00229	0.00651(UJ)	n/a	0.00528	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-81
EPCs for AOC C-61-002 for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	20	20	1020	27700	Normal	16264	95% Student's t
Antimony	20	6	0.737	1.75	Normal	1.1	95% KM (t)
Arsenic	20	20	0.828	6.03	Gamma	3.14	95% Approximate Gamma
Beryllium	20	20	0.233	2.22	Normal	1.47	95% Student's t
Chromium	20	20	2.17	13.5	Gamma	9.48	95% Approximate Gamma
Copper	20	20	0.645	14	Normal	7.89	95% Student's t
Iron	20	20	6340	25600	Normal	14884	95% Student's t
Lead	20	20	5.24	27.6	Lognormal	19.8	95% Chebyshev
Mercury	20	20	0.00611	0.123	Nonparametric	0.0656	95% Chebyshev (Mean, Sd)
Nickel	20	20	1.79	19.8	Normal	12.1	95% Student's t
Selenium	20	0	1.06(U)	2.56(UJ)	n/a	2.56(UJ)	Maximum detection limit
Vanadium	20	20	4.48	31.1	Gamma	19.4	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acetone	20	3	0.00229	0.00651(UJ)	n/a	0.006	Maximum detected concentration
Benzoic acid	20	1	0.445	0.89(U)	n/a	0.445	Maximum detected concentration
TPH-DRO	20	9	2.72	1450	Nonparametric	401.8	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-82
EPCs for SWMU 61-002 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	20	3	0.16	0.60(U)	n/a*	0.53	Maximum detected concentration
Lead	20	20	3.8	42.6	Gamma	17	95% Approximate Gamma
Mercury	20	7	0.016	0.11	Gamma	0.0425	95% KM (t)
Selenium	20	12	0.11	0.96(U)	Normal	0.49	95% KM (t)
Zinc	20	20	14	555	Nonparametric	176.9	95% KM (Chebyshev)
Organic Chemicals (mg/kg)							
Acetone	20	17	0.0057	4.5	Lognormal	1.3	95% KM (Chebyshev)
Aroclor-1254	20	3	0.035(U)	0.47	n/a	0.47	Maximum detected concentration
Aroclor-1260	20	8	0.029	0.27	Gamma	0.0822	95& KM (t)
Benzene	20	4	0.00028	0.0064	n/a	0.012	Maximum detected concentration
Benzo(a)anthracene	20	2	0.1	3.5(UJ)	n/a	0.18	Maximum detected concentration
Benzo(a)pyrene	20	2	0.096	3.5(U)	n/a	0.16	Maximum detected concentration
Benzo(b)fluoranthene	20	2	0.082	3.5(U)	n/a	0.13	Maximum detected concentration
Benzo(k)fluoranthene	20	2	0.11	3.5(U)	n/a	0.17	Maximum detected concentration
Benzoic acid	20	2	0.15	17(U)	n/a	0.28	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	20	1	0.34	3.5(UJ)	n/a	0.34	Maximum detected concentration
Butanone[2-]	20	5	0.0015	0.17	Gamma	0.0309	95& KM (t)
Butylbenzylphthalate	20	3	0.17	3.5(UJ)	n/a	0.66	Maximum detected concentration
Chlorobenzene	20	1	0.0051(U)	0.01	n/a	0.01	Maximum detected concentration
Chrysene	20	2	0.11	3.5(UJ)	n/a	0.18	Maximum detected concentration
Dichlorobenzene[1,2-]	20	1	0.00042(U)	0.007(U)	n/a	0.0057	Maximum detected concentration
Dichloroethene[cis/trans 1,2-]	20	1	0.0047	0.0064(U)	n/a	0.0047	Maximum detected concentration
Di-n-octylphthalate	20	1	0.075	3.5(U)	n/a	0.075	Maximum detected concentration
Fluoranthene	20	3	0.099	3.5(U)	n/a	0.43	Maximum detected concentration

Table I-2.3-82 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Indeno(1,2,3-cd)pyrene	20	1	0.11	3.88(U)	n/a	0.11	Maximum detected concentration
Phenanthrene	20	2	0.15	3.5(U)	n/a	0.36	Maximum detected concentration
Pyrene	20	3	0.12	3.5(U)	n/a	0.39	Maximum detected concentration
Toluene	20	7	0.00064(U)	0.0064(U)	Normal	0.0011	95& KM (t)

Note: Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-2.3-83
EPCs for SWMU 61-002 for the Ecological Risk

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	65	13	0.16	0.69(UJ)	Normal	0.284	95% KM (t)
Lead	65	65	3.4	51.9	Approximate Gamma	14.7	95% Approximate Gamma
Mercury	65	34	0.011	0.15	Gamma	0.0414	95% KM (t)
Selenium	65	30	0.11	1.7	Gamma	0.461	95% KM (t)
Zinc	65	63	2.4(U)	555	Nonparametric	79.4	95% KM (Chebyshev)
Organic Chemicals (mg/kg)							
Acenaphthene	65	1	0.16	3.5(U)	n/a*	0.16	Maximum detected concentration
Acetone	65	36	0.0039(U)	7(U)	Nonparametric	0.457	95% KM (Chebyshev)
Anthracene	65	1	0.3	3.5(U)	n/a	0.3	Maximum detected concentration
Aroclor-1254	65	13	0.035(U)	11	Lognormal	0.682	95% KM (BCA)
Aroclor-1260	65	19	0.029	1.3	Lognormal	0.121	95% KM (t)
Benzene	65	6	0.00028	1.8(U)	Gamma	0.00215	95% KM (t)
Benzo(a)anthracene	65	3	0.036(U)	3.5(UJ)	n/a*	0.59	Maximum detected concentration
Benzo(a)pyrene	65	3	0.096	3.5(U)	n/a	0.52	Maximum detected concentration

Table I-2.3-83 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(b)fluoranthene	65	3	0.082	3.5(U)	n/a	0.39	Maximum detected concentration
Benzo(g,h,i)perylene	65	1	0.34(U)	3.5(U)	n/a	0.34	Maximum detected concentration
Benzo(k)fluoranthene	65	3	0.11	3.5(U)	n/a	0.54	Maximum detected concentration
Benzoic acid	65	2	0.15	17(U)	n/a	0.28	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	65	2	0.34	3.5(UJ)	n/a	1.3	Maximum detected concentration
Butanone[2-]	65	7	0.0012	7(U)	Lognormal	0.0227	95% KM (Chebyshev)
Butylbenzylphthalate	65	3	0.17	3.5(UJ)	n/a	0.66	Maximum detected concentration
Chlorobenzene	65	6	0.0013	1.8(U)	Gamma	0.00789	95% KM (t)
Chrysene	65	3	0.11	3.5(UJ)	n/a	0.67	Maximum detected concentration
Dichlorobenzene[1,2-]	65	6	0.00033(U)	1.8(U)	Gamma	0.00539	95% KM (t)
Dichlorobenzene[1,4-]	65	1	0.00058(U)	1.8(U)	n/a	0.069	Maximum detected concentration
Dichloroethene[cis/trans 1,2-]	65	3	0.00081	1.8(U)	n/a	0.0047	Maximum detected concentration
Di-n-octylphthalate	65	1	0.075	3.5(U)	n/a	0.075	Maximum detected concentration
Fluoranthene	65	7	0.083	3.5(U)	Approximate Gamma	0.227	95% KM (t)
Fluorene	65	1	0.16	3.5(U)	n/a	0.16	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	65	2	0.11	3.88(U)	n/a	0.37	Maximum detected concentration
Methylnaphthalene[2-]	65	1	0.34(U)	3.5(U)	n/a	2	Maximum detected concentration
Naphthalene	65	1	0.34(U)	3.5(U)	n/a	1.5	Maximum detected concentration
Phenanthrene	65	4	0.13	3.5(U)	n/a	1.4	Maximum detected concentration
Pyrene	65	7	0.092	3.5(U)	Gamma	0.215	95% KM (t)
Stryene	65	2	0.00041(U)	0.13	n/a	0.13	Maximum detected concentration
Tetrachloroethene	65	2	0.00082	1.8(U)	n/a	0.001	Maximum detected concentration
Toluene	65	17	0.00064(U)	1.7	Nonparametric	0.144	95% KM (Chebyshev)
Xylene(Total)	65	2	0.0051(U)	11	n/a	11	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-2.3-84
EPCs for SWMU 61-002 for the Construction Worker and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	78	16	0.16	0.69(UJ)	Lognormal	0.256	95% KM (t)
Lead	78	78	3.4	51.9	Approximate Gamma	13.7	95% Approximate Gamma
Mercury	78	45	0.0063	2.2	Nonparametric	0.108	95% KM (t)
Selenium	78	31	0.11	7.39	Nonparametric	0.602	95% KM (t)
Zinc	78	76	2.4(U)	555	Nonparametric	52.6	95% KM (BCA)
Organic Chemicals (mg/kg)							
Acenaphthene	78	1	0.036(U)	3.5(U)	n/a*	0.16	Maximum detected concentration
Acetone	78	37	0.0039(U)	7(U)	Nonparametric	0.263	95% KM (BCA)
Anthracene	78	1	0.036(U)	3.5(U)	n/a	0.3	Maximum detected concentration
Aroclor-1254	78	13	0.0036(U)	11	Lognormal	0.563	95% KM (BCA)
Aroclor-1260	78	20	0.0036(U)	1.3	Lognormal	0.106	95% KM (t)
Benzene	78	6	0.00028	1.8(U)	Gamma	0.00195	95% KM (t)
Benzo(a)anthracene	78	3	0.036(U)	3.5(UJ)	n/a	0.59	Maximum detected concentration
Benzo(a)pyrene	78	3	0.036(U)	3.5(U)	n/a	0.52	Maximum detected concentration
Benzo(b)fluoranthene	78	3	0.036(U)	3.5(U)	n/a	0.39	Maximum detected concentration
Benzo(g,h,i)perylene	78	1	0.036(U)	3.5(U)	n/a	0.34	Maximum detected concentration
Benzo(k)fluoranthene	78	3	0.036(U)	3.5(U)	n/a	0.54	Maximum detected concentration
Benzoic acid	78	2	0.15	17(U)	n/a	0.28	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	78	2	0.18(U)	3.5(UJ)	n/a	1.3	Maximum detected concentration
Butanone[2-]	78	7	0.0012	7(U)	Lognormal	0.0201	95% KM (Chebyshev)
Butylbenzene[n-]	78	1	0.00054	1.8(U)	n/a	0.00054	Maximum detected concentration
Butylbenzylphthalate	78	3	0.17	3.5(UJ)	n/a	0.66	Maximum detected concentration
Chlorobenzene	78	6	0.00108(U)	1.8(U)	Gamma	0.00691	95% KM (t)
Chloromethane	78	9	0.00108(U)	3.5(U)	Nonparametric	0.00376	95% KM (t)
Chrysene	78	3	0.036(U)	3.5(UJ)	n/a	0.67	Maximum detected concentration

Table I-2.3-84 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Dibromo-3-chloropropane[1,2-]	78	1	0.00108(U)	3.5(U)	n/a	0.0015	Maximum detected concentration
Dichlorobenzene[1,2-]	78	6	0.00033(U)	1.8(U)	Gamma	0.00471	95% KM (t)
Dichlorobenzene[1,4-]	78	1	0.00058(U)	1.8(U)	n/a	0.069	Maximum detected concentration
Dichloroethene[cis/trans 1,2-]	77	3	0.00081	1.8(U)	n/a	0.0047	Maximum detected concentration
Di-n-octylphthalate	78	1	0.075	3.5(U)	n/a	0.075	Maximum detected concentration
Ethylbenzene	78	2	0.00108(U)	3	n/a	3	Maximum detected concentration
Fluoranthene	78	7	0.036(U)	3.5(U)	Approximate Gamma	0.204	95% KM (t)
Fluorene	78	1	0.036(U)	3.5(U)	n/a	0.16	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	78	2	0.036(U)	3.88(U)	n/a	0.37	Maximum detected concentration
Isopropylbenzene	78	2	0.00108(U)	1.6(U)	n/a	0.72	Maximum detected concentration
Isopropyltoluene[4-]	78	4	0.00047	1.8(U)	n/a	1.5	Maximum detected concentration
Methylnaphthalene[2-]	78	3	0.036(U)	10	n/a	10	Maximum detected concentration
Naphthalene	78	3	0.036(U)	5.8	n/a	5.8	Maximum detected concentration
Phenanthrene	78	4	0.036(U)	3.5(U)	n/a	1.4	Maximum detected concentration
Propylbenzene[1-]	78	2	0.00108(U)	3.5	n/a	3.5	Maximum detected concentration
Pyrene	78	7	0.036(U)	3.5(U)	Gamma	0.196	95% KM (t)
Stryene	78	2	0.00041(U)	1.5(U)	n/a	0.13	Maximum detected concentration
Tetrachloroethene	78	2	0.00082	1.8(U)	n/a	0.001	Maximum detected concentration
Toluene	78	19	0.00064(U)	2.5	Nonparametric	0.236	95% KM (Chebyshev)
TPH-DRO	5	4	3.43	220	n/a	220	Maximum detected concentration
Trimethylbenzene[1,2,4-]	78	5	0.00026(U)	42	Normal	2.4	95% KM (t)
Trimethylbenzene[1,3,5-]	78	4	0.00108(U)	11	n/a	11	Maximum detected concentration
Xylene (Total)	77	4	0.0051(U)	29	n/a	29	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-3.2-1
Physical and Chemical Properties of Inorganic COPCs for Upper Sandia 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	850	Insoluble
Cobalt	45	Insoluble
Copper	35	Insoluble
Cyanide (total)	9.9	na[c]
Hexavalent chromium	19	Insoluble
Iron	25	Insoluble
Lead	900	Insoluble
Manganese	65	Insoluble
Mercury	52	Insoluble
Nickel	65	Insoluble
Nitrate	0.0356	Soluble
Perchlorate	na	245
Selenium	5	Insoluble
Silver	8.3	Insoluble
Thallium	71	Insoluble
Vanadium	1000	Insoluble
Zinc	62	Insoluble

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad.

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] na = Not available.

Table I-3.2-2
Physical and Chemical Properties of Organic COPCs for Upper Sandia 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)
Acenaphthene	3.60E+00[b]	6.12E+03	3.92E+00[b]	2.50E-03[b]
Acenaphthylene	1.61E+01	5.03E+03	3.94E+00	6.68E-03
Acetone	1.00E+06[b]	1.98E+00	-2.40E-01[b]	2.31E+02[b]
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-1248	5.32E-02	4.39E+04	6.34E+00	4.94E-04
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]
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]
Benzene	1.79E+03	1.66E+02	2.13E+00	1.79E+03
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]
Butanone[2-]	2.23E+05	3.83E+00	2.90E-01	9.06E+01
Butylbenzene[n-]	1.18E+01	1.76E+03	4.38E+00	1.06E+00
Butylbenzene[sec]	1.76E+01	1.58E+03	4.57E+00	1.75E+00
Butylbenzene[tert-]	2.95E+01	1.18E+03	4.11E+00	2.20E+00
Butylbenzylphthalate	2.69E+00	9.36E+03	4.73E+00	8.25E-06
Carbazole	1.80E+00	1.13E+04	3.72E+00	7.50E-07
Carbon disulfide	1.18E+03	1.00E+00	1.94E+00	3.59E+02
Chlordane[gamma-]	5.60E-02	6.75E+04	6.22 E+00	9.98E-06
Chlorobenzene	4.98E+02	2.34E+02	2.84E+00	1.20E+01
Chloroethane	6.71E+03	2.17E+01	1.43E+00	1.01E+03
Chloromethane	5.32E+03	1.43E+01	9.10E-01	4.30E+03
Chrysene	6.30E-03[b]	2.36E+05	5.81E+00[b]	6.23E-09[b]
Dibenz[a,h]anthracene	1.03E-03	2.62E+06	6.54E+00	1.39E-11
Dibenzofuran	3.10E+00	1.13E+04	4.12E+00	2.48E-03
Dibromo-3-chloropropane[1,2-]	1.23E+03	1.16E+02	2.96E+00	5.80E-01
Dibromoethane[1,2-]	3.91E+03	3.96E+01	1.96E+00	1.12E+01
DDT[4,4'-]	5.50E-03	1.69E+05	6.91E+00	1.60E-07
Dichlorobenzene[1,2-]	1.56E+02	3.83E+02	3.43E+00	1.47E+00
Dichlorobenzene[1,4-]	8.13E+01	3.75E+02	3.44E+00	1.74E+00
Dichloroethene[cis-1,2-]	6.41E+03	3.96E+01	1.86E+00	2.01E+02
Dichloroethene[mixed isomers1,2-]	3.50E+03	3.90E+01	2.09E+00	2.01E+02
Diethylphthalate	1.08E+03	1.05E+02	2.42E+00	2.10E-03
Di-n-butyl phthalate	1.46E+03	4.50E+00	4.70E+00[b]	2.01E-05
Di-n-octyl phthalate	2.20E-02	1.45E+05	8.10E+00	1.00E-07
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]
Fluorene	1.89E+00[b]	1.13E+04	4.18E+00[b]	8.42E-04[b]

Table I-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)
Hexanone[2-]	1.75E+04	1.30E+01	1.38E+00	1.16E+01
Indeno(1,2,3-cd)pyrene	1.90E-04	1.95E+06	6.70E+00	1.25E-12
Isopropylbenzene	6.13E+01	6.98E+02	3.66E+00	4.50E+00
Isopropyltoluene[4-]	2.34E+01[b]	na[d]	4.10E+00[b]	1.64E+00[b]
MCPA	6.30E+02	2.96E+01	3.25E+00	5.90E-06
MCPP	6.20E+02	4.85E+01	3.13E+00	3.00E-06
Methyl-2-pentanone[4-]	1.90E+04[b]	1.09E+01	1.31E+00[b]	1.99E+01[b]
Methylene chloride	1.30E+04[b]	2.37E+01	1.30E+00[b]	4.30E+02[b]
Methylnaphthalene[2-]	2.46E+01	2.98E+03	3.86E+00	5.50E-02
Naphthalene	3.10E+01	1.84E+03	3.30E+00	8.50E-02
Phenanthrene	1.15E+00[b]	2.08E+04	4.46E+00[b]	1.12E-04[b]
Propylbenzene[1-]	5.22E+01	9.55E+02	3.69E+00	3.42E+00
Pyrene	1.35E-01[b]	6.94E+04	4.88E+00[b]	4.50E-06[b]
Styrene	3.10E+02	5.18E+02	2.95E+00	6.40E+00
TCDD[2,3,7,8-]	2.00E-04	1.46E+05	na	na
Tetrachloroethene	2.06E+02	9.49E+01	3.40E+00	1.85E+01
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
Xylene[1,2-] (o-xylene)	1.61E+02	4.34E+02	3.20E+00	8.29E+00
Xylenes	1.78E+02	3.83E+02	3.12E+00	7.99E+00

[a] Information from http://rais.ornl.gov/cgi-bin/tools/TOX_search, unless noted otherwise.

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] Information from NMED (2102, 219971).

[d] na = Not available.

Table I-3.2-3
Physical and Chemical Properties of Radionuclide COPCs

COPC	Soil-Water Partition Coefficient, K_d[a] (cm^3/g)	Water Solubility[b] (g/L)
Americium-241	680	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 I-3.3-1
Dioxin/Furan TEF Calculations for All Scenarios for SWMU 03-045(h)

Dioxin and Furan Congeners	EPC for CAMO-09-6010 (mg/kg)	EPC for CAMO-09-6011 (mg/kg)	TEF[a]	CAMO-09-6010 TEF EPC	CAMO-09-6011 TEF EPC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	8.45E-05	4.59E-06	0.01	4.59E-08	4.59E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6.73E-07	ND[b]	0.1	6.73E-08	—[c]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	2.60E-06	2.98E-07	0.1	2.60E-07	2.98E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.39E-06	ND	0.1	1.39E-07	—
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.36E-03	4.70E-05	0.0003	4.08E-07	1.41E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.07E-07	ND	1	4.07E-07	—
Tetrachlorodibenzodioxin[2,3,7,8-]	ND	ND	1	—	—
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	8.61E-06	1.52E-07	0.01	8.61E-08	1.52E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.03E-06	ND	0.01	1.03E-08	—
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1.31E-06	ND	0.1	1.31E-07	—
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.83E-07	ND	0.1	5.83E-08	—
Hexachlorodibenzofuran[1,2,3,7,8,9-]	3.61E-07	ND	0.1	3.61E-08	—
Hexachlorodibenzofuran[2,3,4,6,7,8-]	7.84E-07	ND	0.1	7.84E-08	—
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.57E-05	3.34E-07	0.0003	4.71E-09	1.00E-10
Pentachlorodibenzofuran[1,2,3,7,8-]	1.94E-07	ND	0.03	5.82E-09	—
Pentachlorodibenzofuran[2,3,4,7,8-]	4.95E-07	ND	0.3	1.49E-07	—
Tetrachlorodibenzofuran[2,3,7,8-]	5.88E-07	ND	0.1	5.88E-08	—
			2,3,7,8-TCDD Equivalent	**1.95E-06**	**9.14E-08**

[a] TEF values from http://www.who.int/foodsafety/chem/tef_update/en/index.html.

[b] Not detected.

[c] No value.

Table I-4.1-1
Exposure Parameter Values Used to Calculate Chemical SSLs for the Industrial, Construction Worker, and Residential Scenarios

Parameters	Residential Values	Industrial Values	Construction Worker 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	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]	n/a
Body weight–child	15 kg (0–6 yr of age)	n/a	n/a
Cancer slope factor–oral (chemical-specific)	(mg/kg-d)$^{-1}$	(mg/kg-d)$^{-1}$	(mg/kg-d)$^{-1}$
Inhalation unit risk (chemical-specific)	(µg/m^3)	(µg/m^3)	(µg/m^3)
Exposure frequency	350 d/yr	225 d/yr	250 d/yr
Exposure time	24 hr/d	8 hr/day	8 hr/d
Exposure duration–child	6 yr[b]	n/a	n/a
Age-adjusted ingestion factor for carcinogens	114 mg-yr/kg-d	n/a	n/a
Age-adjusted ingestion factor for mutagens	489.5 mg-yr/kg-d	n/a	n/a
Soil ingestion rate–child	200 mg/d	n/a	n/a
Particulate emission factor	6.61×10^9 m^3/kg	6.61×10^9 m^3/kg	2.1×10^6 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	2800 cm^2/d	n/a	n/a
Age-adjusted skin contact factor for carcinogens	361 mg-yr/kg-d	n/a	n/a
Age-adjusted skin contact factor for mutagens	1445 mg-yr/kg-d	n/a	n/a
Volatilization factor for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Body weight–adult	70 kg	70 kg	70 kg
Exposure duration[c]	30 yr[d]	25 yr	1 yr
Adherence factor–adult	0.07 mg/cm^2	0.2 mg/cm^2	0.3 mg/cm^2
Soil ingestion rate–adult	100 mg/d	100 mg/d	330 mg/d
Exposed surface area–adult	5700 cm^2/d	3300 cm^2/d	3300 cm^2/d

Note: Parameter values from NMED (2012, 219971).
[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 30 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (24 yr).
[d] The adult exposure duration for mutagens is subdivided into 6–16 yr and 16–30 yr.

Table I-4.1-2
Parameters 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)	1.5×10^{-7}[c]	1.5×10^{-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 × 10^9 m^3/kg) × 1000 g/kg, where 6.6 × 10^9 m^3/kg is the particulate emission factor (NMED 2012, 219971).

[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 2012, 219971; 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 2012, 219971).

Table I-4.1-3
Parameter Values Used to Calculate Radionuclide SALs for the Industrial and Construction Worker Scenarios

Parameters	Industrial, Adult	Construction Worker, Adult
Inhalation rate (m^3/yr)	7780[a]	7780[a]
Mass loading (g/m^3)	1.5×10^{-7}[b]	0.0004[c]
Outdoor time fraction	0.2053[d]	0.2282[e]
Indoor time fraction	0[f]	0
Soil ingestion (g/yr)	109.6[g]	362[h]

[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 × 10^9 m^3/kg) x 1000 g/kg, where 6.6 × 10^9 m^3/kg is the particulate emission factor (NMED 2012, 219971).

[c] Calculated as (1 / 2.1 × 10^6 m^3/kg) × 1000 g/kg, where 2.1 × 10^6 m^3/kg is the particulate emission factor (NMED 2012, 219971).

[d] 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 2012, 219971).

[e] Calculated as (8 h/d × 250 d/yr) / 8766 h/yr, where 8 h/d is an estimate of the average length of the work day and 250 d/yr is the exposure frequency (NMED 2012, 219971).

[f] The commercial/industrial worker is defined as someone who “spends most of the work day conducting maintenance or manual labor activities outdoors” (NMED 2012, 219971, p. 13).

[g] 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 2012, 219971).

[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 [0.33 g/d × 250 d/yr] / [indoor + outdoor time fractions], where 0.33 g/d is the site-related daily soil ingestion rate for a construction worker (NMED 2012, 219971).

Table I-4.2-1
Industrial Carcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Excess Cancer Risk
Benzo(a)anthracene	0.0199	23.4	8.49E-09
Benzo(a)pyrene	0.0153	2.34	6.53E-08
Benzo(b)fluoranthene	0.0152	23.4	6.48E-09
Chlordane	0.000983	71.9	1.37E-10
Chrysene	0.0121	2340	5.16E-11
DDT[4,4'-]	0.00308	78.1	3.95E-10
		Total Excess Cancer Risk	**8E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-2
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	0.483	454	1.06E-03
Lead	19.2	800	2.40E-02
Fluoranthene	0.0266	24400	1.09E-06
Phenanthrene	0.0264	20500	1.29E-06
Pyrene	0.0298	18300	1.63E-06
		HI	**0.03**

* SSLs from NMED (2012, 219971).

Table I-4.2-3
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Excess Cancer Risk
Benzo(a)anthracene	0.0199	213	9.35E-10
Benzo(a)pyrene	0.0153	21.3	7.19E-09
Benzo(b)fluoranthene	0.0152	213	7.14E-10
Chrysene	0.0121	20600	5.87E-12
		Total Excess Cancer Risk	**9E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-4
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	0.483	124	3.90E-03
Lead	22.7	800	2.84E-02
Chlordane[gamma-]	0.000983	135	7.26E-06
DDT[4,4'-]	0.00308	142	2.17E-05
Fluoranthene	0.0266	8910	2.98E-06
Phenanthrene	0.0264	7150	3.69E-06
Pyrene	0.0298	6680	4.46E-06
		HI	**0.03**

* SSLs from NMED (2012, 219971).

Table I-4.2-5
Residential Carcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Excess Cancer Risk
Benzo(a)anthracene	0.0199	1.48	1.35E-07
Benzo(a)pyrene	0.0153	0.148	1.04E-06
Benzo(b)fluoranthene	0.0152	1.48	1.03E-07
Chlordane[gamma-]	0.000983	16.2	6.05E-10
Chrysene	0.0121	148	8.20E-10
DDT[4,4'-]	0.00308	17.2	1.79E-09
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-6
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-002(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.483	31.3	1.54E-02
Lead	22.7	400	5.68E-02
Fluoranthene	0.0266	2290	1.16E-05
Phenanthrene	0.0264	1830	1.44E-05
Pyrene	0.0298	1720	1.73E-05
		HI	**0.07**

* SSLs from NMED (2012, 219971).

Table I-4.2-7
Industrial Carcinogenic
Screening Evaluation for AOC 03-003(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.19	8.26	2.30E-07
Aroclor-1260	0.489	8.26	5.92E-07
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-8
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-003(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.555	75.8	7.32E-08
		Total Excess Cancer Risk	**7E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-9
Construction Worker Noncarcinogenic
Screening Evaluation for AOC 03-003(d)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Aroclor-1254	0.19	4.36	4.36E-02
		HI	**0.04**

* SSLs from NMED (2012, 219971).

Table I-4.2-10
Residential Carcinogenic
Screening Evaluation for AOC 03-003(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.555	2.22	2.50E-06
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-11
Residential Noncarcinogenic
Screening Evaluation for AOC 03-003(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aroclor-1254	0.19	1.12	1.69E-01
		HI	**0.2**

* SSLs from NMED (2012, 219971).

Table I-4.2-12
Industrial Carcinogenic
Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0069	8.26	8.35E-09
Benzo(a)anthracene	0.0557	23.4	2.38E-08
Benzo(a)pyrene	0.0511	2.34	2.18E-07
Benzo(b)fluoranthene	0.0854	23.4	3.65E-08
Chrysene	0.0505	2340	2.16E-10
Indeno(1,2,3-cd)pyrene	0.0249	23.4	1.06E-08
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-13
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.05(U)	454	2.31E-03
Chromium	15.4	1700000[b]	9.06E-06
Selenium	1.05(U)	5680	1.85E-04
Acenaphthene	0.0119	36700	3.24E-07
Anthracene	0.0219	183000	1.20E-07
Benzo(g,h,i)perylene	0.0299	18300[c]	1.63E-06
Fluoranthene	0.138	24400	5.66E-06
Fluorene	0.0117	24400	4.80E-07
Phenanthrene	0.0913	20500	4.45E-06
Pyrene	0.126	18300	6.89E-06
		HI	**0.003**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-14
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0382	75.8	5.04E-09
Benzo(a)anthracene	0.33	213	1.55E-08
Benzo(a)pyrene	0.387	21.3	1.82E-07
Benzo(b)fluoranthene	1.03	213	4.81E-08
Benzo(k)fluoranthene	0.0148	2060	7.18E-11
Chrysene	0.337	20600	1.64E-10
Ethylbenzene	0.000756	1830	4.13E-12
Indeno(1,2,3-cd)pyrene	0.408	213	1.92E-08
Total Excess Cancer Risk			**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-15
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.18	124	1.45E-03
Chromium	12.7	465000[b]	2.72E-05
Selenium	0.43	1550	2.77E-04
Acenaphthene	0.108	18600	5.81E-06
Anthracene	0.293	66800	4.39E-06
Aroclor-1254	0.0396	4.36	9.08E-03
Benzo(g,h,i)perylene	0.179	6680[c]	2.68E-05
Bis(2-ethylhexyl)phthalate	0.148	4760	3.11E-05
Butylbenzene[sec-]	0.000825	15500[d]	5.32E-08
Fluoranthene	1.17	8910	1.31E-04
Fluorene	0.0329	8910	3.69E-06
Isopropylbenzene	0.000412	2810	1.47E-07
Isopropyltoluene[4-]	0.00183	2810[e]	6.51E-07
Methylene chloride	0.023	1120	2.06E-05
Methylnaphthalene[2-]	0.915	1240[f]	7.38E-04
Naphthalene	0.24	158	1.52E-03
Phenanthrene	0.359	7150	5.02E-05
Propylbenzene[1-]	0.000744	15100[f]	4.93E-08

Table I-4.2-15 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Pyrene	1.18	6680	1.77E-04
Trimethylbenzene[1,2,4-]	0.00206	329[f]	6.26E-06
Trimethylbenzene[1,3,5-]	0.00111	3100[f]	3.58E-07
Xylene[1,2-]	0.00071	823	8.63E-07
Xylene[1,3-]+1,4-Xylene	0.000687	743[g]	9.25E-07
		HI	**0.01**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Butylbenzene[n-] SSL used as surrogate based on structural similarity and calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[g] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-16
Residential Carcinogenic
Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0382	2.22	1.72E-07
Benzo(a)anthracene	0.33	1.48	2.23E-06
Benzo(a)pyrene	0.387	0.148	2.61E-05
Benzo(b)fluoranthene	1.03	1.48	6.93E-06
Benzo(k)fluoranthene	0.0148	14.8	1.00E-08
Bis(2-ethylhexyl)phthalate	0.148	347	4.27E-09
Chrysene	0.337	148	2.28E-08
Ethylbenzene	0.000756	68.4	1.11E-10
Indeno(1,2,3-c,d)pyrene	0.408	1.48	2.76E-06
Naphthalene	0.24	43	5.58E-08
		Total Excess Cancer Risk	**4E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-17
Residential Noncarcinogenic Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.18	31.3	5.75E-03
Chromium	12.7	117000[b]	1.08E-04
Selenium	0.43	391	1.1E-03
Acenaphthene	0.108	3440	3.14E-05
Anthracene	0.293	17200	1.7E-05
Aroclor-1254	0.0396	1.12	3.54E-02
Benzo(g,h,i)perylene	0.179	1720[c]	1.04E-04
Butylbenzene[sec-]	0.000825	3930[d]	2.1E-07
Fluoranthene	1.17	2290	5.11E-04
Fluorene	0.0329	2290	1.44E-05
Isopropylbenzene	0.000412	2430	1.7E-07
Isopropyltoluene[4-]	0.00183	2430[e]	7.53E-07
Methylene chloride	0.023	409	5.62E-05
Methylnaphthalene[2-]	0.915	230[f]	3.98E-03
Phenanthrene	0.359	1830	1.96E-04
Propylbenzene[1-]	0.000744	3400[f]	2.19E-07
Pyrene	1.18	1720	6.89E-04
Trimethylbenzene[1,2,4-]	0.00206	62[f]	3.32E-05
Trimethylbenzene[1,3,5-]	0.00111	780[f]	1.42E-06
Xylene[1,2-]	0.00071	898	7.91E-07
Xylene[1,3-]+1,4-Xylene	0.000687	814[g]	8.44E-07
		HI	**0.05**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] Butylbenzene[n-] SSL used as surrogate based on structural similarity from EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[e] Isopropylbenzene SSL used as surrogate based on structural similarity.
[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[g] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-18
Industrial TPH Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	23.7	1800	**0.01**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-19
Construction Worker TPH Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	87.8	1800	**0.05**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-20
Residential TPH Screening Evaluation for SWMU 03-009(a)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	87.8	1000	**0.09**

* Screening guideline for residentail diesel No. 2 from NMED (2012, 219971).

Table I-4.2-21
Industrial Carcinogenic Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0297	8.26	3.59E-08
Aroclor-1260	0.0589	8.26	7.13E-08
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-22
Industrial Noncarcinogenic Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	2.44	454	5.37E-03
Barium	85.7	223000	3.84E-04
Chromium	7.23	1700000[b]	4.24E-06
Cobalt	3.26	300[c]	1.09E-02
Copper	7.07	45400	1.56E-04
Lead	10.8	800	1.35E-02
Nickel	6.37	22500	2.83E-04
Selenium	1.03(U)	5680	1.81E-04
Vanadium	16.7	5680	2.94E-03
Anthracene	0.0364	183000	1.99E-07
Fluoranthene	0.0526	24400	2.15E-06
Pyrene	0.0536	18300	2.92E-06
		HI	**0.03**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-23
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0589	75.8	7.77E-09
		Total Excess Cancer Risk	**8E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-24
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.26	124	1.02E-02
Barium	82.8	4350	1.90E-02
Chromium	8.08	465000[b]	1.74E-05
Cobalt	3.49	34.6[c]	1.01E-01
Copper	8.73	12400	7.05E-04
Cyanide	0.631	186	3.40E-03
Lead	11.2	800	1.40E-02
Nickel	5.84	6190	9.43E-04
Selenium	1.09(U)	1550	7.04E-04
Vanadium	15	1550	9.69E-03
Anthracene	0.0367	66800	5.49E-07
Aroclor-1254	0.0297	4.36	6.81E-03
Fluoranthene	0.0526	8910	5.90E-06
Hexanone[2-]	0.00228	1540[c]	1.48E-06
Methylene chloride	0.00234	1120	2.09E-06
Pyrene	0.0536	6680	8.02E-06
		HI	**0.2**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-25
Residential Carcinogenic
Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0589	2.22	2.66E-07
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-26
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.26	31.3	4.03E-02
Barium	82.8	15600	5.32E-03
Chromium	8.08	117000[b]	6.89E-05
Cobalt	3.49	23[c]	1.52E-01
Copper	8.73	3130	2.79E-03
Cyanide	0.631	46.9	1.34E-02
Lead	11.2	400	2.80E-02
Nickel	5.84	1560	3.75E-03
Selenium	1.09(U)	391	2.79E-03
Vanadium	15	391	3.84E-02
Anthracene	0.0367	17200	2.13E-06
Aroclor-1254	0.0297	1.12	2.64E-02
Fluoranthene	0.0526	2290	2.29E-05
Hexanone[2-]	0.00228	210[c]	1.09E-05
Methylene chloride	0.00234	409	5.72E-06
Pyrene	0.0536	1720	3.12E-05
		HI	**0.3**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-27
Industrial TPH Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	36.4	1800	**0.02**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-28
Construction Worker TPH Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	16.9	1800	**0.009**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-29
Residential TPH Screening Evaluation for SWMU 03-009(i)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	16.9	1000	**0.02**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-30
Industrial Carcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.336	8.26	4.07E-07
Aroclor-1260	0.925	8.26	1.12E-06
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-31
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	0.528(U)	454	1.16E-03
Chromium	52.3	1700000[b]	3.08E-05
Chromium hexavalent ion	0.241	63.1	3.82E-03
Silver	1.59	5680	2.80E-04
Zinc	64.7	341000	1.90E-04
		HI	**0.005**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-32
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.241	65.6	3.67E-08
Aroclor-1260	0.925	75.8	1.22E-07
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-33
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	5.57(U)	124	4.49E-02
Chromium	20.8	465000[b]	4.48E-05
Silver	0.807	1550	5.21E-04
Zinc	51	92900	5.49E-04
Aroclor-1254	0.336	4.36	7.71E-02
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-34
Residential Carcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.241	2.97	8.11E-07
Aroclor-1260	0.925	2.22	4.17E-06
		Total Excess Cancer Risk	**5E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-35
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-012(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	5.57(U)	31.3	1.78E-01
Chromium	20.8	117000[b]	1.78E-04
Silver	0.807	391	2.06E-03
Zinc	51	23500	2.17E-03
Aroclor-1254	0.336	1.12	3.00E-01
		HI	**0.5**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-36
Industrial Carcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0297	8.26	3.60E-08
Aroclor-1254	0.668	8.26	8.09E-07
Aroclor-1260	0.522	8.26	6.32E-07
Benzo(a)anthracene	0.0839	23.4	3.59E-08
Benzo(a)pyrene	0.0979	2.34	4.18E-07
Benzo(b)fluoranthene	0.129	23.4	5.51E-08
Benzo(k)fluoranthene	0.0541	234	2.31E-09
Bis(2-ethylhexyl)phthalate	0.146	1370	1.07E-09
Chrysene	0.0965	2340	4.12E-10
Dibenz(a,h)anthracene	0.0668	2.34	2.85E-07
Ethylbenzene	0.000366	378	9.68E-12
Indeno(1,2,3-c,d)pyrene	0.0654	23.4	2.79E-08
Methylene chloride	0.00267	4700	5.68E-12
Naphthalene	0.192	241	7.97E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-37
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	2.078	454	4.58E-03
Copper	10.9	45400	2.41E-04
Lead	120.7	800	1.51E-01
Selenium	0.874	5680	1.54E-04
Zinc	175.7	341000	5.15E-04
Acenaphthene	0.0378	36700	1.03E-06
Acenaphthylene	0.0421	18300[b]	2.30E-06
Anthracene	0.0456	183000	2.49E-07
Benzo(g,h,i)perylene	0.0687	18300[b]	3.75E-06
Benzoic acid	0.689	2500000[c]	2.76E-07
Dibenzofuran	0.0797	1000[c]	7.97E-05
Fluoranthene	0.301	24400	1.23E-05
Fluorene	0.0343	24400	1.41E-06
Methylnaphthalene[2-]	0.0783	2200	3.56E-05
Phenanthrene	0.249	20500	1.21E-05
Pyrene	0.31	18300	1.69E-05
Toluene	0.00282	57700	4.89E-08
Xylene[1,2-]	0.000548	4410	1.24E-07
Xylene[1,3-]+1,4-Xylene	0.00111	3980[d]	2.79E-07
		HI	**0.2**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-38
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0297	75.8	3.92E-09
Aroclor-1260	0.153	75.8	2.02E-08
Benzo(a)anthracene	0.0554	213	2.60E-09
Benzo(a)pyrene	0.0623	21.3	2.92E-08
Benzo(b)fluoranthene	0.0804	213	3.77E-09
Benzo(k)fluoranthene	0.0351	2060	1.70E-10
Chrysene	0.0629	20600	3.05E-11
Dibenz(a,h)anthracene	0.0668	21.3	3.14E-08
Ethylbenzene	0.000366	1830	2.00E-12
Indeno(1,2,3-c,d)pyrene	0.0436	213	2.05E-09
		Total Excess Cancer Risk	**9E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-39
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.31	124	1.06E-02
Copper	9.49	12400	7.65E-04
Lead	73.4	800	9.17E-02
Selenium	0.874	1550	5.64E-04
Zinc	109.8	92900	1.18E-03
Acenaphthene	0.0275	18600	1.48E-06
Acenaphthylene	0.0421	6680[b]	6.30E-06
Acetone	0.376	221000	1.70E-06
Anthracene	0.0343	66800	5.13E-07
Aroclor-1254	0.339	4.36	7.78E-02
Benzo(g,h,i)perylene	0.0463	6680[b]	6.93E-06
Benzoic acid	0.689	952000[c]	7.24E-07
Bis(2-ethylhexyl)phthalate	0.269	4760	5.65E-05
Butanone[2-]	0.0174	84300	2.06E-07
Dibenzofuran	0.0797	552[c]	1.44E-04
Fluoranthene	0.164	8910	1.84E-05

Table I-4.2-39 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Fluorene	0.0247	8910	2.77E-06
Isopropyltoluene[4-]	0.0017	2810[d]	6.05E-07
Methylene chloride	0.0027	1120	2.41E-06
Methylnaphthalene[2-]	0.0783	1240	6.31E-05
Naphthalene	0.192	158	1.22E-03
Phenanthrene	0.143	7150	2.00E-05
Pyrene	0.168	6680	2.51E-05
Toluene	0.00147	13400	1.10E-07
Trimethylbenzene[1,2,4-]	0.00035	329[c]	1.06E-06
Xylene[1,2-]	0.000548	823	6.66E-07
Xylene[1,3-]+1,4-Xylene	0.00111	743[e]	1.49E-06
		HI	**0.2**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-40
Residential Carcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0297	2.22	1.34E-07
Aroclor-1260	0.153	2.22	6.89E-07
Benzo(a)anthracene	0.0554	1.48	3.74E-07
Benzo(a)pyrene	0.0623	0.148	4.21E-06
Benzo(b)fluoranthene	0.0804	1.48	5.43E-07
Benzo(k)fluoranthene	0.0351	14.8	2.37E-08
Bis(2-ethylhexyl)phthalate	0.269	347	7.75E-09
Chrysene	0.0629	148	4.25E-09
Dibenz(a,h)anthracene	0.0668	0.148	4.51E-06
Ethylbenzene	0.000366	68.4	5.35E-11
Indeno(1,2,3-c,d)pyrene	0.0436	1.48	2.95E-07
Naphthalene	0.192	43	4.47E-08
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-41
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.31	31.3	4.19E-02
Copper	9.49	3130	3.03E-03
Lead	73.4	400	1.83E-01
Selenium	0.874	391	2.24E-03
Zinc	109.8	23500	4.67E-03
Acenaphthene	0.0275	3440	7.99E-06
Acenaphthylene	0.0421	1720[b]	2.45E-05
Acetone	0.376	66600	5.65E-06
Anthracene	0.0343	17200	1.99E-06
Aroclor-1254	0.339	1.12	3.03E-01
Benzo(g,h,i)perylene	0.0463	1720[b]	2.69E-05
Benzoic acid	0.689	240000[c]	2.87E-06
Butanone[2-]	0.0174	37100	4.69E-07
Dibenzofuran	0.0797	78[c]	1.02E-03
Fluoranthene	0.164	2290	7.16E-05
Fluorene	0.0247	2290	1.08E-05
Isopropyltoluene[4-]	0.0017	2430[d]	7.00E-07
Methylene chloride	0.0027	409	6.60E-06
Methylnaphthalene[2-]	0.0783	230[c]	3.40E-04
Phenanthrene	0.143	1830	7.81E-05
Pyrene	0.168	1720	9.77E-05
Toluene	0.00147	5270	2.79E-07
Trimethylbenzene[1,2,4-]	0.00035	62[c]	5.65E-06
Xylene[1,2-]	0.000548	898	6.10E-07
Xylene[1,3-]+1,4-Xylene	0.00111	814[e]	1.36E-06
		HI	**0.5**

[a] SSLs from NMED (2012, 219971).
[b] Pyrene SSL used as surrogate based on structural similarity.
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[d] Isopropylbenzene SSL used as surrogate based on structural similarity.
[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-42
Industrial TPH Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	1512	1800	**0.8**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-43
Construction Worker TPH Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	943.1	1800	**0.5**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-44
Residential TPH Screening Evaluation for SWMU 03-013(i)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	943.1	1000	**0.9**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-45
Industrial Carcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.021	8.26	2.54E-08
Aroclor-1260	0.0214	8.26	2.59E-08
Benzo(a)pyrene	0.0191	2.34	8.15E-08
Benzo(b)fluoranthene	0.0224	23.4	9.56E-09
Benzo(k)fluoranthene	0.0155	234	6.61E-10
Chrysene	0.0188	2340	8.02E-11
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-46
Industrial Noncarcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.29(U)	454	2.84E-03
Cyanide	1.54	0.0681	2.26E-03
Lead	37.3	800	4.66E-02
Perchlorate	0.0009	795	1.13E-06
Selenium	1.29(U)	5680	2.27E-04
Zinc	82.4	341000	2.42E-04
Acetone	0.00952	868000	1.10E-08
Fluoranthene	0.037	24400	1.51E-06
Phenanthrene	0.0186	20500	9.06E-07
Pyrene	0.0329	18300	1.79E-06
		HI	**0.05**

Note: Data qualifiers are defined in Appendix A.
* SSLs from NMED (2012, 219971).

Table I-4.2-47
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0259	75.8	3.42E-09
Benzo(a)pyrene	0.0191	21.3	8.97E-09
Benzo(b)fluoranthene	0.0224	213	1.05E-09
Benzo(k)fluoranthene	0.0155	2060	7.52E-11
Chrysene	0.0188	20600	9.12E-12
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-48
Construction Worker Noncarcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.29(U)	124	1.04E-02
Chromium	14.9	465000[b]	3.21E-05
Cyanide	1.61	186	8.66E-03
Lead	18.2	800	2.27E-02
Perchlorate	0.00173	217	7.98E-06
Selenium	1.29(U)	1550	8.33E-04
Zinc	52.6	92900	5.66E-04
Acetone	0.0144	221000	6.52E-08
Aroclor-1254	0.0296	4.36	6.79E-02
Bis(2-ethylhexyl)phthalate	0.1	4760	2.10E-05
Fluoranthene	0.037	8910	4.15E-06
Phenanthrene	0.0186	7150	2.60E-06
Pyrene	0.0329	6680	4.92E-06
		HI	**0.05**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-49
Residential Carcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0259	2.22	1.17E-07
Benzo(a)pyrene	0.0191	0.148	1.29E-06
Benzo(b)fluoranthene	0.0224	1.48	1.52E-07
Benzo(k)fluoranthene	0.0155	14.8	1.05E-08
Bis(2-ethylhexyl)phthalate	0.1	347	2.88E-09
Chrysene	0.0188	148	1.27E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-50
Residential Noncarcinogenic
Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.29(U)	31.3	4.12E-02
Chromium	14.9	117000[b]	1.27E-04
Cyanide	1.61	46.9	3.43E-02
Lead	18.2	400	4.54E-02
Perchlorate	0.00173	54.8	3.16E-05
Selenium	1.29(U)	391	3.30E-03
Zinc	52.6	23500	2.24E-03
Acetone	0.0144	66600	2.16E-07
Aroclor-1254	0.0296	1.12	2.63E-02
Fluoranthene	0.037	2290	1.61E-05
Phenanthrene	0.0186	1830	1.01E-05
Pyrene	0.0329	1720	1.91E-05
		HI	**0.2**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-51
Industrial TPH Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	32.1	1800	**0.02**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-52
Construction Worker TPH Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	20.8	1800	**0.01**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-53
Residential TPH Screening Evaluation for AOC 03-014(b2)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	20.8	1000	**0.02**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-54
Industrial Carcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	1.34	8.26	1.63E-06
Aroclor-1260	1.08	8.26	1.31E-06
Benzo(a)anthracene	0.146	23.4	6.24E-08
Benzo(a)pyrene	0.173	2.34	7.39E-07
Benzo(b)fluoranthene	0.188	23.4	8.03E-08
Benzo(k)fluoranthene	0.0889	234	3.80E-09
Chrysene	0.138	2340	5.90E-10
Indeno(1,2,3-c,d)pyrene	0.0975	23.4	4.17E-08
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-55
Industrial Noncarcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.11(U)	454	2.44E-03
Chromium	21.5	1700000[b]	1.26E-05
Copper	22	45400	4.84E-04
Cyanide	21.3	681	3.13E-02
Mercury	0.583	341	1.71E-03
Perchlorate	0.000557	795	7.01E-07
Selenium	1.13(U)	5680	1.99E-04
Silver	8.22	5680	1.45E-03
Zinc	58.8	341000	1.72E-04
Acetone	0.00196	868000	2.26E-09
Anthracene	0.0353	183000	1.93E-07
Benzo(g,h,i)perylene	0.0575	18300[c]	3.14E-06
Fluoranthene	0.257	24400	1.05E-05
Phenanthrene	0.0832	20500	4.06E-06
Pyrene	0.274	18300	1.50E-05
		HI	**0.04**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-56
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1248	0.0141	75.8	1.86E-09
Aroclor-1260	2.239	75.8	2.95E-07
Benzo(a)anthracene	0.146	213	6.85E-09
Benzo(a)pyrene	0.173	21.3	8.12E-08
Benzo(b)fluoranthene	0.0666	213	3.13E-09
Benzo(k)fluoranthene	0.0889	2060	4.32E-10
Chrysene	0.0521	20600	2.53E-11
Indeno(1,2,3-c,d)pyrene	0.0587	213	2.76E-09
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-57
Construction Worker Noncarcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.11(U)	124	8.95E-03
Chromium	17.4	465000[b]	3.74E-05
Copper	17.2	12400	1.39E-03
Cyanide	11.3	186	6.06E-02
Mercury	0.543	92.9	5.84E-03
Perchlorate	0.000989	217	4.56E-06
Selenium	1.14(U)	1550	7.35E-04
Silver	6.06	1550	3.91E-03
Zinc	55.4	92900	5.96E-04
Acetone	0.0511	221000	2.31E-07
Anthracene	0.0353	66800	5.28E-07
Aroclor-1254	2.54	4.36	5.82E-01
Benzo(g,h,i)perylene	0.0358	6680[c]	5.36E-06
Butylbenzene[tert-]	0.000685	15500[d]	4.42E-08
Fluoranthene	0.0854	8910	9.58E-06

Table I-4.2-57 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Isopropyltoluene[4-]	0.0333	2810[e]	1.19E-05
Phenanthrene	0.05	7150	6.99E-06
Pyrene	0.0952	6680	1.43E-05
Toluene	0.00156	13400	1.16E-07
		HI	**0.7**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Butylbenzene[n-] SSL used as surrogate and calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-58
Construction Worker Radionuclide
Screening Evaluation for SWMU 03-014(c2)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0498	140	0.0089
		Total Dose	**0.009**

* SALs from LANL (2012, 228852).

Table I-4.2-59
Residential Carcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1248	0.0141	2.22	6.35E-08
Aroclor-1260	2.24	2.22	1.01E-05
Benzo(a)anthracene	0.146	1.48	9.86E-07
Benzo(a)pyrene	0.173	0.148	1.17E-05
Benzo(b)fluoranthene	0.0666	1.48	4.50E-07
Benzo(k)fluoranthene	0.0889	14.8	6.01E-08
Chrysene	0.0521	148	3.52E-09
Indeno(1,2,3-c,d)pyrene	0.0587	1.48	3.97E-07
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-60
Residential Noncarcinogenic
Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.11(U)	31.3	3.55E-02
Chromium	17.4	117000[b]	1.49E-04
Copper	17.2	3130	5.50E-03
Cyanide	11.3	46.9	2.41E-01
Mercury	0.543	23.5	2.31E-02
Perchlorate	0.000989	54.8	1.80E-05
Selenium	1.14(U)	391	2.92E-03
Silver	6.06	391	1.55E-02
Zinc	55.4	23500	2.36E-03
Acetone	0.0511	66600	7.67E-07
Anthracene	0.0353	17200	2.05E-06
Aroclor-1254	2.54	1.12	2.27E+00
Benzo(g,h,i)perylene	0.0358	1720[c]	2.08E-05
Butylbenzene[tert-]	0.000685	3930[d]	1.74E-07
Fluoranthene	0.0854	2290	3.73E-05
Isopropyltoluene[4-]	0.0333	2430[e]	1.37E-05
Phenanthrene	0.05	1830	2.73E-05
Pyrene	0.0952	1720	5.53E-05
Toluene	0.00156	5270	2.96E-07
		HI	**3**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity

[d] Butylbenzene[n-] SSL used as surrogate from EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm.

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-61
Residential Radionuclide
Screening Evaluation for SWMU 03-014(c2)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0498	82	0.015
		Total Dose	**0.02**

* SALs from LANL (2012, 228852).

Table I-4.2-62
Industrial TPH Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	42.7	1800	**0.02**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-63
Construction Worker TPH Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	35.1	1800	**0.02**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-64
Residential TPH Screening Evaluation for AOC 03-014(c2)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	35.1	1000	**0.04**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-65
Industrial Carcinogenic
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	3	8.26	3.63E-06
Aroclor-1260	0.099	8.26	1.20E-07
Benzo(a)anthracene	11	23.4	4.70E-06
Benzo(a)pyrene	8.3	2.34	3.55E-05
Benzo(b)fluoranthene	7.09	23.4	3.03E-06
Bis(2-ethylhexyl)phthalate	44	1370	3.21E-07
Buytlbenzylphthalate	30	9100[b]	3.30E-08
Chrysene	9.3	2340	3.97E-08
Dibenz(a,h)anthracene	1.1	2.34	4.70E-06
Dichlorobenzene[1,4-]	1.4	177	7.91E-08
Indeno(1,2,3-c,d)pyrene	4.6	23.4	1.97E-06
Naphthalene	0.94	241	3.90E-08
Total Excess Cancer Risk			**5E-05**

[a] SSLs from NMED (2012, 219971).
[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-66
Industrial Noncarcinogenic Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	8.3	454	1.83E-02
Cadmium	4.8	897	5.35E-03
Chromium	28.5	1700000[b]	1.68E-05
Copper	95.3	45400	2.10E-03
Cyanide	9.48	681	1.39E-02
Lead	141.9	800	1.77E-01
Mercury	0.784	341	2.30E-03
Nickel	13.4	22500	5.96E-04
Selenium	0.96	5680	1.69E-04
Silver	8.72	5680	1.54E-03
Zinc	370.7	341000	1.09E-03
Acenaphthene	2.3	36700	6.27E-05
Acetone	2.2	868000	2.53E-06
Anthracene	3.9	183000	2.13E-05
Benzo(g,h,i)perylene	5.6	18300[c]	3.06E-04
Carbon disulfide	0.00281	8330	3.37E-07
Dibenzofuran	1.2	1000[d]	1.20E-03
Fluoranthene	11.35	24400	4.65E-04
Fluorene	2	24400	8.20E-05
Isopropyltoluene[4-]	0.00157	14500[e]	1.08E-07
Phenanthrene	22	20500	1.07E-03
Pyrene	15.1	18300	8.25E-04
		HI	**0.2**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-67
Industrial Radionuclide
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.0567	200000	0.0000071
Uranium-234	2.31	3000	0.019
Uranium-235/236	0.237	150	0.04
Uranium-238	2.08	750	0.069
		Total Dose	**0.1**

* SALs from LANL (2012, 228852).

Table I-4.2-68
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0141	75.8	1.86E-09
Aroclor-1260	0.0349	75.8	4.60E-09
Benzo(a)anthracene	1.44	213	6.76E-08
Benzo(a)pyrene	1.07	21.3	5.02E-07
Benzo(b)fluoranthene	1.91	213	8.97E-08
Chrysene	1.2	20600	5.83E-10
Dibenz(a,h)anthracene	1.1	21.3	5.16E-07
Dichlorobenzene[1,4-]	1.4	831	1.68E-08
Indeno(1,2,3-c,d)pyrene	4.6	213	2.16E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-69
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	8.3	124	6.69E-02
Cadmium	1.49	277	5.38E-03
Chromium	16.9	465000[b]	3.63E-05
Copper	39.4	12400	3.18E-03
Cyanide	1.62	186	8.71E-03
Lead	46.7	800	5.84E-02
Mercury	0.269	92.9	2.90E-03
Nickel	9.07	6190	1.47E-03
Perchlorate	0.00355	217	1.64E-05
Selenium	0.96	1550	6.19E-04
Silver	3.85	1550	2.48E-03
Zinc	144.8	92900	1.56E-03
Acenaphthene	2.3	18600	1.24E-04
Acetone	2.2	221000	9.95E-06
Anthracene	0.264	66800	3.95E-06
Aroclor-1254	0.823	4.36	1.89E-01
Benzo(g,h,i)perylene	5.6	6680[c]	8.38E-04
Bis(2-ethylhexyl)phthalate	44	4760	9.24E-03

Table I-4.2-69 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Butylbenzylphthalate	30	47600[d]	6.30E-04
Carbon disulfide	0.00978	1580	6.19E-06
Dibenzofuran	1.2	552[d]	2.17E-03
Fluoranthene	3.04	8910	3.41E-04
Fluorene	2	8910	2.24E-04
Hexanone[2-]	0.02	1540[d]	1.30E-05
Isopropyltoluene[4-]	0.0061	2810[e]	2.17E-06
Methylnaphthalene[2-]	0.0268	1240	2.16E-05
Naphthalene	0.94	158	5.95E-03
Phenanthrene	2.87	7150	4.01E-04
Pyrene	4.05	6680	6.06E-04
Toluene	0.004	13400	2.99E-07
		HI	**0.4**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-70
Construction Worker Radionuclide
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.0353	62000	0.000014
Uranium-234	0.871	770	0.028
Uranium-235/236	0.037	100	0.009
Uranium-238	0.705	410	0.043
		Total Dose	**0.1**

* SALs from LANL (2012, 228852).

Table I-4.2-71
Residential Carcinogenic
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1242	0.0141	2.22	6.35E-08
Aroclor-1260	0.0349	2.22	1.57E-07
Benzo(a)anthracene	1.44	1.48	9.73E-06
Benzo(a)pyrene	1.07	0.148	7.23E-05
Benzo(b)fluoranthene	1.91	1.48	1.29E-05
Bis(2-ethylhexyl)phthalate	44	347	1.27E-06
Buytlbenzylphthalate	30	2600[b]	1.15E-07
Chrysene	1.2	148	8.11E-08
Dibenz(a,h)anthracene	1.1	0.148	7.43E-05
Dichlorobenzene[1,4-]	1.4	31.7	4.42E-07
Indeno(1,2,3-c,d)pyrene	4.6	1.48	3.11E-05
Naphthalene	0.94	43	2.19E-07
		Total Excess Cancer Risk	**8E-04**

[a] SSLs from NMED (2012, 219971).
[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-72
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	8.3	31.3	2.65E-01
Cadmium	1.49	70.3	2.12E-02
Chromium	16.9	117000[b]	1.44E-04
Copper	39.4	3130	1.26E-02
Cyanide	1.62	46.9	3.45E-02
Lead	46.7	400	1.17E-01
Mercury	0.269	23.5	1.14E-02
Nickel	9.07	1560	5.81E-03
Perchlorate	0.00355	54.8	6.48E-05
Selenium	0.96	391	2.46E-03
Silver	3.85	391	9.85E-03
Zinc	144.8	23500	6.16E-03
Acenaphthene	2.3	3440	6.69E-04
Acetone	2.2	66600	3.30E-05
Anthracene	0.264	17200	1.53E-05
Aroclor-1254	0.823	1.12	7.35E-01

Table I-4.2-72 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Benzo(g,h,i)perylene	5.6	1720[c]	3.26E-03
Carbon disulfide	0.00978	1530	6.39E-06
Dibenzofuran	1.2	78[d]	1.54E-02
Fluoranthene	3.04	2290	1.33E-03
Fluorene	2	2290	8.73E-04
Hexanone[2-]	0.02	210[d]	9.52E-05
Isopropyltoluene[4-]	0.0061	2430[e]	2.51E-06
Methylnaphthalene[2-]	0.0268	230	1.17E-04
Phenanthrene	2.87	1830	1.57E-03
Pyrene	4.05	1720	2.35E-03
Toluene	0.004	5270	7.59E-07
		HI	**1**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-73
Residential Radionuclide
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.0353	850	0.001
Uranium-234	0.871	270	0.08
Uranium-235/236	0.037	39	0.024
Uranium-238	0.705	150	0.12
		Total Dose	**0.2**

* SALs from LANL (2012, 228852).

Table I-4.2-74
Industrial TPH Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	9356	1800	**5**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-75
Construction Worker TPH
Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	5375	1800	**3**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-76
Residential TPH Screening Evaluation for SWMU 03-014(k,l,m,n)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	5375	1000	**5**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-77
Industrial Carcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0353	8.26	4.27E-08
Aroclor-1260	1.22	8.26	1.48E-06
Benzo(a)anthracene	0.48	23.4	2.05E-07
Benzo(a)pyrene	0.65	2.34	2.78E-06
Benzo(b)fluoranthene	1.2	23.4	5.13E-07
Benzo(k)fluoranthene	0.46	234	1.97E-08
Chrysene	0.69	2340	2.95E-09
Dibenz(a,h)anthracene	0.084	2.34	3.59E-07
Indeno(1,2,3-c,d)pyrene	0.31	23.4	1.32E-07
Methylene chloride	0.00349	4700	7.43E-12
		Total Excess Cancer Risk	**6E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-78
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	5.38(U)	454	1.19E-02
Chromium	136	1700000[b]	8.00E-05
Copper	122	45400	2.69E-03
Cyanide	2.7	681	3.96E-03
Lead	45.1	800	5.64E-02
Mercury	3.8	341	1.11E-02
Selenium	0.339	5680	5.97E-05
Silver	71.3	5680	1.26E-02
Zinc	131	341000	3.84E-04
Acenaphthylene	0.036	18300[c]	1.97E-06
Anthracene	0.057	183000	3.11E-07
Benzo(g,h,i)perylene	0.29	18300[c]	1.58E-05
Benzoic acid	0.12	2500000[d]	4.80E-08
Fluoranthene	0.81	24400	3.32E-05
Isopropyltoluene[4-]	0.00037	14500[e]	2.55E-08
MCPA	0.956	310[d]	3.08E-03
MCPP	0.993	620[d]	1.60E-03
Phenanthrene	0.29	20500	1.41E-05
Pyrene	0.74	18300	4.04E-05
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-79
Industrial Radionuclide
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.131	1200	0.0027
Strontium-90	8.01	3500	0.057
Uranium-234	2.68	3000	0.022
		Total Dose	**0.08**

* SALs from LANL (2012, 228852).

Table I-4.2-80
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0918	75.8	1.21E-08
Aroclor-1260	0.271	75.8	3.58E-08
Benzo(a)anthracene	0.48	213	2.25E-08
Benzo(a)pyrene	0.65	21.3	3.05E-07
Benzo(b)fluoranthene	1.2	213	5.63E-08
Benzo(k)fluoranthene	0.46	2060	2.23E-09
Chrysene	0.69	20600	3.35E-10
Dibenz(a,h)anthracene	0.084	21.3	3.94E-08
Indeno(1,2,3-c,d)pyrene	0.31	213	1.46E-08
Total Excess Cancer Risk			**5E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-81
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	5.38(U)	124	4.34E-02
Chromium	32.2	465000[b]	6.93E-05
Copper	27.3	12400	2.20E-03
Cyanide	0.63	186	3.39E-03
Lead	10.7	800	1.34E-02
Mercury	0.772	92.9	8.31E-03
Selenium	0.339	1550	2.19E-04
Silver	14.2	1550	9.14E-03
Zinc	47	92900	5.06E-04
Acenaphthene	0.1	18600	5.38E-06
Acenaphthylene	0.036	6680[c]	5.39E-06
Acetone	0.00257	221000	1.16E-08
Anthracene	0.057	66800	8.53E-07
Aroclor-1254	0.109	4.36	2.50E-02
Benzo(g,h,i)perylene	0.29	6680[c]	4.34E-05
Benzoic acid	0.12	952000[d]	1.26E-07
Bis(2-ethylhexyl)phthalate	0.0877	4760	1.84E-05
Fluoranthene	0.81	8910	9.09E-05

Table I-4.2-81 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Hexanone[2-]	0.00392	1540[d]	2.55E-06
Isopropyltoluene[4-]	0.00037	2810[e]	1.32E-07
MCPA	0.956	119[d]	0.008
MCPP	0.993	238[d]	0.0042
Methylene chloride	0.00324	1120	2.89E-06
Phenanthrene	0.29	7150	4.06E-05
Pyrene	0.74	6680	1.11E-04
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-82
Construction Worker Radionuclide
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.186	120	0.039
Strontium-90	8.01	1600	0.13
Tritium	0.00955	62000	0.0000039
Uranium-234	1.84	770	0.06
		Total Dose	**0.2**

* SALs from LANL (2012, 228852).

Table I-4.2-83
Residential Carcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0918	2.22	4.14E-07
Aroclor-1260	0.271	2.22	1.22E-06
Benzo(a)anthracene	0.48	1.48	3.24E-06
Benzo(a)pyrene	0.65	0.148	4.39E-05
Benzo(b)fluoranthene	1.2	1.48	8.11E-06
Benzo(k)fluoranthene	0.46	14.8	3.11E-07
Bis(2-ethylhexyl)phthalate	0.0877	347	2.53E-09
Chrysene	0.69	148	4.66E-08
Dibenz(a,h)anthracene	0.084	0.148	5.68E-06
Indeno(1,2,3-c,d)pyrene	0.31	1.48	2.09E-06
Total Excess Cancer Risk			**7E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-84
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	5.38(U)	31.3	1.72E-01
Chromium	32.2	117000[b]	2.75E-04
Copper	27.3	3130	8.72E-03
Cyanide	0.63	46.9	1.34E-02
Lead	10.7	400	2.69E-02
Mercury	0.772	23.5	3.29E-02
Selenium	0.339	391	8.67E-04
Silver	14.2	391	3.62E-02
Zinc	47	23500	2.00E-03
Acenaphthene	0.1	3440	2.91E-05
Acenaphthylene	0.036	1720[c]	2.09E-05
Acetone	0.00257	66600	3.86E-08
Anthracene	0.057	17200	3.31E-06
Aroclor-1254	0.109	1.12	9.73E-02
Benzo(g,h,i)perylene	0.29	1720[c]	1.69E-04
Benzoic acid	0.12	240000[d]	5.00E-07
Fluoranthene	0.81	2290	3.54E-04
Hexanone[2-]	0.00392	210[d]	1.87E-05

Table I-4.2-84 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Isopropyltoluene[4-]	0.00037	2430[e]	1.52E-07
MCPA	0.956	31[d]	3.08E-02
MCPP	0.993	61[d]	1.63E-02
Methylene chloride	0.00324	409	7.92E-06
Phenanthrene	0.29	1830	1.58E-04
Pyrene	0.74	1720	4.30E-04
		HI	**0.4**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[e] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-85
Residential Radionuclide
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.186	79	0.059
Strontium-90	8.01	15	13.35
Tritium	0.00955	850	0.00028
Uranium-234	1.84	270	0.17
		Total Dose	**14**

* SALs from LANL (2012, 228852).

Table I-4.2-86
Industrial TPH Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	3.42	1800	**0.002**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-87
Construction Worker TPH
Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	4.12	1800	**0.002**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-88
Residential TPH Screening Evaluation for SWMU 03-014(o)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	4.12	1000	**0.004**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-89
Industrial Carcinogenic Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.303	8.26	3.67E-07
Aroclor-1260	0.233	8.26	2.82E-07
Benzo(a)anthracene	0.0774	23.4	3.31E-08
Benzo(a)pyrene	0.0578	2.34	2.47E-07
Benzo(b)fluoranthene	0.198	23.4	8.46E-08
Bis(2-ethylhexyl)phthalate	0.341	1370	2.49E-09
Chrysene	0.0681	2340	2.91E-10
Dibenz(a,h)anthracene	0.0276	2.34	1.18E-07
Indeno(1,2,3-c,d)pyrene	0.0478	23.4	2.04E-08
Methylene chloride	0.00344	4700	7.32E-12
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-90
Industrial Noncarcinogenic Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.21(U)	454	2.67E-03
Chromium	14.6	1700000[b]	8.59E-06
Copper	152.1	45400	3.35E-03
Lead	56.8	800	7.10E-02
Mercury	1.83	341	5.36E-03
Selenium	1.21(U)	5680	2.13E-04
Silver	45	5680	7.92E-03
Zinc	77.8	341000	2.28E-04
Acenaphthene	0.0377	36700	1.03E-06
Anthracene	0.01	183000	5.46E-08
Benzo(g,h,i)perylene	0.0531	18300[c]	2.90E-06
Diethyl phthalate	0.0916	547000	1.67E-07
Fluoranthene	0.092	24400	3.77E-06
Phenanthrene	0.0457	20500	2.23E-06
Pyrene	0.0956	18300	5.22E-06
		HI	**0.09**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-91
Industrial Radionuclide Screening Evaluation for SWMU 03-014(u)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-238	0.0285	990	0.00072
		Total Dose	**0.0007**

* SALs from LANL (2012, 228852).

Table I-4.2-92
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.199	75.8	2.63E-08
Benzo(a)anthracene	0.0335	213	1.57E-09
Benzo(a)pyrene	0.0417	21.3	1.96E-08
Benzo(b)fluoranthene	0.0817	213	3.84E-09
Chrysene	0.0448	20600	2.17E-11
Dibenz(a,h)anthracene	0.0276	21.3	1.30E-08
Indeno(1,2,3-c,d)pyrene	0.0357	213	1.68E-09
Total Excess Cancer Risk			**7E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-93
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.21(U)	124	9.76E-03
Chromium	64.6	465000[b]	1.39E-04
Copper	85.1	12400	6.86E-03
Cyanide	27.7	186	1.49E-01
Lead	50.3	800	6.28E-02
Mercury	0.76	92.9	8.18E-03
Selenium	1.21(U)	1550	7.81E-04
Silver	24.9	1550	1.61E-02
Zinc	63.7	92900	6.86E-04
Acenaphthene	0.0377	18600	2.03E-06
Anthracene	0.01	66800	1.50E-07
Aroclor-1254	0.254	4.36	5.83E-02
Benzo(g,h,i)perylene	0.0396	6680[c]	5.93E-06
Bis(2-ethylhexyl)phthalate	0.341	4760	7.16E-05
Diethyl phthalate	0.0916	191000	4.80E-07
Fluoranthene	0.0596	8910	6.69E-06
Methylene chloride	0.0035	1120	3.13E-06
Phenanthrene	0.0337	7150	4.71E-06
Pyrene	0.0602	6680	9.01E-06
HI			**0.3**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-94
Construction Worker Radionuclide
Screening Evaluation for SWMU 03-014(u)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.0285	140	0.0051
		Total Dose	**0.005**

* SALs from LANL (2012, 228852).

Table I-4.2-95
Residential Carcinogenic Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.199	2.22	8.96E-07
Benzo(a)anthracene	0.0335	1.48	2.26E-07
Benzo(a)pyrene	0.0417	0.148	2.82E-06
Benzo(b)fluoranthene	0.0817	1.48	5.52E-07
Bis(2-ethylhexyl)phthalate	0.341	347	9.83E-09
Chrysene	0.0448	148	3.03E-09
Dibenz(a,h)anthracene	0.0276	0.148	1.86E-06
Indeno(1,2,3-c,d)pyrene	0.0357	1.48	2.41E-07
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-96
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.21(U)	31.3	3.87E-02
Chromium	64.6	117000[b]	5.52E-04
Copper	85.1	3130	2.72E-02
Cyanide	27.7	46.9	5.91E-01
Lead	50.3	400	1.26E-01
Mercury	0.76	23.5	3.23E-02
Selenium	1.21(U)	391	3.09E-03
Silver	24.9	391	6.37E-02
Zinc	63.7	23500	2.71E-03
Acenaphthene	0.0377	3440	1.1E-05
Anthracene	0.01	17200	5.81E-07

Table I-4.2-96 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aroclor-1254	0.254	1.12	2.27E-01
Benzo(g,h,i)perylene	0.0396	1720[c]	2.3E-05
Diethyl phthalate	0.0916	48900	1.87E-06
Fluoranthene	0.0596	2290	2.6E-05
Methylene chloride	0.0035	409	8.56E-06
Phenanthrene	0.0337	1830	1.84E-05
Pyrene	0.0602	1720	3.5E-05
		HI	**1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-97
Residential Radionuclide Screening Evaluation for SWMU 03-014(u)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-238	0.0285	82	0.0087
		Total Dose	**0.009**

* SALs from LANL (2012, 228852).

Table I-4.2-98
Industrial TPH Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	191.7	1800	**0.1**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-99
Construction Worker TPH
Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	117.6	1800	**0.07**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-100
Residential TPH Screening Evaluation for SWMU 03-014(u)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	117.6	1000	**0.1**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-101
Industrial Carcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	1.28	8.26	1.55E-06
Aroclor-1260	0.487	8.26	5.90E-07
Benzo(a)anthracene	2.61	23.4	1.12E-06
Benzo(a)pyrene	2.36	2.34	1.01E-05
Benzo(b)fluoranthene	4.79	23.4	2.05E-06
Chrysene	2.85	2340	1.22E-08
Indeno(1,2,3-c,d)pyrene	1.22	23.4	5.21E-07
Naphthalene	0.344	241	1.43E-08
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-102
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	7.39	454	1.63E-02
Barium	181	223000	8.12E-04
Chromium	10.5	1700000[b]	6.18E-06
Copper	18.8	45400	4.14E-04
Lead	35.5	800	4.44E-02
Mercury	0.211	341	6.19E-04
Perchlorate	0.00119	795	1.50E-06
Selenium	1.17(U)	5680	2.06E-04
Silver	1.36	5680	2.39E-04
Zinc	129	341000	3.78E-04
Acenaphthene	0.539	36700	1.47E-05
Anthracene	0.892	183000	4.87E-06
Benzo(g,h,i)perylene	1.58	18300[c]	8.63E-05
Fluoranthene	6.75	24400	2.77E-04

Table I-4.2-102 (continued)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Fluorene	0.508	24400	2.08E-05
Methylnaphthalene[2-]	0.111	2200[d]	5.05E-05
Phenanthrene	4.55	20500	2.22E-04
Pyrene	5.56	18300	3.04E-04
		HI	**0.06**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-103
Industrial Radionuclide
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Uranium-238	2.36	750	0.079
		Total Dose	**0.08**

* SALs from LANL (2012, 228852).

Table I-4.2-104
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.118	75.8	1.56E-08
Benzo(a)anthracene	1.1	213	5.15E-08
Benzo(a)pyrene	0.622	21.3	2.92E-07
Benzo(b)fluoranthene	2.01	213	9.44E-08
Benzo(k)fluoranthene	0.11	2060	5.34E-10
Chrysene	1.2	20600	5.80E-10
Indeno(1,2,3-c,d)pyrene	0.3	213	1.41E-08
		Total Excess Cancer Risk	**5E-07**

*SSLs from NMED (2012, 219971).

Table I-4.2-105
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	7.39	124	5.96E-02
Barium	123.7	4350	2.84E-02
Chromium	28.4	465000[b]	6.10E-05
Copper	11.1	12400	8.97E-04
Lead	84.8	800	1.06E-01
Mercury	0.118	92.9	1.27E-03
Perchlorate	0.00119	217	5.48E-06
Selenium	1.35(UJ)	1550	8.71E-04
Silver	0.578	1550	3.73E-04
Zinc	67	92900	7.21E-04
Acenaphthene	0.137	18600	7.37E-06
Acetone	0.00842	221000	3.81E-08
Anthracene	0.242	66800	3.62E-06
Aroclor-1254	1.28	4.36	2.94E-01
Benzo(g,h,i)perylene	0.385	6680[c]	5.76E-05
Fluoranthene	1.7	8910	1.91E-04
Fluorene	0.128	8910	1.44E-05
Methylnaphthalene[2-]	0.111	1240[d]	8.95E-05
Naphthalene	0.0929	158	5.88E-04
Phenanthrene	1.14	7150	1.60E-04
Pyrene	1.40	6680	2.10E-04
		HI	**0.5**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-106
Construction Worker Radionuclide
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Uranium-238	1.14	410	0.069
		Total Dose	**0.07**

* SALs from LANL (2012, 228852).

Table I-4.2-107
Residential Carcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.118	2.22	5.32E-07
Benzo(a)anthracene	1.1	1.48	7.42E-06
Benzo(a)pyrene	0.622	0.148	4.20E-05
Benzo(b)fluoranthene	2.01	1.48	1.36E-05
Benzo(k)fluoranthene	0.11	14.8	7.43E-08
Chrysene	1.2	148	8.07E-08
Indeno(1,2,3-c,d)pyrene	0.3	1.48	2.03E-06
Naphthalene	0.0929	43	2.16E-08
		Total Excess Cancer Risk	**7E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-108
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	7.39	31.3	2.36E-01
Barium	123.7	15600	7.93E-03
Chromium	28.4	117000[b]	2.42E-04
Copper	11.1	3130	3.55E-03
Lead	84.8	400	2.12E-01
Mercury	0.118	23.5	5.02E-03
Perchlorate	0.00119	54.8	2.17E-05
Selenium	1.35	391	3.45E-03
Silver	0.578	391	1.48E-03
Zinc	67	23500	2.85E-03
Acenaphthene	0.137	3440	3.98E-05
Acetone	0.00842	66600	1.26E-07
Anthracene	0.242	17200	1.41E-05
Aroclor-1254	1.28	1.12	1.14E+00
Benzo(g,h,i)perylene	0.385	1720[c]	2.24E-04
Fluoranthene	1.7	2290	7.43E-04
Fluorene	0.128	2290	5.59E-05
Methylnaphthalene[2-]	0.111	230[d]	4.83E-04
Phenanthrene	1.14	1830	6.24E-04
Pyrene	1.4	1720	8.16E-04
		HI	**2**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-109
Residential Radionuclide Screening
Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Uranium-238	1.14	150	0.19
		Total Dose	**0.2**

* SALs from LANL (2012, 228852).

Table I-4.2-110
Industrial TPH Screening
Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	89.8	1800	**0.05**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-111
Construction Worker TPH Screening
Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	47.2	1800	**0.03**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-112
Residential TPH Screening
Evaluation for SWMU 03-015 and AOC 03-053

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	47.2	1000	**0.05**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-113
Industrial Carcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0256	8.26	3.1E-08
Aroclor-1260	0.0178	8.26	2.15E-08
Benzo(a)anthracene	0.044	23.4	1.88E-08
Benzo(a)pyrene	0.0276	2.34	1.18E-07
Benzo(b)fluoranthene	0.0431	23.4	1.84E-08
Benzo(k)fluoranthene	0.0183	234	7.82E-10
Chrysene	0.0421	2340	1.80E-10
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-114
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.24	454	2.73E-03
Barium	76.4	223000	3.43E-04
Chromium	13.1	1700000[b]	7.71E-06
Lead	53.8	800	6.73E-02
Nickel	24.5	22500	1.09E-03
Selenium	0.98	5680	1.73E-04
Thallium	2.1	11.4	1.84E-01
Zinc	53	341000	1.55E-04
Anthracene	0.0154	183000	8.42E-08
Fluoranthene	0.13	24400	5.33E-06
Phenanthrene	0.0806	20500	3.93E-06
Pyrene	0.125	18300	6.83E-06
		HI	**0.3**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-115
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.014	75.8	1.85E-09
Benzo(a)anthracene	0.044	213	2.07E-09
Benzo(a)pyrene	0.0276	21.3	1.30E-08
Benzo(b)fluoranthene	0.0431	213	2.02E-09
Benzo(k)fluoranthene	0.0183	2060	8.88E-11
Chrysene	0.0421	20600	2.04E-11
		Total Excess Cancer Risk	**2E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-116
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.729	124	5.88E-03
Barium	75.2	4350	1.73E-02
Chromium	22.6	465000[b]	4.87E-05
Lead	59.5	800	7.43E-02
Nickel	8.02	6190	1.30E-03
Selenium	0.786	1550	5.07E-04
Thallium	0.49	3.1	1.58E-01
Zinc	61.1	92900	6.57E-04
Acetone	0.0144	221000	6.52E-08
Anthracene	0.0154	66800	2.31E-07
Aroclor-1254	0.0162	4.36	3.72E-03
Fluoranthene	0.13	8910	1.46E-05
Phenanthrene	0.0806	7150	1.13E-05
Pyrene	0.125	6680	1.87E-05
		HI	**0.3**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-117
Residential Carcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.014	2.22	6.31E-08
Benzo(a)anthracene	0.044	1.48	2.97E-07
Benzo(a)pyrene	0.0276	0.148	1.86E-06
Benzo(b)fluoranthene	0.0431	1.48	2.91E-07
Benzo(k)fluoranthene	0.0183	14.8	1.24E-08
Chrysene	0.0421	148	2.84E-09
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-118
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-021

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.729	31.3	2.33E-02
Barium	75.2	15600	4.82E-03
Chromium	22.6	117000[b]	1.94E-04
Lead	59.5	400	1.49E-01
Nickel	8.02	1560	5.14E-03
Selenium	0.786	391	2.01E-03
Thallium	0.49	0.782	6.27E-01
Zinc	61.1	23500	2.60E-03
Acetone	0.0144	66600	2.16E-07
Anthracene	0.0154	17200	8.95E-07
Aroclor-1254	0.0162	1.12	1.45E-02
Fluoranthene	0.13	2290	5.68E-05
Phenanthrene	0.0806	1830	4.4E-05
Pyrene	0.125	1720	7.27E-05
		HI	**0.8**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-119
Industrial Carcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0203	8.26	2.46E-08
Aroclor-1260	0.0117	8.26	1.42E-08
Total Excess Cancer Risk			**4E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-120
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.1(U)	454	2.42E-03
Chromium	13.8	1700000[b]	8.10E-06
Copper	18.9	45400	4.16E-04
Selenium	1.12(U)	5680	1.97E-04
HI			**0.003**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-121
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0141	75.8	1.86E-09
Benzo(a)anthracene	0.0225	213	1.06E-09
Benzo(a)pyrene	0.0184	21.3	8.64E-09
Benzo(b)fluoranthene	0.0286	213	1.34E-09
Chrysene	0.0185	20600	8.97E-12
Total Excess Cancer Risk			**1E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-122
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.1(U)	124	8.88E-03
Chromium	16.3	465000[b]	3.50E-05
Copper	25.3	12400	2.04E-03
Selenium	1.14(U)	1550	7.36E-04
Aroclor-1254	0.0159	4.36	3.65E-03
Fluoranthene	0.032	8910	3.59E-06
Phenanthrene	0.0126	7150	1.76E-06
Pyrene	0.032	6680	4.79E-06
		HI	**0.02**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-123
Residential Carcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0141	2.22	6.36E-08
Benzo(a)anthracene	0.0225	1.48	1.52E-07
Benzo(a)pyrene	0.0184	0.148	1.25E-06
Benzo(b)fluoranthene	0.0286	1.48	1.94E-07
Chrysene	0.0185	148	1.25E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-124
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.1(U)	31.3	3.52E-02
Chromium	16.3	117000[b]	1.39E-04
Copper	25.3	3130	8.08E-03
Selenium	1.14(U)	391	2.92E-03
Aroclor-1254	0.0159	1.12	1.41E-02
Fluoranthene	0.032	2290	1.40E-05
Phenanthrene	0.0126	1830	6.87E-06
Pyrene	0.032	1720	1.86E-05
		HI	**0.06**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

Table I-4.2-125
Industrial TPH Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	2.86	1800	**0.002**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-126
Construction Worker TPH
Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	4.598	1800	**0.003**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-127
Residential TPH Screening Evaluation for SWMU 03-029

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	4.598	1000	**0.005**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-128
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.137	8.26	1.66E-07
Aroclor-1260	0.366	8.26	4.43E-07
Benzo(a)anthracene	3.8	23.4	1.62E-06
Benzo(a)pyrene	3.35	2.34	1.43E-05
Benzo(b)fluoranthene	5.85	23.4	2.50E-06
Chrysene	3.56	2340	1.52E-08
Indeno(1,2,3-c,d)pyrene	1.65	23.4	7.04E-07
Naphthalene	0.72	241	2.99E-08
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-129
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.22(U)	454	2.69E-03
Chromium	88.2	1700000[b]	5.18E-05
Copper	34	45400	7.49E-04
Lead	365	800	4.56E-01
Mercury	0.374	341	1.10E-03
Selenium	1.27(U)	5680	2.24E-04
Silver	1.76	5680	3.10E-04
Zinc	161	341000	4.73E-04
Acenaphthene	0.954	36700	2.60E-05
Acetone	0.00224	868000	2.58E-09
Anthracene	1.99	183000	1.09E-05
Benzo(g,h,i)perylene	1.63	18300[c]	8.89E-05
Fluoranthene	9.3	24400	3.80E-04
Fluorene	1.05	24400	4.30E-05
Isopropyltoluene[4-]	0.023	14500[d]	1.59E-06
Methylnaphthalene[2-]	0.173	2200[e]	7.86E-05
Phenanthrene	8.26	20500	4.02E-04
Pyrene	8.32	18300	4.54E-04
		HI	**0.5**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] Isopropylbenzene SSL used as surrogate based on structural similarity.
[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-130
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.258	75.8	3.40E-08
Benzo(a)anthracene	3.8	213	1.79E-07
Benzo(a)pyrene	3.35	21.3	1.57E-06
Benzo(b)fluoranthene	5.85	213	2.75E-07
Chrysene	3.56	20600	1.73E-09
Indeno(1,2,3-c,d)pyrene	1.65	213	7.75E-08
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-131
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.29(U)	124	1.04E-02
Chromium	49	465000[b]	1.05E-04
Copper	20.1	12400	1.62E-03
Lead	334.3	800	4.18E-01
Mercury	0.374	92.9	4.03E-03
Selenium	1.32(U)	1550	8.52E-04
Silver	1.32	1550	8.52E-04
Zinc	99.5	92900	1.07E-03
Acenaphthene	0.954	18600	5.13E-05
Acetone	0.00224	221000	1.01E-08
Anthracene	1.99	66800	2.98E-05
Aroclor-1254	0.137	4.36	3.14E-02
Benzo(g,h,i)perylene	1.63	6680[c]	2.44E-04
Fluoranthene	9.3	8910	1.04E-03
Fluorene	1.05	8910	1.18E-04
Isopropyltoluene[4-]	0.023	2810[d]	8.19E-06
Methylnaphthalene[2-]	0.173	1240[e]	1.40E-04
Naphthalene	0.72	158	4.56E-03
Phenanthrene	8.26	7150	1.16E-03
Pyrene	8.32	6680	1.24E-03
		HI	**0.5**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (21012, 219971).

Table I-4.2-132
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.258	2.22	1.16E-06
Benzo(a)anthracene	3.8	1.48	2.57E-05
Benzo(a)pyrene	3.35	0.148	2.27E-04
Benzo(b)fluoranthene	5.85	1.48	3.96E-05
Chrysene	3.56	148	2.41E-07
Indeno(1,2,3-c,d)pyrene	1.65	1.48	1.12E-05
Naphthalene	0.72	43.0	1.68E-07
		Total Excess Cancer Risk	**3E-04**

* SSLs from NMED (2012, 219971).

Table I-4.2-133
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.29(U)	31.3	4.12E-02
Chromium	49	117000[b]	4.18E-04
Copper	20.1	3130	6.43E-03
Lead	334.3	400	8.36E-01
Mercury	0.374	23.5	1.59E-02
Selenium	1.32(U)	391	3.38E-03
Silver	1.32	391	3.37E-03
Zinc	99.5	23500	4.24E-03
Acenaphthene	0.954	3440	2.77E-04
Acetone	0.00224	66600	3.37E-08
Anthracene	1.99	17200	1.16E-04
Aroclor-1254	0.137	1.12	1.22E-01
Benzo(g,h,i)perylene	1.63	1720[c]	9.48E-04
Fluoranthene	9.3	2290	4.05E-03
Fluorene	1.05	2290	4.59E-04
Isopropyltoluene[4-]	0.023	2430[d]	9.47E-06
Methylnaphthalene[2-]	0.173	230[e]	7.52E-04
Phenanthrene	8.26	1830	4.51E-03
Pyrene	8.32	1720	4.84E-03
		HI	**1**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] Isopropylbenzene SSL used as surrogate based on structural similarity.
[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-134
Industrial TPH Screening
Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	273	1800	**0.2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-135
Construction Worker TPH
Screening Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	120.5	1800	**0.07**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-136
Residential TPH Screening
Evaluation for SWMU 03-045(a)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	120.5	1000	**0.1**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-137
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0803	8.26	9.72E-08
Aroclor-1260	0.117	8.26	1.42E-07
Benzo(a)pyrene	0.0562	2.34	2.40E-07
Benzo(b)fluoranthene	0.111	23.4	4.74E-08
Chrysene	0.0493	2340	2.10E-10
Indeno(1,2,3-c,d)pyrene	0.0297	23.4	1.27E-08
		Total Excess Cancer Risk	**5E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-138
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.06(U)	454	2.33E-03
Mercury	0.159	341	4.67E-04
Silver	1.17	5680	2.06E-04
Anthracene	0.00901	183000	4.91E-08
Benzo(g,h,i)perylene	0.03	18300[b]	1.64E-06
Fluoranthene	0.102	24400	4.17E-06
Phenanthrene	0.0362	20500	1.76E-06
Pyrene	0.0845	18300	4.61E-06
		HI	**0.003**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-139
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.117	75.8	1.54E-08
Benzo(a)pyrene	0.0562	21.3	2.64E-08
Benzo(b)fluoranthene	0.111	213	5.21E-09
Chrysene	0.0493	20600	2.39E-11
Indeno(1,2,3-c,d)pyrene	0.0297	213	1.40E-09
		Total Excess Cancer Risk	**5E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-140
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.07(U)	124	8.64E-03
Mercury	0.159	92.9	1.71E-03
Silver	1.17	1550	7.56E-04
Anthracene	0.00901	66800	1.35E-07
Aroclor-1254	0.0803	4.36	1.84E-02
Benzo(g,h,i)perylene	0.03	6680[b]	4.49E-06
Fluoranthene	0.102	8910	1.14E-05
Methylene chloride	0.00225	1120	2.01E-06
Phenanthrene	0.0362	7150	5.07E-06
Pyrene	0.0845	6680	1.26E-05
		HI	**0.03**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity

Table I-4.2-141
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.117	2.22	5.27E-07
Benzo(a)pyrene	0.0562	0.148	3.81E-06
Benzo(b)fluoranthene	0.111	1.48	7.52E-07
Chrysene	0.0493	148	3.34E-09
Indeno(1,2,3-c,d)pyrene	0.0297	1.48	2.01E-07
		Total Excess Cancer Risk	**5E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-142
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.07(U)	31.3	3.42E-02
Mercury	0.159	23.5	6.78E-03
Silver	1.17	391	2.99E-03
Anthracene	0.00901	17200	5.24E-07
Aroclor-1254	0.0803	1.12	7.15E-02
Benzo(g,h,i)perylene	0.03	1720[b]	1.74E-05
Fluoranthene	0.102	2290	4.45E-05
Methylene chloride	0.00225	409	5.50E-06
Phenanthrene	0.0362	1830	1.97E-05
Pyrene	0.0845	1720	4.91E-05
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Pyrene SSL used as surrogate based on structural similarity

Table I-4.2-143
Industrial TPH Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	8.88	1800	**0.005**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-144
Construction Worker TPH
Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	8.88	1800	**0.005**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-145
Residential TPH Screening Evaluation for SWMU 03-045(b)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	8.88	1000	**0.009**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-146
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.235	8.26	2.84E-07
Aroclor-1260	0.862	8.26	1.04E-06
Benzo(b)fluoranthene	0.0451	23.4	1.92E-08
Chrysene	0.0233	2340	9.94E-11
Methylene chloride	0.00256	4700	5.45E-12
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-147
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.14(U)	454	2.51E-03
Fluoranthene	0.0468	24400	1.91E-06
Phenanthrene	0.0615	20500	3.00E-06
Pyrene	0.0475	18300	2.59E-06
		HI	**0.002**

* SSLs from NMED (2012, 219971).

Table I-4.2-148
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	3.19	75.8	4.21E-07
Benzo(a)anthracene	0.287	213	1.35E-08
Benzo(a)pyrene	0.242	21.3	1.14E-07
Benzo(b)fluoranthene	0.451	213	2.12E-08
Chrysene	0.232	20600	1.13E-10
Indeno(1,2,3-c,d)pyrene	0.111	213	5.21E-09
		Total Excess Cancer Risk	**6E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-149
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.14(U)	124	9.20E-03
Acenaphthene	0.0542	18600	2.92E-06
Anthracene	0.139	66800	2.08E-06
Aroclor-1254	0.812	4.36	1.86E-01
Benzo(g,h,i)perylene	0.12	6680[b]	1.80E-05
Fluoranthene	0.548	8910	6.15E-05
Fluorene	0.0624	8910	7.00E-06
Methlyene chloride	0.00256	1120	2.29E-06
Methylnaphthalene[2-]	0.00868	1240[c]	7.00E-06
Naphthalene	0.025	158	1.58E-04
Phenanthrene	0.447	7150	6.25E-05
Pyrene	0.534	6680	7.99E-05
		HI	**0.2**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-150
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	3.19	2.22	1.44E-05
Benzo(a)anthracene	0.287	1.48	1.94E-06
Benzo(a)pyrene	0.242	0.148	1.64E-05
Benzo(b)fluoranthene	0.451	1.48	3.05E-06
Chrysene	0.232	148	1.57E-08
Indeno(1,2,3-c,d)pyrene	0.111	1.48	7.52E-07
Naphthalene	0.025	43	5.82E-09
		Total Excess Cancer Risk	**4E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-151
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.14(U)	31.3	3.64E-02
Acenaphthene	0.0542	3440	1.58E-05
Anthracene	0.139	17200	8.08E-06
Aroclor-1254	0.812	1.12	7.23E-01
Benzo(g,h,i)perylene	0.12	1720[b]	6.98E-05
Fluoranthene	0.548	2290	2.39E-04
Fluorene	0.0624	2290	2.72E-05
Methylene chloride	0.00256	409	6.25E-06
Methylnaphthalene[2-]	0.00868	230[c]	3.77E-05
Phenanthrene	0.447	1830	2.44E-04
Pyrene	0.534	1720	3.10E-04
		HI	**0.8**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-152
Industrial TPH Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	2.98	1800	**0.002**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-153
Construction Worker TPH
Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	53.8	1800	**0.03**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-154
Residential TPH Screening Evaluation for SWMU 03-045(c)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	53.8	1000	**0.05**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-155
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0024	8.26	2.90E-09
Aroclor-1260	0.0058	8.26	7.02E-09
Benzo(b)fluoranthene	0.0599	23.4	2.56E-08
		Total Excess Cancer Risk	**4E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-156
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.09(U)	454	2.40E-03
Lead	70.7	800	8.84E-02
Fluoranthene	0.0814	24400	3.33E-06
Phenanthrene	0.0589	20500	2.87E-06
Pyrene	0.0796	18300	4.34E-06
		HI	**0.09**

Note: Data qualifiers are defined in Appendix A.
* SSLs from NMED (2012, 219971).

Table I-4.2-157
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0058	75.8	7.65E-10
Benzo(b)fluoranthene	0.0599	213	2.81E-09
		Total Excess Cancer Risk	**4E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-158
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.09(U)	124	8.80E-03
Lead	99.6	800	1.25E-01
Aroclor-1254	0.0024	4.36	5.50E-04
Fluoranthene	0.239	8910	2.68E-05
Isopropyltoluene[4-]	0.00173	2810[b]	6.16E-07
Phenanthrene	0.251	7150	3.51E-05
Pyrene	0.288	6680	4.31E-05
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-159
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0058	2.22	2.61E-08
Benzo(b)fluoranthene	0.0599	1.48	4.06E-07
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-160
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.09	31.3	3.48E-02
Lead	99.6	400	2.49E-01
Aroclor-1254	0.0024	1.12	2.14E-03
Fluoranthene	0.239	2290	1.04E-04
Isopropyltoluene[4-]	0.00173	2430[b]	7.12E-07
Phenanthrene	0.251	1830	1.37E-04
Pyrene	0.288	1720	1.67E-04
		HI	**0.3**

[a] SSLs from NMED (2012, 219971).

[b] Isopropylbenzene SSL used as surrogate based on structural similarity

Table I-4.2-161
Industrial TPH Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	300	1800	**0.2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-162
Construction Worker TPH
Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	3250	1800	**2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-163
Residential TPH Screening Evaluation for SWMU 03-045(e)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	3250	1000	**3**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-164
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0314	8.26	3.80E-08
		Total Excess Cancer Risk	**4E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-165
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	0.984	454	2.17E-03
Acetone	0.00474	868000	5.46E-09
Fluoranthene	0.0257	24400	1.05E-06
Isopropyltoluene[4-]	0.000364	14500b	2.51E-08
Phenanthrene	0.0125	20500	6.09E-07
Pyrene	0.0175	18300	9.54E-07
		HI	**0.002**

[a] SSLs from NMED (2012, 219971).

[b] Isopropylbenzene SSL used as surrogate based on structural similarity

Table I-4.2-166
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0314	75.8	4.14E-09
		Total Excess Cancer Risk	**4E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-167
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.08	124	8.72E-03
Acetone	0.00474	221000	2.15E-08
Fluoranthene	0.0257	8910	2.88E-06
Isopropylbenzene	0.000427	2810	1.52E-07
Isopropyltoluene[4-]	0.000364	2810b	1.30E-07
Phenanthrene	0.0125	7150	1.75E-06
Pyrene	0.0175	6680	2.62E-06
		HI	**0.01**

[a] SSLs from NMED (2012, 219971).

[b] Isopropylbenzene SSL used as surrogate based on structural similarity

Table I-4.2-168
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0314	2.22	1.42E-07
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-169
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(f)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.08	31.3	3.45E-02
Acetone	0.00474	66600	7.12E-08
Fluoranthene	0.0257	2290	1.12E-05
Isopropylbenzene	0.000427	2430	1.76E-07
Isopropyltoluene[4-]	0.000364	2430b	1.50E-07
Phenanthrene	0.0125	1830	6.82E-06
Pyrene	0.0175	1720	1.02E-05
		HI	**0.03**

[a] SSLs from NMED (2012, 219971).

[b] Isopropylbenzene SSL used as surrogate based on structural similarity

Table I-4.2-170
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	4.2	17.7	2.37E-06
Aroclor-1254	0.0052	8.26	6.29E-09
Aroclor-1260	0.0153	8.26	1.85E-08
Benzo(a)anthracene	0.16	23.4	6.83E-08
Benzo(a)pyrene	0.22	2.34	9.38E-07
Benzo(b)fluoranthene	0.19	23.4	8.11E-08
Benzo(k)fluoranthene	0.2	234	8.53E-09
Bis(2-ethylhexyl)phthalate	0.77	1370	5.63E-09
Chrysene	0.21	2340	8.96E-10
Indeno(1,2,3-c,d)pyrene	0.18	23.4	7.68E-08
Methylene chloride	0.018	4700	3.83E-11
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-171
Industrial Noncarcinogenic Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	0.49	454	1.08E-03
Barium	262	223000	1.17E-03
Cadmium	0.93	897	1.04E-03
Chromium	27.7	1700000[b]	1.63E-05
Cobalt	7.9	300[c]	2.63E-02
Copper	39.2	45400	8.63E-04
Iron	19900	795000	2.50E-02
Lead	27.3	800	3.41E-02
Manganese	582	26700	2.18E-02
Nickel	19.3	22500	8.58E-04
Selenium	0.831	5680	1.46E-04
Vanadium	32	5680	5.64E-03
Zinc	141	341000	4.14E-04
Benzo(g,h,i)perylene	0.2	18300[d]	1.09E-05
Fluoranthene	0.37	24400	1.51E-05
Phenanthrene	0.14	20500	6.82E-06
Pyrene	0.38	18300	2.07E-05
		HI	**0.1**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[d] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-172
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0153	75.8	2.02E-09
Benzo(a)anthracene	0.104	213	4.89E-09
Benzo(a)pyrene	0.122	21.3	5.73E-08
Benzo(b)fluoranthene	0.116	213	5.45E-09
Benzo(k)fluoranthene	0.106	2060	5.14E-10
Bis(2-ethylhexyl)phthalate	0.77	4760	1.62E-09
Chrysene	0.123	20600	5.97E-11
Indeno(1,2,3-c,d)pyrene	0.139	213	6.53E-09
Trichloroethene	0.0019	7.68	2.47E-09
		Total Excess Cancer Risk	8E-08

* SSLs from NMED (2012, 219971).

Table I-4.2-173
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.49	124	3.96E-03
Arsenic	2.61	53.0	4.93E-02
Barium	145.1	4350	3.33E-02
Cadmium	0.445	277	1.61E-03
Chromium	31.6	465000[b]	6.80E-05
Cobalt	4.72	34.6[c]	1.37E-01
Copper	23.1	12400	1.86E-03
Iron	14211	217000	6.56E-02
Lead	15	800	1.88E-02
Manganese	399.1	440	9.06E-01
Nickel	11.7	6190	1.89E-03
Selenium	0.831	1550	5.37E-04
Vanadium	21.1	1550	1.36E-02
Zinc	77.9	92900	8.38E-04
Aroclor-1254	0.0052	4.36	1.19E-03
Benzo(g,h,i)perylene	0.2	6680[d]	2.99E-05
Benzoic acid	0.174	952000[c]	1.83E-07
Butylbenzene[n-]	0.0018	15500[c]	1.16E-07
Fluoranthene	0.224	8910	2.51E-05
Isopropyltoluene[4-]	0.014	2810[e]	4.99E-06
Methylene chloride	0.018	1120	1.61E-05
Phenanthrene	0.106	7150	1.48E-05
Pyrene	0.206	6680	3.08E-05
Trimethylbenzene[1,2,4-]	0.0029	329[c]	8.81E-06
Trimethylbenzene[1,3,5-]	0.0011	3100[c]	3.55E-07
		HI	**1**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Pyrene SSL used as surrogate based on structural similarity.

[e] Isopropylbenzene SSL used as surrogate.

Table I-4.2-174
Residential Carcinogenic
Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.61	3.90	6.71E-06
Aroclor-1260	0.0153	2.22	6.90E-08
Benzo(a)anthracene	0.104	1.48	7.04E-07
Benzo(a)pyrene	0.122	0.148	8.26E-06
Benzo(b)fluoranthene	0.116	1.48	7.86E-07
Benzo(k)fluoranthene	0.106	14.8	7.18E-08
Bis(2-ethylhexyl)phthalate	0.77	347	2.22E-08
Chrysene	0.123	148	8.33E-09
Indeno(1,2,3-c,d)pyrene	0.139	1.48	9.42E-07
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-175
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.49	31.3	1.57E-02
Barium	145.1	15600	9.33E-03
Cadmium	0.445	70.3	6.33E-03
Chromium	31.6	117000[b]	2.69E-04
Cobalt	4.72	23[c]	2.05E-01
Copper	23.1	3130	7.38E-03
Iron	14211	54800	2.60E-01
Lead	15	400	3.75E-02
Manganese	399.1	1860	2.14E-01
Nickel	11.7	1560	7.51E-03
Selenium	0.831	391	2.12E-03
Vanadium	21.1	391	5.40E-02
Zinc	77.9	23500	3.32E-03
Aroclor-1254	0.0052	1.12	4.63E-03
Benzo(g,h,i)perylene	0.2	1720[c]	1.16E-04
Benzoic acid	0.174	240000[d]	7.25E-07
Butylbenzene[n-]	0.0018	3900[d]	4.62E-07
Fluoranthene	0.224	2290	9.77E-05
Isopropyltoluene[4-]	0.014	2430[e]	5.76E-06

Table I-4.2-175 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Methylene chloride	0.018	409	4.40E-05
Phenanthrene	0.106	1830	5.78E-05
Pyrene	0.206	1720	1.20E-04
Trichloroethene	0.0019	8.77	2.17E-04
Trimethylbenzene[1,2,4-]	0.0029	62.0[c]	4.68E-05
Trimethylbenzene[1,3,5-]	0.0011	780[c]	1.41E-06
		HI	**0.8**

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Pyrene SSL used as surrogate based on structural similarity

[e] Isopropylbenzene SSL used as a surrogate.

Table I-4.2-176
Industrial TPH Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	48.5	1800	**0.03**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-177
Construction Worker TPH Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	28.5	1800	**0.02**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-178
Residential TPH Screening Evaluation for SWMU 03-045(g)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	28.5	1000	**0.03**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-179
Industrial Carcinogenic
Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0193	8.26	2.34E-08
Aroclor-1260	0.0196	8.26	2.37E-08
Benzo(b)fluoranthene	0.0155	23.4	6.61E-09
TCDD[2,3,7,8-]	1.95E-06	0.000204	9.55E-08
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-180
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.13(U)	454	2.49E-03
Chromium hexavalent ion	0.142	63.1	2.25E-03
Fluoranthene	0.0236	24400	9.65E-07
Phenanthrene	0.0148	20500	7.21E-07
Pyrene	0.0187	18300	1.02E-06
		HI	**0.005**

Note: Data qualifiers are defined in Appendix A.
* SSLs from NMED (2012, 219971).

Table I-4.2-181
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.142	65.6	2.16E-08
Aroclor-1260	0.0196	75.8	2.58E-09
Benzo(b)fluoranthene	0.0155	213	7.28E-10
		Total Excess Cancer Risk	**2E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-182
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	10500	40700	2.58E-01
Antimony	1.13(UJ)	124	9.12E-03
Barium	112	4350	2.57E-02
Chromium	15.7	465000[b]	3.38E-05
Cobalt	4.46	34.6[c]	1.29E-01
Copper	10.5	12400	8.48E-04
Nickel	11.4	6190	1.84E-03
Selenium	1.14(U)	1550	7.36E-04
Vanadium	21.4	1550	1.38E-02
Aroclor-1254	0.0193	4.36	4.42E-03
Fluoranthene	0.0236	8910	2.65E-06
Phenanthrene	0.0148	7150	2.07E-06
Pyrene	0.0187	6680	2.80E-06
TCDD[2,3,7,8-]	1.95E-06	0.000284	6.86E-03
		HI	**0.5**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-183
Residential Carcinogenic Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.142	2.97	4.78E-07
Aroclor-1260	0.0196	2.22	8.84E-08
Benzo(b)fluoranthene	0.0155	1.48	1.05E-07
TCDD[2,3,7,8-]	1.95E-06	0.000045	4.33E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-184
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-045(h)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	10500	78000	1.35E-01
Antimony	1.13(UJ)	31.3	3.61E-02
Barium	112	15600	7.20E-03
Chromium	15.7	117000[b]	1.34E-04
Cobalt	4.46	23[c]	1.94E-01
Copper	10.5	3130	3.36E-03
Nickel	11.4	1560	7.31E-03
Selenium	1.14(U)	391	2.92E-03
Vanadium	21.4	391	5.47E-02
Aroclor-1254	0.0193	1.12	1.72E-02
Fluoranthene	0.0236	2290	1.03E-05
Phenanthrene	0.0148	1830	8.07E-06
Pyrene	0.0187	1720	1.09E-05
		HI	**0.5**

[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-185
Industrial Carcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0674	8.26	8.16E-08
Aroclor-1254	0.126	8.26	1.52E-07
Aroclor-1260	0.241	8.26	2.92E-07
Benzo(a)anthracene	0.198	23.4	8.45E-08
Benzo(a)pyrene	0.191	2.34	8.15E-07
Benzo(b)fluoranthene	0.405	23.4	1.73E-07
Chrysene	0.207	2340	8.83E-10
Indeno(1,2,3-c,d)pyrene	0.0821	23.4	3.50E-08
Tetrachloroethene	0.000572	36.6	1.56E-10
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-186
Industrial Noncarcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.12(U)	454	2.47E-03
Lead	15.5	800	1.94E-02
Acenaphthene	0.0241	36700	6.57E-07
Acetone	0.00208	868000	2.40E-09
Anthracene	0.0448	183000	2.44E-07
Benzo(g,h,i)perylene	0.112	18300[b]	6.11E-06
Fluoranthene	0.437	24400	1.79E-05
Fluorene	0.0185	24400	7.58E-07
Phenanthrene	0.231	20500	1.13E-05
Pyrene	0.522	18300	2.85E-05
		HI	**0.02**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity

Table I-4.2-187
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.364	75.8	4.80E-08
Aroclor-1260	0.241	75.8	3.18E-08
Benzo(a)anthracene	0.198	213	9.30E-09
Benzo(a)pyrene	0.191	21.3	8.97E-08
Benzo(b)fluoranthene	0.405	213	1.90E-08
Chrysene	0.207	20600	1.00E-10
Indeno(1,2,3-c,d)pyrene	0.0821	213	3.86E-09
Tetrachloroethene	0.000572	212	2.70E-11
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-188
Construction Worker Noncarcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.3(U)	124	1.05E-02
Lead	27.8	800	3.47E-02
Acenaphthene	0.0241	18600	1.30E-06
Acetone	0.00486	221000	2.20E-08
Anthracene	0.0448	66800	6.70E-07
Aroclor-1254	0.313	4.36	7.18E-02
Benzo(g,h,i)perylene	0.112	6680[b]	1.68E-05
Fluoranthene	0.437	8910	4.90E-05
Fluorene	0.0185	8910	2.08E-06
Phenanthrene	0.231	7150	3.23E-05
Pyrene	0.522	6680	7.81E-05
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity

Table I-4.2-189
Residential Carcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.364	2.22	1.64E-06
Aroclor-1260	0.241	2.22	1.09E-06
Benzo(a)anthracene	0.198	1.48	1.34E-06
Benzo(a)pyrene	0.191	0.148	1.29E-05
Benzo(b)fluoranthene	0.405	1.48	2.74E-06
Chrysene	0.207	148	1.40E-08
Indeno(1,2,3-c,d)pyrene	0.0821	1.48	5.56E-07
Tetrachloroethene	0.000572	7.02	8.15E-10
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-190
Residential Noncarcinogenic
Screening Evaluation for AOC 03-047(g)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.3(U)	31.3	4.16E-02
Lead	27.8	400	6.94E-02
Acenaphthene	0.0241	3440	7.00E-06
Acetone	0.00486	66600	7.30E-08
Anthracene	0.0448	17200	2.60E-06
Aroclor-1254	0.313	1.12	2.79E-01
Benzo(g,h,i)perylene	0.112	1720[b]	6.51E-05
Fluoranthene	0.437	2290	1.91E-04
Fluorene	0.0185	2290	8.08E-06
Phenanthrene	0.231	1830	1.26E-04
Pyrene	0.522	1720	3.03E-04
		HI	**0.4**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity

Table I-4.2-191
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0091	75.8	1.20E-09
Aroclor-1260	0.109	75.8	1.44E-08
Benzo(a)anthracene	1.36	213	6.39E-08
Benzo(a)pyrene	1.21	21.3	5.68E-07
Benzo(b)fluoranthene	1.92	213	9.02E-08
Chrysene	1.3	20600	6.30E-10
Dibenz(a,h)anthracene	0.168	21.3	7.89E-08
Indeno(1,2,3-c,d)pyrene	0.545	213	2.56E-08
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-192
Construction Worker Noncarcinogenic Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.26(U)	124	1.02E-02
Cobalt	11.2	34.6[b]	3.24E-01
Zinc	114	92900	1.23E-03
Acenaphthene	0.227	18600	1.22E-05
Anthracene	0.534	66800	7.99E-06
Aroclor-1254	0.038	4.36	8.71E-03
Benz(g,h,i)perylene	0.63	6680	9.43E-05
Dibenzofuran	0.115	552[b]	2.08E-04
Fluoranthene	3.03	8910	3.40E-04
Fluorene	0.229	8910	2.57E-05
Methylnaphthalene[2-]	0.0625	1240[b]	5.04E-05
Naphthalene	0.133	158	8.43E-04
Phenanthrene	2.12	7150	2.97E-04
Pyrene	2.56	6680	3.83E-04
		HI	**0.4**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-193
Residential Carcinogenic Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0091	2.22	4.10E-08
Aroclor-1260	0.109	2.22	4.91E-07
Benzo(a)anthracene	1.36	1.48	9.21E-06
Benzo(a)pyrene	1.21	0.148	8.20E-05
Benzo(b)fluoranthene	1.92	1.48	1.30E-05
Chrysene	1.3	148	8.81E-08
Dibenz(a,h)anthracene	0.168	0.148	1.14E-05
Indeno(1,2,3-c,d)pyrene	0.545	1.48	3.69E-06
Naphthalene	0.133	43	3.10E-08
		Total Excess Cancer Risk	**1E-04**

* SSLs from NMED (2012, 219971).

Table I-4.2-194
Residential Noncarcinogenic
Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.26(U)	31.3	4.03E-02
Cobalt	11.2	23[b]	4.87E-01
Zinc	114	23500	4.86E-03
Acenaphthene	0.227	3440	6.60E-05
Anthracene	0.534	17200	3.10E-05
Aroclor-1254	0.038	1.12	3.38E-02
Benz(g,h,i)perylene	0.63	1720	3.66E-04
Dibenzofuran	0.115	78.0[b]	1.47E-03
Fluoranthene	3.03	2290	1.32E-03
Fluorene	0.229	2290	1.00E-04
Methylnaphthalene[2-]	0.0625	230[b]	2.72E-04
Phenanthrene	2.12	1830	1.16E-03
Pyrene	2.56	1720	1.49E-03
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-195
Construction Worker TPH
Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	87	1800	**0.05**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-196
Residential TPH Screening Evaluation for AOC 03-051(c)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	87	1000	**0.09**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-197
Industrial Noncarcinogenic
Screening Evaluation for AOC 03-052(b)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Aluminum	19800	1130000	1.75E-02
Antimony	7.7(UJ)	454	1.70E-02
Barium	144	223000	6.46E-04
Beryllium	1.1	2260	4.87E-04
Cobalt	21.5	300[b]	7.17E-02
Copper	10.9	45400	2.40E-04
Lead	19.6	800	2.45E-02
Nickel	14.5	22500	6.44E-04
Selenium	0.21	5680	3.70E-05
Silver	2.2(U)	5680	3.87E-04
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-198
Construction Worker Carcinogenic
Screening Evaluation for AOC 03-052(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.36	75.8	4.75E-08
Aroclor-1260	0.193	75.8	2.55E-08
Benzo(a)anthracene	0.0977	213	4.59E-09
Benzo(a)pyrene	0.0383	21.3	1.80E-08
Benzo(b)fluoranthene	0.0709	213	3.33E-09
Benzo(k)fluoranthene	0.041	2060	1.99E-10
Chrysene	0.0385	20600	1.87E-11
Indeno(1,2,3-c,d)pyrene	0.15	213	7.04E-09
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-199
Construction Worker Noncarcinogenic Screening Evaluation for AOC 03-052(b)

COPC	EPC(mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	11626	40700	2.86E-01
Antimony	7.7(UJ)	124	6.21E-02
Barium	202.6	4350	4.66E-02
Beryllium	1.19	144	8.25E-03
Cobalt	5.86	34.6[b]	1.69E-01
Copper	7.53	12400	6.07E-04
Lead	21.6	800	2.70E-02
Nickel	9.03	6190	1.46E-03
Selenium	0.21	1550	1.35E-04
Silver	0.404	1550	2.61E-04
Acenaphthene	0.0345	18600	1.85E-06
Acetone	0.00828	221000	3.75E-08
Anthracene	0.0144	66800	2.16E-07
Aroclor-1254	0.119	4.36	2.73E-02
Benzo(g,h,i)perylene	0.0281	6680[c]	4.21E-06
Butanone[2-]	0.00798	84300	9.47E-08
Fluoranthene	0.0536	8910	6.02E-06
Fluorene	0.03	8910	3.37E-06
Isopropyltoluene[4-]	0.000817	2810[d]	2.91E-07
Naphthalene	0.0171	158	1.08E-04
Phenanthrene	0.048	7150	6.71E-06
Pyrene	0.0468	6680	7.01E-06
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-200
Residential Carcinogenic
Screening Evaluation for AOC 03-052(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.36	2.22	1.62E-06
Aroclor-1260	0.193	2.22	8.69E-07
Benzo(a)anthracene	0.0977	1.48	6.60E-07
Benzo(a)pyrene	0.0383	0.148	2.59E-06
Benzo(b)fluoranthene	0.0709	1.48	4.79E-07
Benzo(k)fluoranthene	0.041	14.8	2.77E-08
Chrysene	0.0385	148	2.60E-09
Indeno(1,2,3-c,d)pyrene	0.15	1.48	1.01E-06
Naphthalene	0.0171	43	3.98E-09
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-201
Residential Noncarcinogenic
Screening Evaluation for AOC 03-052(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	11626	78000	1.49E-01
Antimony	7.7(UJ)	31.3	2.46E-01
Barium	202.6	15600	1.30E-02
Beryllium	1.19	156	7.62E-03
Cobalt	5.86	23[b]	2.55E-01
Copper	7.53	3130	2.41E-03
Lead	21.6	400	5.39E-02
Nickel	9.03	1560	5.79E-03
Selenium	0.21	391	5.37E-04
Silver	0.404	391	1.03E-03
Acenaphthene	0.0345	3440	1.00E-05
Acetone	0.00828	66600	1.24E-07
Anthracene	0.0144	17200	8.37E-07
Aroclor-1254	0.119	1.12	1.06E-01
Benzo(g,h,i)perylene	0.0281	1720[c]	1.63E-05
Butanone[2-]	0.00798	37100	2.15E-07
Fluoranthene	0.0536	2290	2.34E-05
Fluorene	0.03	2290	1.31E-05

Table I-4.2-201 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Isopropyltoluene[4-]	0.000817	2430[d]	3.36E-07
Phenanthrene	0.048	1830	2.62E-05
Pyrene	0.0468	1720	2.72E-05
		HI	**0.8**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table I-4.2-202
Industrial Carcinogenic
Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.128	8.26	1.55E-07
Aroclor-1260	0.14	8.26	1.69E-07
Benzo(a)anthracene	19.9	23.4	8.50E-06
Benzo(a)pyrene	18.7	2.34	7.99E-05
Benzo(b)fluoranthene	24.2	23.4	1.03E-05
Benzo(k)fluoranthene	4.86	234	2.08E-07
Bis(2-ethylhexyl)phthalate	0.29	1370	2.12E-09
Chrysene	22.9	2340	9.79E-08
Dibenz(a,h)anthracene	1.17	2.34	5.00E-06
Indeno(1,2,3-c,d)pyrene	3.62	23.4	1.55E-06
Naphthalene	0.607	241	2.52E-08
Nitroaniline[4-]	0.46	860[b]	5.35E-09
		Total Excess Cancer Risk	**1E-04**

[a] SSLs from NMED (2012, 219971).

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-203
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	0.544	454	1.20E-03
Barium	102	223000	4.57E-04
Chromium	16.4	1700000[b]	9.65E-06
Copper	20.9	45400	4.60E-04
Cyanide	12.8	681	1.88E-02
Lead	54.1	800	6.76E-02
Perchlorate	0.000821	795	1.03E-06
Selenium	1.37(U)	5680	2.41E-04
Zinc	200	341000	5.87E-04
Acenaphthene	3.35	36700	9.13E-05
Acenaphthylene	0.0448	18300[c]	2.45E-06
Acetone	0.0226	868000	2.60E-08
Anthracene	3.86	183000	2.11E-05
Benzo(g,h,i)perylene	3.49	18300[c]	1.91E-04
Dibenzofuran	1.23	1000[d]	1.23E-03
Fluoranthene	49.6	24400	2.03E-03
Fluorene	2.24	24400	9.18E-05
Methylnaphthalene[2-]	0.299	2200[d]	1.36E-04
Phenanthrene	50.8	20500	2.48E-03
Pyrene	64.3	18300	3.51E-03
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-204
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0915	75.8	1.21E-08
Benzo(a)anthracene	8.27	213	3.88E-07
Benzo(a)pyrene	7.8	21.3	3.66E-06
Benzo(b)fluoranthene	10.1	213	4.75E-07
Benzo(k)fluoranthene	2.26	2060	1.10E-08
Chrysene	9.51	20600	4.62E-09
Dibenz(a,h)anthracene	1.17	21.3	5.49E-07
Indeno(1,2,3-c,d)pyrene	1.724	213	8.09E-08
		Total Excess Cancer Risk	**5E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-205
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.544	124	4.39E-03
Barium	73.2	4350	1.68E-02
Chromium	35.1	465000[b]	7.55E-05
Copper	16.3	12400	1.31E-03
Cyanide	2.894	186	1.56E-02
Lead	37	800	4.63E-02
Perchlorate	0.00085	217	3.92E-06
Selenium	1.42(U)	1550	9.16E-04
Zinc	139.7	92900	1.50E-03
Acenaphthene	0.992	18600	5.33E-05
Acenaphthylene	0.0448	6680[c]	6.71E-06
Acetone	0.0226	221000	1.02E-07
Anthracene	1.85	66800	2.77E-05
Aroclor-1254	0.0792	4.36	1.82E-02
Benzo(g,h,i)perylene	1.7	6680[c]	2.54E-04
Bis(2-ethylhexyl)phthalate	0.237	4760	4.98E-05
Dibenzofuran	0.441	552[d]	7.99E-04
Fluoranthene	20.61	8910	2.31E-03
Fluorene	0.696	8910	7.81E-05
Methylnaphthalene[2-]	0.135	1240[d]	1.09E-04
Naphthalene	0.28	158	1.77E-03
Nitroaniline[4-]	0.46	937[d]	4.91E-04
Phenanthrene	21.09	7150	2.95E-03
Pyrene	27	6680	4.04E-03
Toluene	0.000507	13400	3.78E-08
Trimethylbenzene[1,2,4-]	0.000435	329[d]	1.32E-06
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-206
Residential Carcinogenic
Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1260	0.0915	2.22	4.12E-07
Benzo(a)anthracene	8.27	1.48	5.59E-05
Benzo(a)pyrene	7.8	0.148	5.27E-04
Benzo(b)fluoranthene	10.1	1.48	6.83E-05
Benzo(k)fluoranthene	2.26	14.8	1.53E-06
Bis(2-ethylhexyl)phthalate	0.237	347	6.83E-09
Chrysene	9.51	148	6.43E-07
Dibenz(a,h)anthracene	1.17	0.148	7.91E-05
Indeno(1,2,3-c,d)pyrene	1.72	1.48	1.16E-05
Naphthalene	0.28	43	6.51E-08
Nitroaniline[4-]	0.46	240[b]	1.92E-08
		Total Excess Cancer Risk	**7E-04**

[a] SSLs from NMED (2012, 219971).
[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-207
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.544	31.3	1.74E-02
Barium	73.2	15600	4.69E-03
Chromium	35.1	117000[b]	3.00E-04
Copper	16.3	3130	5.21E-03
Cyanide	2.89	46.9	6.17E-02
Lead	37	400	9.26E-02
Perchlorate	0.00085	54.8	1.55E-05
Selenium	1.42(U)	391	3.63E-03
Zinc	139.7	23500	5.94E-03
Acenaphthene	0.992	3440	2.88E-04
Acenaphthylene	0.0448	1720[c]	2.60E-05
Acetone	0.0226	66600	3.39E-07
Anthracene	1.85	17200	1.08E-04
Aroclor-1254	0.0792	1.12	7.07E-02
Benzo(g,h,i)perylene	1.7	1720[c]	9.87E-04
Dibenzofuran	0.441	78[d]	5.65E-03

Table I-4.2-207 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Fluoranthene	20.6	2290	9.00E-03
Fluorene	0.696	2290	3.04E-04
Methylnaphthalene[2-]	0.135	230[d]	5.87E-04
Phenanthrene	21.1	1830	1.15E-02
Pyrene	27	1720	1.57E-02
Toluene	0.000507	5270	9.62E-08
Trimethylbenzene[1,2,4-]	0.000435	62[d]	7.02E-06
		HI	**0.3**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-208
Industrial TPH Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	693	1800	**0.4**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-209
Construction Worker TPH Screening Evaluation for SWMUs 03-052(f)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	296.7	1800	**0.2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-210
Residential TPH Screening Evaluation for SWMU 03-052(f)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	296.7	1000	**0.3**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-211
Industrial Carcinogenic
Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.003	8.26	3.63E-09
Aroclor-1260	0.0046	8.26	5.57E-09
Benzo(a)anthracene	0.0218	23.4	9.32E-09
Benzo(a)pyrene	0.0138	2.34	5.90E-08
Benzo(b)fluoranthene	0.0163	23.4	6.97E-09
Chrysene	0.0175	2340	7.48E-11
		Total Excess Cancer Risk	**8E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-212
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Silver	0.394	5680	6.94E-05
Acetone	0.00241	868000	2.78E-09
Anthracene	0.0111	183000	6.07E-08
Fluoranthene	0.0378	24400	1.55E-06
Phenanthrene	0.0387	20500	1.89E-06
Pyrene	0.0398	18300	2.17E-06
		HI	**0.0001**

* SSLs from NMED (2012, 219971).

Table I-4.2-213
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0133	75.8	1.75E-09
Benzo(a)anthracene	0.0218	213	1.02E-09
Benzo(a)pyrene	0.0138	21.3	6.48E-09
Benzo(b)fluoranthene	0.0163	213	7.65E-10
Chrysene	0.0175	20600	8.50E-12
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-214
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Silver	0.667	1550	4.30E-04
Acetone	0.00241	221000	1.09E-08
Anthracene	0.0111	66800	1.66E-07
Aroclor-1254	0.0366	4.36	8.39E-03
Fluoranthene	0.0378	8910	4.24E-06
Phenanthrene	0.0387	7150	5.41E-06
Pyrene	0.0398	6680	5.96E-06
		HI	**0.01**

* SSLs from NMED (2012, 219971).

Table I-4.2-215
Residential Carcinogenic Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0133	2.22	5.99E-08
Benzo(a)anthracene	0.0218	1.48	1.47E-07
Benzo(a)pyrene	0.0138	0.148	9.32E-07
Benzo(b)fluoranthene	0.0163	1.48	1.10E-07
Chrysene	0.0175	148	1.18E-09
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-216
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Silver	0.667	391	1.71E-03
Acetone	0.00241	66600	3.62E-08
Anthracene	0.0111	17200	6.45E-07
Aroclor-1254	0.0366	1.12	3.27E-02
Fluoranthene	0.0378	2290	1.65E-05
Phenanthrene	0.0387	1830	2.11E-05
Pyrene	0.0398	1720	2.31E-05
		HI	**0.03**

* SSLs from NMED (2012, 219971).

Table I-4.2-217
Industrial TPH Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	104	1800	**0.06**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-218
Construction Worker TPH Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	119.2	1800	**0.07**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-219
Residential TPH Screening Evaluation for SWMU 03-056(a)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	119.2	1000	**0.1**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-220
Industrial Carcinogenic Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0014	8.26	1.69E-09
		Total Excess Cancer Risk	**2E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-221
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.07(U)	454	2.36E-03
Copper	2.38	45400	5.24E-05
Mercury	0.00721	341	2.12E-05
Silver	0.454	5680	8.00E-05
		HI	**0.003**

* SSLs from NMED (2012, 219971).

Table I-4.2-222
Construction Worker Carcinogenic
Screening Evaluation for SWMU 03-056(d)

COPC	EPC(mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0769	75.8	1.01E-08
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-223
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	1.07(U)	124	8.64E-03
Copper	21.8	12400	1.76E-03
Cyanide	0.554	186	2.98E-03
Mercury	0.161	92.9	1.73E-03
Silver	12	1550	7.75E-03
Aroclor-1254	0.0539	4.36	1.24E-02
		HI	**0.04**

* SSLs from NMED (2012, 219971).

Table I-4.2-224
Residential Carcinogenic
Screening Evaluation for SWMU 03-056(d)

COPC	EPC(mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0769	2.22	3.47E-07
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-225
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	1.07(U)	31.3	3.42E-02
Copper	21.8	3130	6.97E-03
Cyanide	0.554	46.9	1.18E-02
Mercury	0.161	23.5	6.86E-03
Silver	12	391	3.07E-02
Aroclor-1254	0.0539	1.12	4.80E-02
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.
* SSLs from NMED (2012, 219971).

Table I-4.2-226
Construction Worker TPH
Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	3.19	1800	**0.002**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-227
Residential TPH Screening Evaluation for SWMU 03-056(d)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	3.19	1000	**0.003**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-228
Industrial Carcinogenic
Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0349	8.26	4.23E-08
Aroclor-1260	0.0362	8.26	4.38E-08
Benzo(a)anthracene	2.08	23.4	8.89E-07
Benzo(a)pyrene	1.63	2.34	6.97E-06
Benzo(b)fluoranthene	2.59	23.4	1.11E-06
Chrysene	1.78	2340	7.61E-09
Dibenz(a,h)anthracene	0.0912	2.34	3.90E-07
Indeno(1,2,3-c,d)pyrene	0.896	23.4	3.83E-07
Naphthalene	0.705	241	2.93E-08
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-229
Industrial Noncarcinogenic
Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	6.6(UJ)	454	1.45E-02
Copper	20.1	45400	4.43E-04
Mercury	0.113	341	3.31E-04
Silver	0.493	5680	8.68E-05
Acenaphthene	0.975	36700	2.66E-05
Anthracene	1.65	183000	9.02E-06
Benzo(g,h,i)perylene	0.949	18300[b]	5.19E-05
Dibenzofuran	0.409	1000[c]	4.09E-04
Fluoranthene	5.22	24400	2.14E-04
Fluorene	0.876	24400	3.59E-05
Methylnaphthalene[2-]	0.236	2200[c]	1.07E-04
Phenanthrene	5.05	20500	2.46E-04
Pyrene	4.56	18300	2.49E-04
		HI	**0.02**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] Pyrene SSL used as surrogate based on structural similarity.
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-230
Industrial Radionuclide
Screening Evaluation for AOC 03-056(k)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Uranium-235/236	0.113	150	0.019
Uranium-238	5.74	750	0.19
		Total Dose	**0.2**

* SALs from LANL (2012, 228852).

Table I-4.2-231
Construction Worker Carcinogenic Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0183	75.8	2.41E-09
Benzo(a)anthracene	0.707	213	3.32E-08
Benzo(a)pyrene	0.374	21.3	1.76E-07
Benzo(b)fluoranthene	0.973	213	4.57E-08
Chrysene	0.391	20600	1.90E-10
Dibenz(a,h)anthracene	0.0912	21.3	4.28E-08
Indeno(1,2,3-c,d)pyrene	0.229	213	1.08E-08
Total Excess Cancer Risk			**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-232
Construction Worker Noncarcinogenic Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	7.6(UJ)	124	6.13E-02
Copper	11.6	12400	9.31E-04
Mercury	0.0429	92.9	4.62E-04
Silver	0.466	1550	3.01E-04
Acenaphthene	0.274	18600	1.47E-05
Acetone	0.0878	221000	3.97E-07
Anthracene	0.454	66800	6.80E-06
Aroclor-1254	0.016	4.36	3.67E-03
Benzo(g,h,i)perylene	0.245	6680[b]	3.67E-05
Butanone[2-]	0.00715	84300	8.48E-08
Carbon disulfide	0.004	1580	2.53E-06
Dibenzofuran	0.409	552[c]	7.41E-04
Fluoranthene	1.62	8910	1.82E-04
Fluorene	0.144	8910	1.62E-05
Isopropyltoluene[4-]	7.64	2810[d]	2.72E-03
Methyl-2-pentanone[4-]	0.00274	18500	1.48E-07
Methylnaphthalene[2-]	0.236	1240[c]	1.90E-04
Naphthalene	0.705	158	4.46E-03
Phenanthrene	1.36	7150	1.90E-04

Table I-4.2-232 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Pyrene	1.4	6680	2.10E-04
Toluene	0.00109	13400	8.13E-08
Trimethylbenzene[1,2,4-]	0.000581	329[c]	1.77E-06
Xylene[1,3-]+1,4-Xylene	0.000561	743[e]	7.55E-07
		HI	**0.08**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-233
Construction Worker Radionuclide
Screening Evaluation for AOC 03-056(k)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Uranium-235/236	0.102	100	0.026
Uranium-238	3.94	410	0.24
		Total Dose	**0.3**

* SALs from LANL (2012, 228852).

Table I-4.2-234
Residential Carcinogenic Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0183	2.22	8.24E-08
Benzo(a)anthracene	0.707	1.48	4.78E-06
Benzo(a)pyrene	0.374	0.148	2.53E-05
Benzo(b)fluoranthene	0.973	1.48	6.57E-06
Chrysene	0.391	148	2.64E-08
Dibenz(a,h)anthracene	0.0912	0.148	6.16E-06
Indeno(1,2,3-c,d)pyrene	0.229	1.48	1.55E-06
Naphthalene	0.705	43	1.64E-07
		Total Excess Cancer Risk	**4E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-235
Residential Noncarcinogenic
Screening Evaluation for AOC 03-056(k)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	7.6(UJ)	31.3	2.43E-01
Copper	11.6	3130	3.69E-03
Mercury	0.0429	23.5	1.83E-03
Silver	0.466	391	1.19E-03
Acenaphthene	0.274	3440	7.97E-05
Acetone	0.0878	66600	1.32E-06
Anthracene	0.454	17200	2.64E-05
Aroclor-1254	0.016	1.12	1.43E-02
Benzo(g,h,i)perylene	0.245	1720[b]	1.42E-04
Butanone[2-]	0.00715	37100	1.93E-07
Carbon disulfide	0.004	1530	2.61E-06
Dibenzofuran	0.409	78[c]	5.24E-03
Fluoranthene	1.62	2290	7.10E-04
Fluorene	0.144	2290	6.29E-05
Isopropyltoluene[4-]	7.64	2430[d]	3.14E-03
Methyl-2-pentanone[4-]	0.00274	5820	4.71E-07
Methylnaphthalene[2-]	0.236	230[c]	1.03E-03
Phenanthrene	1.36	1830	7.42E-04
Pyrene	1.4	1720	8.15E-04
Toluene	0.00109	5270	2.07E-07
Trimethylbenzene[1,2,4-]	0.000581	62[c]	9.37E-06
Xylene[1,3-]+1,4-Xylene	0.000561	814[e]	6.89E-07
		HI	**0.3**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-236
Residential Radionuclide
Screening Evaluation for AOC 03-056(k)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Uranium-235/236	0.102	39	0.065
Uranium-238	3.94	150	0.66
		Total Dose	**0.7**

* SALs from LANL (2012, 228852).

Table I-4.2-237
Industrial Carcinogenic
Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0182	8.26	2.20E-08
Aroclor-1254	3.99	8.26	4.83E-06
Aroclor-1260	1.7	8.26	2.05E-06
Benzo(a)anthracene	0.0672	23.4	2.87E-08
Benzo(a)pyrene	0.0648	2.34	2.77E-07
Benzo(b)fluoranthene	0.0953	23.4	4.07E-08
Benzo(k)fluoranthene	0.139	234	5.94E-09
Bis(2-ethylhexyl)phthalate	0.289	1370	2.11E-09
Butylbenzylphthalate	1.83	9100	2.01E-09
Chrysene	0.0788	2340	3.37E-10
Dibenz(a,h)anthracene	0.028	2.34	1.20E-07
Indeno(1,2,3-c,d)pyrene	0.0398	23.4	1.70E-08
Methylene chloride	0.00246	4700	5.23E-12
Naphthalene	0.0291	241	1.21E-09
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-238
Industrial Noncarcinogenic
Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.12	454	2.48E-03
Mercury	0.265	341	7.77E-04
Perchlorate	0.00104	795	1.31E-06
Acenaphthene	0.0411	36700	1.12E-06
Acenaphthylene	0.0228	18300[b]	1.25E-06
Acetone	0.004	868000	4.61E-09
Anthracene	0.0573	183000	3.13E-07
Benzo(g,h,i)perylene	0.0397	18300[b]	2.17E-06
Fluoranthene	0.133	24400	5.45E-06
Fluorene	0.0359	24400	1.47E-06
Methylnaphthalene[2-]	0.0138	2200[c]	6.27E-06
Phenanthrene	0.0654	20500	3.19E-06
Pyrene	0.121	18300	6.61E-06
		HI	**0.003**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-239
Industrial Radionuclide Screening Evaluation for SWMU 03-059

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.625	200000	0.000078
		Total Dose	**0.00008**

* SALs from LANL (2012, 228852).

Table I-4.2-240
Construction Worker Carcinogenic Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0182	75.8	2.40E-09
Aroclor-1260	1.028	75.8	1.36E-07
Benzo(a)anthracene	0.0489	213	2.30E-09
Benzo(a)pyrene	0.0469	21.3	2.20E-08
Benzo(b)fluoranthene	0.0701	213	3.29E-09
Benzo(k)fluoranthene	0.0385	2060	1.87E-10
Chrysene	0.0584	20600	2.83E-11
Dibenz(a,h)anthracene	0.028	21.3	1.31E-08
Indeno(1,2,3-c,d)pyrene	0.033	213	1.55E-09
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-241
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.891	124	7.19E-03
Mercury	0.157	92.9	1.69E-03
Perchlorate	0.00171	217	7.88E-06
Acenaphthene	0.0411	18600	2.21E-06
Acenaphthylene	0.0228	6680[b]	3.41E-06
Acetone	0.004	221000	1.81E-08
Anthracene	0.0308	66800	4.61E-07
Aroclor-1254	2.63	4.36	6.04E-01
Benzo(g,h,i)perylene	0.0328	6680[b]	4.91E-06
Benzoic acid	0.496	952000[c]	5.21E-07
Bis(2-ethylhexyl)phthalate	0.194	4760	4.08E-05
Butylbenzylphthalate	1.83	47600	3.84E-05

Table I-4.2-241 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Fluoranthene	0.0928	8910	1.04E-05
Fluorene	0.0484	8910	5.43E-06
Methylene chloride	0.00246	1120	2.20E-06
Methylnaphthalene[2-]	0.0138	1240c	1.11E-05
Naphthalene	0.0291	158	1.84E-04
Phenanthrene	0.06	7150	8.39E-06
Pyrene	0.0879	6680	1.32E-05
		HI	**0.6**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-242
Construction Worker Radionuclide Screening Evaluation for SWMU 03-059

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.179	62000	0.000072
		Total Dose	**0.00007**

* SALs from LANL (2012, 228852).

Table I-4.2-243
Residential Carcinogenic Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1242	0.0182	2.22	8.20E-08
Aroclor-1260	1.03	2.22	4.63E-06
Benzo(a)anthracene	0.0489	1.48	3.30E-07
Benzo(a)pyrene	0.0469	0.148	3.17E-06
Benzo(b)fluoranthene	0.0701	1.48	4.74E-07
Benzo(k)fluoranthene	0.0385	14.8	2.60E-08
Bis(2-ethylhexyl)phthalate	0.194	347	5.59E-09
Butylbenzylphthalate	1.83	2600	7.04E-09
Chrysene	0.0584	148	3.95E-09
Dibenz(a,h)anthracene	0.028	0.148	1.89E-06
Indeno(1,2,3-c,d)pyrene	0.033	1.48	2.23E-07
Naphthalene	0.0291	43	6.77E-09
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-244
Residential Noncarcinogenic
Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.891	31.3	2.85E-02
Mercury	0.157	23.5	6.68E-03
Perchlorate	0.00171	54.8	3.12E-05
Acenaphthene	0.0411	3440	1.19E-05
Acenaphthylene	0.0228	1720[b]	1.33E-05
Acetone	0.004	66600	6.01E-08
Anthracene	0.0308	17200	1.79E-06
Aroclor-1254	2.63	1.12	2.35E+00
Benzo(g,h,i)perylene	0.0328	1720[b]	1.91E-05
Benzoic acid	0.496	240000[c]	2.07E-06
Fluoranthene	0.0928	2290	4.05E-05
Fluorene	0.0484	2290	2.11E-05
Methylene chloride	0.00246	409	6.01E-06
Methylnaphthalene[2-]	0.0138	230[c]	6.00E-05
Phenanthrene	0.06	1830	3.28E-05
Pyrene	0.0879	1720	5.11E-05
		HI	**2**

[a] SSLs from NMED (2012, 219971).
[b] Pyrene SSL used as surrogate based on structural similarity.
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-245
Residential Radionuclide
Screening Evaluation for SWMU 03-059

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.179	850	0.0053
		Total Dose	**0.005**

* SALs from LANL (2012, 228852).

Table I-4.2-246
Industrial TPH Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	70.1	1800	**0.04**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-247
Construction Worker TPH Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	10.8	1800	**0.006**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-248
Residential TPH Screening Evaluation for SWMU 03-059

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	10.8	1000	**0.01**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-249
Construction Worker Noncarcinogenic Screening Evaluation for AOC C-03-022

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	1.12(U)	124	9.04E-03
		HI	**0.009**

* SSLs from NMED (2012, 219971).

Table I-4.2-250
Residential Noncarcinogenic Screening Evaluation for AOC C-03-022

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	1.12(U)	31.3	3.58E-02
		HI	**0.04**

* SSLs from NMED (2012, 219971).

Table I-4.2-251
Construction Worker TPH Screening Evaluation for AOC C-03-022

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	27900	1800	**16**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-252
Residential TPH Screening Evaluation for AOC C-03-022

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	27900	1000	**28**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-253
Construction Worker Carcinogenic
Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Benzo(a)anthracene	0.154	213	7.23E-09
Benzo(a)pyrene	0.119	21.3	5.59E-08
Benzo(b)fluoranthene	0.139	213	6.53E-09
Chrysene	0.132	20600	6.40E-11
Indeno(1,2,3-cd)pyrene	0.221	213	1.04E-08
		Total Excess Cancer Risk	**8E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-254
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	14192	40700	3.49E-01
Antimony	1.16(U)	124	9.36E-03
Barium	182.8	4350	4.20E-02
Chromium	11.3	465000[b]	2.43E-05
Cobalt	5.37	34.6[c]	1.55E-01
Copper	8.29	12400	6.69E-04
Lead	38.5	800	4.82E-02
Nickel	9.09	6190	1.47E-03
Selenium	1.13(UJ)	1550	7.30E-04
Vanadium	26.9	1550	1.73E-02
Acetone	0.0189	221000	8.55E-08
Anthracene	0.0541	66800	8.09E-07
Benzo(g,h,i)perylene	0.0715	6680[d]	1.07E-05
Fluoranthene	0.297	8910	3.33E-05
Phenanthrene	0.22	7150	3.08E-05
Pyrene	0.297	6680	4.44E-05
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-255
Residential Carcinogenic
Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Benzo(a)anthracene	0.154	1.48	1.04E-06
Benzo(a)pyrene	0.119	0.148	8.06E-06
Benzo(b)fluoranthene	0.139	1.48	9.42E-07
Chrysene	0.132	148	8.94E-09
Indeno(1,2,3-cd)pyrene	0.221	1.48	1.50E-06
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2012, 219971).

Table I-4.2-256
Residential Noncarcinogenic
Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	14192	78000	1.82E-01
Antimony	1.16(U)	31.3	3.71E-02
Barium	182.8	15600	1.17E-02
Chromium	11.3	117000[b]	9.61E-05
Cobalt	5.37	23.0[c]	2.33E-01
Copper	8.29	3130	2.65E-03
Lead	38.5	400	9.63E-02
Nickel	9.09	15600	5.83E-03
Selenium	1.13(UJ)	391	2.89E-03
Vanadium	26.9	391	6.87E-02
Acetone	0.0189	66600	2.84E-07
Anthracene	0.0541	17200	3.14E-06
Benzo(g,h,i)perylene	0.0715	1720[d]	4.16E-05
Fluoranthene	0.297	2290	1.29E-04
Phenanthrene	0.22	1830	1.20E-04
Pyrene	0.297	1720	1.73E-04
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Pyrene SSL used as surrogate based on structural similarity.

Table I-4.2-257
Construction Worker TPH
Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	25.9	1800	**0.01**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-258
Residential TPH Screening Evaluation for SWMU 60-002 (West)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	25.9	1000	**0.03**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-259
Industrial Carcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0202	8.26	2.44E-08
Aroclor-1260	0.0162	8.26	1.96E-08
		Total Excess Cancer Risk	**4E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-260
Industrial Noncarcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Acenaphthene	0.0244	36700	6.65E-07
		HI	**0.0000007**

* SSLs from NMED (2012, 219971).

Table I-4.2-261
Construction Worker Carcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0162	75.8	2.14E-09
		Total Excess Cancer Risk	**2E-09**

* SSLs from NMED (2012, 219971).

Table I-4.2-262
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Acenaphthene	0.0244	18600	1.31E-06
Aroclor-1254	0.0202	4.36	4.63E-03
		HI	**0.005**

* SSLs from NMED (2012, 219971).

Table I-4.2-263
Residential Carcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0162	2.22	7.30E-08
		Total Excess Cancer Risk	**7E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-264
Residential Noncarcinogenic
Screening Evaluation for SWMU 60-002 (Central)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Acenaphthene	0.0244	3440	7.09E-06
Aroclor-1254	0.0202	1.12	1.80E-02
		HI	**0.02**

* SSLs from NMED (2012, 219971).

Table I-4.2-265
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 60-002 (East)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	27840	40700	6.84E-01
Barium	375	4350	8.61E-02
Cobalt	10	34.6[b]	2.89E-01
Nickel	17.1	6190	2.76E-03
Selenium	0.579	1550	3.74E-04
Acetone	0.0062	221000	2.81E-08
Fluoranthene	0.0357	8910	4.01E-06
Fluorene	0.0056	8910	6.29E-07
Pyrene	0.0443	6680	6.63E-06
		HI	**1**

[a] SSLs from NMED (2012, 219971).

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-266
Residential Noncarcinogenic
Screening Evaluation for SWMU 60-002 (East)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	27840	78000	3.57E-01
Barium	375	15600	2.41E-02
Cobalt	10	23[b]	4.35E-01
Nickel	17.1	1560	1.10E-02
Selenium	0.579	391	1.48E-03
Acetone	0.0062	66600	9.32E-08
Fluoranthene	0.0357	2290	1.56E-05
Fluorene	0.0056	2290	2.45E-06
Pyrene	0.0443	1720	2.58E-05
		HI	**0.8**

[a] SSLs from NMED (2012, 219971).

[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-267
Construction Worker TPH Screening Evaluation for SWMU 60-002 (East)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	12.9	1800	**0.007**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-268
Residential TPH Screening Evaluation for SWMU 60-002 (East)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	12.9	1000	**0.01**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-269
Construction Worker Carcinogenic
Screening Evaluation for AOC 60-004(f)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.153	75.8	2.02E-08
Benzo(a)anthracene	2.33	213	1.09E-07
Benzo(a)pyrene	2.18	21.3	1.02E-06
Benzo(b)fluoranthene	3.06	213	1.44E-07
Benzo(k)fluoranthene	0.975	2060	4.73E-09
Chrysene	2.29	20600	1.11E-09
Dibenz(a,h)anthracene	0.401	21.3	1.88E-07
Dichloroethene[cis-1,2-]	0.000926	619	1.50E-11
Indeno(1,2,3-c,d)pyrene	1.05	213	4.93E-08
Trichloroethelene	0.000446	7.68	5.81E-10
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-270
Construction Worker Noncarcinogenic Screening Evaluation for AOC 60-004(f)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	10452	40700	2.57E-01
Antimony	1.21(UJ)	124	9.76E-03
Barium	149.8	4350	3.44E-02
Chromium	17.6	465000[b]	3.78E-05
Cobalt	7.24	34.6[c]	2.09E-01
Copper	22.8	12400	1.84E-03
Lead	20.1	800	2.52E-02
Mercury	0.0937	92.9	1.01E-03
Nickel	8.58	6190	1.39E-03
Selenium	1.2(UJ)	1550	7.74E-04
Silver	0.614	1550	3.96E-04
Vanadium	28	1550	1.81E-02
Zinc	67.5	92900	7.26E-04
Acenaphthene	0.217	18600	1.17E-05
Acetone	0.00488	221000	2.21E-08
Anthracene	0.69	66800	1.03E-05
Aroclor-1254	0.116	4.36	2.66E-02
Benzene	0.000707	138	5.12E-06
Benzo(g,h,i)perylene	0.973	6680[d]	1.46E-04
Bis(2-ethylhexyl)phthalate	0.0949	4760	1.99E-05
Dibenzofuran	0.15	552[c]	2.72E-04
Di-n-butyl phthalate	0.118	23800	4.95E-06
Fluoranthene	3.99	8910	4.48E-04
Fluorene	0.252	8910	2.83E-05
Methylene chloride	0.00283	1120	2.53E-06
Methylnaphthalene[2-]	0.0372	1240[c]	3.00E-05
Naphthalene	0.106	158	6.71E-04
Phenanthrene	2.35	7150	3.29E-04
Pyrene	2.99	6680	4.48E-04
Toluene	0.000767	13400	5.72E-08
Trimethylbenzene[1,2,4-]	0.00102	329[c]	3.10E-06
Trimethylbenzene[1,3,5-]	0.000621	3100[c]	2.00E-07
Xylene[1,3-]+1,4-Xylene	0.000565	743[e]	7.60E-07
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Pyrene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

**Table I-4.2-271
Construction Worker Radionuclide
Screening Evaluation for AOC 60-004(f)**

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.148	62000	0.00006
		Total Dose	**0.00006**

* SALs from LANL (2012, 228852).

**Table I-4.2-272
Residential Carcinogenic
Screening Evaluation for AOC 60-004(f)**

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.153	2.22	6.89E-07
Benzene	0.000707	15.4	4.59E-10
Benzo(a)anthracene	2.33	1.48	1.57E-05
Benzo(a)pyrene	2.18	0.148	1.47E-04
Benzo(b)fluoranthene	3.06	1.48	2.07E-05
Benzo(k)fluoranthene	0.975	14.8	6.59E-07
Bis(2-ethylhexyl)phthalate	0.0949	347	2.73E-09
Chrysene	2.29	148	1.55E-07
Dibenz(a,h)anthracene	0.401	0.148	2.71E-05
Indeno(1,2,3-c,d)pyrene	1.05	1.48	7.09E-06
Naphthalene	0.106	43	2.47E-08
		Total Excess Cancer Risk	**2E-04**

* SSLs from NMED (2012, 219971).

Table I-4.2-273
Residential Noncarcinogenic
Screening Evaluation for AOC 60-004(f)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	10452	78000	1.34E-01
Antimony	1.21(UJ)	31.3	3.87E-02
Barium	149.8	15600	9.60E-03
Chromium	17.6	117000[b]	1.50E-04
Cobalt	7.24	23[c]	3.15E-01
Copper	22.8	3130	7.28E-03
Lead	20.1	400	5.03E-02
Mercury	0.0937	23.5	3.99E-03
Nickel	8.58	1560	5.50E-03
Selenium	1.2(UJ)	391	3.07E-03
Silver	0.614	391	1.57E-03
Vanadium	28	391	7.16E-02
Zinc	67.5	23500	2.87E-03
Acenaphthene	0.217	3440	6.31E-05
Acetone	0.00488	66600	7.33E-08
Anthracene	0.69	17200	4.01E-05
Aroclor-1254	0.116	1.12	1.04E-01
Benzo(g,h,i)perylene	0.973	1720[d]	5.66E-04
Dibenzofuran	0.15	78[c]	1.92E-03
Dichloroethene[cis-1,2-]	0.000926	156	5.94E-06
Di-n-butyl phthalate	0.118	6110	1.93E-05
Fluoranthene	3.99	2290	1.74E-03
Fluorene	0.252	2290	1.10E-04
Methylene chloride	0.00283	409	6.92E-06
Methylnaphthalene[2-]	0.0372	230[c]	1.62E-04
Phenanthrene	2.35	1830	1.28E-03
Pyrene	2.99	1720	1.74E-03
Toluene	0.000767	5270	1.46E-07
Trichloroethelene	0.000446	8.77	5.09E-05
Trimethylbenzene[1,2,4-]	0.00102	62[c]	1.65E-05
Trimethylbenzene[1,3,5-]	0.000621	780[c]	7.96E-07
Xylene[1,3-]+1,4-Xylene	0.000565	814[e]	6.94E-07
		HI	**0.8**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Pyrene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-274
Residential Radionuclide
Screening Evaluation for AOC 60-004(f)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.148	850	0.0044
		Total Dose	**0.004**

* SALs from LANL (2012, 228852).

Table I-4.2-275
Construction Worker TPH Screening Evaluation for AOC 60-004(f)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	7.17	1800	**0.004**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-276
Residential TPH Screening Evaluation for AOC 60-004(f)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	7.17	1000	**0.07**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-277
Industrial Noncarcinogenic
Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.02	454	2.25E-03
Toluene	0.001	57700	1.73E-08
		HI	**0.002**

* SSLs from NMED (2012, 219971).

Table I-4.2-278
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	1.26	124	1.02E-02
Toluene	0.001	13400	7.46E-08
		HI	**0.01**

* SSLs from NMED (2012, 219971).

Table I-4.2-279
Residential Noncarcinogenic
Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	1.26	31.3	4.03E-02
Toluene	0.001	5270	1.90E-07
		HI	**0.04**

* SSLs from NMED (2012, 219971).

Table I-4.2-280
Industrial TPH Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	652.2	1800	**0.4**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-281
Construction Worker TPH Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	360.7	1800	**0.2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-282
Residential TPH Screening Evaluation for SWMU 60-007(a)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	360.7	1000	**0.4**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-283
Industrial Carcinogenic Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0033	8.26	4.00E-09
Aroclor-1260	0.0038	8.26	4.60E-09
Benzo(a)anthracene	0.11	23.4	4.70E-08
Benzo(a)pyrene	0.0996	2.34	4.26E-07
Benzo(b)fluoranthene	0.153	23.4	6.54E-08
Benzo(k)fluoranthene	0.131	234	5.60E-09
Bis(2-ethylhexyl)phthalate	0.389	1370	2.84E-09
Chloromethane	0.0418	1290	3.24E-10
Chrysene	0.124	2340	5.30E-10
Indeno(1,2,3-c,d)pyrene	0.254	23.4	1.09E-07
		Total Excess Cancer Risk	**7E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-284
Industrial Noncarcinogenic
Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Aluminum	5812	1130000	5.14E-03
Antimony	1.21(U)	454	2.67E-03
Barium	72.3	223000	3.24E-04
Chromium	7.42	1700000[b]	4.37E-06
Selenium	1.18(UJ)	5680	2.08E-04
Zinc	78.8	341000	2.31E-04
Acenaphthene	0.0319	36700	8.69E-07
Acetone	0.00966	868000	1.11E-08
Anthracene	0.0707	183000	3.86E-07
Benzo(g,h,i)perylene	0.096	18300[c]	5.25E-06
Fluoranthene	0.236	24400	9.67E-06
Fluorene	0.0315	24400	1.29E-06
Isopropyltoluene[4-]	0.000537	14500[d]	3.70E-08
Phenanthrene	0.167	20500	8.15E-06
Pyrene	0.239	18300	1.31E-05
Toluene	0.00103	57700	1.79E-08
Trimethylbenzene[1,2,4-]	0.000413	260[e]	1.59E-06
		HI	**0.01**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] Isopropylbenzene SSL used as surrogate based on structural similarity.
[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-285
Construction Worker Carcinogenic
Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0038	75.8	5.01E-10
Benzo(a)anthracene	0.0846	213	3.97E-09
Benzo(a)pyrene	0.0769	21.3	3.61E-08
Benzo(b)fluoranthene	0.115	213	5.40E-09
Benzo(k)fluoranthene	0.0557	2060	2.70E-10
Chrysene	0.0923	20600	4.48E-11
Indeno(1,2,3-c,d)pyrene	0.0723	213	3.39E-09
		Total Excess Cancer Risk	**5E-08**

* SSLs from NMED (2012, 219971).

Table I-4.2-286
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	5671	40700	1.39E-01
Antimony	1.21(U)	124	9.76E-03
Barium	66.4	4350	1.53E-02
Chromium	8.62	465000[b]	1.85E-05
Selenium	1.18(UJ)	1550	7.61E-04
Zinc	64	92900	6.89E-04
Acenaphthene	0.0394	18600	2.12E-06
Acetone	0.00966	221000	4.37E-08
Anthracene	0.034	66800	5.09E-07
Aroclor-1254	0.0033	4.36	7.57E-04
Benzo(g,h,i)perylene	0.0503	6680[c]	7.53E-06
Bis(2-ethylhexyl)phthalate	0.389	4760	8.17E-05
Chloromethane	0.0418	241	1.73E-04
Fluoranthene	0.181	8910	2.03E-05
Fluorene	0.0426	8910	4.78E-06
Isopropyltoluene[4-]	0.000537	2810[d]	1.91E-07

Table I-4.2-286 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Phenanthrene	0.138	7150	1.93E-05
Pyrene	0.185	6680	2.77E-05
Toluene	0.00103	13400	7.69E-08
Trimethylbenzene[1,2,4-]	0.000413	329[e]	1.26E-06
		HI	**0.2**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-287
Residential Carcinogenic Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor-1260	0.0038	2.22	1.71E-08
Benzo(a)anthracene	0.0846	1.48	5.72E-07
Benzo(a)pyrene	0.0769	0.148	5.20E-06
Benzo(b)fluoranthene	0.115	1.48	7.77E-07
Benzo(k)fluoranthene	0.0557	14.8	3.76E-08
Bis(2-ethylhexyl)phthalate	0.389	347	1.12E-08
Chrysene	0.0923	148	6.24E-09
Indeno(1,2,3-c,d)pyrene	0.0723	1.48	4.89E-07
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-288
Residential Noncarcinogenic Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	5671	78000	7.27E-02
Antimony	1.21(U)	31.3	3.87E-02
Barium	66.4	15600	4.26E-03
Chromium	8.62	117000[b]	7.37E-05
Selenium	1.18(UJ)	391	3.02E-03
Zinc	64	23500	2.73E-03
Acenaphthene	0.0394	3440	1.15E-05
Acetone	0.00966	66600	1.45E-07
Anthracene	0.034	17200	1.98E-06
Aroclor-1254	0.0033	1.12	2.95E-03
Benzo(g,h,i)perylene	0.0503	1720[c]	2.92E-05
Chloromethane	0.0418	275	1.52E-04
Fluoranthene	0.181	2290	7.90E-05
Fluorene	0.0426	2290	1.86E-05
Isopropyltoluene[4-]	0.000537	2430[d]	2.21E-07
Phenanthrene	0.138	1830	7.54E-05
Pyrene	0.185	1720	1.08E-04
Toluene	0.00103	5270	1.95E-07
Trimethylbenzene[1,2,4-]	0.000413	62[e]	6.66E-06
		HI	**0.1**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] Pyrene SSL used as surrogate based on structural similarity.
[d] Isopropylbenzene SSL used as surrogate based on structural similarity.
[e] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-289
Industrial TPH Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Industrial* (mg/kg)	HQ
TPH-DRO	71	1800	**0.04**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-290
Construction Worker TPH
Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	48.9	1800	**0.03**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-291
Residential TPH Screening Evaluation for SWMU 60-007(b)

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	48.9	1000	**0.05**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-292
Construction Worker Noncarcinogenic
Screening Evaluation for AOC C-61-002

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	16264	40700	4.00E-01
Antimony	1.1	124	8.85E-03
Arsenic	3.14	53	5.92E-02
Beryllium	1.47	144	1.02E-02
Chromium	9.48	465000[b]	2.04E-05
Copper	7.89	12400	6.36E-04
Iron	14884	217000	6.86E-02
Lead	19.8	800	2.48E-02
Mercury	0.0656	92.9	7.06E-04
Nickel	12.1	6190	1.95E-03
Selenium	2.56(UJ)	1550	1.65E-03
Vanadium	19.4	1550	1.25E-02
Acetone	0.006	221000	2.71E-08
Benzoic acid	0.445	952000[c]	4.67E-07
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.

[a] SSLs from NMED (2012, 219971).

[b] SSL for chromium(III) (NMED 2012, 219971).

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

Table I-4.2-293
Residential Carcinogenic Screening Evaluation for AOC C-61-002

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	3.14	3.9	8.05E-06
		Total Excess Cancer Risk	**8E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-294
Residential Noncarcinogenic Screening Evaluation for AOC C-61-002

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	16264	78000	2.09E-01
Antimony	1.1	31.3	3.51E-02
Beryllium	1.47	156	9.43E-03
Chromium	9.48	117000[b]	8.10E-05
Copper	7.89	3130	2.52E-03
Iron	14884	54800	2.72E-01
Lead	19.8	400	4.96E-02
Mercury	0.0656	23.5	2.79E-03
Nickel	12.1	1560	7.75E-03
Selenium	2.56(UJ)	391	6.55E-03
Vanadium	19.4	391	4.96E-02
Acetone	0.006	66600	9.01E-08
Benzoic acid	0.445	240000[c]	1.85E-06
		HI	**0.6**

Note: Data qualifiers are defined in Appendix A.
[a] SSLs from NMED (2012, 219971).
[b] SSL for chromium(III) (NMED 2012, 219971).
[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-295
Construction Worker TPH Screening Evaluation for AOC C-61-002

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	401.8	1800	**0.2**

* Screening guideline for industrial diesel No. 2 from NMED (2012, 219971).

Table I-4.2-296
Residential TPH Screening Evaluation for AOC C-61-002

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	401.8	1000	**0.4**

* Screening guideline for residential diesel No. 2 from NMED (2012, 219971).

Table I-4.2-297
Industrial Carcinogenic Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor 1254	0.47	8.26	5.69E-07
Aroclor 1260	0.0822	8.26	9.95E-08
Benzene	0.012	84.7	1.42E-09
Benzo(a)anthracene	0.18	23.4	7.69E-08
Benzo(a)pyrene	0.16	2.34	6.84E-07
Benzo(b)fluoranthene	0.13	23.4	5.56E-08
Benzo(k)fluoranthene	0.17	234	7.26E-09
Bis(2-ethylhexyl) phthalate	0.34	1370	2.48E-09
Butylbenzylphthalate	0.66	9100	7.25E-10
Chrysene	0.18	2340	7.69E-10
Indeno(1,2,3-c,d)pyrene	0.11	23.4	4.70E-08
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2012, 219971).

Table I-4.2-298
Industrial Noncarcinogenic Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	0.53	454	1.17E-03
Lead	17	800	2.13E-02
Mercury	0.0425	341	1.25E-04
Selenium	0.49	5680	8.63E-05
Zinc	176.9	341000	5.19E-04
Acetone	1.3	868000	1.50E-06
Anthracene	0.0707	183000	3.86E-07
Benzoic acid	0.28	2500000[b]	1.12E-07
Butanone[2-]	0.0309	375000	8.24E-08
Chlorobenzene	0.01	2120	4.72E-06
Dichlorobenzene[1,2-]	0.0057	14000	4.07E-07
Dichloroethene[cis-1,2-]	0.0047	2270	2.07E-06
Di-n-octyl phthalate	0.075	7400[b]	1.01E-05
Fluoranthene	0.43	24400	1.76E-05
Phenanthrene	0.36	20500	1.76E-05
Pyrene	0.39	18300	2.13E-05
Toluene	0.0011	57700	1.91E-08
		HI	**0.01**

[a] SSLs from NMED (2012, 219971).
[b] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table I-4.2-299
Construction Worker Carcinogenic Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Aroclor 1260	0.106	75.8	1.40E-08
Benzo(a)anthracene	0.59	213	2.77E-08
Benzo(a)pyrene	0.52	21.3	2.44E-07
Benzo(b)fluoranthene	0.39	213	1.83E-08
Benzo(k)fluoranthene	0.54	2060	2.62E-09
Bis(2-ethylhexyl)phthalate	1.3	4760	2.73E-09
Chrysene	0.67	20600	3.25E-10
Dibromo-3-chloropropane[1,2-]	0.0015	5.07	2.96E-09
Dichlorobenzene[1,4-]	0.069	831	8.30E-10
Ethylbenzene	3	1830	1.64E-08
Indeno(1,2,3-c,d)pyrene	0.37	213	1.74E-08
Tetrachloroethene	0.001	2.12E+02	4.72E-11
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2012, 219971).

Table I-4.2-300
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.256	124	2.06E-03
Lead	13.7	800	1.71E-02
Mercury	0.108	92.9	1.16E-03
Selenium	0.602	1550	3.88E-04
Zinc	52.6	92900	5.66E-04
Acenaphthene	0.16	18600	8.60E-06
Acetone	0.263	221000	1.19E-06
Anthracene	0.3	66800	4.49E-06
Aroclor 1254	0.563	4.36	1.29E-01
Benzene	0.00195	138	1.41E-05
Benzo(g,h,i)perylene	0.34	6680[b]	5.09E-05
Benzoic acid	0.28	952000[c]	2.94E-07
Bis(2-ethylhexyl) phthalate	1.3	4760	2.73E-04
Butanone[2-]	0.0201	84300	2.38E-07
Butylbenzene[n-]	0.00054	15500 [c]	3.48E-08
Chlorobenzene	0.00691	406	1.70E-05
Chloromethane	0.00376	241	1.56E-05
Dichlorobenzene[1,2-]	0.000471	2710	1.74E-07
Di-n-octyl phthalate	0.075	3720 [c]	2.02E-05

Table I-4.2-300 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Fluoranthene	0.204	8910	2.29E-05
Fluorene	0.16	8910	1.80E-05
Isopropylbenzene	0.72	2810	2.56E-04
Isopropyltoluene[4-]	1.5	2810 [d]	5.34E-04
Methylnaphthalene[2-]	10	1240 [c]	8.06E-03
Naphthalene	5.8	158	3.67E-02
Phenanthrene	1.4	7150	1.96E-04
Propylbenzene [1-]	3.5	15100 [c]	2.32E-04
Pyrene	0.196	6680	2.93E-05
Styrene	0.13	9990	1.30E-05
Toluene	0.236	13400	1.76E-05
Trimethylbenzene[1,2,4-]	2.4	329 [c]	7.29E-03
Trimethylbenzene[1,3,5-]	11	3100 [c]	3.55E-03
Xylene[1,3-]+1,4-Xylene	29	743 [e]	3.90E-02
		HI	**0.2**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2012, 219971).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-301
Residential Carcinogenic Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Aroclor 1260	0.106	2.22	4.77E-07
Benzene	0.00195	15.4	1.27E-09
Benzo(a)anthracene	0.59	1.48	3.99E-06
Benzo(a)pyrene	0.52	0.148	3.51E-05
Benzo(b)fluoranthene	0.39	1.48	2.64E-06
Benzo(k)fluoranthene	0.54	14.8	3.65E-07
Bis(2-ethylhexyl) phthalate	1.3	347	3.75E-08
Chrysene	0.67	148	4.53E-08
Dibromo-3-chloropropane[1,2-]	0.0015	1.86	8.06E-09
Dichlorobenzene[1,4-]	0.069	31.7	2.18E-08
Ethylbenzene	3	68.4	4.39E-07
Indeno(1,2,3-c,d)pyrene	0.37	1.48	2.50E-06
Naphthalene	5.8	43	1.35E-06
Tetrachloroethene	0.001	7.02	1.42E-09
		Total Excess Cancer Risk	**5E-05**

*SSLs from NMED (2012, 219971).

Table I-4.2-302
Residential Noncarcinogenic
Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.256	31.3	8.18E-03
Lead	13.7	400	3.43E-02
Mercury	0.108	23.5	4.60E-03
Selenium	0.602	391	1.54E-03
Zinc	52.6	23500	2.24E-03
Acenaphthene	0.16	3440	4.65E-05
Acetone	0.263	66600	3.95E-06
Anthracene	0.3	17200	1.74E-05
Aroclor 1254	0.563	1.12	5.03E-01
Benzo(g,h,i)perylene	0.34	1720[b]	1.98E-04
Benzoic acid	0.28	240000[c]	1.17E-06
Butanone[2-]	0.0201	37100	5.42E-07
Butylbenzene[n-]	0.00054	3930 [c]	1.37E-07
Chlorobenzene	0.00691	376	1.84E-05
Chloromethane	0.00376	275	1.37E-05
Dichlorobenzene[1,2-]	0.000471	2310	2.04E-07
Dichloroethene[cis-1,2-]	0.0047	156	3.01E-05
Di-n-octyl phthalate	0.075	730 [c]	1.03E-04
Fluoranthene	0.204	2290	8.91E-05
Fluorene	0.16	2290	6.99E-05
Isopropylbenzene	0.72	2430	2.96E-04
Isopropyltoluene[4-]	1.5	2430 [d]	6.17E-04
Methylnaphthalene[2-]	10	230 [c]	4.35E-02
Phenanthrene	1.4	1830	7.65E-04
Propylbenzene [1-]	3.5	3400 [c]	1.03E-03
Pyrene	0.196	1720	1.14E-04
Styrene	0.13	7280	1.79E-05
Toluene	0.236	5270	4.48E-05
Trimethylbenzene[1,2,4-]	2.4	62 [c]	3.87E-02
Trimethylbenzene[1,3,5-]	11	78 [c]	1.41E-01
Xylene[1,3-]+1,4-Xylene	29	814[e]	3.56E-02
		HI	**0.8**

[a] SSLs from NMED (2012, 219971).

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Isopropylbenzene SSL used as surrogate based on structural similarity.

[e] Xylenes SSL used as surrogate based on structural similarity.

Table I-4.2-303
Construction Worker TPH Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Construction Worker* (mg/kg)	HQ
TPH-DRO	67	1800	**0.04**

* Screening guideline for industrial diesel #2 from NMED (2012, 219971).

Table I-4.2-304
Residential TPH Screening Evaluation for SWMU 61-002

COPC	EPC (mg/kg)	Residential* (mg/kg)	HQ
TPH-DRO	67	1000	**0.07**

* Screening guideline for residential diesel #2 from NMED (2012, 219971).

Table I-4.3-1
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-009(a)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Butylbenzene[sec-]	0.000825	6970000	1.18E-09
Isopropylbenzene	0.000412	125000	3.30E-09
Isopropyltoluene[4-]	0.00183	13900[c]	1.32E-07
Methylene chloride	0.031	11800	2.63E-06
Propylbenzene[1-]	0.000744	43900	1.69E-08
Trimethylbenzene[1,2,4-]	0.00206	331	6.22E-06
Trimethylbenzene[1,3,5-]	0.00111	345	3.22E-06
Xylene[1,2-]	0.00071	31300	2.27E-08
Xylene[1,3-]+1,4-Xylene	0.000687	31300[d]	2.19E-08
		HI	**0.00001**

[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.
[d] Xylene[1,4-] used as a surrogate based on structural similarity.

Table I-4.3-2
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-009(a)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Ethylbenzene	0.000756	2930	2.58E-12
Naphthalene	0.24	879	2.28E-09
Tetrachloroethene	0.00057	1240	4.60E-12
		Total Excess Cancer Risk	**2E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-3
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-009(i)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Hexanone[2-]	0.00228	1570000[c]	1.45E-09
Methylene chloride	0.00234	31400	7.45E-08
		HI	**0.00000008**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.
[c] Butanone[2-] used as a surrogate based on structural similarity.

Table I-4.3-4
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-013(i)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.376	19500000	1.93E-08
Butanone[2-]	0.0174	3140000	5.54E-09
Isopropyltoluene[4-]	0.0017	252000[c]	6.75E-09
Methylene chloride	0.00291	47000	6.19E-08
Toluene	0.0104	31400	3.31E-07
Trimethylbenzene[1,2,4-]	0.00035	1860	1.88E-07
Xylene[1,2-]	0.000548	61700	8.88E-09
Xylene[1,3-]+1,4-Xylene	0.00111	7840[d]	1.42E-07
		HI	**0.0000008**

[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.
[d] Xylene[1,4-] used as a surrogate based on structural similarity.

Table I-4.3-5
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-013(i)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Ethylbenzene	0.000366	5760	6.35E-13
Naphthalene	0.192	747	2.57E-09
		Total Excess Cancer Risk	**3E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-6
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-014(k,l,m,n)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	2.2	1890000	1.16E-06
Carbon disulfide	0.00978	36600	2.67E-07
Hexanone[2-]	0.02	1570000[c]	1.27E-08
Isopropyltoluene[4-]	0.0061	20900[d]	2.92E-07
Toluene	0.004	126000	3.17E-08
		HI	**0.000002**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.
[c] Butanone[2-] used as a surrogate based on structural similarity.
[d] Isopropylbenzene used as a surrogate based on structural similarity.

Table I-4.3-7
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-014(k,l,m,n)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b](mg/kg)	Cancer Risk
Dichlorobenzene[1,4-]	1.4	512	2.73E-08
Naphthalene	0.94	1660	5.66E-09
		Total Excess Cancer Risk	**3E-08**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-8
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-014(o)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.00257	2050000	1.25E-09
Hexanone[2-]	0.00392	1570000[c]	2.50E-09
Isopropyltoluene[4-]	0.00037	247000[d]	1.50E-09
Methylene chloride	0.00349	31400	1.11E-07
		HI	**0.0000001**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.
[c] Butanone[2-] used as a surrogate based on structural similarity.
[d] Isopropylbenzene used as a surrogate based on structural similarity.

Table I-4.3-9
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-014(u)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Methylene chloride	0.0035	188000	1.86E-08
		HI	**0.00000002**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-10
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-015 and AOC 03-053

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.00842	2420000	3.48E-09
		HI	**0.000000003**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-11
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-015 and AOC 03-053

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.344	754	4.56E-09
		Total Excess Cancer Risk	**5E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-12
Residential Noncarcinogenic Screening of Vapor Intrusion for AOC 03-047(g)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.00486	9720000	5.00E-10
		HI	**0.0000000005**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-13
Residential Carcinogenic Screening of Vapor Intrusion for AOC 03-047(g)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Tetrachloroethene	0.000572	2440	2.34E-12
		Total Excess Cancer Risk	**2E-12**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-14
Residential Noncarcinogenic Screening of Vapor Intrusion for AOC 03-051(c)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Methylnaphthalene[2-]	0.0625	139000	4.50E-07
		HI	**0.0000005**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-15
Residential Carcinogenic Screening of Vapor Intrusion for AOC 03-051(c)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.133	777	1.71E-09
		Total Excess Cancer Risk	**2E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-16
Residential Noncarcinogenic Screening of Vapor Intrusion for AOC 03-052(b)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.0417	1900000	2.19E-08
Butanone[2-]	0.00798	1590000	5.02E-09
Isopropyltoluene[4-]	0.000817	127000[c]	6.43E-09
		HI	**0.00000003**

[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 I-4.3-17
Residential Carcinogenic Screening of Vapor Intrusion for AOC 03-052(b)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.0171	754	2.27E-10
		Total Excess Cancer Risk	**2E-10**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-18
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-052(f)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.0226	9720000	2.33E-09
Toluene	0.000507	125000	4.06E-09
Trimethylbenzene[1,2,4-]	0.000435	1860	2.34E-07
		HI	**0.0000002**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-19
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-052(f)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.607	754	8.05E-09
		Total Excess Cancer Risk	**8E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-20
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-056(k)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.386	1900000	2.03E-07
Butanone[2-]	0.0213	523000	4.07E-08
Carbon disulfide	0.00203	219000	9.27E-09
Isopropyltoluene[4-]	7.64	41800c	1.83E-04
Methyl-2-pentanone[4-]	0.00274	940000	2.91E-09
Methylnaphthalene[2-]	0.236	136000	1.74E-06
Toluene	0.00294	41800	7.03E-08
Trimethylbenzene[1,2,4-]	0.000581	1860	3.12E-07
Xylene[1,3-]+1,4-Xylene	0.000561	31300d	1.79E-08
		HI	**0.0002**

[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.
[d] Xylene[1,4-] used as a surrogate based on structural similarity.

Table I-4.3-21
Residential Carcinogenic Screening of Vapor Intrusion for AOC 03-056(k)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.705	754	9.35E-09
		Total Excess Cancer Risk	**9E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-22
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 03-059

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.0228	19100000	1.19E-09
Methylene chloride	0.00246	370000	6.65E-09
Methylnaphthalene[2-]	0.0138	134000	1.03E-07
		HI	**0.0000001**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-23
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 03-059

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Naphthalene	0.0291	747	3.90E-10
		Total Excess Cancer Risk	**4E-10**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-24
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU 60-002 (East)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.0118	1950000	6.05E-09
Hexanone[2-]	0.0088	3140000[c]	2.80E-09
		HI	**0.000000009**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.
[c] Butanone[2-] used as a surrogate based on structural similarity.

Table I-4.3-25
Residential Noncarcinogenic Screening of Vapor Intrusion for AOC 60-004(f)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.00703	1900000	3.70E-09
Dichloroethene[cis-1.2-]	0.000926	11000	8.42E-08
Methylene chloride	0.00292	20900	1.40E-07
Methylnaphthalene[2-]	0.0372	136000	2.74E-07
Toluene	0.000767	125000	6.14E-09
Trimethylbenzene[1,2,4-]	0.00102	934	1.09E-06
Trimethylbenzene[1,3,5-]	0.000621	934	6.65E-07
Xylene[1,3-]+1,4-Xylene	0.000565	31300[c]	1.81E-08
		HI	**0.000002**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.
[c] Xylene[1,4-] used as a surrogate based on structural similarity.

Table I-4.3-26
Residential Carcinogenic Screening of Vapor Intrusion for AOC 60-004(f)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Benzene	0.000707	938	7.54E-12
Naphthalene	0.106	754	1.41E-09
Trichloroethene	0.000446	1780	2.51E-12
		Total Excess Cancer Risk	**1E-09**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-4.3-27
Residential Noncarcinogenic Screening of Vapor Intrusion for SWMU60-007(b)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.00966	107000000	9.03E-11
Chloromethane	0.0418	55400	7.55E-07
Isopropyltoluene[4-]	0.000537	247000[c]	2.17E-09
Toluene	0.00103	83100	1.24E-08
Trimethylbenzene[1,2,4-]	0.000413	3670	1.13E-07
		HI	**0.0000009**

[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 I-4.3-28
Residential Noncarcinogenic Screening of Vapor Intrusion for AOC C-61-002

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	HQ
Acetone	0.006	1930000	3.11E-09
		HI	**0.000000003**

[a] Maximum detected concentration.
[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table I-5.3-1
ESLs for Terrestrial Receptors

COPC	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Inorganic Chemicals (mg/kg)											
Antimony	45	na*	na	na	na	na	2.9	0.26	0.48	78	0.05
Arsenic	810	1100	160	42	26	18	160	15	32	6.8	18
Barium	41000	37000	11000	820	930	1000	3300	1300	1800	330	110
Cadmium	510	580	2	4.4	0.54	0.29	9.9	0.27	0.51	140	32
Chromium	1800	1200	260	68	40	28	840	45	110	na	na
Chromium hexavalent	7200	5400	2200	280	220	190	3200	280	860	0.34	0.35
Cobalt	5400	3500	930	170	120	96	1800	160	400	na	13
Copper	3800	1600	110	38	22	15	270	38	64	80	70
Cyanide	2200	0.58	0.47	0.1	0.1	0.1	740	310	340	na	na
Lead	3700	810	120	21	16	14	370	72	120	1700	120
Manganese	41000	90000	35000	1400	1900	3100	2000	1500	1400	450	220
Mercury	46	0.28	0.082	0.07	0.022	0.013	22	1.7	3	0.05	34
Nickel	1200	2900	160	160	38	21	500	9.7	20	280	38
Selenium	84	97	5.6	1	0.87	0.75	2.1	0.66	0.83	4.1	0.52
Silver	4100	840	19	11	4.3	2.6	150	14	24	na	560
Thallium	2.8	75	6.6	9.2	1.6	0.9	2.8	0.032	0.068	na	0.1
Vanadium	3300	170	84	8.9	7.6	6.7	1500	140	480	na	0.025
Zinc	6000	2400	320	350	85	48	1800	98	170	120	160

Table I-5.3-1 (continued)

COPC	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Organic Chemicals (mg/kg)											
Acenaphthene	6200	na	na	na	na	na	490	120	160	na	0.25
Acenaphthylene	5200	na	na	na	na	na	500	120	160	na	na
Acetone	2900	30000.00	1200.00	7.50	14.00	170.00	1.4	15	1.2	na	na
Anthracene	5800	na	na	na	na	na	1100	210	310	na	6.8
Aroclor-1242	16	1.40	0.26	1	0.079	0.041	30	0.38	0.76	na	na
Aroclor-1248	0.075	0.34	0.2	1	0.079	0.041	0.59	0.0072	0.014	na	na
Aroclor-1254	0.15	0.22	0.17	1.3	0.08	0.041	52	0.44	0.88	na	160
Aroclor-1260	0.14	4.60	3.7	46	1.7	0.88	3000	10	20	na	na
Benzene	7600	na	na	na	na	na	35	47	24	na	na
Benzo(a)anthracene	32	9.8	6.9	0.8	0.91	1	6.2	3	3.4	na	18
Benzo(a)pyrene	380	na	na	na	na	na	280	53	85	na	na
Benzo(b)fluoranthene	250	na	na	na	na	na	130	38	52	na	18
Benzo(g,h,i)perylene	94	na	na	na	na	na	540	24	47	na	na
Benzo(k)fluoranthene	400	na	na	na	na	na	350	62	100	na	na
Benzoic acid	350	na	na	na	na	na	4.2	1.0	1.3	na	na
Bis(2-ethylhexyl)phthalate	1.2	0.033	0.045	20	0.040	0.02	2700	0.59	1.1	na	na
Butanone[2-]	420000	na	na	na	na	na	420	2600	360	na	na
Butylbenzylphthalate	1900	na	na	na	na	na	2300	90	160	na	na
Carbazole	5700	na	na	na	na	na	130	100	80	na	na
Carbon disulfide	190	na	na	na	na	na	1.3	1.1	0.82	na	na
Chlordane[gamma-]	12	10	9.2	22	4.2	2.3	69	2.2	4.3	na	2.2
Chlorobenzene	5500	na	na	na	na	na	150	43	54	2.4	na

Table I-5.3-1 (continued)

COPC	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Chrysene	25	na	na	na	na	na	6.5	2.4	3.1	na	na
DDT[4,4'-]	0.19	1.2	1.2	28	0.72	0.36	12	0.044	0.089	na	4.1
Dibenzo(a,h)anthracene	54	na	na	na	na	na	95	12	22	na	na
Dibenzofuran	na	na	na	na	na	na	na	na	na	na	6.1
Dichlorobenzene[1,2-]	73	na	na	na	na	na	11	0.92	1.5	na	na
Dichlorobenzene[1,4-]	72	na	na	na	na	na	11	0.88	1.5	1.2	na
Dichloroethene[cis/trans-1,2-]	7100	na	na	na	na	na	58	23	25	na	na
Diethylphthalate	650000	na	na	na	na	na	8000	3600	3600	na	100
Di-n-butyl phthalate	5000	0.24	0.068	0.39	0.021	0.011	16000	180	370	na	160
Di-n-octyl phthalate	13	na	na	na	na	na	13000	0.91	1.8	na	na
Fluoranthene	360	na	na	na	na	na	260	22	38	10	na
Fluorene	9300	na	na	na	na	na	1100	250	340	3.7	na
Hexanone[2-]	6500	500	2.6	0.47	0.41	0.36	15	5.4	6.1	na	na
Indeno(1,2,3-cd)pryene	270	na	na	na	na	na	590	62	110	na	na
Methy-2-pentanone[4-]	6600	na	na	na	na	na	15	15	9.8	na	na
Methylene chloride	1700	na	na	na	na	na	3.4	9	2.6	na	1600
Methylnaphthalene[2-]	850	na	na	na	na	na	100	16	24	na	na
Naphthalene	1200	590	100	3.4	5.7	16	12	27	9.7	na	1
Phenanthrene	290	na	na	na	na	na	59	10	15	5.5	na
Pyrene	360	460	190	71	46	34	110	22	32	10	na
Styrene	na	na	na	na	na	na	na	na	na	1.2	3.2
TCDD[2,3,7,8-]	1.20E-06	na	na	na	na	na	4.80E-05	2.90E-07	5.80E-07	5	na
Tetrachloroethene	31	na	na	na	na	na	8.8	0.18	0.36	na	10

Table I-5.3-1 (continued)

COPC	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Toluene	3100	na	na	na	na	na	61	23	25	na	200
Trichloroethene	6400	na	na	na	na	na	170	42	55	na	na
Xylene (total)	130	3200	280	90	56	41	7	1.4	2	na	100
Radionuclides (pCi/g)											
Americium-241	26000	62000	35000	13000	4000	4000	32000	31000	32000	44	21000
Plutonium-238	30000	130000	32000	8300	2100	2000	120000	92000	110000	44	110000
Plutonium-239/240	33000	160000	34000	8600	2100	2100	170000	110000	150000	47	160000
Strontium-90	560	1900	2400	600	930	1500	1300	1700	1700	1200	1300
Tritium	190000	580000	630000	300000	440000	600000	230000	340000	330000	48000	36000
Uranium-234	45000	190000	120000	48000	14000	14000	96000	94000	91000	51	14000
Uranium-235/236	4800	10000	10000	9000	6400	6400	5100	5100	5100	55	4000
Uranium-238	2000	4200	4100	3900	3400	3400	2100	2100	2100	55	1800

*na = Not available.

Table I-5.3-2
Minimum ESL Comparison for SWMU 03-002(c)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.48	0.05	Plant	**9.6**
Lead	37.7	14	American robin (insectivore)	**2.69**
Organic Chemicals (mg/kg)				
Benzo(a)anthracene	0.0199	0.8	American robin (insectivore)	0.025
Benzo(a)pyrene	0.0153	53	Shrew	0.0029
Benzo(g,h,i)perylene	0.0152	24	Shrew	0.00063
Chlordane[gamma-]	0.000983	2.2	Shrew	0.00044
Chrysene	0.0121	2.4	Shrew	0.005
DDT[4,4'-]	0.00308	0.044	Shrew	0.07
Fluoranthene	0.0266	10	Earthworm	0.0027
Phenanthrene	0.0264	5.5	Earthworm	0.0048
Pyrene	0.0298	10	Earthworm	0.003

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-3
HI Analysis for SWMU 03-002(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.48	0.011	na*	na	na	na	na	0.17	**1.85**	**1**	0.0062	**9.6**
Lead	37.7	0.01	0.047	**0.31**	**1.8**	**2.36**	**2.69**	0.1	**0.52**	**0.31**	0.022	**0.31**
	HI	0.02	0.05	0.3	**2**	**2**	**3**	0.3	**2**	1	0.03	**10**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-4
Minimum ESL Comparison for AOC 03-003(d)

COPC	EPC	ESL	Receptor	HQ
Organic Chemicals (mg/kg)				
Aroclor-1254	0.19	0.041	American robin (insectivore)	**4.63**
Aroclor-1260	0.555	0.14	Red fox	**3.96**

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-5
HI Analysis for AOC 03-003(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Aroclor-1254	0.19	**1.27**	**0.86**	**1.12**	0.15	**2.38**	**4.63**	0.004	**0.43**	0.22	na*	0.0012
Aroclor-1260	0.555	**3.96**	0.12	0.15	0.012	**0.33**	**0.63**	0.0002	0.06	0.028	na	na
HI		**5**	1	1	0.2	**3**	**5**	0.004	0.5	0.2	na	0.001

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-6
Minimum ESL Comparison for SWMU 03-009(a)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.18	0.05	Plant	**3.6**
Chromium	16.7	28	American robin (insectivore)	**0.6**
Selenium	0.43	0.52	Plant	**0.83**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0272	0.25	Plant	0.11
Anthracene	0.0639	6.8	Plant	0.01
Aroclor-1260	0.0069	0.14	Red fox	0.049
Benzo(a)anthracene	0.179	0.8	American robin (insectivore)	0.22
Benzo(a)pyrene	0.166	53	Montane shrew	0.0031
Benzo(b)fluoranthene	0.27	18	Plant	0.015
Benzo(g,h,i)perylene	0.0996	24	Shrew	0.0042
Chrysene	0.16	2.4	Shrew	0.067
Fluoranthene	0.437	10	Earthworm	0.044
Fluorene	0.0329	3.7	Earthworm	0.0089
Indeno(1,2,3-cd)pyrene	0.0928	62	Montane shrew	0.0015
Mathylene chloride	0.023	2.6	Deer mouse	0.0088
Phenanthrene	0.279	5.5	Earthworm	0.051
Pyrene	0.373	10	Earthworm	0.037

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-7
HI Analysis for SWMU 03-009(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.18	0.004	na*	na	na	na	na	0.062	**0.69**	**0.38**	0.0023	**4**
Chromium	16.7	0.0093	0.014	0.064	0.25	**0.42**	**0.6**	0.02	**0.37**	0.15	na	na
Selenium	0.43	0.0051	0.0044	0.077	**0.43**	**0.49**	**0.57**	0.2	**0.65**	**0.52**	0.1	**0.83**
	HI	0.02	0.02	0.1	0.7	0.9	1	0.3	**2**	1	0.1	**4**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-8
Minimum ESL Comparison for SWMU 03-009(i)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	2.44	0.05	Plant	**48.8**
Barium	97.6	110	Plant	**0.89**
Chromium	9.26	28	American robin (insectivore)	**0.33**
Cobalt	4.09	13	Plant	**0.31**
Copper	7.3	15	American robin (insectivore)	**0.49**
Cyanide	0.63	0.1	American robin (insectivore)	**6.31**
Lead	11.3	14	American robin (insectivore)	**0.81**
Nickel	7.25	9.7	Montane shrew	**0.75**
Selenium	1.07(U)	0.52	Plant	**2.06**
Vanadium	19.2	0.025	Plant	**770**
Organic Chemicals (mg/kg)				
Anthracene	0.0367	6.8	Plant	0.0054
Aroclor-1254	0.0297	0.041	American robin (insectivore)	**0.72**
Aroclor-1260	0.0589	0.14	Red fox	**0.42**
Fluoranthene	0.0526	10	Earthworm	0.0053
Hexanone[2-]	0.00228	0.36	American robin (insectivore)	0.0063
Pyrene	0.0536	10	Earthworm	0.0054

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-9
HI Analysis for SWMU 03-009(i)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	2.44	0.054	na*	na	na	na	na	**0.84**	**9.38**	**5.08**	0.031	**49**
Barium	97.6	0.0024	0.0026	0.009	0.12	0.1	0.1	0.03	0.08	0.054	0.3	**0.89**
Chromium	9.26	0.0051	0.0077	0.036	0.14	0.23	**0.33**	0.011	0.21	0.084	na	na
Cobalt	4.09	0.00076	0.0012	0.0044	0.024	0.034	0.043	0.0023	0.026	0.01	na	**0.31**
Copper	7.3	0.0019	0.0046	0.066	0.19	**0.33**	**0.49**	0.027	0.19	0.11	0.091	0.1
Cyanide	0.63	0.00029	**1.09**	**1.34**	**6.3**	**6.3**	**6.3**	0.00085	0.002	0.0019	na	na
Lead	11.3	0.003	0.014	0.094	**0.54**	**0.7**	**0.81**	0.03	0.16	0.094	0.007	0.094
Nickel	7.25	0.006	0.0025	0.045	0.045	0.19	**0.35**	0.015	**0.75**	**0.36**	0.026	0.19
Selenium	1.07(U)	0.013	0.011	0.19	**1.07**	**1.23**	**1.43**	**0.51**	**1.62**	**1.29**	0.26	**2.06**
Vanadium	19.2	0.0058	0.11	0.23	**2.16**	**2.53**	**2.87**	0.013	0.14	0.04	na	**770**
Aroclor-1254	0.0297	0.2	0.14	0.17	0.023	**0.37**	**0.72**	0.001	0.068	0.034	na	0.00019
Aroclor-1260	0.0589	**0.42**	0.013	0.016	0.001	0.035	0.067	0.00002	0.0059	0.0029	na	na
	HI	0.7	1	**2**	**11**	**12**	**14**	1	**13**	**7**	0.7	**822**

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 I-5.3-10
Minimum ESL Comparison for SWMU 03-012(b)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	5.57(U)	0.05	Plant	**111.4**
Chromium	20.8	28	American robin (insectivore)	**0.74**
Chromium hexavalent ion	0.241	0.34	Earthworm	**0.71**
Silver	0.807	2.6	American robin (insectivore)	**0.31**
Zinc	51	48	American robin (insectivore)	**1.06**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.336	0.041	American robin (insectivore)	**8.2**
Aroclor-1260	0.925	0.14	Red fox	**6.61**

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-11
HI Analysis for SWMU 03-012(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	5.57(U)	0.12	na*	na	na	na	na	**1.92**	**21.42**	**11.6**	0.07	**111**
Chromium	20.84	0.012	0.017	0.08	**0.31**	**0.52**	**0.74**	0.025	**0.46**	0.19	na	na
Chromium hexavalent ion	0.241	0.000033	0.000045	0.00011	0.00086	0.0011	0.0013	0.0000075	0.00086	0.00028	**0.71**	**0.69**
Silver	0.807	0.0002	0.001	0.042	0.073	0.19	**0.31**	0.0054	0.058	0.034	na	0.0014
Zinc	50.98	0.0085	0.021	0.16	0.15	**0.6**	**1.06**	0.028	**0.52**	0.3	**0.42**	**0.32**
Aroclor-1254	0.336	**2.24**	**1.53**	**1.98**	0.26	**4.2**	**8.2**	0.0065	**0.76**	**0.38**	na	0.0021
Aroclor-1260	0.925	**6.61**	0.2	0.25	0.02	**0.54**	**1.05**	0.0003	0.093	0.046	na	na
HI		**9**	**2**	**3**	0.8	**6**	**11**	**2**	**23**	**13**	1	**112**

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 I-5.3-12
Minimum ESL Comparison for SWMU 03-013(i)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.31	0.05	Plant	**26.2**
Copper	9.49	15	American robin (insectivore)	**0.63**
Lead	73.4	14	American robin (insectivore)	**5.24**
Selenium	0.874	0.52	Plant	**1.68**
Zinc	109.8	48	American robin (insectivore)	**2.29**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0275	0.25	Plant	0.11
Acenaphthylene	0.0421	120	Montane shrew	0.00035
Acetone	0.376	1.2	Deer mouse	**0.31**
Anthracene	0.0343	6.8	Plant	0.005
Aroclor-1242	0.0297	0.041	American robin (insectivore)	**0.72**
Aroclor-1254	0.339	0.041	American robin (insectivore)	**8.27**
Aroclor-1260	0.153	0.14	Red fox	**1.09**
Benzo(a)anthracene	0.0554	0.8	American robin (insectivore)	0.069
Benzo(a)pyrene	0.0623	53	Montane shrew	0.0012
Benzo(b)fluoranthene	0.0804	18	Plant	0.0045
Benzo(g,h,i)perylene	0.0463	24	Montane shrew	0.0019
Benzo(k)fluoranthene	0.0351	62	Montane shrew	0.00057
Benzoic Acid	0.689	1	Deer mouse	**0.69**
Bis(2-ethylhexyl)phthalate	0.269	0.02	American robin (insectivore)	**13.45**
Butanone[2-]	0.0174	360	Deer mouse	0.000048
Chrysene	0.0629	2.4	Montane shrew	0.026
Dibenz(a,h)anthracene	0.0668	12	Montane shrew	0.0056
Dibenzofuran	0.0797	6.1	Plant	0.013
Fluoranthene	0.164	10	Earthworm	0.016
Fluorene	0.0247	3.7	Earthworm	0.0067
Indeno(1,2,3-cd)pyrene	0.0436	62	Montane shrew	0.0007
Methylene chloride	0.0027	2.6	Deer mouse	0.001
Methylnaphthalene[2-]	0.0783	16	Shrew	0.0049
Naphthalene	0.192	1	Plant	0.19
Phenanthrene	0.143	5.5	Earthworm	0.026
Pyrene	0.168	10	Earthworm	0.017
Toluene	0.00147	23	Montane shrew	0.000064

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-13
HI Analysis for SWMU 03-013(i)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.31	0.029	na*	na	na	na	na	**0.45**	**5.04**	**2.73**	0.017	**26.2**
Copper	9.492	0.0025	0.0059	0.086	0.25	**0.43**	**0.63**	0.035	0.25	0.15	0.12	0.14
Lead	73.35	0.02	0.091	**0.61**	**3.49**	**4.58**	**5.24**	0.2	**1.02**	**0.61**	0.043	**0.61**
Selenium	0.874	0.01	0.009	0.16	**0.87**	**1**	**1.17**	**0.42**	**1.32**	**1.05**	0.21	**1.68**
Zinc	109.8	0.018	0.046	**0.34**	**0.31**	**1.29**	**2.29**	0.061	**1.12**	**0.65**	**0.92**	**0.69**
Acetone	0.376	0.00013	0.000013	0.00031	0.05	0.027	0.0022	0.27	0.025	**0.31**	na	na
Aroclor-1242	0.0297	0.0019	0.021	0.11	0.03	**0.38**	**0.72**	0.00099	0.078	0.039	na	na
Aroclor-1254	0.339	**2.26**	**1.54**	**1.99**	0.26	**4.24**	**8.27**	0.0065	**0.77**	**0.39**	na	0.0021
Aroclor-1260	0.15	**1.09**	0.033	0.041	0.0033	0.09	0.17	0.000051	0.015	0.0077	na	na
Benzoic acid	0.69	0.002	na	na	na	na	na	0.16	**0.69**	**0.53**	na	na
Bis(2-ethylhexyl)phthalate	0.27	0.22	**8.15**	**5.98**	0.013	**6.73**	**13.45**	0.0001	**0.46**	0.24	na	na
HI		**4**	**10**	**9**	**5**	**19**	**32**	**2**	**11**	**7**	1	**29**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-14
Minimum ESL Comparison for AOC 03-014(b2)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.29(U)	0.05	Plant	**25.8**
Chromium	14.9	28	American robin (insectivore)	**0.53**
Cyanide	1.61	0.1	American robin (insectivore)	**16.1**
Lead	18.2	14	American robin (insectivore)	**1.3**
Selenium	1.29(U)	0.52	Plant	**2.48**
Zinc	52.6	48	American robin (insectivore)	**1.1**
Organic Chemicals (mg/kg)				
Acetone	0.014	1.2	Deer mouse	0.012
Aroclor-1254	0.0693	0.041	American robin (insectivore)	**1.69**
Aroclor-1260	0.0514	0.14	Red fox	**0.37**
Benzo(a)pyrene	0.0191	53	Shrew	0.00036
Benzo(b)fluoranthene	0.0224	18	Plant	0.0012
Benzo(k)fluoranthene	0.0155	62	Montane shrew	0.00025
Bis(2-ethylhexyl)phthalate	0.1	0.02	American robin (insectivore)	**5**
Chrysene	0.0188	2.4	Montane shrew	0.0078
Fluoranthene	0.037	10	Earthworm	0.0037
Phenanthrene	0.0186	5.5	Earthworm	0.0034
Pyrene	0.0329	10	Earthworm	0.0033

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-15
HI Analysis for AOC 03-014(b2)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.29(U)	0.029	na*	na	na	na	na	**0.44**	**4.96**	**2.69**	0.017	**25.8**
Chromium	14.9	0.0083	0.012	0.057	0.22	**0.37**	**0.53**	0.018	**0.33**	0.14	na	na
Cyanide	1.61	0.00073	**2.78**	**3.43**	**16.1**	**16.1**	**16.1**	0.0022	0.0052	0.0047	na	na
Lead	18.16	0.0049	0.022	0.15	**0.86**	**1.14**	**1.30**	0.049	0.25	0.15	0.011	0.15
Selenium	1.29(U)	0.015	0.013	0.23	**1.29**	**1.48**	**1.72**	**0.61**	**1.95**	**1.55**	**0.31**	**2.48**
Zinc	52.56	0.0088	0.022	0.16	0.15	**0.62**	**1.10**	0.029	**0.54**	**0.31**	**0.44**	**0.33**
Aroclor-1254	0.0693	**0.46**	**0.32**	**0.41**	0.053	**0.87**	**1.69**	0.0013	0.16	0.079	na	0.00043
Aroclor-1260	0.05	**0.37**	0.011	0.014	0.0011	0.03	0.058	0.000017	0.0051	0.0026	na	na
Bis(2-ethylhexyl)phthalate	0.10	0.083	**3.03**	**2.22**	0.005	**2.5**	**5**	0.000037	0.17	0.091	na	na
	HI	1	**6**	**7**	**19**	**23**	**27**	1	**8**	**5**	0.8	**29**

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 I-5.3-16
Minimum ESL Comparison for AOC 03-014(c2)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.11(U)	0.05	Plant	**22.2**
Chromium	17.4	28	American robin (insectivore)	**0.62**
Copper	17.23	15	American robin (insectivore)	**1.15**
Cyanide	11.3	0.1	American robin (insectivore)	**112.8**
Mercury	0.543	0.013	American robin (insectivore)	**41.77**
Selenium	1.14(U)	0.52	Plant	**2.19**
Silver	6.06	2.6	American robin (insectivore)	**2.33**
Zinc	55.4	48	American robin (insectivore)	**1.15**
Organic Chemicals (mg/kg)				
Acetone	0.0511	1.2	Deer mouse	0.043
Anthracene	0.0353	6.8	Plant	0.0052
Aroclor-1248	0.0141	0.0072	Montane shrew	**1.96**
Aroclor-1254	2.537	0.041	American robin (insectivore)	**61.9**
Aroclor-1260	2.239	0.14	Red fox	**16**
Benzo(a)anthracene	0.146	0.8	American robin (insectivore)	0.18
Benzo(a)pyrene	0.173	53	Montane shrew	0.0033
Benzo(b)fluoranthene	0.0666	18	Plant	0.0037
Benzo(g,h,i)perylene	0.0358	24	Montane shrew	0.0015
Benzo(k)fluoranthene	0.0889	62	Montane shrew	0.0014
Chrysene	0.0521	2.4	Montane shrew	0.022
Fluoranthene	0.0854	10	Earthworm	0.0085
Indeno(1,2,3-cd)pyrene	0.0587	62	Montane shrew	0.00095
Phenanthrene	0.05	5.5	Earthworm	0.0091
Pyrene	0.0952	10	Earthworm	0.01
Toluene	0.00156	23	Montane shrew	0.000068
Radionuclides (pCi/g)				
Americium-241	0.0498	44	Earthworm	0.0011

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-17
HI Analysis for AOC 03-014(c2)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.11(U)	0.025	na*	na	na	na	na	**0.38**	**4.27**	**2.31**	0.014	**22.2**
Chromium	17.38	0.0097	0.014	0.067	0.26	**0.43**	**0.62**	0.021	**0.39**	0.16	na	na
Copper	17.23	0.0045	0.011	0.16	**0.45**	**0.78**	**1.15**	0.064	**0.45**	0.27	0.22	0.25
Cyanide	11.28	0.0051	**19.45**	**24**	**112.8**	**112.8**	**112.8**	0.015	0.036	0.033	na	na
Mercury	0.543	0.012	**1.94**	**6.62**	**7.76**	**24.68**	**41.77**	0.025	**0.32**	0.18	**10.86**	0.016
Selenium	1.14(U)	0.014	0.012	0.2	**1.14**	**1.31**	**1.52**	**0.54**	**1.73**	**1.37**	0.28	**2.19**
Silver	6.064	0.0015	0.0072	**0.32**	**0.55**	**1.41**	**2.33**	0.04	**0.43**	0.25	na	0.011
Zinc	55.41	0.0092	0.023	0.17	0.16	**0.65**	**1.15**	0.031	**0.57**	**0.33**	**0.46**	**0.35**
Aroclor-1248	0.0141	0.19	0.041	0.071	0.014	**0.18**	**0.34**	0.024	**1.96**	**1.01**	na	na
Aroclor-1254	2.54	**16.91**	**11.53**	**14.92**	**1.95**	**31.71**	**61.88**	0.049	**5.77**	**2.88**	na	0.016
Aroclor-1260	2.24	**15.99**	**0.49**	**0.61**	0.049	**1.32**	**2.54**	0.00075	0.22	0.11	na	na
	HI	**33**	**34**	**47**	**125**	**175**	**226**	1	**16**	**9**	**12**	**25**

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 I-5.3-18
Minimum ESL Comparison for SWMU 03-014(k,l,m,n)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	8.3	0.05	Plant	**166**
Cadmium	1.89	0.27	Montane Shrew	**7**
Chromium	20.7	28	American robin (insectivore)	**0.74**
Copper	52.1	15	American robin (insectivore)	**3.47**
Cyanide	2.47	0.1	American robin (insectivore)	**24.7**
Lead	60.5	14	American robin (insectivore)	**4.32**
Mercury	0.355	0.013	American robin (insectivore)	**27.3**
Nickel	8.36	9.7	Montane shrew	**0.86**
Selenium	0.96	0.52	Plant	**1.85**
Silver	4.97	2.6	American robin (insectivore)	**1.91**
Zinc	175	48	American robin (insectivore)	**3.65**
Organic Chemicals (mg/kg)				
Acenaphthene	2.3	0.25	Plant	**9.2**
Acetone	2.2	1.2	Deer mouse	**1.83**
Anthracene	3.9	6.8	Plant	**0.57**
Aroclor-1254	1.06	0.041	American robin (insectivore)	**25.85**
Aroclor-1260	0.0439	0.14	Red fox	**0.31**
Benzo(a)anthracene	11	0.8	American robin (insectivore)	**13.75**
Benzo(a)pyrene	1.39	53	Montane shrew	0.026
Benzo(b)fluoranthene	2.46	18	Plant	0.14
Benzo(g,h,i)perylene	5.6	24	Montane shrew	0.23
Bis(2-ethylhexyl)phthalate	44	0.02	American robin (insectivore)	**2200**
Butylbenzylphthalate	30	90	Montane shrew	**0.33**
Carbon disulfide	0.00978	0.82	Deer mouse	0.012
Chrysene	1.56	2.4	Montane shrew	**0.65**
Dibenz(a,h)anthracene	1.1	12	Montane shrew	0.092
Dibenzofuran	1.2	6.1	Plant	0.2
Dichlorobenzene[1,4-]	1.4	0.88	Montane shrew	**1.59**
Fluoranthene	3.93	10	Earthworm	**0.39**
Fluorene	2	3.7	Earthworm	**0.54**
Hexanone[2-]	0.02	0.36	American robin (insectivore)	0.056
Indeno(1,2,3-cd)pyrene	4.6	62	Montane shrew	0.074
Naphthalene	0.94	1	Plant	**0.94**
Phenanthrene	22	5.5	Earthworm	**4**
Pyrene	5.24	10	Earthworm	**0.52**
Toluene	0.004	23	Montane shrew	0.00017
Radionuclides (pCi/g)				
Tritium	0.0276	36000	Plant	7.67E-07
Uranium-234	1.44	51	Earthworm	0.028
Uranium-235	0.0438	55	Earthworm	0.0008
Uranium-238	0.806	55	Earthworm	0.015

Note: Bolded values indicate HQ greater than 0.3..

Table I-5.3-19
HI Analysis for SWMU 03-014(k,l,m,n)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	8.3	0.18	na	na	na	na	na	2.86	**31.92**	**17.29**	0.11	**166**
Cadmium	1.89	0.0037	0.0033	**0.95**	**0.43**	**3.5**	**6.52**	0.19	**7**	**3.7**	0.014	0.059
Chromium	20.7	0.012	0.017	0.08	0.3	**0.52**	**0.74**	0.025	**0.46**	0.19	na	na
Copper	52.1	0.014	0.033	0.47	**1.37**	**2.37**	**3.47**	0.19	**1.37**	**0.81**	**0.65**	**0.74**
Cyanide	2.47	0.0011	**4.26**	**5.26**	**24.7**	**24.7**	**24.7**	0.0033	0.008	0.0073	na	na
Lead	60.5	0.016	0.075	**0.50**	**2.88**	**3.78**	**4.32**	0.16	**0.84**	**0.5**	0.036	**0.5**
Mercury	0.355	0.0077	**1.27**	**4.33**	**5.07**	**16.14**	**27.31**	0.016	0.21	0.12	**7.1**	0.01
Nickel	8.36	0.007	0.0029	0.052	0.052	0.22	**0.4**	0.017	**0.86**	**0.42**	0.03	0.22
Selenium	0.96	0.011	0.0099	0.17	**0.96**	**1.1**	**1.28**	**0.46**	**1.45**	**1.16**	0.23	**1.85**
Silver	4.97	0.0012	0.0059	**0.26**	**0.45**	**1.16**	**1.91**	0.033	**0.36**	0.21	na	0.0089
Zinc	175	0.029	0.073	0.547	**0.5**	**2.06**	**3.65**	0.097	**1.79**	**1.03**	**1.46**	**1.09**
Acenaphthene	2.3	0.00037	na	na	na	na	na	0.0047	0.019	0.014	na	**9.2**
Acetone	2.2	0.00076	0.000073	0.0018	0.29	0.16	0.013	**1.57**	0.15	**1.83**	na	na
Anthracene	3.9	0.00067	na	na	na	na	na	0.0035	0.019	0.013	na	**0.57**
Aroclor-1254	1.06	**7.07**	**4.82**	6.24	**0.82**	**13.25**	**25.85**	0.02	**2.41**	**1.2**	na	0.0066
Aroclor-1260	0.043	**0.31**	0.0093	0.0116	0.00093	0.025	0.049	0.000014	0.0043	0.0022	na	na
Benzo(a)anthracene	11	**0.34**	**1.12**	**1.59**	**13.75**	**12.09**	**11**	**1.77**	**3.67**	**3.24**	na	**0.61**
Bis(2-ethylhexyl)phthalate	44	**36.67**	**1333**	**978**	**2.2**	**1100**	**2200**	0.016	**74.58**	**40**	na	na
Butylbenzylphthalate	30	0.016	na	na	na	na	na	0.013	**0.33**	0.19	na	na
Chrysene	1.56	0.062	na	na	na	na	na	0.24	**0.65**	**0.5**	na	na
Dichlorobenzene[1,4-]	1.4	0.019	na	na	na	na	na	0.13	**1.59**	**0.93**	**1.17**	na
Fluoranthene	3.93	0.011	na	na	na	na	na	0.015	0.18	0.1	**0.39**	na

Table I-5.3-19 (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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Fluorene	2	0.00022	na	na	na	na	na	0.0018	0.008	0.0059	**0.54**	na
Naphthalene	0.94	0.00078	0.0016	0.01	0.28	0.16	0.059	0.078	0.035	0.1	na	**0.94**
Phenanthrene	22	0.076	na	na	na	na	na	**0.37**	**2.2**	**1.47**	**4**	na
Pyrene	5.24	0.015	0.011	0.03	0.07	0.11	0.15	0.05	0.24	0.16	**0.52**	na
	HI	**45**	**1345**	**998**	**54**	**1181**	**2311**	**8**	**132**	**75**	**16**	**182**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.3-20
Minimum ESL Comparison for SWMU 03-014(o)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	5.38(U)	0.05	Plant	**107.6**
Chromium	39.3	28	American robin (insectivore)	**1.4**
Copper	34.1	0.1	American robin (insectivore)	**2.27**
Cyanide	1.14	0.1	American robin (insectivore)	**11.44**
Lead	10.3	14	American robin (insectivore)	**0.74**
Mercury	0.989	0.013	American robin (insectivore)	**76.1**
Selenium	0.34	0.52	Plant	**0.65**
Silver	18	2.6	American robin (insectivore)	**6.94**
Zinc	47.5	48	American robin (insectivore)	**0.99**
Organic Chemicals (mg/kg)				
Acenaphthylene	0.036	120	Montane shrew	0.0003
Acetone	0.002	1.2	Deer mouse	0.0017
Anthracene	0.057	6.8	Plant	0.0084
Aroclor-1242	0.0918	0.041	American robin (insectivore)	**2.24**
Aroclor-1254	0.136	0.041	American robin (insectivore)	**3.32**
Aroclor-1260	0.344	0.14	Red fox	**2.46**
Benzo(a)anthracene	0.48	0.8	American robin (insectivore)	**0.6**
Benzo(a)pyrene	0.65	53	Montane shrew	0.012
Benzo(b)fluoranthene	1.2	18	Plant	0.067
Benzo(g,h,i)perylene	0.29	24	Montane shrew	0.012
Benzo(k)fluoranthene	0.46	62	Montane shrew	0.0074
Benzoic acid	0.12	1	Deer mouse	0.12
Bis(2-ethylhexyl)phthalate	0.0746	0.02	American robin (insectivore)	**3.73**
Carbazole	0.037	80	Deer mouse	0.00046
Chrysene	0.69	2.4	Montane shrew	0.29
Dibenz(a,h)anthracene	0.084	12	Montane shrew	0.007
Fluoranthene	0.81	10	Earthworm	0.081
Indeno(1,2,3-cd)pyrene	0.31	62	Montane shrew	0.005
Methylene chloride	0.00325	2.6	Deer mouse	0.0013
Phenanthrene	0.29	5.5	Earthworm	0.053
Pyrene	0.74	10	Earthworm	0.074
Radionuclides (pCi/g)				
Plutonium-239	0.186	47	Earthworm	0.004
Strontium-90	8.01	560	Red fox	0.014
Tritium	0.01997	36000	Plant	0.00000055
Uranium-234	1.84	51	Earthworm	0.036

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-21
HI Analysis for SWMU 03-014(o)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	5.38(U)	0.12	na*	na	na	na	na	**1.86**	**20.69**	**11.21**	0.069	**107.6**
Chromium	39.3	0.022	0.033	0.15	**0.58**	**0.98**	**1.4**	0.047	**0.87**	**0.36**	na	na
Copper	34.1	0.009	0.021	**0.31**	**0.9**	**1.55**	**2.27**	0.13	**0.9**	**0.53**	**0.43**	**0.49**
Cyanide	1.14	0.00052	**1.97**	**2.43**	**11.4**	**11.4**	**11.4**	0.002	0.0037	0.0034	na	na
Lead	10.3	0.0028	0.013	0.086	**0.49**	**0.65**	**0.74**	0.028	0.14	0.09	0.0061	0.086
Mercury	0.989	0.022	**3.53**	**12.06**	**14.13**	**44.95**	**76.1**	0.045	**0.58**	**0.33**	**19.78**	0.029
Selenium	0.34	0.004	0.0035	0.061	**0.34**	**0.39**	**0.45**	0.16	**0.52**	**0.41**	0.083	**0.65**
Silver	18	0.0044	0.021	**0.95**	**1.64**	**4.2**	**6.94**	0.12	**1.29**	**0.75**	na	0.032
Zinc	47.5	0.0079	0.02	0.15	0.14	**0.56**	**0.99**	0.026	**0.48**	0.28	**0.4**	0.3
Aroclor-1242	0.0918	0.0057	0.066	**0.35**	0.092	**1.16**	**2.24**	0.0031	0.24	0.12	na	na
Aroclor-1254	0.136	**0.91**	**0.62**	**0.8**	0.1	**1.7**	**3.32**	0.0026	**0.31**	0.15	na	0.00085
Aroclor-1260	0.344	**2.46**	0.075	0.093	0.0075	0.2	**0.39**	0.00011	0.034	0.017	na	na
Benzo(a)anthracene	0.48	0.015	0.049	0.07	**0.6**	**0.53**	**0.48**	0.077	0.16	0.14	na	0.027
Bis(2-ethylhexyl)phthalate	0.0746	0.062	**2.26**	**1.66**	0.0037	**1.87**	**3.73**	0.000028	0.13	0.068	na	na
	HI	**4**	**9**	**19**	**30**	**70**	**110**	**2**	**26**	**14**	**21**	**109**

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 I-5.3-22
Minimum ESL Comparison for SWMU 03-014(u)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.21(U)	0.05	Plant	**24.2**
Chromium	64.6	28	American robin (insectivore)	**2.31**
Copper	85.1	15	American robin (insectivore)	**5.67**
Cyanide	27.7	0.1	American robin (insectivore)	**277**
Lead	50.3	14	American robin (insectivore)	**3.59**
Mercury	0.76	0.013	American robin (insectivore)	**58.46**
Selenium	1.21(U)	0.52	Plant	**2.33**
Silver	24.9	2.6	American robin (insectivore)	**9.58**
Zinc	63.7	48	American robin (insectivore)	**1.33**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0377	0.25	Plant	0.15
Anthracene	0.01	6.8	Plant	0.0015
Aroclor-1254	0.254	0.041	American robin (insectivore)	**6.2**
Aroclor-1260	0.199	0.14	Red fox	**1.42**
Benzo(a)anthracene	0.0335	0.8	American robin (insectivore)	0.042
Benzo(a)pyrene	0.0417	53	Montane shrew	0.00079
Benzo(b)fluoranthene	0.0817	18	Plant	0.0045
Benzo(g,h,i)perylene	0.0396	24	Montane shrew	0.0017
Bis(2-ethylhexyl)phthalate	0.341	0.02	American robin (insectivore)	**17.1**
Chrysene	0.0448	2.4	Montane shrew	0.019
Dibenz(a,h)anthracene	0.0276	12	Montane shrew	0.0023
Diethylphthalate	0.0916	100	Plant	0.00092
Fluoranthene	0.0596	10	Earthworm	0.006
Indeno(1,2,3-cd)pyrene	0.0357	62	Montane shrew	0.00058
Methylene chloride	0.0035	2.6	Deer mouse	0.0013
Phenanthrene	0.0337	5.5	Earthworm	0.0061
Pyrene	0.0602	10	Earthworm	0.006
Radionuclides (pCi/g)				
Plutonium-238	0.0285	44	Earthworm	0.00065

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-23
HI Analysis for SWMU 03-014(u)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	0.027	na*	na	na	na	na	**0.42**	**4.65**	**2.52**	0.02	**24.2**
Chromium	64.59	0.036	0.054	0.25	**0.95**	**1.61**	**2.31**	0.077	**1.44**	**0.59**	na	na
Copper	85.11	0.022	0.053	**0.77**	**2.24**	**3.87**	**5.67**	**0.32**	**2.24**	**1.33**	**1.06**	**1.22**
Cyanide	27.7	0.013	**47.76**	**58.94**	**277**	**277**	**277**	0.037	0.089	0.081	na	na
Lead	50.27	0.014	0.062	**0.42**	**2.39**	**3.14**	**3.59**	0.14	**0.7**	**0.42**	0.03	**0.42**
Mercury	0.76	0.017	**2.71**	**9.27**	**10.86**	**34.55**	**58.46**	0.035	**0.45**	0.25	**15.2**	0.022
Selenium	1.21(U)	0.014	0.012	0.22	**1.21**	**1.39**	**1.61**	**0.58**	**1.83**	**1.46**	0.3	**2.33**
Silver	24.92	0.0061	0.03	**1.31**	**2.27**	**5.8**	**9.58**	0.17	**1.78**	**1.04**	na	0.045
Zinc	63.73	0.011	0.027	0.2	0.18	**0.75**	**1.33**	0.035	**0.65**	**0.37**	**0.53**	**0.4**
Aroclor-1254	0.254	**1.69**	**1.15**	**1.49**	0.2	**3.18**	**6.2**	0.0049	**0.58**	0.29	na	0.0016
Aroclor-1260	0.199	**1.42**	0.043	0.054	0.0043	0.12	0.23	0.000066	0.02	0.01	na	na
Bis(2-ethylhexyl)phthalate	0.341	0.28	**10.33**	**7.58**	0.017	**8.53**	**17.1**	0.00013	**0.58**	**0.31**	na	na
	HI	**4**	**62**	**80**	**297**	**340**	**383**	**2**	**15**	**9**	**17**	**29**

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 I-5.3-24
Minimum ESL Comparison for SWMU 03-015 and AOC 03-053

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	7.39	0.05	Plant	**147.8**
Barium	116.1	110	Plant	**1.06**
Chromium	30.7	28	American robin (insectivore)	**1.1**
Copper	11.2	0.1	American robin (insectivore)	**0.74**
Lead	94.5	14	American robin (insectivore)	**6.75**
Mercury	0.125	0.013	American robin (insectivore)	**9.62**
Selenium	1.35(UJ)	0.52	Plant	**2.6**
Silver	0.591	2.6	American robin (insectivore)	0.23
Zinc	70.3	48	American robin (insectivore)	**1.46**
Organic Chemicals (mg/kg)				
Acenaphthene	0.145	0.25	Plant	**0.58**
Acetone	0.00479	1.2	Deer mouse	0.004
Anthracene	0.242	6.8	Plant	0.036
Aroclor-1254	1.28	0.041	American robin (insectivore)	**31.22**
Aroclor-1260	0.138	0.14	Red fox	**0.99**
Benzo(a)anthracene	1.17	0.8	American robin (insectivore)	**1.47**
Benzo(a)pyrene	0.636	53	Montane shrew	0.012
Benzo(b)fluoranthene	2.15	18	Plant	0.12
Benzo(g,h,i)perylene	0.7	24	Montane shrew	0.029
Benzo(k)fluoranthene	0.11	62	Montane shrew	0.0018
Chrysene	1.28	2.4	Montane shrew	**0.53**
Fluoranthene	1.83	10	Earthworm	0.18
Fluorene	0.136	3.7	Earthworm	0.037
Indeno(1,2,3-cd)pyrene	0.32	62	Montane shrew	0.0052
Methylnaphthalene[2-]	0.111	16	Montane shrew	0.0069
Naphthalene	0.101	1	Plant	0.1
Phenanthrene	1.22	5.5	Earthworm	0.22
Pyrene	1.55	10	Earthworm	0.16
Radionuclides (pCi/g)				
Uranium-238	1.18	55	Earthworm	0.021

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-25
HI Analysis for SWMU 03-015 and AOC 03-053

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.39	0.16	na*	na	na	na	na	**2.55**	**28.42**	**15.4**	0.095	**147.8**
Barium	116.1	0.0028	0.0031	0.011	0.14	0.12	0.12	0.035	0.089	0.065	**0.35**	**1.06**
Chromium	30.7	0.017	0.026	0.12	**0.45**	**0.77**	**1.1**	0.037	**0.68**	0.28	na	na
Copper	11.2	0.0029	0.007	0.1	0.29	**0.51**	**0.74**	0.041	0.29	0.17	0.14	0.16
Lead	94.5	0.026	0.12	**0.79**	**4.5**	**5.91**	**6.75**	0.26	**1.31**	**0.79**	0.056	**0.79**
Mercury	0.125	0.0027	**0.45**	**1.52**	**1.79**	**5.68**	**9.62**	0.0057	0.074	0.042	**2.5**	0.0037
Selenium	1.35(UJ)	0.016	0.014	0.24	**1.35**	**1.55**	**1.8**	**0.64**	**2.05**	**1.63**	**0.33**	**2.6**
Zinc	70.3	0.012	0.029	0.22	0.2	**0.83**	**1.46**	0.039	**0.72**	**0.41**	**0.59**	**0.44**
Acenaphthene	0.145	0.000023	na	na	na	na	na	0.0003	0.0012	0.00091	na	**0.58**
Aroclor-1254	1.28	**8.53**	**5.82**	**7.53**	**0.98**	**16**	**31.22**	0.025	**2.91**	**1.45**	na	0.008
Aroclor-1260	0.138	**0.99**	0.03	0.037	0.003	0.081	0.16	0.000046	0.014	0.0069	na	na
Benzo(a)anthracene	1.17	0.037	0.12	0.17	**1.47**	**1.29**	**1.17**	0.19	**0.39**	**0.35**	na	0.065
Chrysene	1.28	0.051	na	na	na	na	na	0.2	**0.53**	**0.41**	na	na
	HI	**10**	**7**	**11**	**11**	**33**	**54**	**4**	**37**	**21**	**4**	**153**

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 I-5.3-26
Minimum ESL Comparison for SWMU 03-021

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.732	0.05	Plant	**14.6**
Barium	79	110	Plant	**0.72**
Chromium	24.8	28	American robin (insectivore)	**0.89**
Lead	63.1	14	American robin (insectivore)	**4.51**
Nickel	8.38	9.7	Montane shrew	**0.86**
Selenium	0.786	0.52	Plant	**1.51**
Thallium	0.597	0.032	Montane shrew	**18.66**
Zinc	61.6	48	American robin (insectivore)	**1.28**
Organic Chemicals (mg/kg)				
Acetone	0.0144	1.2	Deer mouse	0.012
Anthracene	0.0154	6.8	Plant	0.0023
Aroclor-1254	0.018	0.041	American robin (insectivore)	**0.44**
Aroclor-1260	0.0152	0.14	Red fox	0.11
Benzo(a)anthracene	0.044	0.8	American robin (insectivore)	0.055
Benzo(a)pyrene	0.0276	53	Montane shrew	0.00052
Benzo(b)fluoranthene	0.0431	18	Plant	0.0024
Benzo(k)fluoranthene	0.0183	62	Montane shrew	0.0003
Chrysene	0.0421	2.4	Montane shrew	0.018
Fluoranthene	0.13	10	Earthworm	0.013
Phenanthrene	0.0806	5.5	Earthworm	0.015
Pyrene	0.125	10	Earthworm	0.013

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-27
HI Analysis for SWMU 03-021

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.732	0.016	na*	na	na	na	na	0.25	**2.82**	**1.53**	0.0094	**14.6**
Barium	79	0.0019	0.0021	0.0072	0.1	0.085	0.079	0.024	0.061	0.044	0.24	**0.72**
Chromium	24.8	0.014	0.021	0.095	**0.36**	**0.62**	**0.89**	0.03	**0.55**	0.23	na	na
Lead	63.1	0.017	0.078	**0.53**	**3.01**	**3.95**	**4.51**	0.17	**0.88**	**0.53**	0.037	**0.53**
Nickel	8.38	0.007	0.0029	0.052	0.052	0.22	**0.4**	0.017	**0.86**	**0.42**	0.03	0.22
Selenium	0.786	0.0094	0.0081	0.14	**0.79**	**0.9**	**1.05**	**0.37**	**1.19**	**0.95**	0.19	**1.51**
Thallium	0.597	0.21	0.008	0.09	0.065	**0.37**	**0.66**	0.21	**18.66**	**8.78**	na	**5.97**
Zinc	61.6	0.01	0.026	0.19	0.18	**0.73**	**1.28**	0.034	**0.63**	**0.36**	**0.51**	**0.39**
Aroclor-1254	0.018	0.12	0.082	0.11	0.014	0.23	**0.44**	0.00035	0.041	0.02	na	0.00011
	HI	0.4	0.2	1	**5**	**7**	**9**	1	**26**	**13**	1	**24**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-28
Minimum ESL Comparison for SWMU 03-029

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.1(U)	0.05	Plant	**22**
Chromium	15.6	28	American robin (insectivore)	**0.56**
Copper	27.3	0.1	American robin (insectivore)	**1.82**
Selenium	1.14(U)	0.52	Plant	**2.19**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0192	0.041	American robin (insectivore)	**0.47**
Aroclor-1260	0.0161	0.14	Red fox	0.12
Benzo(a)anthracene	0.0225	0.8	American robin (insectivore)	0.03
Benzo(a)pyrene	0.0184	53	Shrew	0.00035
Benzo(b)fluoranthene	0.0286	18	Plant	0.0016
Chrysene	0.0185	2.4	Montane shrew	0.0077
Fluoranthene	0.032	10	Earthworm	0.0032
Phenanthrene	0.0126	5.5	Earthworm	0.0023
Pyrene	0.032	10	Earthworm	0.0032

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-29
HI Analysis for SWMU 03-029

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.1(U)	0.024	na*	na	na	na	na	**0.38**	**4.23**	**2.29**	0.014	**22**
Chromium	15.6	0.0087	0.013	0.06	0.23	**0.39**	**0.56**	0.019	**0.35**	0.14	na	na
Copper	27.3	0.0072	0.017	0.25	**0.72**	**1.24**	**1.82**	0.1	**0.72**	**0.43**	**0.34**	**0.39**
Selenium	1.14(U)	0.014	0.012	0.2	**1.14**	**1.31**	**1.52**	**0.54**	**1.73**	**1.37**	0.28	**2.19**
Aroclor-1254	0.0192	0.13	0.087	0.11	0.015	0.24	**0.47**	0.00037	0.044	0.022	na	0.00012
	HI	0.2	0.1	0.6	**2**	**3**	**4**	1	**7**	**4**	0.6	**25**

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 I-5.3-30
Minimum ESL Comparison for SWMU 03-045(a)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.29(U)	0.05	Plant	**25.8**
Chromium	49	28	American robin (insectivore)	**1.75**
Copper	20.1	0.1	American robin (insectivore)	**1.34**
Lead	334.3	14	American robin (insectivore)	**23.9**
Mercury	0.374	0.013	American robin (insectivore)	**28.8**
Selenium	1.32(U)	0.52	Plant	**2.54**
Silver	1.32	2.6	American robin (insectivore)	**0.51**
Zinc	99.5	48	American robin (insectivore)	**2.07**
Organic Chemicals (mg/kg)				
Acenaphthene	0.954	0.25	Plant	**3.82**
Acetone	0.00224	1.2	Deer mouse	0.0019
Anthracene	1.99	6.8	Plant	0.29
Aroclor-1254	0.137	0.041	American robin (insectivore)	**3.34**
Aroclor-1260	0.258	0.14	Red fox	**1.84**
Benzo(a)anthracene	3.8	0.8	American robin (insectivore)	**4.75**
Benzo(a)pyrene	3.35	53	Shrew	0.063
Benzo(b)fluoranthene	5.85	18	Plant	**0.32**
Benzo(g,h,i)perylene	1.63	24	Montane shrew	0.068
Chrysene	3.56	2.4	Montane shrew	**1.48**
Fluoranthene	9.3	10	Earthworm	**0.93**
Fluorene	1.05	3.7	Earthworm	0.28
Indeno(1,2,3-cd)pyrene	1.65	62	Montane shrew	0.027
Methylnaphthalene[2-]	0.173	16	Montane shrew	0.011
Naphthalene	0.72	1	Plant	**0.72**
Phenanthrene	8.26	5.5	Earthworm	**1.5**
Pyrene	8.32	10	Earthworm	**0.83**

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-31
HI Analysis for SWMU 03-045(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.29(U)	0.029	na*	na	na	na	na	**0.44**	**4.96**	**2.69**	0.017	**25.8**
Chromium	49	0.027	0.041	0.19	**0.72**	**1.22**	**1.75**	0.058	**1.09**	**0.45**	na	na
Copper	20.1	0.0053	0.013	0.18	**0.53**	**0.92**	**1.34**	0.075	**0.53**	**0.31**	0.25	0.29
Lead	334.3	0.09	**0.41**	**2.79**	**15.92**	**20.89**	**23.88**	**0.9**	**4.64**	**2.79**	0.2	**2.79**
Mercury	0.374	0.008	**1.32**	**4.51**	**5.29**	**16.82**	**28.46**	0.017	0.22	0.12	**7.4**	0.011
Selenium	1.32(U)	0.016	0.014	0.24	**1.32**	**1.52**	**1.76**	**0.63**	**2**	**1.59**	**0.32**	**2.54**
Silver	1.32	0.00032	0.0016	0.069	0.12	**0.31**	**0.51**	0.0088	0.094	0.055	na	0.0024
Zinc	99.5	0.017	0.041	**0.31**	0.28	**1.17**	**2.07**	0.055	**1.02**	**0.59**	**0.83**	**0.62**
Acenaphthene	0.954	0.00015	na	na	na	na	na	0.0019	0.008	0.006	na	**3.82**
Aroclor-1254	0.137	**0.91**	**0.62**	**0.81**	0.11	**1.71**	**3.34**	0.0026	**0.31**	0.16	na	0.00086
Aroclor-1260	0.258	**1.84**	0.056	0.07	0.0056	0.15	0.29	0.000086	0.026	0.013	na	na
Benzo(a)anthracene	3.8	0.12	**0.39**	**0.55**	**4.75**	**4.18**	**3.8**	**0.61**	**1.27**	**1.12**	na	0.21
Benzo(b)fluoranthene	5.85	0.023	na	na	na	na	na	0.045	0.15	0.11	na	**0.33**
Chrysene	3.56	0.14	na	na	na	na	na	**0.55**	**1.48**	**1.15**	na	na
Fluoranthene	9.3	0.026	na	na	na	na	na	0.036	**0.42**	0.24	**0.93**	na
Naphthalene	0.72	0.0006	0.0012	0.0072	0.21	0.13	0.045	0.06	0.027	0.074	na	**0.72**
Phenanthrene	8.26	0.028	na	na	na	na	na	0.14	**0.83**	**0.55**	**1.5**	na
Pyrene	8.32	0.023	0.018	0.044	0.12	0.18	0.24	0.076	**0.38**	0.26	**0.83**	na
	HI	**3**	**3**	**10**	**29**	**49**	**68**	**4**	**19**	**12**	**12**	**37**

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 I-5.3-32
Minimum ESL Comparison for SWMU 03-045(b)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.07(U)	0.05	Plant	**21.4**
Mercury	0.159	0.013	American robin (insectivore)	**12.2**
Silver	1.17	2.6	American robin (insectivore)	**0.45**
Organic Chemicals (mg/kg)				
Anthracene	0.00901	6.8	Plant	0.0013
Aroclor-1254	0.0803	0.041	American robin (insectivore)	**1.96**
Aroclor-1260	0.117	0.14	Red fox	**0.84**
Benzo(a)pyrene	0.0562	53	Shrew	0.0011
Benzo(b)fluoranthene	0.111	18	Plant	0.0062
Benzo(g,h,i)perylene	0.03	24	Montane shrew	0.0013
Chrysene	0.049	2.4	Montane shrew	0.021
Fluoranthene	0.102	10	Earthworm	0.01
Indeno(1,2,3-cd)pyrene	0.0297	62	Montane shrew	0.00048
Methylene chloride	0.00225	2.6	Deer mouse	0.00087
Phenanthrene	0.0362	5.5	Earthworm	0.0066
Pyrene	0.0845	10	Earthworm	0.0085

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-33
HI Analysis for SWMU 03-045(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.07(U)	0.024	na*	na	na	na	na	**0.37**	**4.12**	**2.23**	0.014	**21.4**
Mercury	0.159	0.0035	**0.57**	**1.95**	**2.29**	**7.27**	**12.31**	0.0073	0.094	0.053	**3.2**	0.0047
Silver	1.17	0.00029	0.0014	0.062	0.11	0.27	**0.45**	0.0078	0.084	0.049	na	0.0021
Aroclor-1254	0.0803	**0.53**	**0.36**	**0.47**	0.062	**1**	**1.95**	0.0015	0.18	0.091	na	0.0005
Aroclor-1260	0.117	**0.84**	0.025	0.032	0.0025	0.069	0.13	0.00004	0.012	0.006	na	na
	HI	1	1	**3**	**2**	**9**	**15**	0.4	**4**	**2**	**3**	**21**

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 I-5.3-34
Minimum ESL Comparison for SWMU 03-045(c)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.14(U)	0.05	Plant	**22.8**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0542	0.25	Plant	0.22
Anthracene	0.139	6.8	Plant	0.02
Aroclor-1254	0.812	0.041	American robin (insectivore)	**19.8**
Aroclor-1260	3.19	0.14	Red fox	**22.8**
Benzo(a)anthracene	0.287	0.8	American robin (insectivore)	**0.36**
Benzo(a)pyrene	0.242	53	Montane shrew	0.0046
Benzo(b)fluoranthene	0.451	18	Plant	0.025
Benzo(g,h,i)perylene	0.12	24	Montane shrew	0.005
Chrysene	0.232	2.4	Montane shrew	0.097
Fluoranthene	0.548	10	Earthworm	0.055
Fluorene	0.0624	3.7	Earthworm	0.017
Indeno(1,2,3-cd)pyrene	0.111	62	Montane shrew	0.0018
Methylene chloride	0.00256	2.6	Deer mouse	0.00098
Methylnaphthalene[2-]	0.00868	16	Montane shrew	0.00054
Naphthalene	0.025	1	Plant	0.025
Phenanthrene	0.447	5.5	Earthworm	0.081
Pyrene	0.534	10	Earthworm	0.053

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-35
HI Analysis for SWMU 03-045(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.14(U)	0.025	na	na	na	na	na	**0.39**	**4.38**	**2.38**	0.015	**22.8**
Aroclor-1254	0.812	**5.41**	**3.69**	**4.78**	**0.62**	**10.15**	**19.8**	0.016	**1.85**	**0.92**	na	0.0051
Aroclor-1260	3.19	**22.79**	**0.69**	**0.86**	0.069	**1.88**	**3.63**	0.0011	**0.32**	0.16	na	na
Benzo(a)anthracene	0.287	0.009	0.029	0.042	**0.36**	**0.32**	0.29	0.046	0.1	0.084	na	0.016
	HI	**28**	**4**	**6**	1	**12**	**24**	0.5	**7**	**4**	0.01	**23**

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 I-5.3-36
Minimum ESL Comparison for SWMU 03-045(e)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.09(U)	0.05	Plant	**21.8**
Lead	99.6	14	American robin (insectivore)	**7.11**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0024	0.041	American robin (insectivore)	0.059
Aroclor-1260	0.0058	0.14	Red fox	0.041
Benzo(b)fluoranthene	0.0599	18	Plant	0.0033
Fluoranthene	0.239	10	Earthworm	0.024
Phenanthrene	0.251	5.5	Earthworm	0.046
Pyrene	0.288	10	Earthworm	0.029

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-37
HI Analysis for SWMU 03-045(e)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.09(U)	0.024	na*	na	na	na	na	**0.38**	**4.19**	**2.27**	0.014	**21.8**
Lead	99.6	0.027	0.12	**0.83**	**4.74**	**6.23**	**7.11**	0.27	**1.38**	**0.83**	0.059	**0.83**
	HI	0.05	0.1	0.8	**5**	**6**	**7**	0.7	**6**	**3**	0.07	**23**

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 I-5.3-38
Minimum ESL Comparison for SWMU 03-045(f)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.08	0.05	Plant	**21.6**
Organic Chemicals (mg/kg)				
Acetone	0.00474	1.2	Deer mouse	0.004
Aroclor-1260	0.0314	0.14	Red fox	0.22
Fluoranthene	0.0257	10	Earthworm	0.0026
Phenanthrene	0.0125	5.5	Earthworm	0.0025
Pyrene	0.0175	10	Earthworm	0.0018

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-39
HI Analysis for SWMU 03-045(f)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.08	0.024	na*	na	na	na	na	**0.37**	**4.15**	**2.25**	0.014	**21.6**
	HI	0.02	na	na	na	na	na	0.4	**4**	**2**	0.01	**22**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-40
Minimum ESL Comparison for SWMU 03-045(g)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.49	0.05	Plant	**9.8**
Arsenic	2.61	6.8	Earthworm	**0.38**
Barium	145.1	110	Plant	**1.32**
Cadmium	0.445	0.27	Montane shrew	**1.65**
Chromium	31.6	28	American robin (insectivore)	**1.13**
Cobalt	4.72	13	Plant	**0.36**
Copper	23.1	0.1	American robin (insectivore)	**1.54**
Lead	15	14	American robin (insectivore)	**1.07**
Manganese	399.1	220	Plant	**1.81**
Nickel	11.7	9.7	Montane shrew	**1.21**
Selenium	0.831	0.52	Plant	**1.6**
Vanadium	21.1	0.025	Plant	**844**
Zinc	77.9	48	American robin (insectivore)	**1.62**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0052	0.041	American robin (insectivore)	0.13
Aroclor-1260	0.0153	0.14	Red fox	0.11
Benzo(a)anthracene	0.104	0.8	American robin (insectivore)	0.13
Benzo(a)pyrene	0.122	53	Shrew	0.0023
Benzo(b)fluoranthene	0.116	18	Plant	0.0064
Benzo(g,h,i)perylene	0.2	24	Montane shrew	0.0083
Benzo(k)fluoranthene	0.106	62	Montane shrew	0.0017
Benzoic acid	0.174	1	Deer mouse	0.17
Bis(2-ethylhexyl)phthalate	0.77	0.02	American robin (insectivore)	**38.5**
Chrysene	0.123	2.4	Montane shrew	0.051
Fluoranthene	0.224	10	Earthworm	0.022
Indeno(1,2,3-cd)pyrene	0.139	62	Montane shrew	0.0022
Methylene chloride	0.018	2.6	Deer mouse	0.0069
Phenanthrene	0.106	5.5	Earthworm	0.019
Pyrene	0.206	10	Earthworm	0.021
Trichloroethene	0.0019	42	Montane shrew	0.000045

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-41
HI Analysis for SWMU 03-045(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.49	0.011	na*	na	na	na	na	0.17	**1.88**	**1.02**	0.006	**9.8**
Arsenic	2.61	0.0032	0.0024	0.016	0.062	0.1	0.15	0.016	0.17	0.082	**0.38**	0.15
Barium	145.1	0.0035	0.0039	0.013	0.18	0.16	0.15	0.044	0.11	0.081	**0.44**	**1.32**
Cadmium	0.445	0.0009	0.00078	0.23	0.1	**0.83**	**1.55**	0.045	**1.67**	**0.88**	0.003	0.014
Chromium	31.6	0.018	0.026	0.12	**0.46**	**0.79**	**1.13**	0.038	**0.7**	0.29	na	na
Cobalt	4.72	0.00087	0.0013	0.0051	0.028	0.039	0.049	0.0026	0.03	0.012	na	**0.36**
Copper	23.1	0.0061	0.014	0.21	**0.61**	**1.05**	**1.54**	0.086	**0.61**	**0.36**	0.29	**0.33**
Lead	15	0.0041	0.019	0.13	**0.71**	**0.94**	**1.07**	0.041	0.21	0.13	0.0088	0.13
Manganese	399.1	0.01	0.0044	0.011	0.29	0.21	0.13	0.2	0.27	0.29	**0.89**	**1.81**
Nickel	11.7	0.01	0.004	0.073	0.073	**0.31**	**0.56**	0.023	**1.21**	**0.59**	0.042	**0.31**
Selenium	0.831	0.01	0.0086	0.15	**0.83**	**0.95**	**1.11**	**0.4**	**1.26**	**1**	0.2	**1.6**
Vanadium	21.1	0.0064	0.12	0.25	**2.37**	**2.78**	**3.15**	0.014	0.15	0.044	na	**844**
Zinc	77.9	0.013	0.032	0.24	0.22	**0.92**	**1.62**	0.043	**0.79**	**0.46**	**0.65**	**0.49**
Bis(2-ethylhexyl)phthalate	0.77	**0.64**	**23.33**	**17.11**	0.039	**19.25**	**38.5**	0.0003	**1.31**	**0.7**	na	na
	HI	0.7	**24**	**19**	**6**	**28**	**51**	1	**10**	**6**	**3**	**861**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-42
Minimum ESL Comparison for SWMU 03-045(h)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.13(UJ)	0.05	Plant	**22.6**
Chromium hexavalent ion	0.142	0.34	Earthworm	**0.42**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0193	0.041	American robin (insectivore)	**0.47**
Aroclor-1260	0.0196	0.14	Red fox	0.14
Benzo(b)fluoranthene	0.0155	18	Plant	0.00086
Fluoranthene	0.0236	10	Earthworm	0.0024
Phenanthrene	0.0148	5.5	Earthworm	0.0027
Pyrene	0.0187	10	Earthworm	0.0019
TCDD[2,3,7,8-]	1.95E-06	0.00000029	Montane shrew	**6.72**

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-43
HI Analysis for SWMU 03-045(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.13(UJ)	0.025	na*	na	na	na	na	**0.39**	**4.35**	**2.35**	0.014	**22.6**
Chromium hexavalent ion	0.14	0.000019	0.000026	0.000064	0.0005	0.00064	0.00074	0.000044	0.0005	0.00016	**0.41**	**0.4**
Aroclor-1254	0.0193	0.13	0.088	0.11	0.015	0.24	**0.47**	0.00037	0.044	0.022	na	0.00012
TCDD[2,3,7,8-]	1.95E-06	**1.63**	na	na	na	na	na	0.041	**6.72**	**3.36**	0.00000039	na
	HI	**2**	0.09	0.1	0.02	0.2	0.5	0.4	**11**	**6**	0.4	**23**

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 I-5.3-44
Minimum ESL Comparison for AOC 03-047(g)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.3(U)	0.05	Plant	**26**
Lead	27.8	14	American robin (insectivore)	**1.98**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0241	0.25	Plant	0.096
Acetone	0.00486	1.2	Deer mouse	0.0041
Anthracene	0.0448	6.8	Plant	0.0066
Aroclor-1242	0.364	0.041	American robin (insectivore)	**8.88**
Aroclor-1254	0.313	0.041	American robin (insectivore)	**7.63**
Aroclor-1260	0.241	0.14	Red fox	**1.72**
Benzo(a)anthracene	0.198	0.8	American robin (insectivore)	0.25
Benzo(a)pyrene	0.191	53	Shrew	0.0036
Benzo(b)fluoranthene	0.405	18	Plant	0.023
Benzo(g,h,i)perylene	0.112	24	Montane shrew	0.0047
Chrysene	0.207	2.4	Montane shrew	0.086
Fluoranthene	0.437	10	Earthworm	0.044
Fluorene	0.0185	3.7	Earthworm	0.005
Indeno(1,2,3-cd)pyrene	0.0821	62	Montane shrew	0.0013
Phenanthrene	0.231	5.5	Earthworm	0.042
Pyrene	0.522	10	Earthworm	0.052
Tetrachloroethene	0.000572	0.18	Montane shrew	0.0032

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-45
HI Analysis for AOC 03-047(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.3(U)	0.029	na*	na	na	na	na	**0.45**	**5**	**2.71**	0.017	**26**
Lead	27.8	0.0075	0.034	0.23	**1.32**	**1.74**	**1.98**	0.075	**0.39**	0.23	0.016	0.23
Aroclor-1242	0.364	0.023	0.26	**1.4**	**0.36**	**4.61**	**8.88**	0.012	**0.96**	**0.48**	na	na
Aroclor-1254	0.313	**2.09**	**1.42**	**1.84**	0.24	**3.91**	**7.63**	0.006	**0.71**	**0.36**	na	0.002
Aroclor-1260	0.241	**1.72**	0.052	0.065	0.0052	0.14	0.27	0.00008	0.024	0.012	na	na
	HI	**4**	**2**	**4**	**2**	**10**	**19**	0.5	**7**	**4**	0.03	**26**

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 I-5.3-46
Minimum ESL Comparison for AOC 03-051(c)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.26(U)	0.05	Plant	**25.2**
Cobalt	11.2	13	Plant	**0.86**
Zinc	114	48	American robin (insectivore)	**2.38**
Organic Chemicals (mg/kg)				
Acenaphthene	0.227	0.25	Plant	**0.91**
Anthracene	0.534	6.8	Plant	0.08
Aroclor-1242	0.0091	0.041	American robin (insectivore)	0.22
Aroclor-1254	0.038	0.041	American robin (insectivore)	**0.93**
Aroclor-1260	0.109	0.14	Red fox	**0.78**
Benzo(a)anthracene	1.36	0.8	American robin (insectivore)	**1.7**
Benzo(a)pyrene	1.21	53	Shrew	0.023
Benzo(b)fluoranthene	1.92	18	Plant	0.11
Benzo(g,h,i)perylene	0.63	24	Montane shrew	0.026
Chrysene	1.3	2.4	Montane shrew	**0.54**
Dibenz(a,h)anthracene	0.168	12	Montane shrew	0.014
Dibenzofuran	0.115	6.1	Plant	0.019
Fluoranthene	3.03	10	Earthworm	0.3
Fluorene	0.229	3.7	Earthworm	0.062
Indeno(1,2,3-cd)pyrene	0.545	62	Montane shrew	0.0088
Methylnaphthalene[2-]	0.0625	16	Montane shrew	0.0039
Naphthalene	0.133	1	Plant	0.13
Phenanthrene	2.12	5.5	Earthworm	**0.38**
Pyrene	2.56	10	Earthworm	0.26

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-47
HI Analysis for AOC 03-051(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.26(U)	0.028	na*	na	na	na	na	**0.43**	**4.85**	**2.63**	0.016	**25.2**
Cobalt	11.2	0.0021	0.0032	0.012	0.066	0.093	0.12	0.0062	0.07	0.028	na	**0.86**
Zinc	114	0.019	0.048	**0.36**	**0.33**	**1.34**	**2.38**	0.063	**1.16**	**0.67**	**0.95**	**0.71**
Acenaphthene	0.227	0.000037	na	na	na	na	na	0.00046	0.0019	0.0014	na	**0.91**
Aroclor-1254	0.038	0.25	0.17	0.22	0.029	**0.48**	**0.93**	0.00073	0.086	0.043	na	0.00024
Aroclor-1260	0.109	**0.78**	0.024	0.029	0.0024	0.064	0.12	0.000036	0.011	0.0055	na	na
Benzo(a)anthracene	1.36	0.043	0.14	0.2	**1.70**	**1.49**	**1.36**	0.22	**0.45**	**0.4**	na	0.076
Chrysene	1.3	0.052	na	na	na	na	na	0.2	**0.54**	**0.42**	na	na
Phenanthrene	2.12	0.0073	na	na	na	na	na	0.036	0.21	0.14	**0.39**	na
	HI	1	0.4	0.8	**2**	**3**	**5**	1	**7**	**4**	1	**28**

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 I-5.3-48
Minimum ESL Comparison for AOC 03-052(b)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	7.7(UJ)	0.05	Plant	**154**
Barium	209.8	110	Plant	**1.91**
Beryllium	1.22	2.5	Plant	**0.49**
Cobalt	6.16	13	Plant	**0.47**
Copper	7.72	15	American robin (insectivore)	**0.51**
Lead	18.3	14	American robin (insectivore)	**1.31**
Nickel	9.17	9.7	Montane shrew	**0.95**
Selenium	0.21	0.52	Plant	**0.4**
Silver	0.406	2.6	American robin (insectivore)	0.16
Organic Chemicals (mg/kg)				
Acenaphthene	0.0345	0.25	Plant	0.14
Acetone	0.00853	1.2	Deer mouse	0.0071
Anthracene	0.0538	6.8	Plant	0.0079
Aroclor-1242	0.36	0.041	American robin (insectivore)	**8.78**
Aroclor-1254	0.075	0.041	American robin (insectivore)	**1.83**
Aroclor-1260	0.218	0.14	Red fox	**1.56**
Benzo(a)anthracene	0.0977	0.8	American robin (insectivore)	0.12
Benzo(a)pyrene	0.0719	53	Montane shrew	0.0014
Benzo(b)fluoranthene	0.0737	18	Plant	0.0041
Benzo(g,h,i)perylene	0.0248	24	Montane shrew	0.001
Butanone[2-]	0.00798	360	Deer mouse	0.000022
Chrysene	0.0332	2.4	Montane shrew	0.014
Fluoranthene	0.0493	10	Earthworm	0.0049
Fluorene	0.03	3.7	Earthworm	0.0081
Indeno(1,2,3-cd)pyrene	0.0155	62	Montane shrew	0.00025
Naphthalene	0.0171	1	Plant	0.017
Phenanthrene	0.207	5.5	Earthworm	0.038
Pyrene	0.0443	10	Earthworm	0.0044

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-49
HI Analysis for AOC 03-052(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.7(UJ)	0.17	na*	na	na	na	na	**2.66**	**29.62**	**16.04**	0.1	**154**
Barium	209.8	0.0051	0.0057	0.019	0.26	0.23	0.21	0.064	0.16	0.12	**0.64**	**1.91**
Beryllium	1.225	0.0029	na	na	na	na	na	0.0072	0.068	0.022	0.031	**0.49**
Cobalt	6.159	0.0011	0.0018	0.0066	0.036	0.051	0.064	0.0034	0.038	0.015	na	**0.47**
Copper	7.715	0.002	0.0048	0.07	0.2	**0.35**	**0.51**	0.029	0.2	0.12	0.1	0.11
Lead	18.31	0.0049	0.023	0.15	**0.87**	**1.14**	**1.31**	0.049	0.25	0.15	0.011	0.15
Nickel	9.171	0.0076	0.0032	0.057	0.057	0.24	**0.44**	0.018	**0.95**	**0.46**	0.033	0.24
Selenium	0.21	0.0025	0.0022	0.038	0.21	0.24	0.28	0.1	**0.32**	0.25	0.051	**0.4**
Aroclor-1242	0.36	0.023	0.26	**1.38**	**0.36**	**4.56**	**8.78**	0.012	**0.95**	**0.47**	na	na
Aroclor-1254	0.075	**1**	0.22	**0.38**	0.075	**0.95**	**1.83**	0.13	**10.42**	**5.36**	na	na
Aroclor-1260	0.218	**1.45**	**0.99**	**1.28**	0.17	**2.73**	**5.32**	0.0042	**0.5**	0.25	na	0.0014
	HI	**3**	**2**	**3**	**2**	**10**	**19**	**3**	**43**	**23**	1	**158**

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 I-5.3-50
Minimum ESL Comparison for SWMU 03-052(f)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.544	0.05	Plant	**10.9**
Barium	73.2	110	Plant	**0.67**
Chromium	35.1	28	American robin (insectivore)	**1.25**
Copper	16.3	15	American robin (insectivore)	**1.09**
Cyanide	2.89	0.1	American robin (insectivore)	**28.9**
Lead	37	14	American robin (insectivore)	**2.65**
Selenium	1.42(U)	0.52	Plant	**2.73**
Zinc	139.7	48	American robin (insectivore)	**2.91**
Organic Chemicals (mg/kg)				
Acenaphthene	0.992	0.25	Plant	**3.97**
Acenaphthylene	0.0448	120	Montane shrew	0.00037
Acetone	0.0226	1.2	Deer mouse	0.019
Anthracene	1.85	6.8	Plant	0.27
Aroclor-1254	0.0792	0.041	American robin (insectivore)	**1.93**
Aroclor-1260	0.0915	0.14	Red fox	**0.65**
Benzo(a)anthracene	8.27	0.8	American robin (insectivore)	**10.34**
Benzo(a)pyrene	7.8	53	Montane shrew	0.15
Benzo(b)fluoranthene	10.1	18	Plant	**0.56**
Benzo(g,h,i)perylene	1.7	24	Montane shrew	0.071
Benzo(k)fluoranthene	2.26	62	Montane shrew	0.0365
Bis(2-ethylhexyl)phthalate	0.237	0.02	American robin (insectivore)	**11.85**
Chrysene	9.51	2.4	Montane shrew	**3.96**
Dibenz(a,h)anthracene	1.17	12	Montane shrew	0.098
Dibenzofuran	0.441	6.1	Plant	0.072
Fluoranthene	20.6	10	Earthworm	**2.06**
Fluorene	0.696	3.7	Earthworm	0.19
Indeno(1,2,3-cd)pyrene	1.72	62	Montane shrew	0.028
Methylnaphthalene[2-]	0.135	16	Shrew	0.0084
Naphthalene	0.28	1	Plant	0.28
Phenanthrene	21.1	5.5	Earthworm	**3.83**
Pyrene	27	10	Earthworm	**2.7**
Toluene	0.000507	23	Montane shrew	0.000022

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-51
HI Analysis for SWMU 03-052(f)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.544	0.012	na*	na	na	na	na	0.19	**2.09**	**1.13**	0.007	**10.9**
Barium	73.2	0.0018	0.002	0.01	0.089	0.079	0.073	0.022	0.056	0.041	0.22	**0.67**
Chromium	35.1	0.019	0.029	0.13	**0.52**	**0.88**	**1.25**	0.042	**0.78**	**0.32**	na	na
Copper	16.3	0.0043	0.01	0.15	**0.43**	**0.74**	**1.09**	0.06	**0.43**	0.25	0.2	0.23
Cyanide	2.89	0.0013	**4.99**	**6.16**	**28.9**	**28.9**	**28.9**	0.0039	0.0093	0.0085	na	na
Lead	37	0.01	0.046	**0.31**	**1.76**	**2.32**	**2.65**	0.1	**0.51**	**0.31**	0.022	**0.31**
Selenium	1.42(U)	0.017	0.015	0.25	**1.42**	**1.63**	**1.89**	**0.68**	**2.15**	**1.71**	**0.35**	**2.73**
Zinc	139.7	0.023	0.058	**0.44**	**0.4**	**1.64**	**2.91**	0.078	**1.43**	**0.82**	**1.16**	**0.87**
Acenaphthene	0.992	0.00016	na	na	na	na	na	0.002	0.0083	0.0062	na	**3.97**
Aroclor-1254	0.0792	**0.53**	**0.36**	**0.47**	0.061	**0.99**	**1.93**	0.0015	0.18	0.09	na	0.0005
Aroclor-1260	0.0915	**0.65**	0.02	0.025	0.002	0.054	0.1	0.000031	0.0092	0.0046	na	na
Benzo(a)anthracene	8.27	0.26	**0.84**	**1.20**	**10.34**	**9.09**	**8.27**	**1.33**	**2.76**	**2.43**	na	**0.46**
Benzo(b)fluoranthene	10.1	0.04	na	na	na	na	na	0.078	0.27	0.19	na	**0.56**
Bis(2-ethylhexyl)phthalate	0.237	0.2	**7.18**	**5.27**	0.012	**5.93**	**11.85**	0.000088	**0.4**	0.22	na	na
Chrysene	9.51	**0.38**	na	na	na	na	na	**1.46**	**3.96**	**3.07**	na	na
Fluoranthene	20.6	0.057	na	na	na	na	na	0.079	**0.94**	**0.54**	**2.06**	na
Phenanthrene	21.1	0.073	na	na	na	na	na	**0.36**	**2.11**	**1.41**	**3.83**	na
Pyrene	27	0.075	0.059	0.14	**0.38**	**0.59**	**0.79**	0.25	**1.23**	**0.84**	**2.7**	na
	HI	**2**	**14**	**15**	**44**	**53**	**62**	**5**	**19**	**13**	**11**	**21**

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 I-5.3-52
Minimum ESL Comparison for SWMU 03-056(a)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Silver	0.667	2.6	American robin (insectivore)	0.26
Organic Chemicals (mg/kg)				
Acetone	0.00241	1.2	Deer mouse	0.002
Anthracene	0.0111	6.8	Plant	0.0016
Aroclor-1254	0.0366	0.041	American robin (insectivore)	**0.89**
Aroclor-1260	0.0133	0.14	Red fox	0.1
Benzo(a)anthracene	0.0218	0.8	American robin (insectivore)	0.027
Benzo(a)pyrene	0.0138	53	Montane shrew	0.00026
Benzo(b)fluoranthene	0.0163	18	Plant	0.00091
Chrysene	0.0175	2.4	Montane shrew	0.0073
Fluoranthene	0.0378	10	Earthworm	0.0038
Phenanthrene	0.0387	5.5	Earthworm	0.007
Pyrene	0.0398	10	Earthworm	0.004

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-53
HI Analysis for SWMU 03-056(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Aroclor-1254	0.0366	0.24	0.17	0.22	0.028	**0.46**	**0.89**	0.0007	0.083	0.042	na*	0.00023
	HI	0.2	0.2	0.2	0.03	0.5	0.9	0.0007	0.08	0.04	na	0.0002

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-54
Minimum ESL Comparison for SWMU 03-056(d)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.07(U)	0.05	Plant	**21.4**
Copper	21.8	0.1	American robin (insectivore)	**1.45**
Cyanide	0.554	0.1	American robin (insectivore)	**5.54**
Mercury	0.161	0.013	American robin (insectivore)	**12.38**
Silver	12	2.6	American robin (insectivore)	**4.62**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0539	0.041	American robin (insectivore)	**1.31**
Aroclor-1260	0.0769	0.14	Red fox	**0.55**

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-55
HI Analysis for SWMU 03-056(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.07(U)	0.024	na*	na	na	na	na	**0.37**	**4.12**	**2.23**	0.014	**21.4**
Copper	21.8	0.0057	0.014	0.2	**0.57**	**0.99**	**1.45**	0.081	**0.57**	**0.34**	0.27	**0.31**
Cyanide	0.554	0.00025	**0.95**	**1.17**	**5.5**	**5.5**	**5.5**	0.0007	0.0018	0.0016	na	na
Mercury	0.161	0.0035	**0.57**	**1.95**	**2.29**	**7.27**	**12.31**	0.0073	0.094	0.053	**3.2**	0.0047
Silver	12	0.0029	0.014	**0.63**	**1.09**	**2.79**	**4.62**	0.08	**0.86**	**0.5**	na	0.021
Aroclor-1254	0.0539	**0.36**	0.25	**0.32**	0.041	**0.67**	**1.31**	0.001	0.12	0.061	na	0.00034
Aroclor-1260	0.0769	**0.55**	0.017	0.021	0.0017	0.045	0.087	0.000026	0.0077	0.0038	na	na
	HI	1	**2**	**4**	**9**	**17**	**25**	0.5	**6**	**3**	**3**	**22**

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 I-5.3-56
Minimum ESL Comparison for AOC 03-056(k)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	7.6(UJ)	0.05	Plant	**152**
Copper	11.8	15	American robin (insectivore)	**0.79**
Mercury	0.0462	0.013	American robin (insectivore)	**3.55**
Silver	0.486	2.6	American robin (insectivore)	0.19
Organic Chemicals (mg/kg)				
Acenaphthene	0.352	0.25	Plant	**1.41**
Acetone	0.117	1.2	Deer mouse	0.098
Anthracene	0.586	6.8	Plant	0.086
Aroclor-1254	0.0194	0.041	American robin (insectivore)	**0.47**
Aroclor-1260	0.0343	0.14	Red fox	0.25
Benzo(a)anthracene	0.558	0.8	American robin (insectivore)	**0.7**
Benzo(a)pyrene	0.503	53	Montane shrew	0.0095
Benzo(b)fluoranthene	0.757	18	Plant	0.042
Benzo(g,h,i)perylene	0.317	24	Montane shrew	0.013
Butanone[2-]	0.00816	360	Deer mouse	0.000023
Carbon disulfide	0.004	0.82	Deer mouse	0.0049
Chrysene	0.498	2.4	Montane shrew	0.21
Dibenz(a,h)anthracene	0.0912	12	Montane shrew	0.0076
Dibenzofuran	0.409	6.1	Plant	0.067
Fluoranthene	2.09	10	Earthworm	0.21
Fluorene	0.184	3.7	Earthworm	0.05
Indeno(1,2,3-cd)pyrene	0.306	62	Montane shrew	0.0049
Methyl-2-pentanone[4-]	0.00274	9.8	Deer mouse	0.00028
Methylnaphthalene[2-]	0.236	16	Shrew	0.015
Naphthalene	0.705	1	Plant	**0.71**
Phenanthrene	1.76	5.5	Earthworm	**0.32**
Pyrene	1.81	10	Earthworm	0.18
Toluene	0.00119	23	Montane shrew	0.000052
Radionuclides (pCi/g)				
Uranium-235/236	0.108	55	Earthworm	0.002
Uranium-238	4.49	55	Earthworm	0.082

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-57
HI Analysis for AOC 03-056(k)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.6(UJ)	0.17	na*	na	na	na	na	**2.62**	**29.2**	**15.8**	0.097	**152**
Copper	11.85	0.0031	0.0074	0.11	**0.31**	**0.54**	**0.79**	0.044	**0.31**	0.19	0.15	0.17
Mercury	0.0462	0.001	0.17	**0.56**	**0.66**	**2.1**	**3.55**	0.0021	0.027	0.015	**0.92**	0.0014
Acenaphthene	0.352	0.000057	na	na	na	na	na	0.00072	0.0029	0.0022	na	**1.41**
Aroclor-1254	0.0194	0.13	0.088	0.11	0.015	0.24	**0.47**	0.00037	0.044	0.022	na	0.00012
Benzo(a)anthracene	0.558	0.017	0.057	0.081	**0.7**	**0.61**	**0.56**	0.09	0.19	0.16	na	0.031
Naphthalene	0.71	0.00059	0.0012	0.0071	0.21	0.12	0.044	0.059	0.026	0.073	na	**0.71**
Phenanthrene	1.76	0.0061	na	na	na	na	na	0.03	0.18	0.12	**0.32**	na
	HI	0.3	0.3	1	**2**	**4**	**5**	**3**	**30**	**16**	1	**154**

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 I-5.3-58
Minimum ESL Comparison for SWMU 03-059

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.891	0.05	Plant	**17.8**
Mercury	0.157	0.013	American robin (insectivore)	**12.1**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0411	0.25	Plant	0.16
Acenaphthylene	0.0228	120	Montane shrew	0.00019
Acetone	0.004	1.2	Deer mouse	0.0033
Anthracene	0.0308	6.8	Plant	0.0045
Aroclor-1242	0.0182	0.041	American robin (insectivore)	**0.44**
Aroclor-1254	2.63	0.041	American robin (insectivore)	**64.2**
Aroclor-1260	1.03	0.14	Red fox	**7.34**
Benzo(a)anthracene	0.0489	0.8	American robin (insectivore)	0.061
Benzo(a)pyrene	0.0469	53	Montane shrew	0.00088
Benzo(b)fluoranthene	0.0701	18	Plant	0.0039
Benzo(g,h,i)perylene	0.0328	24	Montane shrew	0.0014
Benzo(k)fluoranthene	0.0385	62	Montane shrew	0.00062
Benzoic acid	0.496	1	Deer mouse	**0.5**
Bis(2-ethylhexyl)phthalate	0.194	0.02	American robin (insectivore)	**9.7**
Butylbenzylphthalate	1.83	90	Montane shrew	0.02
Chrysene	0.0584	2.4	Montane shrew	0.024
Dibenz(a,h)anthracene	0.028	12	Montane shrew	0.0023
Fluoranthene	0.0928	10	Earthworm	0.0093
Fluorene	0.0484	3.7	Earthworm	0.013
Indeno(1,2,3-cd)pyrene	0.033	62	Montane shrew	0.00053
Methylene chloride	0.00246	2.6	Deer mouse	0.00095
Methylnaphthalene[2-]	0.0138	16	Shrew	0.00086
Naphthalene	0.0291	1	Plant	0.029
Phenanthrene	0.06	5.5	Earthworm	0.011
Pyrene	0.0879	10	Earthworm	0.0088
Radionuclides (pCi/g)				
Tritium	0.179	36000	Plant	4.97E-06

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-59
HI Analysis for SWMU 03-059

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.891	0.02	na*	na	na	na	na	**0.31**	**3.43**	**1.86**	0.011	**17.8**
Mercury	0.157	0.0034	**0.56**	**1.91**	**2.24**	**7.14**	**12.1**	0.0071	0.092	0.052	**3.14**	0.0046
Aroclor-1242	0.0182	0.0011	0.013	0.07	0.018	0.23	**0.44**	0.00061	0.048	0.024	na	na
Aroclor-1254	2.633	**17.55**	**11.97**	**15.49**	**2.03**	**32.9**	**64.2**	0.051	**5.98**	**2.99**	na	0.016
Aroclor-1260	1.028	**7.34**	0.22	0.28	0.022	**0.6**	**1.17**	0.00034	0.1	0.051	na	na
Benzoic acid	0.496	0.0014	na	na	na	na	na	0.12	**0.5**	**0.38**	na	na
Bis(2-ethylhexyl)phthalate	0.19	0.16	**5.88**	**4.31**	0.0097	**4.85**	**9.7**	0.000072	**0.33**	0.18	na	na
HI		**25**	**19**	**22**	**4**	**46**	**88**	0.5	**10**	**6**	**3**	**18**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-60
Minimum ESL Comparison for AOC C-03-022

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.12(U)	0.05	Plant	**22.4**

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-61
HI Analysis for AOC C-03-022

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.12(U)	0.025	na*	na	na	na	na	**0.39**	**4.31**	**2.33**	0.014	**22.4**
	HI	0.02	na	na	na	na	na	0.4	**4**	**2**	0.01	**22**

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 I-5.3-62
Minimum ESL Comparison for SWMU 60-002 (West)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.16(U)	0.05	Plant	**23.2**
Barium	182.8	110	Plant	**1.66**
Chromium	11.3	28	American robin (insectivore)	**0.4**
Cobalt	5.37	13	Plant	**0.41**
Copper	8.29	0.1	American robin (insectivore)	**0.55**
Lead	38.5	14	American robin (insectivore)	**2.75**
Nickel	9.09	9.7	Montane shrew	**0.94**
Selenium	1.13(UJ)	0.52	Plant	**2.17**
Vanadium	28.9	0.025	Plant	**1156**
Organic Chemicals (mg/kg)				
Acetone	0.0189	1.2	Deer mouse	0.016
Anthracene	0.0541	6.8	Plant	0.008
Benzo(a)anthracene	0.154	0.8	American robin (insectivore)	0.19
Benzo(a)pyrene	0.119	53	Shrew	0.0022
Benzo(b)fluoranthene	0.139	18	Plant	0.0077
Benzo(g,h,i)perylene	0.0715	24	Montane shrew	0.003
Chrysene	0.132	2.4	Montane shrew	0.055
Fluoranthene	0.297	10	Earthworm	0.03
Indeno(1,2,3-cd)pyrene	0.221	62	Montane shrew	0.0036
Phenanthrene	0.22	5.5	Earthworm	0.04
Pyrene	0.297	10	Earthworm	0.03

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-63
HI Analysis for SWMU 60-002 (West)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.16(U)	0.026	na*	na	na	na	na	**0.4**	**4.46**	**2.42**	0.015	**23.2**
Barium	182.8	0.0045	0.0049	0.017	0.22	0.2	0.18	0.055	0.14	0.1	**0.55**	**1.66**
Chromium	11.3	0.0063	0.0094	0.043	0.17	0.28	**0.4**	0.013	0.25	0.1	na	na
Cobalt	5.37	0.001	0.0015	0.0058	0.032	0.045	0.056	0.003	0.034	0.013	na	**0.41**
Copper	8.29	0.0022	0.005	0.075	0.22	**0.38**	**0.55**	0.031	0.22	0.13	0.1	0.12
Lead	38.5	0.01	0.048	**0.32**	**1.83**	**2.41**	**2.75**	0.1	**0.54**	**0.32**	0.023	**0.32**
Nickel	9.09	0.0076	0.0031	0.057	0.057	0.24	**0.43**	0.018	**0.94**	**0.45**	0.032	0.24
Selenium	1.13(UJ)	0.013	0.012	0.2	**1.13**	**1.3**	**1.51**	**0.54**	**1.71**	**1.36**	0.28	**2.17**
Vanadium	28.9	0.0087	0.17	**0.34**	**3.24**	**3.8**	**4.31**	0.019	0.21	0.06	na	**1156**
	HI	0.08	0.3	1	**7**	**9**	**10**	1	**8**	**5**	1	**1184**

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 I-5.3-64
Minimum ESL Comparison for SWMU 60-002 (Central)

COPC	EPC	ESL	Receptor	HQ
Organic Chemicals (mg/kg)				
Acenaphthene	0.0244	0.25	Plant	0.1
Aroclor-1254	0.0202	0.041	American robin (insectivore)	**0.49**
Aroclor-1260	0.0162	0.14	Red fox	0.12

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-65
HI Analysis for SWMU 60-002 (Central)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Aroclor-1254	0.0202	0.13	0.09	0.12	0.02	0.25	**0.49**	0.00039	0.046	0.02	na*	0.0001
	HI	0.1	0.1	0.1	0.02	0.3	0.5	0.0004	0.5	0.02	na	0.0001

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-66
Minimum ESL Comparison for SWMU 60-002 (East)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Barium	310	110	Plant	**2.82**
Cobalt	10	13	Plant	**0.77**
Nickel	17.1	9.7	Montane shrew	**1.76**
Selenium	0.579	0.52	Plant	**1.11**
Organic Chemicals (mg/kg)				
Acetone	0.0062	1.2	Deer mouse	0.005
Fluoranthene	0.0357	10	Earthworm	0.0036
Fluorene	0.0056	3.7	Earthworm	0.0015
Pyrene	0.0443	10	Earthworm	0.0044

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-67
HI Analysis for SWMU 60-002 (East)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Barium	310	0.0076	0.0084	0.028	**0.38**	**0.33**	**0.31**	0.094	0.24	0.17	**0.94**	**2.82**
Cobalt	10	0.0019	0.0029	0.011	0.059	0.083	0.1	0.0056	0.063	0.025	na*	**0.77**
Nickel	17.1	0.014	0.0059	0.11	0.11	**0.45**	**0.81**	0.034	**1.76**	**0.86**	0.061	**0.45**
Selenium	0.579	0.0069	0.0060	0.1	**0.58**	**0.67**	**0.77**	0.28	**0.88**	**0.7**	0.14	**1.11**
	HI	0.03	0.02	0.2	1	**2**	**2**	0.4	**3**	**2**	1	**5**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-68
Minimum ESL Comparison for AOC 60-004(f)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.21(U)	0.05	Plant	**24.2**
Barium	172.4	110	Plant	**1.57**
Chromium	20.3	28	American robin (insectivore)	**0.72**
Cobalt	6.63	13	Plant	**0.51**
Copper	28.8	15	American robin (insectivore)	**1.92**
Lead	23.7	14	American robin (insectivore)	**1.69**
Mercury	0.127	0.013	American robin (insectivore)	**9.77**
Nickel	9.23	9.7	Montane shrew	**0.95**
Selenium	1.2(UJ)	0.52	Plant	**2.31**
Silver	0.675	2.6	American robin (insectivore)	0.26
Vanadium	26.1	0.025	Plant	**1043.6**
Zinc	78	48	American robin (insectivore)	**1.63**

Table I-5.3-68 (continued)

COPC	EPC	ESL	Receptor	HQ
Organic Chemicals (mg/kg)				
Acenaphthene	0.217	0.25	Plant	**0.87**
Acetone	0.00703	1.2	Deer mouse	0.0059
Anthracene	0.69	6.8	Plant	0.1
Aroclor-1254	0.116	0.041	American robin (insectivore)	**2.83**
Aroclor-1260	0.153	0.14	Red fox	**1.09**
Benzene	0.000707	24	Deer mouse	0.000029
Benzo(a)anthracene	2.33	0.8	American robin (insectivore)	**2.91**
Benzo(a)pyrene	2.18	53	Montane shrew	0.041
Benzo(b)fluoranthene	3.06	18	Plant	0.17
Benzo(g,h,i)perylene	0.973	24	Montane shrew	0.041
Benzo(k)fluoranthene	0.975	62	Montane shrew	0.016
Bis(2-ethylhexyl)phthalate	0.091	0.02	American robin (insectivore)	**4.55**
Chrysene	2.29	2.4	Montane shrew	**0.95**
Dibenz(a,h)anthracene	0.401	12	Montane shrew	0.033
Dibenzofuran	0.15	6.1	Plant	0.025
Di-n-butyl phthalate	0.118	0.011	American robin (insectivore)	**10.73**
Fluoranthene	3.99	10	Earthworm	**0.4**
Fluorene	0.252	3.7	Earthworm	0.068
Indeno(1,2,3-cd)pyrene	1.05	62	Montane shrew	0.017
Methylene chloride	0.00283	2.6	Deer mouse	0.0011
Methylnaphthalene[2-]	0.0372	16	Shrew	0.0023
Naphthalene	0.106	1	Plant	0.11
Phenanthrene	2.35	5.5	Earthworm	**0.43**
Pyrene	2.99	10	Earthworm	0.3
Toluene	0.000767	23	Montane shrew	0.000033
Trichloroethene	0.000446	42	Montane shrew	0.000011
Radionuclides (pCi/g)				
Tritium	0.158	36000	Plant	4.39E-06

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-69
HI Analysis for AOC 60-004(f)

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	0.027	na*	na	na	na	na	**0.42**	**4.65**	**2.52**	0.0155	**24.2**
Barium	172.4	0.0042	0.0047	0.016	0.21	0.19	0.17	0.052	0.13	0.096	**0.52**	**1.57**
Chromium	20.3	0.011	0.017	0.078	0.3	**0.51**	**0.72**	0.024	**0.45**	0.18	na	na
Cobalt	6.63	0.0012	0.0019	0.0071	0.039	0.055	0.069	0.0037	0.041	0.017	na	**0.51**
Copper	28.8	0.0076	0.018	0.26	**0.76**	**1.31**	**1.92**	0.11	**0.76**	**0.45**	**0.36**	**0.41**
Lead	23.7	0.0064	0.029	0.2	**1.13**	**1.48**	**1.69**	0.064	**0.33**	0.2	0.014	0.2
Mercury	0.127	0.0028	**0.45**	**1.55**	**1.81**	**5.77**	**9.77**	0.0058	0.075	0.042	**2.54**	0.0037
Nickel	9.23	0.0077	0.0032	0.058	0.058	**0.24**	**0.44**	0.018	**0.95**	**0.46**	0.033	0.24
Selenium	1.2(UJ)	0.014	0.012	0.21	**1.2**	**1.38**	**1.6**	**0.57**	**1.82**	**1.45**	0.29	**2.31**
Vanadium	26.1	0.0079	0.15	**0.31**	**2.93**	**3.43**	**3.89**	0.017	0.19	0.054	na	**1044**
Zinc	78	0.013	0.033	0.24	0.22	**0.92**	**1.63**	0.043	**0.8**	**0.46**	**0.65**	**0.49**
Acenaphthene	0.217	0.000035	na	na	na	na	na	0.00044	0.0018	0.0014	na	**0.87**
Aroclor-1254	0.116	0.77	**0.53**	**0.68**	0.089	**1.45**	**2.83**	0.0022	0.26	0.13	na	0.00073
Aroclor-1260	0.153	1.09	0.033	0.041	0.0033	0.09	0.17	0.000051	0.015	0.0077	na	na
Benzo(a)anthracene	2.33	0.073	0.24	**0.34**	**2.91**	**2.56**	**2.33**	**0.38**	**0.78**	**0.69**	na	0.13
Bis(2-ethylhexyl)phthalate	0.091	0.076	**2.76**	**2.02**	0.0046	**2.28**	**4.55**	0.000034	0.15	0.083	na	na
Chrysene	2.29	0.092	na	na	na	na	na	**0.35**	**0.95**	**0.74**	na	na
Di-n-butyl phthalate	0.118	0.000024	**0.49**	**1.74**	0.3	**5.62**	**10.73**	0.0000074	0.00066	0.00032	na	0.00074
Fluoranthene	3.99	0.011	na	na	na	na	na	0.015	0.18	0.11	**0.4**	na
Phenanthrene	2.35	0.0081	na	na	na	na	na	0.04	0.24	0.16	**0.43**	na
HI		**2**	**5**	**8**	**12**	**27**	**43**	**2**	**13**	**8**	**5**	**1075**

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 I-5.3-70
Minimum ESL Comparison for SWMU 60-007(a)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.26	0.05	Plant	**25.2**
Organic Chemicals (mg/kg)				
Toluene	0.001	23	Montane shrew	0.000043

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-71
HI Analysis for SWMU 60-007(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.26	0.028	na	na	na	na	na	**0.44**	**4.85**	**2.63**	0.0162	**25.2**
	HI	0.03	na	na	na	na	na	0.4	**5**	**3**	0.02	**25**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.3-72
Minimum ESL Comparison for SWMU 60-007(b)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.21(U)	0.05	Plant	**24.2**
Barium	66.4	110	Plant	**0.6**
Chromium	8.62	28	American robin (insectivore)	**0.31**
Selenium	1.18(UJ)	0.52	Plant	**2.27**
Zinc	64	48	American robin (insectivore)	**1.33**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0394	0.25	Plant	0.16
Acetone	0.00966	1.2	Deer mouse	0.0081
Anthracene	0.034	6.8	Plant	0.005
Aroclor-1254	0.0033	0.041	American robin (insectivore)	0.08
Aroclor-1260	0.0038	0.14	Red fox	0.027
Benzo(a)anthracene	0.0846	0.8	American robin (insectivore)	0.11
Benzo(a)pyrene	0.0769	53	Montane shrew	0.0015
Benzo(b)fluoranthene	0.115	18	Plant	0.0064
Benzo(g,h,i)perylene	0.0503	24	Montane shrew	0.0021
Benzo(k)fluoranthene	0.0557	62	Montane shrew	0.0009
Bis(2-ethylhexyl)phthalate	0.389	0.02	American robin (insectivore)	**19.45**
Chrysene	0.0923	2.4	Montane shrew	0.038
Fluoranthene	0.181	10	Earthworm	0.018
Fluorene	0.0426	3.7	Earthworm	0.012
Indeno(1,2,3-cd)pyrene	0.0723	62	Montane shrew	0.0012
Phenanthrene	0.138	5.5	Earthworm	0.025
Pyrene	0.185	10	Earthworm	0.019
Toluene	0.00103	23	Montane shrew	0.000045

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-73
HI Analysis for SWMU 60-007(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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	0.027	na*	na	na	na	na	**0.42**	**4.65**	**2.52**	0.016	**24.2**
Barium	66.4	0.0016	0.0018	0.006	0.081	0.071	0.066	0.02	0.051	0.037	0.2	**0.6**
Chromium	8.62	0.0048	0.0072	0.033	0.13	0.22	**0.31**	0.01	0.19	0.078	na	na
Selenium	1.18(UJ)	0.014	0.012	0.21	**1.18**	**1.36**	**1.57**	**0.56**	**1.79**	**1.42**	0.29	**2.27**
Zinc	64	0.011	0.027	0.2	0.18	**0.75**	**1.33**	0.036	**0.65**	**0.38**	**0.53**	**0.4**
Bis(2-ethylhexyl)phthalate	0.389	**0.32**	**11.79**	**8.64**	0.019	**9.73**	**19.45**	0.00014	**0.66**	**0.35**	na	na
	HI	0.4	**12**	**9**	**2**	**12**	**23**	1	**8**	**5**	1	**27**

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 I-5.3-74
Minimum ESL Comparison for AOC C-61-002

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.14	0.05	Plant	**22.8**
Arsenic	5.2	6.8	Earthworm	**0.76**
Beryllium	2.06	2.5	Plant	**0.82**
Chromium	13.3	28	American robin (insectivore)	**0.48**
Copper	11.5	15	American robin (insectivore)	**0.77**
Lead	27.6	14	American robin (insectivore)	**1.97**
Mercury	0.061	0.013	American robin (insectivore)	**4.69**
Nickel	16	9.7	Montane shrew	**1.65**
Selenium	2.56(UJ)	0.52	Plant	**4.92**
Vanadium	31.1	0.025	Plant	**1244**
Organic Chemicals (mg/kg)				
Acetone	0.00528	1.2	Deer mouse	0.0044

Notes: Bolded values indicate HQ greater than 0.3. Data qualifiers are defined in Appendix A.

Table I-5.3-75
HI Analysis for AOC C-61-002

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.14	0.025	na*	na	na	na	na	**0.39**	**4.38**	**2.38**	0.015	**22.8**
Arsenic	5.2	0.0064	0.0047	0.033	0.12	0.2	0.29	0.033	**0.35**	0.16	**0.76**	0.29
Beryllium	2.06	0.0049	na	na	na	na	na	0.012	0.11	0.037	0.052	**0.82**
Chromium	13.3	0.0074	0.011	0.051	0.2	**0.33**	**0.48**	0.016	0.3	0.12	na	na
Copper	11.5	0.003	0.0072	0.1	0.3	**0.52**	**0.77**	0.043	0.3	0.18	0.14	0.16
Lead	27.6	0.0075	0.034	0.23	**1.31**	**1.73**	**1.97**	0.075	**0.38**	0.23	0.016	0.23
Mercury	0.061	0.0013	0.22	**0.74**	**0.87**	**2.77**	**4.69**	0.0028	0.036	0.02	**1.22**	0.0018
Nickel	16.00	0.013	0.0055	0.1	0.1	**0.42**	**0.76**	0.032	**1.65**	**0.8**	0.057	**0.42**
Selenium	2.56(UJ)	0.03	0.026	**0.46**	**2.56**	**2.94**	**3.41**	**1.22**	**3.88**	**3.08**	**0.62**	**4.92**
Vanadium	31.10	0.0094	0.18	**0.37**	**3.49**	**4.09**	**4.64**	0.021	0.22	0.065	na	**1244**
	HI	0.1	0.5	**2**	**9**	**13**	**17**	**2**	**12**	**7**	**3**	**1274**

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 I-5.3-76
Minimum ESL Comparison for SWMU 61-002

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.284	0.05	Plant	**5.68**
Lead	14.7	28	American robin (insectivore)	**1.05**
Mercury	0.0414	0.013	American robin (insectivore)	**3.18**
Selenium	0.461	0.52	Plant	**0.89**
Zinc	79.4	48	American robin (insectivore)	**1.65**
Organic Chemicals (mg/kg)				
Acenaphthene	0.16	0.25	Plant	**0.64**
Acetone	0.457	1.2	Deer mouse	**0.38**
Anthracene	0.3	6.8	Plant	0.044
Aroclor-1254	0.682	0.041	American robin (insectivore)	**16.63**
Aroclor-1260	0.121	0.14	Red fox	**0.86**
Benzene	0.00215	24	Deer mouse	0.00009
Benzo(a)anthracene	0.59	0.8	American robin (insectivore)	**0.74**
Benzo(a)pyrene	0.52	53	Montane shrew	0.01
Benzo(b)fluoranthene	0.39	18	Plant	0.022
Benzo(g,h,i)perylene	0.34	24	Montane shrew	0.014
Benzo(k)fluoranthene	0.54	62	Montane shrew	0.0087
Benzoic acid	0.28	1	Deer mouse	0.28
Bis(2-ethylhexyl)phthalate	1.3	0.02	American robin (insectivore)	**65**
Butanone[2-]	0.0227	360	Deer mouse	0.000063
Butylbenzylphthalate	0.66	90	Montane shrew	0.0073
Chlorobenzene	0.00789	2.4	Earthworm	0.0033
Chrysene	0.67	2.4	Montane shrew	0.28
Dichlorobenzene[1,2-]	0.00539	0.92	Montane shrew	0.0059
Dichlorobenzene[1,4-]	0.069	0.88	Montane shrew	0.078
Dichloroethene[cis/trans-1,2-]	0.0047	23	Montane shrew	0.0002
Di-n-octyl phthalate	0.075	0.91	Montane shrew	0.082
Fluoranthene	0.227	10	Earthworm	0.023
Fluorene	0.16	3.7	Earthworm	0.043
Indeno(1,2,3-cd)pyrene	0.37	62	Montane shrew	0.006
Methylnaphthalene[2-]	2	16	Shrew	0.13
Naphthalene	1.5	1	Plant	**1.5**
Phenanthrene	1.4	5.5	Earthworm	0.25
Pyrene	0.215	10	Earthworm	0.022
Styrene	0.13	1.2	Earthworm	0.11
Tetrachloroethene	0.001	0.18	Montane shrew	0.0056
Toluene	0.144	23	Montane shrew	0.0063
Xylene (total)	11	1.4	Montane shrew	**7.86**

Note: Bolded values indicate HQ greater than 0.3.

Table I-5.3-77
HI Analysis for SWMU 61-002

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.284	0.0063	na	na	na	na	na	0.1	**1.09**	**0.59**	0.0036	**5.68**
Lead	14.7	0.004	0.018	0.12	**0.7**	**0.92**	**1.05**	0.04	0.2	0.12	0.0086	0.12
Mercury	0.0414	0.0009	0.15	**0.5**	**0.59**	**1.88**	**3.18**	0.002	0.024	0.014	**0.83**	0.0012
Selenium	0.461	0.0055	0.0048	0.08	**0.46**	**0.53**	**0.61**	0.22	**0.7**	**0.56**	0.11	**0.89**
Zinc	79.4	0.013	0.033	0.25	0.23	**0.93**	**1.65**	0.044	**0.81**	**0.47**	**0.66**	**0.5**
Acenaphthene	0.16	0.000026	na	na	na	na	na	0.00033	0.0013	0.001	na	**0.64**
Acetone	0.457	0.00016	0.000015	0.00038	0.061	0.033	0.0027	**0.33**	0.03	**0.38**	na	na
Aroclor-1254	0.68	**4.55**	**3.1**	**4.01**	**0.52**	**8.53**	**16.6**	0.013	**1.55**	**0.78**	na	0.0043
Aroclor-1260	0.12	**0.86**	0.026	0.033	0.0026	0.071	0.14	0.00004	0.012	0.0061	na	na
Benzo(a)anthracene	0.59	0.018	0.06	0.086	**0.74**	**0.65**	**0.59**	0.095	0.2	0.17	na	0.033
Bis(2-ethylhexyl)phthalate	1.3	**1.08**	**39.4**	**28.9**	0.065	**32.5**	**65**	0.00048	**2.2**	**1.18**	na	na
Naphthalene	1.5	0.0013	0.0025	0.015	**0.44**	0.26	0.094	0.13	0.056	0.15	na	**1.5**
Xylene (total)	11	0.085	0.0034	0.039	0.12	0.2	0.27	**1.57**	**7.86**	**5.5**	na	0.11
	HI	**7**	**43**	**34**	**4**	**47**	**89**	**3**	**15**	**10**	**2**	**9**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table I-5.4-1
Mexican Spotted Owl AUFs for Sites within the Upper Sandia Canyon Aggregate Area

Site	Site area (ha)	AUF*
SWMU 03-002(c)	0.019	5.1E-05
SWMU 03-003(d)	0.010	2.9E-05
SWMU 03-009(a)	0.087	2.4E-04
SWMU 03-009(i)	0.18	5.0E-04
SWMU 03-012(b)	0.51	1.4E-03
SWMU 03-013(i)	0.015	4.1E-05
SWMU 03-014(b2)	0.15	4.1E-04
AOC 03-014(c2)	0.15	4.2E-04
SWMU 03-014(k,l,m,n)	0.10	2.9E-04
SWMU 03-014(o)	0.10	2.9E-04
SWMU 03-014(u)	0.025	6.8E-05
SWMU 03-015 and AOC 03-053	0.16	4.5E-04
SWMU 03-021	0.011	3.1E-05
SWMU 03-029	0.076	2.1E-04
SWMU 03-045(a)	0.0052	1.4E-05
SWMU 03-045(b)	8.36E-05	2.3E-07
SWMU 03-045(c)	8.36E-05	2.3E-07
SWMU 03-045(d)	8.36E-05	2.3E-07
SWMU 03-045(e)	8.36E-05	2.3E-07
SWMU 03-045(f)	0.0015	4.2E-06
SWMU 03-045(g)	0.0014	3.8E-06
SWMU 03-045(h)	4.18E-04	1.1E-06
AOC 03-047(g)	9.29E-04	2.5E-06
AOC 03-051(c)	0.0019	5.1E-06
AOC 03-052(b)	0.064	1.7E-04
SWMU 03-052(f)	0.010	2.7E-05
SWMU 03-056(a)	0.0093	2.5E-05
SWMU 03-056(d)	0.0074	2.0E-05
AOC 03-056(k)	0.091	2.5E-04
SWMU 03-059	0.55	1.5E-03
AOC C-03-022	0.018	5.0E-05
SWMU 60-002 (West)	0.45	1.2E-03
SWMU 60-002 (Central)	0.0084	2.3E-05
SWMU 60-002 (East)	0.26	7.1E-04
AOC 60-004(f)	0.082	2.2E-04
SWMU 60-006(a)	0.0033	8.9E-06
SWMU 60-007(a)	0.11	3.1E-04
SWMU 60-007(b)	1.38	3.8E-03
AOC C-61-002	0.042	1.1E-04
SWMU 61-002	0.13	3.6E-04

*AUF is calculated as the area of the site divided by the owl home range of 366 ha.

Table I-5.4-2
PAUFs for Ecological Receptors for SWMU 03-002(c)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000045
American Robin	0.42	16.8	0.0011
Deer Mouse	0.077	3	0.0062
Desert Cottontail	3.1	124	0.00015
Montane Shrew	0.39	15.6	0.0012
Red Fox	1038	41,520	0.00000046

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.019 ha) divided by the population area.

Table I-5.4-3
Adjusted HIs at SWMU 03-002(c)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.48	4.88E-09	na*	na	na	na	na	2.54E-05	2.25E-03	6.17E-03	0.0062	**9.6**
Lead	37.70	4.66E-09	2.09E-07	1.41E-06	2.03E-03	2.66E-03	3.05E-03	1.56E-05	6.38E-04	1.94E-03	0.022	**0.31**
	HI	1E-08	2E-07	1E-06	0.002	0.003	0.003	4E-05	0.003	0.008	0.03	**10**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-4
PAUFs for Ecological Receptors for SWMU 03-003(d)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000022
American Robin	0.42	16.8	0.0006
Deer Mouse	0.077	3	0.0032
Desert Cottontail	3.1	124	0.000081
Montane Shrew	0.39	15.6	0.00064
Red Fox	1038	41,520	0.00000024

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.01 ha) divided by the population area.

Table I-5.4-5
Adjusted HIs at SWMU 03-003(d)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Aroclor-1254	0.19	3.05E-07	2.04E-06	2.64E-06	8.70E-05	1.41E-03	2.76E-03	2.95E-07	2.77E-04	7.01E-04	na*	1.19E-03
Aroclor-1260	0.56	9.55E-07	2.85E-07	3.54E-07	7.18E-06	1.94E-04	3.75E-04	1.49E-08	3.56E-05	9.01E-05	na	na
	HI	1E-06	2E-06	3E-06	9E-05	0.002	0.003	3E-07	0.0003	0.0008	na	0.001

*na = Not available.

Table I-5.4-6
PAUFs for Ecological Receptors for SWMU 03-009(a)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000021
American Robin	0.42	16.8	0.0052
Deer Mouse	0.077	3	0.028
Desert Cottontail	3.1	124	0.0007
Montane Shrew	0.39	15.6	0.0056
Red Fox	1038	41,520	0.0000021

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.087 ha) divided by the population area.

Table I-5.4-7
Adjusted HIs at SWMU 03-009(a)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.18	8.38E-09	na*	na	na	na	na	4.35E-05	3.86E-03	0.011	2.31E-03	**3.6**
Chromium	16.7	1.94E-08	2.86E-07	1.32E-06	1.27E-03	2.16E-03	3.09E-03	1.39E-05	2.07E-03	4.29E-03	na	na
Selenium	0.43	1.07E-08	9.10E-08	1.58E-06	2.23E-03	2.56E-03	2.97E-03	1.44E-04	3.63E-03	0.015	0.1	**0.83**
	HI	4E-08	4E-07	3E-06	0.003	0.005	0.006	0.0002	0.01	0.03	0.1	**4**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-8
PAUFs for Ecological Receptors for SWMU 03-009(i)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000042
American Robin	0.42	16.8	0.011
Deer Mouse	0.077	3	0.058
Desert Cottontail	3.1	124	0.0015
Montane Shrew	0.39	15.6	0.012
Red Fox	1038	41,520	0.0000046

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.18 ha) divided by the population area.

Table I-5.4-9
Adjusted HIs at SWMU 03-009(i)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	2.44	2.35E-07	na*	na	na	na	na	1.22E-03	0.11	0.3	0.03	**48.8**
Barium	97.62	1.03E-08	1.12E-07	3.77E-07	1.28E-03	1.12E-03	1.05E-03	4.29E-05	8.66E-04	3.17E-03	0.3	**0.89**
Chromium	9.26	2.23E-08	3.28E-07	1.51E-06	1.46E-03	2.48E-03	3.54E-03	1.60E-05	2.37E-03	4.92E-03	na	na
Cobalt	4.09	3.28E-09	4.96E-08	1.87E-07	2.58E-04	3.65E-04	4.56E-04	3.30E-06	2.95E-04	5.98E-04	na	**0.31**
Copper	7.3	8.33E-09	1.94E-07	2.82E-06	2.06E-03	3.56E-03	5.21E-03	3.92E-05	2.22E-03	6.67E-03	0.09	0.1
Cyanide	0.63	1.24E-09	4.61E-05	5.69E-05	0.068	0.068	0.068	1.24E-06	2.34E-05	1.08E-04	na	na
Lead	11.27	1.32E-08	5.91E-07	3.99E-06	5.75E-03	7.55E-03	8.63E-03	4.42E-05	1.81E-03	5.49E-03	0.01	0.09

Table I-5.4-9 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Nickel	7.25	2.62E-08	1.06E-07	1.92E-06	4.85E-04	2.04E-03	3.70E-03	2.10E-05	8.62E-03	0.021	0.03	0.19
Selenium	1.07(U)	5.52E-08	4.68E-07	8.11E-06	0.011	0.013	0.015	7.40E-04	0.019	0.075	0.26	**2.06**
Vanadium	19.24	2.53E-08	4.80E-06	9.72E-06	0.023	0.027	0.031	1.86E-05	1.59E-03	2.34E-03	na	**770**
Aroclor-1254	0.03	8.58E-07	5.73E-06	7.42E-06	2.45E-04	3.98E-03	7.76E-03	8.29E-07	7.79E-04	1.97E-03	na	0.0002
Aroclor-1260	0.06	1.82E-06	5.44E-07	6.76E-07	1.37E-05	3.71E-04	7.17E-04	2.85E-08	6.80E-05	1.72E-04	na	na
HI		3E-06	6E-05	9E-05	0.1	0.1	0.1	0.002	0.1	0.4	0.7	**822**

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 I-5.4-10
PAUFs for Ecological Receptors for SWMU 03-012(b)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00012
American Robin	0.42	16.8	0.03
Deer Mouse	0.077	3	0.17
Desert Cottontail	3.1	124	0.0041
Montane Shrew	0.39	15.6	0.033
Red Fox	1038	41,520	0.000012

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.512 ha) divided by the population area.

Table I-5.4-11
Adjusted HIs at SWMU 03-012(b)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	5.57(U)	1.53E-06	na*	na	na	na	na	7.93E-03	**0.703**	**1.93**	0.071	**111.4**
Chromium	20.84	1.43E-07	2.10E-06	9.68E-06	9.34E-03	0.016	0.023	1.02E-04	0.015	0.031	na	na
Chromium hexavalent ion	0.241	3.96E-10	5.40E-09	1.32E-08	2.58E-05	3.30E-05	3.90E-05	3.08E-08	2.84E-05	4.76E-05	**0.71**	**0.69**
Silver	0.807	2.43E-09	1.16E-07	5.13E-06	2.24E-03	5.72E-03	9.46E-03	2.22E-05	1.89E-03	5.59E-03	na	1.44E-03
Zinc	50.98	1.05E-07	2.57E-06	1.92E-05	4.44E-03	0.018	0.032	1.17E-04	0.017	0.05	**0.42**	**0.32**
Aroclor-1254	0.336	2.76E-05	1.84E-04	2.39E-04	7.88E-03	0.13	0.25	2.67E-05	0.025	0.06	na	2.1E-03
Aroclor-1260	0.925	8.15E-05	2.43E-05	3.02E-05	6.13E-04	0.017	0.032	1.27E-06	3.04E-03	7.69E-03	na	na
	HI	0.0001	0.0002	0.0003	0.02	0.2	0.3	0.008	0.8	**2**	1	**112**

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 I-5.4-12
PAUFs for Ecological Receptors for SWMU 03-013(i)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000035
American Robin	0.42	16.8	0.00089
Deer Mouse	0.077	3	0.0049
Desert Cottontail	3.1	124	0.00012
Montane Shrew	0.39	15.6	0.00096
Red Fox	1038	41,520	0.00000036

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.015 ha) divided by the population area.

Table I-5.4-13
Adjusted HIs at SWMU 03-013(i)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.31	1.05E-08	na*	na	na	na	na	5.46E-05	4.84E-03	0.013	0.017	**26.2**
Copper	9.492	9.02E-10	2.10E-08	3.05E-07	2.23E-04	3.85E-04	5.65E-04	4.25E-06	2.40E-04	7.22E-04	0.12	0.14
Lead	73.35	7.16E-09	3.20E-07	2.16E-06	3.12E-03	4.09E-03	4.68E-03	2.40E-05	9.80E-04	2.98E-03	0.043	**0.61**
Selenium	0.874	3.76E-09	3.19E-08	5.52E-07	7.80E-04	8.97E-04	1.04E-03	5.03E-05	1.27E-03	5.13E-03	0.21	**1.68**
Zinc	109.8	6.61E-09	1.62E-07	1.21E-06	2.80E-04	1.15E-03	2.04E-03	7.38E-06	1.08E-03	3.15E-03	**0.92**	**0.69**
Acetone	0.376	4.68E-11	4.43E-11	1.11E-09	4.48E-05	2.40E-05	1.97E-06	3.25E-05	2.41E-05	1.53E-03	na	na
Aroclor-1242	0.0297	6.71E-10	7.51E-08	4.04E-07	2.65E-05	3.36E-04	6.47E-04	1.20E-07	7.52E-05	1.90E-04	na	na
Aroclor-1254	0.339	8.16E-07	5.45E-06	7.05E-06	2.33E-04	3.78E-03	7.38E-03	7.89E-07	7.41E-04	1.88E-03	na	0.0021
Aroclor-1260	0.15	3.95E-07	1.18E-07	1.46E-07	2.97E-06	8.04E-05	1.55E-04	6.17E-09	1.47E-05	3.73E-05	na	na
Benzoic Acid	0.69	7.11E-10	na	na	na	na	na	1.98E-05	6.63E-04	2.58E-03	na	na
Bis(2-ethylhexyl)phthalate	0.27	8.10E-08	2.88E-05	2.11E-05	1.20E-05	6.00E-03	0.012	1.21E-08	4.38E-04	1.19E-03	na	na
	HI	1E-06	4E-05	3E-05	0.005	0.02	0.03	0.0002	0.01	0.03	1	**29**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-14
PAUFs for Ecological Receptors for AOC 03-014(b2)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000035
American Robin	0.42	16.8	0.0089
Deer Mouse	0.077	3	0.049
Desert Cottontail	3.1	124	0.0012
Montane Shrew	0.39	15.6	0.0096
Red Fox	1038	41,520	0.0000036

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.15 ha) divided by the population area.

Table I-5.4-15
Adjusted HIs at AOC 03-014(b2)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.29(U)	1.04E-07	na*	na	na	na	na	5.38E-04	0.048	0.13	0.017	**25.8**
Chromium	14.9	2.99E-08	4.39E-07	2.03E-06	1.96E-03	3.33E-03	4.75E-03	2.15E-05	3.18E-03	6.60E-03	na	na
Cyanide	1.61	2.64E-09	9.82E-05	1.21E-04	0.14	0.14	0.14	2.63E-06	4.99E-05	2.31E-04	na	na
Lead	18.16	1.77E-08	7.93E-07	5.35E-06	7.72E-03	0.01	0.012	5.94E-05	2.43E-03	7.37E-03	0.011	0.15
Selenium	1.29(U)	5.55E-08	4.70E-07	8.15E-06	0.012	0.013	0.015	7.43E-04	0.019	0.076	**0.31**	**2.48**
Zinc	52.56	3.16E-08	7.75E-07	5.81E-06	1.34E-03	5.52E-03	9.78E-03	3.53E-05	5.16E-03	0.015	**0.44**	**0.33**
Aroclor-1254	0.0693	1.67E-06	1.11E-05	1.44E-05	4.76E-04	7.73E-03	0.015	1.61E-06	1.51E-03	3.84E-03	na	0.0004
Aroclor-1260	0.05	1.33E-06	3.95E-07	4.91E-07	9.98E-06	2.70E-04	5.22E-04	2.07E-08	4.94E-05	1.25E-04	na	na
Bis(2-ethylhexyl)phthalate	0.10	3.01E-07	1.07E-04	7.86E-05	4.46E-05	0.022	0.045	4.48E-08	1.63E-03	4.43E-03	na	na
HI		4E-06	0.0002	0.0002	0.2	0.2	0.2	0.001	0.08	0.2	0.8	**29**

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 I-5.4-16
PAUFs for Ecological Receptors for AOC 03-014(c2)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000035
American Robin	0.42	16.8	0.0089
Deer Mouse	0.077	3	0.049
Desert Cottontail	3.1	124	0.0012
Montane Shrew	0.39	15.6	0.0096
Red Fox	1038	41,520	0.0000036

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.15 ha) divided by the population area.

Table I-5.4-17
Adjusted HIs at AOC 03-014(c2)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.11(U)	8.91E-08	na*	na	na	na	na	4.63E-04	0.041	0.11	0.014	**22.2**
Chromium	17.38	3.49E-08	5.12E-07	2.36E-06	2.28E-03	3.88E-03	5.54E-03	2.50E-05	3.71E-03	7.69E-03	na	na
Copper	17.23	1.64E-08	3.81E-07	5.54E-06	4.05E-03	6.99E-03	0.01	7.72E-05	4.36E-03	0.013	0.22	0.25
Cyanide	11.28	1.85E-08	6.88E-04	8.49E-04	**1.01**	**1.01**	**1.01**	1.84E-05	3.50E-04	1.62E-03	na	na
Mercury	0.543	4.26E-08	6.86E-05	2.34E-04	0.069	0.22	**0.37**	2.99E-05	3.07E-03	8.81E-03	**10.86**	0.016
Selenium	1.14(U)	4.90E-08	4.16E-07	7.20E-06	0.01	0.012	0.014	6.57E-04	0.017	0.067	0.28	**2.19**
Silver	6.064	5.34E-09	2.55E-07	1.13E-05	4.92E-03	0.013	0.021	4.89E-05	4.16E-03	0.012	na	0.011

Table I-5.4-17 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Zinc	55.41	3.34E-08	8.17E-07	6.13E-06	1.41E-03	5.82E-03	0.01	3.72E-05	5.44E-03	0.016	**0.46**	**0.35**
Aroclor-1248	0.0141	6.79E-07	1.47E-06	2.49E-06	1.26E-04	1.59E-03	0.003	2.89E-05	0.019	0.049	na	na
Aroclor-1254	2.54	6.11E-05	4.08E-04	5.28E-04	0.017	0.28	**0.55**	5.90E-05	0.055	0.14	na	0.016
Aroclor-1260	2.24	5.78E-05	1.72E-05	2.14E-05	4.35E-04	0.012	0.023	9.03E-07	2.15E-03	5.45E-03	na	na
	HI	0.0001	0.001	0.002	1	**2**	**2**	0.001	0.2	0.4	**12**	**25**

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 I-5.4-18
PAUFs for Ecological Receptors for SWMU 03-014(k,l,m,n)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000024
American Robin	0.42	16.8	0.006
Deer Mouse	0.077	3	0.032
Desert Cottontail	3.1	124	0.00081
Montane Shrew	0.39	15.6	0.0064
Red Fox	1038	41,520	0.0000024

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.1 ha) divided by the population area.

Table I-5.4-19
Adjusted HIs at SWMU 03-014(k,l,m,n)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	8.3	4.44E-08	na	na	na	na	na	2.31E-04	0.020	0.056	0.11	**166**
Cadmium	1.89	8.93E-10	7.69E-09	2.23E-06	2.56E-04	2.08E-03	3.88E-03	1.54E-05	4.49E-03	0.012	0.014	0.059
Chromium	20.7	2.77E-09	4.07E-08	1.88E-07	1.81E-04	3.08E-04	4.40E-04	1.99E-06	2.95E-04	6.11E-04	na	na
Copper	52.1	3.30E-09	7.68E-08	1.12E-06	8.16E-04	1.41E-03	2.07E-03	1.56E-05	8.79E-04	2.64E-03	**0.65**	**0.74**
Cyanide	2.47	2.70E-10	1.00E-05	1.24E-05	0.015	0.015	0.015	2.69E-07	5.11E-06	2.36E-05	na	na
Lead	60.5	3.94E-09	1.76E-07	1.19E-06	1.71E-03	2.25E-03	2.57E-03	1.32E-05	5.39E-04	1.64E-03	0.036	**0.5**
Mercury	0.355	1.86E-09	2.99E-06	1.02E-05	3.02E-03	9.60E-03	0.016	1.30E-06	1.34E-04	3.84E-04	**7.1**	0.01
Nickel	8.36	1.68E-09	6.80E-09	1.23E-07	3.11E-05	1.31E-04	2.37E-04	1.35E-06	5.52E-04	1.36E-03	0.03	0.22
Selenium	0.96	2.75E-09	2.33E-08	4.04E-07	5.71E-04	6.57E-04	7.62E-04	3.69E-05	9.32E-04	3.76E-03	0.23	**1.85**
Silver	4.97	2.92E-10	1.40E-08	6.17E-07	2.69E-04	6.88E-04	1.14E-03	2.67E-06	2.28E-04	6.72E-04	na	8.88E-03
Zinc	175	7.02E-09	1.72E-07	1.29E-06	2.98E-04	1.23E-03	2.17E-03	7.84E-06	1.14E-03	3.34E-03	**1.46**	**1.09**
Acenaphthene	2.3	8.93E-11	na	na	na	na	na	3.79E-07	1.23E-05	4.67E-05	na	**9.2**
Acetone	2.2	1.83E-10	1.73E-10	4.32E-09	1.75E-04	9.35E-05	7.70E-06	1.27E-04	9.40E-05	5.95E-03	na	na
Anthracene	3.9	1.62E-10	na	na	na	na	na	2.86E-07	1.19E-05	4.08E-05	na	**0.57**
Aroclor-1254	1.06	1.70E-06	1.14E-05	1.47E-05	4.85E-04	7.89E-03	0.015	1.64E-06	1.54E-03	3.91E-03	na	6.63E-03
Aroclor-1260	0.043	7.40E-08	2.20E-08	2.74E-08	5.56E-07	1.51E-05	2.91E-05	1.16E-09	2.76E-06	6.98E-06	na	na
Benzo(a)anthracene	11	8.28E-08	2.65E-06	3.76E-06	8.18E-03	7.20E-03	6.55E-03	1.43E-04	2.35E-03	0.011	na	**0.61**
Bis(2-ethylhexyl)phthalate	44	8.83E-06	3.14E-03	2.31E-03	1.31E-03	**0.65**	**1.31**	1.31E-06	0.048	0.13	na	na
Butylbenzylphthalate	30	3.80E-09	na	na	na	na	na	1.05E-06	2.14E-04	6.09E-04	na	na
Chrysene	1.56	1.50E-08	na	na	na	na	na	1.94E-05	4.17E-04	1.63E-03	na	na
Dichlorobenzene[1,4-]	1.4	4.68E-09	na	na	na	na	na	1.03E-05	1.02E-03	3.03E-03	**1.17**	na

Table I-5.4-19 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Fluoranthene	3.93	2.63E-09	na	na	na	na	na	1.22E-06	1.15E-04	3.36E-04	**0.39**	na
Fluorene	2	5.18E-11	na	na	na	na	na	1.47E-07	5.13E-06	1.91E-05	**0.54**	na
Naphthalene	0.94	1.89E-10	3.76E-09	2.22E-08	1.65E-04	9.82E-05	3.50E-05	6.32E-06	2.23E-05	3.15E-04	na	**0.94**
Phenanthrene	22	1.83E-08	na	na	na	na	na	3.01E-05	1.41E-03	4.76E-03	**4**	na
Pyrene	5.24	3.51E-09	2.69E-08	6.50E-08	4.39E-05	6.78E-05	9.17E-05	3.84E-06	1.53E-04	5.32E-04	**0.52**	na
	HI	1E-05	0.003	0.002	0.03	0.7	1	0.0007	0.08	0.2	**16**	**182**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-20
PAUFs for Ecological Receptors for SWMU 03-014(o)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000024
American Robin	0.42	16.8	0.006
Deer Mouse	0.077	3	0.032
Desert Cottontail	3.1	124	0.00081
Montane Shrew	0.39	15.6	0.0064
Red Fox	1038	41,520	0.0000024

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.1 ha) divided by the population area.

Table I-5.4-21
Adjusted HIs at SWMU 03-014(o)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	5.38(U)	2.88E-07	na*	na	na	na	na	1.50E-03	0.13	**0.36**	0.069	**107.6**
Chromium	39.3	5.26E-08	7.72E-07	3.56E-06	3.44E-03	5.85E-03	8.35E-03	3.77E-05	5.60E-03	0.012	na	na
Copper	34.1	2.16E-08	5.02E-07	7.30E-06	5.34E-03	9.22E-03	0.014	1.02E-04	5.75E-03	0.017	**0.43**	**0.49**
Cyanide	1.14	1.25E-09	4.64E-05	5.72E-05	0.068	0.068	0.068	1.24E-06	2.36E-05	1.09E-04	na	na
Lead	10.3	6.72E-09	3.00E-07	2.03E-06	2.93E-03	3.84E-03	4.39E-03	2.25E-05	9.19E-04	2.79E-03	6.07E-03	0.086
Mercury	0.989	5.18E-08	8.33E-05	2.84E-04	0.084	0.27	**0.45**	3.63E-05	3.73E-03	0.011	**19.78**	0.029
Selenium	0.34	9.75E-09	8.27E-08	1.43E-06	2.02E-03	2.33E-03	2.70E-03	1.31E-04	3.30E-03	0.013	0.083	**0.65**
Silver	18.00	1.06E-08	5.07E-07	2.24E-05	9.76E-03	0.025	0.041	9.70E-05	8.26E-03	0.024	na	0.032
Zinc	47.50	1.91E-08	4.66E-07	3.50E-06	8.07E-04	3.32E-03	5.89E-03	2.13E-05	3.10E-03	9.06E-03	**0.4**	0.3
Aroclor-1242	0.0918	1.38E-08	1.55E-06	8.33E-06	5.46E-04	6.92E-03	0.013	2.47E-06	1.55E-03	3.92E-03	na	na
Aroclor-1254	0.136	2.18E-06	1.46E-05	1.89E-05	6.23E-04	0.01	0.02	2.11E-06	1.98E-03	5.02E-03	na	8.50E-04
Aroclor-1260	0.344	5.92E-06	1.76E-06	2.19E-06	4.45E-05	1.20E-03	2.33E-03	9.25E-08	2.21E-04	5.58E-04	na	na
Benzo(a)anthracene	0.48	3.61E-08	1.16E-06	1.64E-06	3.57E-03	3.14E-03	2.86E-03	6.24E-05	1.03E-03	4.58E-03	na	0.027
Bis(2-ethylhexyl)phthalate	0.0746	1.50E-07	5.33E-05	3.91E-05	2.22E-05	0.011	0.022	2.23E-08	8.11E-04	2.20E-03	na	na
HI		9E-06	0.0002	0.0005	0.2	0.4	0.7	0.002	0.2	0.5	**21**	**109**

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 I-5.4-22
PAUFs for Ecological Receptors for SWMU 03-014(u)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000059
American Robin	0.42	16.8	0.0015
Deer Mouse	0.077	3	0.0081
Desert Cottontail	3.1	124	0.0002
Montane Shrew	0.39	15.6	0.0016
Red Fox	1038	41,520	0.0000006

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.025 ha) divided by the population area.

Table I-5.4-23
Adjusted HIs at SWMU 03-014(u)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	1.62E-08	na*	na	na	na	na	8.41E-05	7.46E-03	0.02	0.016	**24.2**
Chromium	64.6	2.16E-08	3.17E-07	1.46E-06	1.41E-03	2.40E-03	3.43E-03	1.55E-05	2.30E-03	4.77E-03	na	na
Copper	85.1	1.35E-08	3.14E-07	4.56E-06	3.33E-03	5.76E-03	8.44E-03	6.36E-05	3.59E-03	0.011	**1.06**	**1.22**
Cyanide	27.7	7.58E-09	2.82E-04	3.48E-04	**0.41**	**0.41**	**0.41**	7.55E-06	1.43E-04	6.61E-04	na	na
Lead	50.3	8.18E-09	3.66E-07	2.47E-06	3.56E-03	4.68E-03	0.01	2.74E-05	1.12E-03	3.40E-03	0.03	**0.42**
Mercury	0.76	9.95E-09	1.60E-05	5.46E-05	0.016	0.051	0.087	6.96E-06	7.16E-04	2.06E-03	**15.2**	0.022
Selenium	1.21(U)	8.67E-09	7.36E-08	1.27E-06	1.80E-03	2.07E-03	2.40E-03	1.16E-04	2.94E-03	0.012	0.3	**2.33**

Table I-5.4-23 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Silver	24.9	3.66E-09	1.75E-07	7.73E-06	3.37E-03	8.62E-03	0.014	3.35E-05	2.85E-03	8.43E-03	na	0.045
Zinc	63.7	6.40E-09	1.57E-07	1.17E-06	2.71E-04	1.12E-03	1.98E-03	7.14E-06	1.04E-03	3.04E-03	**0.53**	**0.4**
Aroclor-1254	0.254	1.02E-06	6.81E-06	8.81E-06	2.91E-04	4.72E-03	9.22E-03	9.85E-07	9.25E-04	2.34E-03	na	0.0016
Aroclor-1260	0.199	8.56E-07	2.55E-07	3.17E-07	6.44E-06	1.74E-04	3.37E-04	1.34E-08	3.19E-05	8.08E-05	na	na
Bis(2-ethylhexyl)phthalate	0.341	1.71E-07	6.09E-05	1.13E-02	2.54E-05	0.013	0.025	2.55E-08	9.26E-04	2.52E-03	na	na
HI		2E-06	0.0004	0.01	0.4	0.5	0.6	0.0004	0.02	0.07	**17**	**29**

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 I-5.4-24
PAUFs for Ecological Receptors for SWMU 03-015 and AOC 03-053

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000038
American Robin	0.42	16.8	0.0095
Deer Mouse	0.077	3	0.052
Desert Cottontail	3.1	124	0.0013
Montane Shrew	0.39	15.6	0.01
Red Fox	1038	41,520	0.0000039

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.16 ha) divided by the population area.

Table I-5.4-25
Adjusted HIs at SWMU 03-015 and AOC 03-053

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.39	6.33E-07	na*	na	na	na	na	3.29E-03	0.29	**0.8**	0.095	**148**
Barium	116.1	1.09E-08	1.18E-07	3.98E-07	1.35E-03	1.19E-03	1.11E-03	4.54E-05	9.16E-04	3.35E-03	**0.35**	**1.06**
Chromium	30.72	6.58E-08	9.66E-07	4.46E-06	4.30E-03	7.31E-03	0.01	4.72E-05	7.00E-03	0.015	na	na
Copper	11.17	1.13E-08	2.63E-07	3.83E-06	2.80E-03	4.84E-03	7.09E-03	5.34E-05	3.01E-03	9.07E-03	0.14	0.16
Lead	94.51	9.84E-08	4.40E-06	2.97E-05	0.043	0.056	0.064	3.30E-04	0.013	0.041	0.056	**0.79**
Mercury	0.125	1.05E-08	1.68E-05	5.75E-05	0.017	0.054	0.092	7.33E-06	7.54E-04	2.16E-03	**2.5**	0.0037
Selenium	1.35(UJ)	6.19E-08	5.25E-07	9.10E-06	0.013	0.015	0.017	8.29E-04	0.021	0.084	**0.33**	**2.6**
Zinc	70.28	4.51E-08	1.11E-06	8.29E-06	1.91E-03	7.87E-03	0.014	5.04E-05	7.36E-03	0.021	**0.59**	**0.44**
Acenaphthene	0.15	9.01E-11	na	na	na	na	na	3.82E-07	1.24E-05	4.71E-05	na	**0.58**
Aroclor-1254	1.28	3.29E-05	2.20E-04	2.84E-04	9.38E-03	0.15	0.3	3.18E-05	0.03	0.076	na	0.008
Aroclor-1260	0.14	3.80E-06	1.13E-06	1.41E-06	2.86E-05	7.73E-04	1.49E-03	5.94E-08	1.42E-04	3.58E-04	na	na
Benzo(a)anthracene	1.17	1.41E-07	4.52E-06	6.42E-06	0.014	0.012	0.011	2.44E-04	4.01E-03	0.018	na	0.065
	HI	4E-05	0.0002	0.0004	0.1	0.3	0.5	0.005	0.4	1	**4**	**153**

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 I-5.4-26
PAUFs for Ecological Receptors for SWMU 03-021

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000026
American Robin	0.42	16.8	0.0065
Deer Mouse	0.077	3	0.036
Desert Cottontail	3.1	124	0.00089
Montane Shrew	0.39	15.6	0.0071
Red Fox	1038	41,520	0.0000026

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.011 ha) divided by the population area.

Table I-5.4-27
Adjusted HIs at SWMU 03-021

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.732	4.31E-08	na*	na	na	na	na	2.24E-04	0.02	0.054	9.38E-03	**14.64**
Barium	79	5.10E-09	5.54E-08	1.86E-07	6.31E-04	5.56E-04	5.17E-04	2.12E-05	4.28E-04	1.57E-03	0.24	**0.72**
Chromium	24.8	3.65E-08	5.36E-07	2.48E-06	2.39E-03	4.06E-03	5.80E-03	2.62E-05	3.89E-03	8.06E-03	na	na
Lead	63.1	4.52E-08	2.02E-06	1.36E-05	0.02	0.026	0.03	1.51E-04	6.18E-03	0.019	0.037	**0.53**
Nickel	8.38	1.85E-08	7.49E-08	1.36E-06	3.43E-04	1.44E-03	2.61E-03	1.49E-05	6.09E-03	0.015	0.03	0.22
Selenium	0.786	2.48E-08	2.10E-07	3.64E-06	5.15E-03	5.92E-03	6.86E-03	3.32E-04	8.40E-03	0.034	0.19	**1.51**
Thallium	0.597	5.65E-07	2.07E-07	2.35E-06	4.25E-04	2.44E-03	4.34E-03	1.89E-04	0.13	0.31	na	**5.97**
Zinc	61.6	2.72E-08	6.66E-07	5.00E-06	1.15E-03	4.75E-03	8.41E-03	3.04E-05	4.43E-03	0.0129	**0.51**	**0.39**
Aroclor-1254	0.018	3.18E-07	2.12E-06	2.75E-06	9.07E-05	1.47E-03	2.87E-03	3.07E-07	2.88E-04	7.31E-04	na	1.13E-04
	HI	1E-06	6E-06	3E-05	0.03	0.05	0.06	0.001	0.2	0.5	1	**24**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-28
PAUFs for Ecological Receptors for SWMU 03-029

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000019
American Robin	0.42	16.8	0.0048
Deer Mouse	0.077	3	0.026
Desert Cottontail	3.1	124	0.00065
Montane Shrew	0.39	15.6	0.0051
Red Fox	1038	41,520	0.0000019

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.08 ha) divided by the population area.

Table I-5.4-29
Adjusted HIs at SWMU 03-029

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.1(U)	4.71E-08	na*	na	na	na	na	2.45E-04	0.022	0.06	0.014	**22**
Chromium	15.6	1.67E-08	2.45E-07	1.13E-06	1.09E-03	1.86E-03	2.65E-03	1.20E-05	1.78E-03	3.69E-03	na	na
Copper	27.3	1.38E-08	3.22E-07	4.68E-06	3.42E-03	5.90E-03	8.66E-03	6.52E-05	3.68E-03	0.011	**0.34**	**0.39**
Selenium	1.14(U)	2.61E-08	2.22E-07	3.84E-06	5.43E-03	6.24E-03	7.24E-03	3.50E-04	8.86E-03	0.036	0.28	**2.19**
Aroclor-1254	0.0192	2.47E-07	1.65E-06	2.13E-06	7.03E-05	1.14E-03	2.23E-03	2.38E-07	2.24E-04	5.67E-04	na	1.20E-04
HI		4E-07	2E-06	1E-05	0.01	0.02	0.02	0.0007	0.04	0.11	0.6	**25**

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 I-5.4-30
PAUFs for Ecological Receptors for SWMU 03-045(a)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000012
American Robin	0.42	16.8	0.0003
Deer Mouse	0.077	3	0.0016
Desert Cottontail	3.1	124	0.00004
Montane Shrew	0.39	15.6	0.00032
Red Fox	1038	41,520	0.00000012

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.005 ha) divided by the population area.

Table I-5.4-31
Adjusted HIs at SWMU 03-045(a)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.29(U)	3.45E-09	na*	na	na	na	na	1.79E-05	1.59E-03	4.36E-03	0.017	**25.8**
Chromium	49	3.28E-09	4.81E-08	2.22E-07	2.14E-04	3.65E-04	5.21E-04	2.35E-06	3.49E-04	7.23E-04	na	na
Copper	20.1	6.38E-10	1.48E-08	2.16E-07	1.58E-04	2.72E-04	3.99E-04	3.01E-06	1.70E-04	5.11E-04	0.25	0.29
Lead	334.3	1.09E-08	4.87E-07	3.29E-06	4.74E-03	6.22E-03	7.11E-03	3.64E-05	1.49E-03	4.52E-03	0.2	**2.79**
Mercury	0.374	9.69E-10	1.56E-06	5.32E-06	1.57E-03	5.01E-03	8.47E-03	6.78E-07	6.98E-05	2.00E-04	**7.4**	0.011
Selenium	1.32(U)	1.89E-09	1.60E-08	2.78E-07	3.93E-04	4.52E-04	5.24E-04	2.53E-05	6.41E-04	2.58E-03	**0.32**	**2.54**
Silver	1.32	3.88E-11	1.85E-09	8.19E-08	3.57E-05	9.14E-05	1.51E-04	3.55E-07	3.02E-05	8.93E-05	na	2.36E-03
Zinc	99.5	2.00E-09	4.89E-08	3.67E-07	8.46E-05	3.48E-04	6.17E-04	2.23E-06	3.25E-04	9.50E-04	**0.83**	**0.62**
Acenaphthene	0.954	1.85E-11	na	na	na	na	na	7.85E-08	2.55E-06	9.68E-06	na	**3.82**

Table I-5.4-31 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Aroclor-1254	0.137	1.10E-07	7.34E-07	9.50E-07	3.14E-05	5.10E-04	9.94E-04	1.06E-07	9.98E-05	2.53E-04	na	8.56E-04
Aroclor-1260	0.258	2.22E-07	6.61E-08	8.22E-08	1.67E-06	4.52E-05	8.73E-05	3.47E-09	8.27E-06	2.09E-05	na	na
Benzo(a)anthracene	3.8	1.43E-08	4.57E-07	6.49E-07	1.41E-03	1.24E-03	1.13E-03	2.47E-05	4.06E-04	1.81E-03	na	0.21
Benzo(b)fluoranthene	5.85	2.82E-09	na	na	na	na	na	1.81E-06	4.93E-05	1.83E-04	na	**0.33**
Chrysene	3.56	1.71E-08	na	na	na	na	na	2.21E-05	4.75E-04	1.86E-03	na	na
Fluoranthene	9.3	3.11E-09	na	na	na	na	na	1.44E-06	1.35E-04	3.97E-04	**0.93**	na
Naphthalene	0.72	7.23E-11	1.44E-09	8.49E-09	6.30E-05	3.76E-05	1.34E-05	2.42E-06	8.55E-06	1.20E-04	na	**0.72**
Phenanthrene	8.26	3.43E-09	na	na	na	na	na	5.65E-06	2.65E-04	8.94E-04	**1.5**	na
Pyrene	8.32	2.78E-09	2.13E-08	5.16E-08	3.49E-05	5.38E-05	7.28E-05	3.05E-06	1.21E-04	4.22E-04	**0.83**	na
	HI	4E-07	3E-06	1E-05	0.01	0.01	0.02	0.0001	0.01	0.02	**12**	**37**

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 I-5.4-32
PAUFs for Ecological Receptors for SWMU 03-045(b)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000002
American Robin	0.42	16.8	0.000005
Deer Mouse	0.077	3	0.000027
Desert Cottontail	3.1	124	0.00000067
Montane Shrew	0.39	15.6	0.0000054
Red Fox	1038	41,520	0.000000002

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.000084 ha) divided by the population area.

Table I-5.4-33
Adjusted HIs at SWMU 03-045(b)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.07(U)	4.79E-11	na*	na	na	na	na	2.49E-07	2.21E-05	6.05E-05	0.014	**21.4**
Mercury	0.159	7.00E-12	1.13E-08	3.85E-08	1.14E-05	3.62E-05	6.12E-05	4.90E-09	5.04E-07	1.45E-06	**3.2**	0.0047
Silver	1.17	5.75E-13	2.75E-11	1.21E-09	5.29E-07	1.35E-06	2.24E-06	5.26E-09	4.48E-07	1.32E-06	na	0.0021
Aroclor-1254	0.0803	1.07E-09	7.17E-09	9.28E-09	3.06E-07	4.98E-06	9.71E-06	1.04E-09	9.74E-07	2.47E-06	na	0.0005
Aroclor-1260	0.117	1.68E-09	5.01E-10	6.23E-10	1.27E-08	3.42E-07	6.62E-07	2.63E-11	6.27E-08	1.59E-07	na	na
	HI	3E-09	2E-08	5E-08	1E-05	4E-05	7E-05	3E-07	2E-05	7E-05	**3**	**21**

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 I-5.4-34
PAUFs for Ecological Receptors for SWMU 03-045(c)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000002
American Robin	0.42	16.8	0.000005
Deer Mouse	0.077	3	0.000027
Desert Cottontail	3.1	124	0.00000067
Montane Shrew	0.39	15.6	0.0000054
Red Fox	1038	41,520	0.000000002

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.000084 ha) divided by the population area.

Table I-5.4-35
Adjusted HIs at SWMU 03-045(c)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.14(U)	5.10E-11	na*	na	na	na	na	2.65E-07	2.35E-05	6.45E-05	0.015	**22.8**
Aroclor-1254	0.812	1.09E-08	7.28E-08	9.42E-08	3.11E-06	5.05E-05	9.86E-05	1.05E-08	9.89E-06	2.50E-05	na	5.08E-03
Aroclor-1260	3.19	4.59E-08	1.37E-08	1.70E-08	3.45E-07	9.34E-06	1.80E-05	7.17E-10	1.71E-06	4.33E-06	na	na
Benzo(a)anthracene	0.287	1.81E-11	5.77E-10	8.20E-10	1.79E-06	1.57E-06	1.43E-06	3.12E-08	5.13E-07	2.29E-06	na	0.016
	HI	6E-08	9E-08	1E-07	5E-06	6E-05	0.0001	3E-07	4E-05	0.0001	0.01	**23**

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 I-5.4-36
PAUFs for Ecological Receptors for SWMU 03-045(e)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000002
American Robin	0.42	16.8	0.000005
Deer Mouse	0.077	3	0.000027
Desert Cottontail	3.1	124	0.00000067
Montane Shrew	0.39	15.6	0.0000054
Red Fox	1038	41,520	0.000000002

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.000084 ha) divided by the population area.

Table I-5.4-37
Adjusted HIs at SWMU 03-045(e)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.09(U)	4.88E-11	na*	na	na	na	na	2.53E-07	2.25E-05	6.16E-05	0.014	**21.8**
Lead	99.6	5.42E-11	2.42E-09	1.64E-08	2.36E-05	3.10E-05	3.54E-05	1.81E-07	7.41E-06	2.25E-05	0.059	**0.83**
	HI	1E-10	2E-09	2E-08	2E-05	3E-05	4E-05	4E-07	3E-05	8E-05	0.07	**23**

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 I-5.4-38
PAUFs for Ecological Receptors for SWMU 03-045(f)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000035
American Robin	0.42	16.8	0.000089
Deer Mouse	0.077	3	0.00049
Desert Cottontail	3.1	124	0.000012
Montane Shrew	0.39	15.6	0.000096
Red Fox	1038	41,520	0.000000036

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0015 ha) divided by the population area.

Table I-5.4-39
Adjusted HIs at SWMU 03-045(f)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.08	8.67E-10	na*	na	na	na	na	4.51E-06	3.99E-04	1.10E-03	0.01	**21.6**
	HI	9E-10	na	na	na	na	na	5E-06	0.0004	0.001	0.01	**22**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-40
PAUFs for Ecological Receptors for SWMU 03-045(g)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000002
American Robin	0.42	16.8	0.000005
Deer Mouse	0.077	3	0.000027
Desert Cottontail	3.1	124	0.00000067
Montane Shrew	0.39	15.6	0.0000054
Red Fox	1038	41,520	0.000000002

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0014 ha) divided by the population area.

Table I-5.4-41
Adjusted HIs at SWMU 03-045(g)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.49	3.67E-10	na*	na	na	na	na	1.91E-06	1.69E-04	4.64E-04	6.28E-03	**9.8**
Arsenic	2.61	1.09E-10	7.83E-10	5.39E-09	5.18E-06	8.37E-06	1.21E-05	1.84E-07	1.56E-05	3.71E-05	**0.38**	0.15
Barium	145.1	1.19E-10	1.29E-09	4.36E-09	1.47E-05	1.30E-05	1.21E-05	4.96E-07	1.00E-05	3.66E-05	**0.44**	**1.32**
Cadmium	0.445	2.98E-11	2.56E-10	7.43E-08	8.52E-06	6.94E-05	1.29E-04	5.13E-07	1.50E-04	4.01E-04	3.21E-03	0.014
Chromium	31.6	5.92E-10	8.69E-09	4.01E-08	3.87E-05	6.58E-05	9.40E-05	4.25E-07	6.30E-05	1.31E-04	na	na
Cobalt	4.72	2.95E-11	4.45E-10	1.68E-09	2.31E-06	3.28E-06	4.10E-06	2.96E-08	2.65E-06	5.36E-06	na	**0.36**
Copper	23.1	2.05E-10	4.77E-09	6.93E-08	5.06E-05	8.75E-05	1.28E-04	9.66E-07	5.45E-05	1.64E-04	0.29	**0.33**
Lead	15	1.37E-10	6.11E-09	4.13E-08	5.95E-05	7.81E-05	8.93E-05	4.58E-07	1.87E-05	5.68E-05	8.82E-03	0.13
Manganese	399.1	3.28E-10	1.46E-09	3.77E-09	2.38E-05	1.75E-05	1.07E-05	2.25E-06	2.39E-05	1.30E-04	**0.89**	**1.81**
Nickel	11.7	3.29E-10	1.33E-09	2.42E-08	6.10E-06	2.57E-05	4.65E-05	2.65E-07	1.08E-04	2.66E-04	0.042	**0.31**
Selenium	0.831	3.33E-10	2.83E-09	4.89E-08	6.92E-05	7.95E-05	9.22E-05	4.46E-06	1.13E-04	4.55E-04	0.2	**1.6**
Vanadium	21.1	2.16E-10	4.10E-08	8.30E-08	1.98E-04	2.31E-04	2.63E-04	1.59E-07	1.35E-05	2.00E-05	na	**844.4**
Zinc	77.9	4.38E-10	1.07E-08	8.03E-08	1.85E-05	7.63E-05	1.35E-04	4.88E-07	7.13E-05	2.08E-04	**0.65**	**0.49**
Bis(2-ethylhexyl)phthalate	0.77	2.16E-08	7.70E-06	1.43E-03	3.21E-06	1.60E-03	3.21E-03	3.22E-09	1.17E-04	3.18E-04	na	na
	HI	2E-08	8E-08	0.001	0.0005	0.002	0.004	1E-05	0.0009	0.003	**3**	**861**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-42
PAUFs for Ecological Receptors for SWMU 03-045(h)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000001
American Robin	0.42	16.8	0.000025
Deer Mouse	0.077	3	0.00014
Desert Cottontail	3.1	124	0.0000034
Montane Shrew	0.39	15.6	0.000027
Red Fox	1038	41,520	0.00000001

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00042 ha) divided by the population area.

Table I-5.4-43
Adjusted HIs at SWMU 03-045(h)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.13(UJ)	2.54E-10	na*	na	na	na	na	1.32E-06	1.17E-04	3.21E-04	0.014	**22.6**
Chromium hexavalent ion	0.14	1.97E-13	2.57E-12	6.30E-12	1.25E-08	1.59E-08	1.84E-08	1.48E-10	1.35E-08	2.22E-08	**0.41**	**0.4**
Aroclor-1254	0.0193	1.30E-09	8.69E-09	1.12E-08	3.71E-07	6.03E-06	1.18E-05	1.26E-09	1.18E-06	2.99E-06	na	1.21E-04
TCDD[2,3,7,8-]	1.95E-06	1.64E-08	na	na	na	na	na	1.38E-07	1.81E-04	4.58E-04	3.90E-07	na
	HI	2E-08	9E-09	1E-08	4E-07	6E-06	1E-05	1E-06	0.0003	0.0008	0.4	**23**

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 I-5.4-44
PAUFs for Ecological Receptors for AOC 03-047(g)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000022
American Robin	0.42	16.8	0.000055
Deer Mouse	0.077	3	0.0003
Desert Cottontail	3.1	124	0.0000075
Montane Shrew	0.39	15.6	0.00006
Red Fox	1038	41,520	0.000000022

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.00093 ha) divided by the population area.

Table I-5.4-45
Adjusted HIs at AOC 03-047(g)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.3(U)	6.47E-10	na*	na	na	na	na	3.36E-06	2.98E-04	8.18E-04	0.017	**26**
Lead	27.8	1.68E-10	7.52E-09	5.07E-08	7.32E-05	9.60E-05	1.10E-04	5.63E-07	2.30E-05	6.99E-05	0.016	0.23
Aroclor-1242	0.364	5.10E-10	5.70E-08	3.07E-07	2.02E-05	2.55E-04	4.91E-04	9.10E-08	5.71E-05	1.45E-04	na	na
Aroclor-1254	0.313	4.67E-08	3.12E-07	4.04E-07	1.33E-05	2.17E-04	4.23E-04	4.51E-08	4.24E-05	1.07E-04	na	1.96E-03
Aroclor-1260	0.241	3.86E-08	1.15E-08	1.43E-08	2.90E-07	7.85E-06	1.52E-05	6.03E-10	1.44E-06	3.64E-06	na	na
	HI	9E-08	4E-07	8E-07	0.0001	0.0006	0.001	4E-06	0.0004	0.001	0.03	**26**

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 I-5.4-46
PAUFs for Ecological Receptors for AOC 03-051(c)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00000045
American Robin	0.42	16.8	0.00011
Deer Mouse	0.077	3	0.00062
Desert Cottontail	3.1	124	0.000015
Montane Shrew	0.39	15.6	0.00012
Red Fox	1038	41,520	0.000000046

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0019 ha) divided by the population area.

Table I-5.4-47
Adjusted HIs at AOC 03-051(c)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.26(U)	1.28E-09	na*	na	na	na	na	6.66E-06	5.90E-04	1.62E-03	0.016	**25.2**
Cobalt	11.2	9.49E-11	1.43E-09	5.40E-09	7.45E-06	1.06E-05	1.32E-05	9.53E-08	8.53E-06	1.73E-05	na	**0.86**
Zinc	114	8.69E-10	2.13E-08	1.60E-07	3.68E-05	1.52E-04	2.69E-04	9.70E-07	1.42E-04	4.14E-04	**0.95**	**0.71**
Acenaphthene	0.227	1.68E-12	na	na	na	na	na	7.10E-09	2.30E-07	8.75E-07	na	**0.91**
Aroclor-1254	0.038	1.16E-08	7.74E-08	1.00E-07	3.31E-06	5.37E-05	1.05E-04	1.12E-08	1.05E-05	2.66E-05	na	2.38E-04
Aroclor-1260	0.109	3.56E-08	1.06E-08	1.32E-08	2.68E-07	7.25E-06	1.40E-05	5.57E-10	1.33E-06	3.36E-06	na	na
Benzo(a)anthracene	1.36	1.94E-09	6.22E-08	8.83E-08	1.92E-04	1.69E-04	1.54E-04	3.36E-06	5.52E-05	2.47E-04	na	0.076
Chrysene	1.3	2.38E-09	na	na	na	na	na	3.06E-06	6.60E-05	2.59E-04	na	na
Phenanthrene	2.12	3.35E-10	na	na	na	na	na	5.51E-07	2.58E-05	8.72E-05	**0.39**	na
	HI	5E-08	2E-07	4E-07	0.0002	0.0004	0.0006	1E-05	0.0009	0.003	1	**28**

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 I-5.4-48
PAUFs for Ecological Receptors for AOC 03-052(b)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000015
American Robin	0.42	16.8	0.0038
Deer Mouse	0.077	3	0.021
Desert Cottontail	3.1	124	0.00052
Montane Shrew	0.39	15.6	0.0041
Red Fox	1038	41,520	0.0000015

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.064 ha) divided by the population area.

Table I-5.4-49
Adjusted HIs at AOC 03-052(b)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.7	2.64E-07	na*	na	na	na	na	1.37E-03	0.12	**0.33**	0.1	**154**
Barium	209.8	7.89E-09	8.56E-08	2.88E-07	9.75E-04	8.59E-04	7.99E-04	3.28E-05	6.62E-04	2.42E-03	**0.64**	**1.91**
Beryllium	1.225	4.50E-09	na	na	na	na	na	3.72E-06	2.79E-04	4.55E-04	0.031	**0.49**
Cobalt	6.159	1.76E-09	2.66E-08	1.00E-07	1.38E-04	1.96E-04	2.44E-04	1.77E-06	1.58E-04	3.20E-04	na	**0.47**
Copper	7.715	3.13E-09	7.28E-08	1.06E-06	7.73E-04	1.34E-03	1.96E-03	1.47E-05	8.33E-04	2.50E-03	0.1	0.11
Lead	18.31	7.63E-09	3.41E-07	2.30E-06	3.32E-03	4.36E-03	4.98E-03	2.55E-05	1.04E-03	3.17E-03	0.011	0.15
Nickel	9.171	1.18E-08	4.77E-08	8.65E-07	2.18E-04	9.19E-04	1.66E-03	9.47E-06	3.88E-03	9.53E-03	0.033	0.24

Table I-5.4-49 (continued)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Selenium	0.21	3.85E-09	3.27E-08	5.66E-07	8.00E-04	9.20E-04	1.07E-03	5.16E-05	1.31E-03	5.26E-03	0.051	**0.4**
Aroclor-1242	0.36	3.47E-08	3.88E-06	2.09E-05	1.37E-03	0.017	0.033	6.19E-06	3.89E-03	9.84E-03	na	na
Aroclor-1254	0.075	1.54E-06	3.33E-06	5.66E-06	2.86E-04	3.62E-03	6.97E-03	6.56E-05	0.043	0.11	na	na
Aroclor-1260	0.218	2.24E-06	1.50E-05	1.94E-05	6.39E-04	0.01	0.02	2.16E-06	2.03E-03	5.15E-03	na	1.36E-03
	HI	4E-06	2E-05	5E-05	0.01	0.04	0.07	0.002	0.2	0.5	1	**158**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-50
PAUFs for Ecological Receptors for SWMU 03-052(f)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000024
American Robin	0.42	16.8	0.0006
Deer Mouse	0.077	3	0.0032
Desert Cottontail	3.1	124	0.000081
Montane Shrew	0.39	15.6	0.00064
Red Fox	1038	41,520	0.00000024

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.01 ha) divided by the population area.

Table I-5.4-51
Adjusted HIs at SWMU 03-052(f)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.544	2.91E-09	na*	na	na	na	na	1.51E-05	1.34E-03	3.68E-03	0.01	**10.88**
Barium	73.2	4.30E-10	4.67E-09	1.57E-08	5.32E-05	4.69E-05	4.36E-05	1.79E-06	3.61E-05	1.32E-04	0.22	**0.67**
Chromium	35.1	4.70E-09	6.90E-08	3.18E-07	3.07E-04	5.22E-04	7.46E-04	3.37E-06	5.00E-04	1.04E-03	na	na
Copper	16.3	1.03E-09	2.40E-08	3.49E-07	2.55E-04	4.41E-04	6.47E-04	4.87E-06	2.75E-04	8.27E-04	0.2	0.23
Cyanide	2.89	3.17E-10	1.18E-05	1.45E-05	0.017	0.017	0.017	3.15E-07	5.98E-06	2.76E-05	na	na
Lead	37	2.41E-09	1.08E-07	7.28E-07	1.05E-03	1.38E-03	1.57E-03	8.07E-06	3.30E-04	1.00E-03	0.022	**0.31**
Selenium	1.42(U)	4.07E-09	3.45E-08	5.98E-07	8.45E-04	9.72E-04	1.13E-03	5.45E-05	1.38E-03	5.55E-03	**0.35**	**2.73**
Zinc	139.7	5.61E-09	1.37E-07	1.03E-06	2.38E-04	9.78E-04	1.73E-03	6.26E-06	9.14E-04	2.67E-03	**1.16**	**0.87**
Acenaphthene	0.992	3.85E-11	na	na	na	na	na	1.63E-07	5.30E-06	2.01E-05	na	**3.97**
Aroclor-1254	0.0792	1.27E-07	8.49E-07	1.10E-06	3.63E-05	5.89E-04	1.15E-03	1.23E-07	1.15E-04	2.92E-04	na	4.95E-04
Aroclor-1260	0.0915	1.57E-07	4.69E-08	5.83E-08	1.18E-06	3.20E-05	6.19E-05	2.46E-09	5.87E-06	1.49E-05	na	na
Benzo(a)anthracene	8.27	6.22E-08	1.99E-06	2.83E-06	6.15E-03	5.41E-03	4.92E-03	1.08E-04	1.77E-03	7.90E-03	na	**0.46**
Benzo(b)fluoranthene	10.1	9.74E-09	na	na	na	na	na	6.27E-06	1.71E-04	6.31E-04	na	**0.56**
Bis(2-ethylhexyl)phthalate	0.237	4.76E-08	1.69E-05	1.24E-05	7.05E-06	3.53E-03	7.05E-03	7.08E-09	2.57E-04	7.00E-04	na	na
Chrysene	9.51	9.16E-08	na	na	na	na	na	1.18E-04	2.54E-03	9.96E-03	na	na
Fluoranthene	20.6	1.38E-08	na	na	na	na	na	6.39E-06	6.01E-04	1.76E-03	**2.06**	na
Phenanthrene	21.1	1.75E-08	na	na	na	na	na	2.88E-05	1.35E-03	4.56E-03	**3.83**	na
Pyrene	27	1.81E-08	1.38E-07	3.35E-07	2.26E-04	3.49E-04	4.73E-04	1.98E-05	7.87E-04	2.74E-03	**2.7**	na
HI		6E-07	3E-05	3E-05	0.03	0.03	0.04	0.0004	0.01	0.04	**11**	**21**

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 I-5.4-52
PAUFs for Ecological Receptors for SWMU 03-056(d)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000017
American Robin	0.42	16.8	0.00044
Deer Mouse	0.077	3	0.0024
Desert Cottontail	3.1	124	0.00006
Montane Shrew	0.39	15.6	0.00047
Red Fox	1038	41,520	0.00000018

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0074 ha) divided by the population area.

Table I-5.4-53
Adjusted HIs at SWMU 03-056(d)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.07(U)	4.24E-09	na*	na	na	na	na	2.20E-05	1.95E-03	5.36E-03	0.014	**21.4**
Copper	21.8	1.02E-09	2.38E-08	3.46E-07	2.53E-04	4.36E-04	6.40E-04	4.82E-06	2.72E-04	8.18E-04	0.27	**0.31**
Cyanide	0.554	4.46E-11	1.66E-06	2.04E-06	2.42E-03	2.42E-03	2.42E-03	4.44E-08	8.42E-07	3.89E-06	na	na
Mercury	0.161	6.20E-10	9.97E-07	3.41E-06	1.01E-03	3.20E-03	5.42E-03	4.34E-07	4.46E-05	1.28E-04	**3.2**	4.71E-03
Silver	12	5.22E-10	2.49E-08	1.10E-06	4.81E-04	1.23E-03	2.03E-03	4.77E-06	4.07E-04	1.20E-03	na	0.021
Aroclor-1254	0.0539	6.40E-08	4.28E-07	5.53E-07	1.83E-05	2.97E-04	5.79E-04	6.19E-08	5.81E-05	1.47E-04	na	3.37E-04
Aroclor-1260	0.0769	9.79E-08	2.92E-08	3.63E-08	7.36E-07	1.99E-05	3.85E-05	1.53E-09	3.65E-06	9.24E-06	na	na
	HI	2E-07	3E-06	7E-06	0.004	0.008	0.01	3E-05	0.003	0.008	**3**	**22**

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 I-5.4-54
PAUFs for Ecological Receptors for AOC 03-056(k)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000021
American Robin	0.42	16.8	0.0054
Deer Mouse	0.077	3	0.03
Desert Cottontail	3.1	124	0.00073
Montane Shrew	0.39	15.6	0.0058
Red Fox	1038	41,520	0.0000022

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.091 ha) divided by the population area.

Table I-5.4-55
Adjusted HIs at AOC 03-056(k)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	7.6(UJ)	3.70E-07	na*	na	na	na	na	1.92E-03	0.17	**0.47**	0.097	**152**
Copper	11.85	6.83E-09	1.59E-07	2.31E-06	1.69E-03	2.92E-03	4.28E-03	3.22E-05	1.82E-03	5.47E-03	0.15	0.17
Mercury	0.0462	2.20E-09	3.54E-06	1.21E-05	3.58E-03	0.011	0.019	1.54E-06	1.59E-04	4.55E-04	**0.92**	1.36E-03
Acenaphthene	0.352	1.24E-10	na	na	na	na	na	5.27E-07	1.71E-05	6.50E-05	na	**1.41**
Aroclor-1254	0.0194	2.83E-07	1.89E-06	2.45E-06	8.08E-05	1.31E-03	2.56E-03	2.74E-07	2.57E-04	6.51E-04	na	1.21E-04
Benzo(a)anthracene	0.558	3.82E-08	1.22E-06	1.74E-06	3.78E-03	3.32E-03	3.02E-03	6.60E-05	1.09E-03	4.85E-03	na	0.031
Naphthalene	0.71	1.29E-09	2.56E-08	1.51E-07	1.12E-03	6.70E-04	2.39E-04	4.31E-05	1.52E-04	2.15E-03	na	**0.71**
Phenanthrene	1.76	1.33E-08	na	na	na	na	na	2.19E-05	1.03E-03	3.47E-03	**0.32**	na
	HI	7E-07	7E-06	2E-05	0.01	0.02	0.03	0.002	0.2	0.5	1	**154**

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 I-5.4-56
PAUFs for Ecological Receptors for SWMU 03-059

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00013
American Robin	0.42	16.8	0.033
Deer Mouse	0.077	3	0.18
Desert Cottontail	3.1	124	0.0044
Montane Shrew	0.39	15.6	0.035
Red Fox	1038	41,520	0.000013

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.55 ha) divided by the population area.

Table I-5.4-57
Adjusted HIs at SWMU 03-059

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.891	2.62E-07	na*	na	na	na	na	1.36E-03	0.12	**0.33**	0.011	**17.82**
Mercury	0.157	4.52E-08	7.27E-05	2.48E-04	0.073	0.23	**0.4**	3.17E-05	3.26E-03	9.35E-03	**3.14**	4.62E-03
Aroclor-1242	0.0182	1.51E-08	1.69E-06	9.08E-06	5.96E-04	7.54E-03	0.015	2.69E-06	1.69E-03	4.28E-03	na	na
Aroclor-1254	2.63	2.33E-04	1.55E-03	2.01E-03	0.066	**1.08**	**2.1**	2.25E-04	0.21	**0.53**	na	0.016
Aroclor-1260	1.03	9.73E-05	2.90E-05	3.60E-05	7.32E-04	0.02	0.038	1.52E-06	3.62E-03	9.18E-03	na	na
Benzoic acid	0.496	1.88E-08	na	na	na	na	na	5.24E-04	0.017	0.068	na	na
Bis(2-ethylhexyl)phthalate	0.194	2.14E-06	7.63E-04	5.59E-04	3.18E-04	0.16	**0.32**	3.19E-07	0.012	0.031	na	na
HI		0.0003	0.002	0.003	0.1	1	**3**	0.002	0.4	1	**3**	**18**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

*na = Not available.

Table I-5.4-58
PAUFs for Ecological Receptors for AOC C-03-022

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000042
American Robin	0.42	16.8	0.0011
Deer Mouse	0.077	3	0.0058
Desert Cottontail	3.1	124	0.00015
Montane Shrew	0.39	15.6	0.0012
Red Fox	1038	41,520	0.00000043

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.018 ha) divided by the population area.

Table I-5.4-59
Adjusted HIs at AOC C-03-022

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.12(U)	1.1E-08	na*	na	na	na	na	0.0001	0.005	0.01	0.01	**22.4**
	HI	1E-08	na	na	na	na	na	0.0001	0.005	0.01	0.01	**22**

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 I-5.4-60
PAUFs for Ecological Receptors for SWMU 60-002 (West)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00011
American Robin	0.42	16.8	0.027
Deer Mouse	0.077	3	0.15
Desert Cottontail	3.1	124	0.0036
Montane Shrew	0.39	15.6	0.029
Red Fox	1038	41,520	0.000011

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.45 ha) divided by the population area.

Table I-5.4-61
Adjusted HIs at SWMU 60-002 (West)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.16	2.79E-07	na*	na	na	na	na	1.45E-03	0.13	**0.35**	0.015	**23.2**
Barium	182.8	4.83E-08	5.24E-07	1.76E-06	5.97E-03	5.26E-03	4.90E-03	2.01E-04	4.06E-03	0.015	**0.55**	**1.66**
Chromium	11.28	6.79E-08	9.98E-07	4.60E-06	4.44E-03	7.55E-03	0.011	4.87E-05	7.23E-03	0.015	na	na
Cobalt	5.37	1.08E-08	1.63E-07	6.13E-07	8.46E-04	1.20E-03	1.50E-03	1.08E-05	9.68E-04	1.96E-03	na	**0.41**
Copper	8.29	2.36E-08	5.50E-07	8.00E-06	5.84E-03	0.01	0.015	1.11E-04	6.29E-03	0.019	0.1	0.12
Lead	38.52	1.13E-07	5.05E-06	3.41E-05	0.0491	0.064	0.074	3.78E-04	0.015	0.047	0.023	**0.32**
Nickel	9.09	8.21E-08	3.33E-07	6.03E-06	1.52E-03	6.41E-03	0.012	6.60E-05	0.027	0.066	0.032	0.24
Selenium	1.13	1.46E-07	1.24E-06	2.14E-05	0.03	0.035	0.04	1.95E-03	0.049	0.2	0.28	**2.17**
Vanadium	28.86	9.48E-08	1.80E-05	3.65E-05	0.087	0.1	0.12	6.98E-05	5.95E-03	8.78E-03	na	**1154**
	HI	9E-07	3E-05	0.0001	0.2	0.2	0.3	0.004	0.2	0.7	1	**1183**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-62
PAUFs for Ecological Receptors for 60-002 (East)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000061
American Robin	0.42	16.8	0.015
Deer Mouse	0.077	3	0.084
Desert Cottontail	3.1	124	0.0021
Montane Shrew	0.39	15.6	0.017
Red Fox	1038	41,520	0.0000063

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.26 ha) divided by the population area.

Table I-5.4-63
Adjusted HIs at 60-002 (East)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Barium	310	4.73E-08	5.14E-07	1.73E-06	5.85E-03	5.16E-03	4.80E-03	1.97E-04	3.97E-03	0.015	**0.94**	**2.82**
Cobalt	10	1.16E-08	1.75E-07	6.59E-07	9.10E-04	1.29E-03	1.61E-03	1.16E-05	1.04E-03	2.11E-03	na	**0.77**
Nickel	17.1	8.92E-08	3.62E-07	6.55E-06	1.65E-03	6.96E-03	0.013	7.17E-05	0.029	0.072	0.061	**0.45**
Selenium	0.579	4.32E-08	3.66E-07	6.34E-06	8.96E-03	0.01	0.012	5.78E-04	0.015	0.059	0.14	**1.11**
	HI	2E-07	1E-06	2E-05	0.02	0.02	0.03	0.0009	0.05	0.1	1	**5**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-64
PAUFs for Ecological Receptors for AOC 60-004(f)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000019
American Robin	0.42	16.8	0.0049
Deer Mouse	0.077	3	0.027
Desert Cottontail	3.1	124	0.00066
Montane Shrew	0.39	15.6	0.0053
Red Fox	1038	41,520	0.000002

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.082 ha) divided by the population area.

Table I-5.4-65
Adjusted HIs at AOC 60-004(f)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	5.31E-08	na*	na	na	na	na	2.76E-04	0.024	0.067	0.0155	**24.2**
Barium	172.4	8.30E-09	9.01E-08	3.03E-07	1.03E-03	9.05E-04	8.41E-04	3.45E-05	6.97E-04	2.55E-03	**0.52**	**1.57**
Chromium	20.3	2.22E-08	3.27E-07	1.51E-06	1.45E-03	2.47E-03	3.53E-03	1.59E-05	2.37E-03	4.90E-03	na	na
Cobalt	6.63	2.42E-09	3.66E-08	1.38E-07	1.90E-04	2.70E-04	3.37E-04	2.43E-06	2.18E-04	4.41E-04	na	**0.51**
Copper	28.8	1.49E-08	3.48E-07	5.05E-06	3.69E-03	6.38E-03	9.36E-03	7.04E-05	3.98E-03	0.012	**0.36**	**0.41**
Lead	23.7	1.26E-08	5.66E-07	3.82E-06	5.51E-03	7.23E-03	8.26E-03	4.23E-05	1.73E-03	5.26E-03	0.014	0.2
Mercury	0.127	5.45E-09	8.77E-06	3.00E-05	8.86E-03	0.028	0.048	3.82E-06	3.93E-04	1.13E-03	**2.54**	0.0037
Nickel	9.23	1.52E-08	6.16E-08	1.12E-06	2.82E-04	1.19E-03	2.15E-03	1.22E-05	5.00E-03	0.012	0.033	0.24
Selenium	1.2(UJ)	2.82E-08	2.39E-07	4.14E-06	5.86E-03	6.73E-03	7.81E-03	3.78E-04	9.56E-03	0.038	0.29	**2.31**
Vanadium	26.1	1.56E-08	2.97E-06	6.01E-06	0.014	0.017	0.019	1.15E-05	9.80E-04	1.45E-03	na	**1044**
Zinc	78	2.57E-08	6.29E-07	4.71E-06	1.09E-03	4.48E-03	7.93E-03	2.87E-05	4.18E-03	0.012	**0.65**	**0.49**
Acenaphthene	0.217	6.91E-11	na	na	na	na	na	2.93E-07	9.51E-06	3.61E-05	na	**0.87**
Aroclor-1254	0.116	1.53E-06	1.02E-05	1.32E-05	4.36E-04	7.08E-03	0.014	1.48E-06	1.39E-03	3.51E-03	na	0.00073
Aroclor-1260	0.153	2.16E-06	6.43E-07	8.00E-07	1.62E-05	4.39E-04	8.49E-04	3.37E-08	8.04E-05	2.04E-04	na	na
Benzo(a)anthracene	2.33	1.44E-07	4.60E-06	6.53E-06	0.014	0.012	0.011	2.49E-04	4.08E-03	0.018	na	0.13
Bis(2-ethylhexyl)phthalate	0.091	1.50E-07	5.33E-05	3.91E-05	2.22E-05	0.011	0.022	2.23E-08	8.11E-04	2.20E-03	na	na
Chrysene	2.29	1.81E-07	na	na	na	na	na	2.33E-04	5.02E-03	0.02	na	na
Di-n-butyl phthalate	0.118	4.66E-11	9.51E-06	3.36E-05	1.48E-03	0.027	0.052	4.88E-09	3.45E-06	8.49E-06	na	0.00074
Fluoranthene	3.99	2.19E-08	na	na	na	na	na	1.01E-05	9.53E-04	2.80E-03	**0.4**	na
Phenanthrene	2.35	1.60E-08	na	na	na	na	na	2.63E-05	1.24E-03	1.04E-04	**0.43**	na
	HI	4E-06	9E-05	0.0001	0.06	0.1	0.2	0.001	0.07	0.2	**5**	**1075**

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 I-5.4-66
PAUFs for Ecological Receptors for SWMU 60-007(a)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.000026
American Robin	0.42	16.8	0.0065
Deer Mouse	0.077	3	0.036
Desert Cottontail	3.1	124	0.00089
Montane Shrew	0.39	15.6	0.0071
Red Fox	1038	41,520	0.0000026

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.11 ha) divided by the population area.

Table I-5.4-67
Adjusted HIs at SWMU 60-007(a)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.26	7.43E-08	na*	na	na	na	na	3.86E-04	0.034	0.094	0.016	**25.2**
	HI	7E-08	na	na	na	na	na	0.0004	0.03	0.09	0.02	**25**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*na = Not available.

Table I-5.4-68
PAUFs for Ecological Receptors for SWMU 60-007(b)

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.00033
American Robin	0.42	16.8	0.082
Deer Mouse	0.077	3	0.45
Desert Cottontail	3.1	124	0.011
Montane Shrew	0.39	15.6	0.088
Red Fox	1038	41,520	0.000033

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (1.38 ha) divided by the population area.

Table I-5.4-69
Adjusted HIs at SWMU 60-007(b)

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.21(U)	8.94E-07	na*	na	na	na	na	4.64E-03	**0.41**	**1.13**	0.016	**24.2**
Barium	66.4	5.38E-08	5.84E-07	1.96E-06	6.65E-03	5.86E-03	5.45E-03	2.24E-04	4.52E-03	0.017	0.2	**0.6**
Chromium	8.62	1.59E-07	2.34E-06	1.08E-05	0.01	0.018	0.025	1.14E-04	0.017	0.035	na	na
Selenium	1.18(UJ)	4.67E-07	3.96E-06	6.86E-05	0.097	0.11	0.13	6.25E-03	0.16	**0.64**	0.29	**2.27**
Zinc	64	3.55E-07	8.69E-06	6.51E-05	0.015	0.062	0.11	3.96E-04	0.058	0.17	**0.53**	**0.4**
Bis(2-ethylhexyl)phthalate	0.389	1.08E-05	3.84E-03	2.81E-03	1.60E-03	**0.8**	**1.6**	1.60E-06	0.058	0.16	na	na
	HI	1E-05	0.004	0.003	0.1	1	**2**	0.01	0.7	**2**	1	**27**

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 I-5.4-70
PAUFs for Ecological Receptors for AOC C-61-002

Receptor	Home Range (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	0.0000099
American Robin	0.42	16.8	0.0025
Deer Mouse	0.077	3	0.014
Desert Cottontail	3.1	124	0.00034
Montane Shrew	0.39	15.6	0.0027
Red Fox	1038	41,520	0.000001

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.042 ha) divided by the population area.

Table I-5.4-71
Adjusted HIs at AOC C-61-002

COPECs	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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	1.14	2.56E-08	na*	na	na	na	na	1.33E-04	0.012	0.032	0.015	**22.8**
Arsenic	5.2	6.49E-09	4.68E-08	3.22E-07	3.10E-04	5.00E-04	7.22E-04	1.10E-05	9.33E-04	2.22E-03	**0.76**	0.29
Beryllium	2.06	4.96E-09	na	na	na	na	na	4.10E-06	3.08E-04	5.02E-04	0.052	**0.82**
Chromium	13.3	7.47E-09	1.10E-07	5.07E-07	4.89E-04	8.31E-04	1.19E-03	5.36E-06	7.96E-04	1.65E-03	na	na
Copper	11.5	3.06E-09	7.12E-08	1.04E-06	7.57E-04	1.31E-03	1.92E-03	1.44E-05	8.15E-04	2.45E-03	0.14	0.16
Lead	27.6	7.55E-09	3.38E-07	2.28E-06	3.29E-03	4.31E-03	4.93E-03	2.53E-05	1.03E-03	3.14E-03	0.016	0.23
Mercury	0.061	1.34E-09	2.16E-06	7.37E-06	2.18E-03	6.93E-03	0.012	9.39E-07	9.66E-05	2.77E-04	**1.22**	1.79E-03
Nickel	16.00	1.35E-08	5.47E-08	9.91E-07	2.50E-04	1.05E-03	1.90E-03	1.08E-05	4.44E-03	0.011	0.057	**0.42**
Selenium	2.56(UJ)	3.08E-08	2.61E-07	4.53E-06	6.40E-03	7.36E-03	8.53E-03	4.13E-04	0.01	0.042	**0.62**	**4.92**
Vanadium	31.10	9.53E-09	1.81E-06	3.67E-06	8.74E-03	0.01	0.012	7.02E-06	5.98E-04	8.84E-04	na	**1244**
	HI	1E-07	5E-06	2E-05	0.02	0.03	0.04	0.0006	0.03	0.1	**3**	**1274**

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 I-5.4-72
PAUFs for Receptors at SWMU 61-002

Receptor	Home Range[a] (ha)	Population Area(ha)	PAUF[b]
American robin	0.42	16.8	0.008
American kestrel	106	4,240	0.00003
Deer mouse	0.077	3.0	0.04
Desert cottontail	3.1	124	0.001
Montane shrew	0.39	15.6	0.008
Red fox	1038	41,520	0.000003

[a] Values from EPA (1993, 059384)
[b] PAUF calculated as the area of the site (0.13 ha) divided by the population area.

Table I-5.4-73
Adjusted HIs at SWMU 61-002

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	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate insectivore)	Plant (terrestrial autotroph-producer)
Antimony	0.284	1.98E-08	na*	na	na	na	na	1.03E-04	9.10E-03	0.025	3.64E-03	**5.68**
Lead	14.7	1.24E-08	5.56E-07	3.76E-06	5.42E-03	7.11E-03	8.13E-03	4.17E-05	1.70E-03	5.17E-03	8.65E-03	0.12
Mercury	0.0414	2.82E-09	4.53E-06	1.55E-05	4.58E-03	0.015	0.025	1.97E-06	2.03E-04	5.82E-04	**0.83**	1.22E-03
Selenium	0.461	1.72E-08	1.46E-07	2.52E-06	3.57E-03	4.10E-03	4.76E-03	2.30E-04	5.82E-03	0.023	0.11	**0.89**
Zinc	79.4	4.14E-08	1.01E-06	7.61E-06	1.76E-03	7.23E-03	0.013	4.62E-05	6.75E-03	0.02	**0.66**	**0.5**
Acenaphthene	0.16	8.08E-11	na	na	na	na	na	3.42E-07	1.11E-05	4.22E-05	na	**0.64**
Acetone	0.457	4.93E-10	4.67E-10	1.17E-08	4.72E-04	2.53E-04	2.08E-05	3.42E-04	2.54E-04	0.016	na	na
Aroclor-1254	0.68	1.42E-05	9.50E-05	1.23E-04	4.06E-03	0.066	0.13	1.38E-05	0.013	0.033	na	4.26E-03
Aroclor-1260	0.12	2.71E-06	8.07E-07	1.00E-06	2.04E-05	5.51E-04	1.06E-03	4.23E-08	1.01E-04	2.55E-04	na	na
Benzo(a)anthracene	0.59	5.77E-08	1.85E-06	2.62E-06	5.71E-03	5.02E-03	4.57E-03	9.98E-05	1.64E-03	7.32E-03	na	0.033
Bis(2-ethylhexyl)phthalate	1.3	3.39E-06	1.21E-03	8.86E-04	5.03E-04	0.25	**0.5**	5.05E-07	0.018	0.05	na	na
Naphthalene	1.5	3.91E-09	7.80E-08	4.60E-07	3.41E-03	2.04E-03	7.25E-04	1.31E-04	4.63E-04	6.53E-03	na	**1.5**
Xylene (total)	11	2.65E-07	1.05E-07	1.20E-06	9.46E-04	1.52E-03	2.08E-03	1.65E-03	0.065	0.23	na	0.11
	HI	2E-05	0.001	0.001	0.03	0.4	0.7	0.003	0.12	0.4	**2**	**9**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table I-5.4-74
LOAEL-Based ESLs for Terrestrial Receptors

COPEC	Receptor	LOAEL–Based ESL* (mg/kg)
Antimony	Plant	0.5
	Deer mouse	4.8
Arsenic	Earthworm	68
Barium	Earthworm	3200
	Plant	260
Beryllium	Plant	25
Cobalt	Plant	130
Copper	Earthworm	530
	Plant	490
Cyanide	Robin	1
Hexavalent chromium	Earthworm	3.4
	Plant	3.5
Lead	Plant	570
Manganese	Earthworm	4500
	Plant	1100
Mercury	Earthworm	0.5
	Robin (insectivore)	0.13
Nickel	Plant	270
Selenium	Earthworm	41
	Plant	3.4
	Deer mouse	1.2
Thallium	Plant	0.5
Vanadium	Plant	0.25
Zinc	Earthworm	930
	Plant	810
Acenaphthene	Plant	2.5
Anthracene	PLant	8.9
Aroclor-1254	Robin (insectivore)	0.41
	Robin (omnivore)	0.8
	Deer mouse	4.9
Benzo(a)anthracene	Plant	180
Benzo(b)fluoranthene	Plant	180
Bis(2-ethylhexyl)phthalate	Robin (insectivore)	0.2
	Robin (omnivore)	0.4
	Deer mouse	11
Dichlorobenzene[1,4-]	Earthworm	12
Fluoranthene	Earthworm	23
Fluorene	Earthworm	19
Naphthalene	Plant	10
Phenanthrene	Earthworm	12
Pyrene	Earthworm	20

*LOAEL-based ESLs from ECORISK Database, Version 3.1 (LANL 2012, 226667).

Table I-5.4-75
HI Analysis Using LOAEL-Based ESLs at SWMU 03-002(c)

COPEC	EPC (mg/kg)	Plant
Antimony	0.48	**0.96**
Lead	37.7	0.066
	HI	1

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

Table I-5.4-76
HI Analysis Using LOAEL-Based ESLs at SWMU 03-009(a)

COPEC	EPC (mg/kg)	Plant
Antimony	0.18	**0.36**
Selenium	0.43	0.12
	HI	0.5

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

Table I-5.4-77
HI Analysis Using LOAEL-Based ESLs at SWMU 03-009(i)

COPEC	EPC (mg/kg)	Plant
Antimony	2.44	**4.9**
Barium	97.62	**0.38**
Cobalt	4.09	0.031
Selenium	1.07(U)	**0.31**
Vanadium	19.24	**77**
	HI	**83**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

Table I-5.4-78
HI Analysis Using LOAEL-Based ESLs at SWMU 03-012(b)

COPEC	EPC (mg/kg)	Deer Mouse	Earthworm	Plant
Antimony	5.57(U)	**1.2**	n/a*	**11.1**
Hexavalent chromium	0.241	n/a	0.071	0.069
Zinc	50.98	n/a	0.055	0.063
	HI	1	0.1	**11**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-5.4-79
HI Analysis Using LOAEL-Based ESLs at SWMU 03-013(i)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.31	n/a*	**2.6**
Lead	73.35	n/a	0.13
Selenium	0.874	n/a	0.26
Zinc	109.8	0.12	n/a
	HI	0.1	**3**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
*n/a = Not applicable.

Table I-5.4-80
HI Analysis Using LOAEL-Based ESLs at AOC 03-014(b2)

COPEC	EPC (mg/kg)	Plant
Antimony	1.29(U)	**2.58**
Selenium	1.29(U)	**0.38**
Zinc	52.56	0.065
	HI	**3**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

Table I-5.4-81
HI Analysis Using LOAEL-Based ESLs at AOC 03-014(c2)

COPEC	EPC (mg/kg)	Robin (insectivore)	Robin (omnivore)	Earthworm	Plant
Antimony	1.11(U)	na[a]	na	n/a[b]	**2.2**
Cyanide	11.28	**11.3**	**11.3**	na	na
Mercury	0.543	**4.2**	n/a	**1.1**	n/a
Selenium	1.14(U)	n/a	n/a	n/a	**0.34**
Zinc	55.41	n/a	n/a	0.06	0.068
Aroclor-1254	2.54	**3.2**	**6.2**	na	n/a
	HI	**19**	**18**	1	**3**

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 I-5.4-82
Adjusted HI Analysis Using LOAEL-Based ESLs at AOC 03-014(c2)

COPEC	EPC (mg/kg)	Robin (insectivore)	Robin (omnivore)	Plant
Antimony	1.11(U)	na[a]	na	**2.2**
Cyanide	11.28	0.1	0.1	na
Mercury	0.543	0.037	n/a[b]	n/a
Selenium	1.14(U)	n/a	n/a	**0.34**
Zinc	55.41	n/a	n/a	0.068
Aroclor-1254	2.54	0.028	0.055	n/a
	HI	0.2	0.2	**3**

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 I-5.4-83
HI Analysis Using LOAEL-Based ESLs at SWMUs 03-014(k,l,m,n)

COPEC	EPC (mg/kg)	Robin (insectivore)	Earthworm	Plant
Antimony	8.3	na[a]	n/a[b]	**16.6**
Copper	57.62	n/a	0.11	0.12
Lead	60.5	n/a	na	0.11
Mercury	0.355	n/a	**0.71**	n/a
Selenium	0.96	n/a	n/a	0.28
Zinc	175	n/a	0.19	0.22
Acenaphthene	2.3	na	na	**0.92**
Anthracene	3.9	na	na	**0.44**
Benzo(a)anthracene	11	n/a	na	0.061
Bis(2-ethylhexyl)phthalate	44	**220**	na	na
Dichlorobenzene[1,4-]	1.4	na	0.12	na
Fluoranthene	3.93	na	0.17	na
Fluorene	2	na	0.11	na
Naphthalene	0.94	n/a	na	0.094
Phenanthrene	22	na	**1.83**	na
Pyrene	5.24	n/a	0.26	na
	HI	**220**	**3**	**19**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

Table I-5.4-84
Adjusted HI Analysis Using LOAEL-Based ESLs at SWMUs 03-014(k,l,m,n)

COPEC	EPC (mg/kg)	Robin (insectivore)	Earthworm	Plant
Antimony	8.3	na[a]	n/a[b]	**16.6**
Copper	52.1	n/a	0.11	0.12
Lead	60.5	n/a	na	0.11
Mercury	0.355	n/a	**0.71**	na
Selenium	0.96	n/a	na	0.28
Zinc	175	n/a	0.19	0.23
Acenaphthene	2.3	na	na	**0.92**
Anthracene	3.9	na	na	**0.44**
Benzo(a)anthracene	11	n/a	na	0.061
Bis(2-ethylhexyl)phthalate	44	**1.3**	na	na
Dichlorobenzene[1,4-]	1.4	na	0.12	na
Fluoranthene	3.93	na	0.17	na
Fluorene	2	na	0.11	na
Naphthalene	0.94	n/a	na	0.094
Phenanthrene	22	na	**1.83**	na
Pyrene	5.24	n/a	0.26	na
	HI	1	**3**	**19**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] na = Not available.
[b] n/a = Not applicable.

Table I-5.4-85
HI Analysis Using LOAEL-Based ESLs at SWMU 03-014(o)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	5.38(U)	n/a*	**10.8**
Copper	34.06	0.064	0.07
Mercury	0.989	**1.98**	n/a
Selenium	0.34	n/a	0.1
Zinc	47.46	0.051	n/a
	HI	**2**	**11**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.
*n/a = Not applicable.

Table I-5.4-86
HI Analysis Using LOAEL-Based ESLs at SWMU 03-014(u)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.21(U)	n/a*	**2.4**
Copper	85.11	0.16	0.17
Lead	50.27	n/a	0.088
Mercury	0.76	**1.5**	n/a
Selenium	1.21(U)	n/a	**0.36**
Zinc	63.73	0.069	0.079
	HI	**2**	**3**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-5.4-87
HI Analysis Using LOAEL-Based ESLs at SWMU 03-015 and AOC 03-053

COPEC	EPC (mg/kg)	Deer Mouse	Earthworm	Plant
Antimony	7.39	**1.54**	na[a]	**14.8**
Barium	116.1	n/a[b]	0.036	**0.45**
Lead	94.51	n/a	n/a	0.17
Mercury	0.125	n/a	0.25	na
Selenium	1.35(UJ)	n/a	0.033	**0.4**
Zinc	70.28	n/a	0.076	0.087
Acenaphthene	0.15	n/a	na	0.06
	HI	**2**	0.4	**16**

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 I-5.4-88
Adjusted HI Analysis Using LOAEL-Based ESLs at SWMU 03-015 and AOC 03-053

COPEC	EPC (mg/kg)	Deer Mouse	Plant
Antimony	7.39	0.08	**14.8**
Barium	116.1	n/a*	**0.45**
Lead	94.51	n/a	0.17
Mercury	0.125	n/a	n/a
Selenium	1.35(UJ)	n/a	**0.4**
Zinc	70.28	n/a	0.087
Acenaphthene	0.15	n/a	0.06
	HI	0.08	**16**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-5.4-89
HI Analysis Using LOAEL-Based ESLs at SWMU 03-021

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	0.732	na[a]	**1.5**
Barium	78.97	n/a[b]	0.3
Lead	63.12	n/a	0.11
Selenium	0.786	n/a	0.23
Thallium	0.597	na	**1.19**
Zinc	61.63	0.066	0.076
	HI	0.07	**3**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

Table I-5.4-90
HI Analysis Using LOAEL-Based ESLs at SWMU 03-029

COPEC	EPC (mg/kg)	Plant
Antimony	1.11(U)	**2.2**
Copper	27.28	0.056
Selenium	1.14(U)	**0.34**
	HI	**3**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

Table I-5.4-91
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(a)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.29(U)	n/a[a]	**2.6**
Lead	334.3	n/a	**0.59**
Mercury	0.374	**0.74**	n/a
Selenium	1.32(U)	0.032	**0.39**
Zinc	99.5	0.11	0.12
Acenaphthene	3.82	na[b]	**1.5**
Benzo(b)fluoranthene	5.85	na	0.033
Fluoranthene	9.3	**0.4**	na
Naphthalene	0.72	na	0.072
Phenanthrene	8.26	**0.69**	na
Pyrene	8.32	**0.42**	na
	HI	**2**	**5**

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 I-5.4-92
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(b)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.07(U)	n/a*	**2.1**
Mercury	0.16	**0.32**	n/a
	HI	0.3	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-5.4-93
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(c)

COPEC	EPC (mg/kg)	Plant
Antimony	1.14(U)	**2.3**
	HI	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

Table I-5.4-94
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(e)

COPEC	EPC (mg/kg)	Plant
Antimony	1.09(U)	**2.2**
Lead	99.6	0.17
	HI	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

Table I-5.4-95
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(f)

COPEC	EPC (mg/kg)	Plant
Antimony	1.08	**2.2**
	HI	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

Table I-5.4-96
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(g)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	0.49	n/a[a]	**0.98**
Arsenic	2.61	0.038	n/a
Barium	145.1	0.045	**0.56**
Cobalt	4.72	na[b]	0.036
Copper	23.09	n/a	0.047
Manganese	399.1	0.089	**0.36**
Nickel	11.72	n/a	0.043
Selenium	0.83	n/a	0.24
Vanadium	21.11	na	**84.4**
Zinc	77.87	0.084	0.096
	HI	0.3	**87**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] n/a = Not applicable.
[b] na = Not available.

Table I-5.4-97
HI Analysis Using LOAEL-Based ESLs at SWMU 03-045(h)

COPEC	EPC (mg/kg)	Plant
Antimony	1.13(U)	**2.3**
Hexavalent chromium	0.14	0.04
	HI	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-5.4-98
HI Analysis Using LOAEL-Based ESLs at AOC 03-047(g)

COPEC	EPC (mg/kg)	Plant
Antimony	1.3(U)	**2.6**
	HI	**3**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

Table I-5.4-99
HI Analysis Using LOAEL-Based ESLs at AOC 03-051(c)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.26(U)	n/a[a]	**2.5**
Cobalt	11.2	na[b]	0.086
Zinc	114	0.12	0.14
Acenaphthene	0.227	na	0.091
Phenanthrene	2.12	0.18	na
	HI	0.3	**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 I-5.4-100
HI Analysis Using LOAEL-Based ESLs at AOC 03-052(b)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	7.7(UJ)	n/a[a]	**15.4**
Barium	209.8	0.07	**0.81**
Beryllium	1.225	n/a	0.049
Cobalt	6.159	na[b]	0.047
Selenium	0.21	n/a	0.062
	HI	0.07	**16**

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 I-5.4-101
HI Analysis Using LOAEL-Based ESLs at AOC 03-052(f)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	0.544	na[a]	**1.09**
Barium	73.24	n/a[b]	0.28
Lead	37.04	n/a	0.065
Selenium	1.42(U)	0.035	**0.42**
Zinc	139.7	0.15	0.17
Acenaphthene	0.99	na	**0.4**
Benzo(a)anthracene	8.27	na	0.046
Benzo(b)fluoranthene	10.11	na	0.056
Fluoranthene	20.61	**0.9**	na
Phenanthrene	21.09	**1.76**	na
Pyrene	27	**1.35**	na
	HI	**4**	**3**

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 I-5.4-102
HI Analysis Using LOAEL-Based ESLs at SWMU 03-056(d)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.07(U)	n/a*	**2.1**
Copper	21.8	n/a	0.044
Mercury	0.161	**0.32**	n/a
	HI	0.3	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

*n/a = Not applicable.

Table I-5.4-103
HI Analysis Using LOAEL-Based ESLs at AOC 03-056(k)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	7.6(UJ)	n/a[a]	**15.2**
Mercury	0.0462	0.092	n/a
Acenaphthene	0.352	na[b]	0.14
Naphthalene	0.71	na	0.071
Phenanthrene	1.76	0.15	na
	HI	0.2	**15**

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 I-5.4-104
HI Analysis Using LOAEL-Based ESLs at SWMU 03-059

COPEC	EPC (mg/kg)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Earthworm	Plant
Antimony	0.891	na[a]	na	0.19	n/a[b]	**1.78**
Mercury	0.157	**1.21**	n/a	n/a	**0.31**	n/a
Aroclor-1254	2.633	**6.42**	**3.29**	**0.54**	na	n/a
Bis(2-ethylhexyl)phthalate	0.19	**0.95**	n/a	n/a	na	na
	HI	**9**	**3**	0.7	0.3	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

Table I-5.4-105
Adjusted HI Analysis Using LOAEL-Based ESLs at SWMU 03-059

COPEC	EPC (mg/kg)	Robin (insectivore)	Robin (omnivore)	Plant
Antimony	0.891	na[a]	na	**1.78**
Mercury	0.157	0.04	n/a[b]	n/a
Aroclor-1254	2.633	0.21	0.11	n/a
Bis(2-ethylhexyl)phthalate	0.19	0.031	n/a	na
	HI	0.3	0.1	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

Table I-5.4-106
HI Analysis Using LOAEL-Based ESLs at AOC C-03-022

COPEC	EPC (mg/kg)	Plant
Antimony	1.12(U)	**2.2**
	HI	**2**

Notes: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
Data qualifiers are defined in Appendix A.

Table I-5.4-107
HI Analysis Using LOAEL-Based ESLs at SWMU 60-002 (West)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.16(U)	n/a[a]	**2.3**
Barium	182.8	0.06	**0.7**
Cobalt	5.37	na[b]	0.04
Lead	38.52	n/a	0.068
Selenium	1.13(UJ)	n/a	**0.33**
Vanadium	28.86	n/a	**115.4**
	HI	0.06	**119**

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 I-5.4-108
HI Analysis Using LOAEL-Based ESLs at SWMU 60-002 (East)

COPEC	EPC (mg/kg)	Earthworm	Plant
Barium	310	0.1	**1.19**
Cobalt	10	na[a]	0.077
Nickel	17.1	n/a[b]	0.06
Selenium	0.579	n/a	0.17
	HI	0.1	1

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] na = Not available.
[b] n/a = Not applicable.

Table I-5.4-109
HI Analysis Using LOAEL-Based ESLs at AOC 60-004(f)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.21(U)	n/a[a]	**2.4**
Barium	172.4	0.054	**0.66**
Cobalt	6.626	na[b]	0.051
Copper	28.75	0.054	0.059
Mercury	0.127	0.25	n/a
Selenium	1.2(U)	n/a	**0.35**
Vanadium	26.09	na	**104.4**
Zinc	78	0.084	0.096
Acenaphthene	0.22	na	0.088
Fluoranthene	3.99	0.17	na
Phenanthrene	2.35	0.2	na
	HI	0.8	**108**

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 I-5.4-110
HI Analysis Using LOAEL-Based ESLs at SWMU 60-007(a)

COPEC	EPC (mg/kg)	Plant
Antimony	1.26	**2.5**
	HI	**3**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

Table I-5.4-111
HI Analysis Using LOAEL-Based ESLs at SWMU 60-007(b)

COPEC	EPC (mg/kg)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Earthworm	Plant
Antimony	1.21(U)	na[a]	na	0.25	n/a[b]	**2.4**
Barium	66.4	n/a	n/a	n/a	n/a	0.26
Selenium	1.18(UJ)	n/a	n/a	**0.98**	n/a	**0.35**
Zinc	64.05	n/a	n/a	n/a	0.069	0.079
Bis(2-ethylhexyl)phthalate	0.389	**1.95**	**0.97**	n/a	na	na
	HI	**2**	1	1	0.07	**3**

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 I-5.4-112
Adjusted HI Analysis Using LOAEL-Based ESLs at SWMU 60-007(b)

COPEC	EPC (mg/kg)	Robin (insectivore)	Plant
Antimony	1.21(U)	n/a[a]	**2.4**
Barium	66.4	n/a	0.26
Selenium	1.18(UJ)	n/a	**0.35**
Zinc	64.05	n/a	0.079
Bis(2-ethylhexyl)phthalate	0.389	0.16	na[b]
	HI	0.2	**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 I-5.4-113
HI Analysis Using LOAEL-Based ESLs at AOC C-61-002

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.14	n/a[a]	**2.3**
Arsenic	5.2	0.076	n/a
Beryllium	2.06	n/a	0.082
Mercury	0.061	0.12	n/a
Nickel	16	n/a	0.059
Selenium	2.56(UJ)	0.062	**0.75**
Vanadium	31.1	na[b]	**124.4**
	HI	0.3	**128**

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 I-5.4-114
HI Analysis Using LOAEL-Based ESLs at SWMU 61-002

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	0.284	n/a[a]	**0.57**
Mercury	0.0414	0.028	n/a
Selenium	0.461	n/a	0.14
Zinc	79.4	0.085	0.098
Acenaphthene	0.16	na[b]	0.064
Naphthalene	1.5	na	0.15
	HI	0.1	1

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] n/a = Not applicable.

[b] na = Not available.

Attachment I-1

ProUCL Files
(on CD included with this document)

Attachment I-2

Vapor Intrusion Model Spreadsheets
(on CD included with this document)

Attachment I-3

Ecological Scoping Checklists

I3-1.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMUs 03-015, 03-021, 03-045(a,b,c,e,f,g,h), AND 60-007(b) AND AOCs 03-014(b2), 03-014(c2) 03-052(b), AND 03-053

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMUs 03-015, 03-021, 03-045(a,b,c,e,f,g,h), and 60-007(b) and AOCs 03-014(b2), 03-014(c2), 03-052(b), and 03-053
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	Sites are outfalls, storm drainages, or storm drainage ditches, and release areas that received effluent from janitorial sinks as well as from floor and roof drains; received treated effluent from the former Technical Area 03 (TA-03) wastewater treatment plant (WWTP); discharged caustic wash and rinse water from compressed-gas-cylinder cleaning operations, noncontact water from steam condensate and water from floor drains, a diesel fuel release, treated sanitary effluent from the TA-46 Sanitary Wastewater Systems Consolidation plant, wastewater from makeup water production and boiler blowdown water from the co-generation plant, and occasional releases of cooling tower blowdown and other discharges from the TA-03 power plant; received cooling tower blowdown water and other wastewater from structures 03-285 and 03-2327, from a floor drain in the oil pump house, from a sink drain, discharge of treated cooling water and storm water, storm drainage and storm water collection areas, wastewater from floor drains, sinks, water fountains, a storm drain, and several spills, and storm drainage ditch that received runoff from two parking lots, a steam-cleaning pad, a used-oil storage tank, and an oil/water separator.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – X **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – A few pine trees may be found at the edge of parking areas, large drainage channels, and the canyon. **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – Paved parking lots, buildings, construction areas and fences. **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only threatened or endangered (T&E) species that could frequent the Los Alamos National Laboratory (LANL) area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	The entire aggregate area is highly developed, particularly TA-03, and the sites are often contiguous and upgradient. Considerable runoff occurs among the sites and drainages eventually run together in several areas until they merge with Sandia Canyon.

Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMUs 03-015, 03-021, 03-045(a,b,c,e,f,g,h), and 60-007(b) and AOCs 03-014(b2), 03-014(c2), 03-052(b), and 03-053
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = low to medium **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The entire area of TA-03 is highly developed with large asphalted areas, parking lots, and streets. TA-60 and TA-61 are also developed but have more pine trees, grasses, and shrubs scattered throughout.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The areas contain terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The habitat quality of the sites is poor to nonexistent for most sites. Some areas retain pine trees and grasses, which provide minimal habitat and may support animal populations. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope), and the area is highly developed; the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow or in drainage channels into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because the sites are paved or covered with structures. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft below ground surface (bgs).

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The areas around the sites are highly disturbed and developed. Large portions of the surrounding areas are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Completed investigations have defined the nature and extent of contamination for most sites. The downgradient portion of some outfalls warrants further sampling to complete the characterization of the site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Once the downgradient portion of some sites is characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Few volatile organic compounds were detected and when detected were generally near or below the estimated quantitation limits and orders of magnitude below the screening levels.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The areas are highly developed and many parts are covered with asphalt and structures. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the sites, but runoff could flow into Sandia Canyon.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs, or perched groundwater present on or near the sites. The depth of groundwater is greater than 1000 ft bgs.

<u>**Question E:**</u>

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

<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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near these sites. Erosion potential is low and there is no evidence of mass wasting events in these areas.

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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: Volatile organic compounds are infrequently detected and at extremely low concentrations. Little evidence of burrowing observed at the sites.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is covered with asphalt and structures.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Low concentrations of chemicals of potential concern (COPCs) were detected in surface soil.

<u>Question J:</u>

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected at low concentrations in surface soil.

<u>Question K:</u>

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

<u>Question L:</u>

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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 Minor Pathway

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: Either radionuclides were not identified as COPCs or no gamma-emitting radionuclides were detected at these sites.

Question N:

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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question P:**</u>

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question Q:**</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question R:**</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question 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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

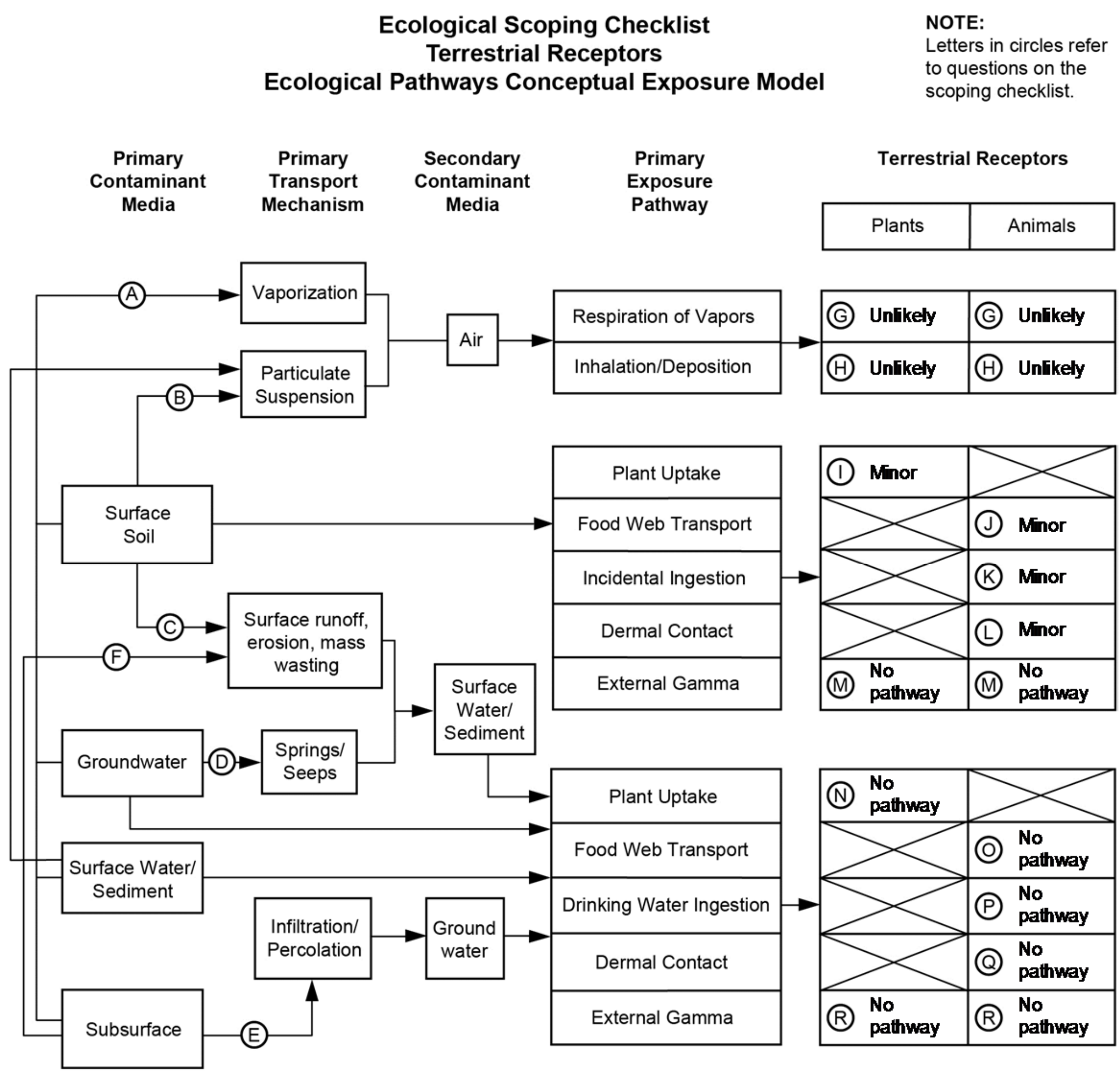
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

Aquatic Animals: 0 No Pathway

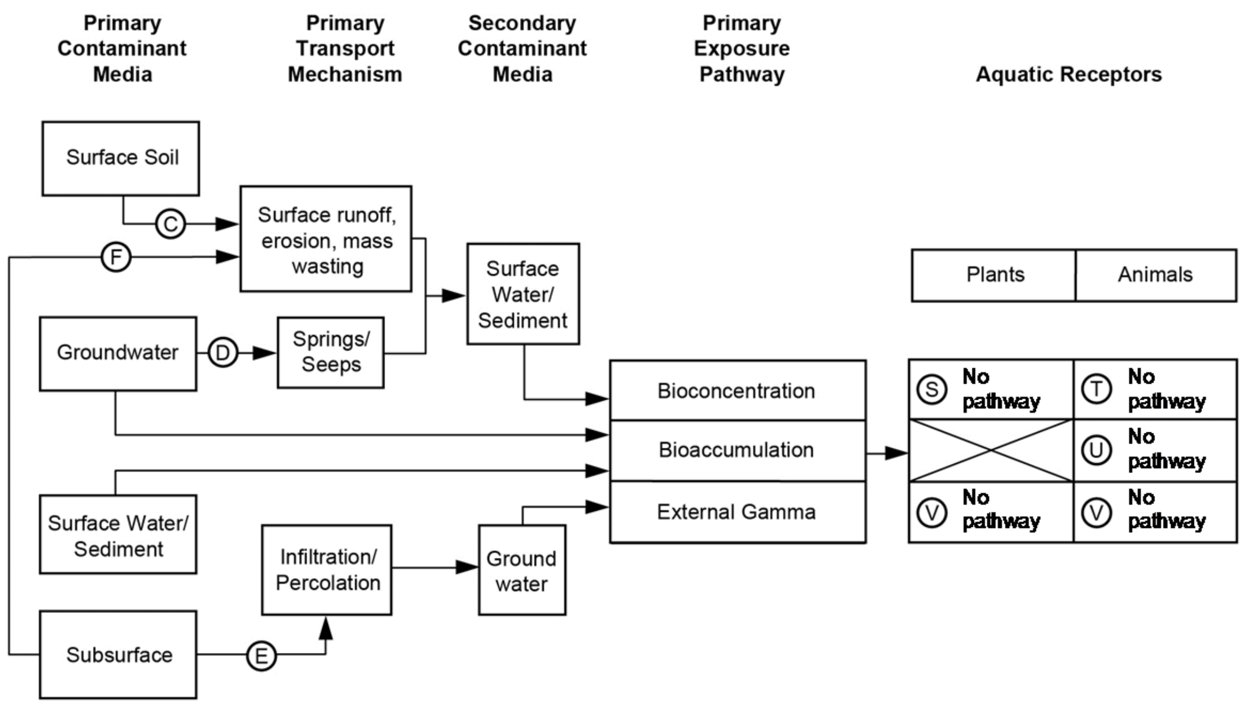
Provide explanation: There are no aquatic environments on-site.



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
Vaporization
Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G Unlikely
G Unlikely
H Unlikely
H Unlikely
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I Minor
J Minor
K Minor
L Minor
M No pathway
M No pathway
C
Surface runoff, erosion, mass wasting
F
Surface Water/ Sediment
Groundwater
D
Springs/ Seeps
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
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the scoping checklist.



SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature):

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature):

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-2.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMUs 03-002(c), 03-009(a), 03-009(i), 03-013(i), 03-056(a), 03-056(d), 03-059, 60-002, AND 60-007(a) and AOCs 03-003(d), 03-047(g), 03-051(c), 03-056(k), AND 60-004(f)

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMUs 03-002(c), 03-009(a), 03-009(i), 03-013(i), 03-056(a), 03-056(d), 03-059, 60-002, and 60-007(a) and AOCs 03-003(d), 03-047(g), 03-051(c), 03-056(k), and 60-004(f)
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	Sites are storage areas, surface disposal sites, transformer pads, drum storage areas, soil contamination, and operational releases to the surface. Mechanisms of release were spills, leaks, and debris. The areas of contamination were primarily within the areas, adjacent to the areas, and downgradient.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – NA **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – NA **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – X **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only T&E species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	The entire aggregate area is highly developed and the sites are often contiguous and upgradient. Considerable runoff occurs among the sites and drainages eventually run together in several areas.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMUs 03-002(c), 03-009(a), 03-009(i), 03-013(i), 03-056(a), 03-056(d), 03-059, 60-002, and 60-007(a) and AOCs 03-003(d), 03-047(g), 03-051(c), 03-056(k), and 60-004(f)
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none to low **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The entire area of TA-03 is highly developed with asphalt parking lots, structures, and streets. TA-60 and TA-61 are also developed but have more pine trees, grasses, and shrubs scattered throughout.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The areas contain some terrestrial biota such as small mammals, insects, birds, and plants. The habitat quality of the sites is poor to nonexistent for most sites. Some areas retain pine trees and grasses, which provide minimal habitat and may support animal populations. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is highly developed and the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow or in drainage channels into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because sites are paved or covered with structures. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft bgs.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The areas around the sites are highly disturbed and developed. Large portions of the surrounding areas are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Completed investigations have defined the nature and extent of contamination for most sites. The lateral or vertical extent warrants further sampling to complete the characterization of a few sites.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Once the sites are characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Few volatile organic compounds were detected and when detected were generally near or below the estimated quantitation limits, in only 1 to 5 samples, and orders of magnitude below the screening levels.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The areas are highly developed and many parts are covered with asphalt and structures. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the sites, but runoff might eventually flow into Sandia Canyon.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs, or perched groundwater present on or near the sites. The depth of groundwater is greater than 1000 ft bgs.

<u>**Question E:**</u>

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

<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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near these sites. Erosion potential is low and there is no evidence of mass wasting events in these areas.

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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: Volatile organic compounds are infrequently detected and at extremely low concentrations. Little evidence of burrowing observed at the sites

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is well covered with asphalt and structures.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Low concentrations of COPCs were detected in surface soil.

<u>**Question J:**</u>

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected at low concentrations in surface soil.

<u>**Question K:**</u>

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

<u>**Question L:**</u>

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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 Minor Pathway

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

<u>**Question M:**</u>

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: The majority of sites did not have radionuclides identified as COPCs or the few sites where radionuclides were analyzed for and detected, no gamma-emitting radionuclides were detected.

<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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question O:**</u>

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question P:**</u>

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question Q:**</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question R:**</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question S:</u>

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question T:</u>

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

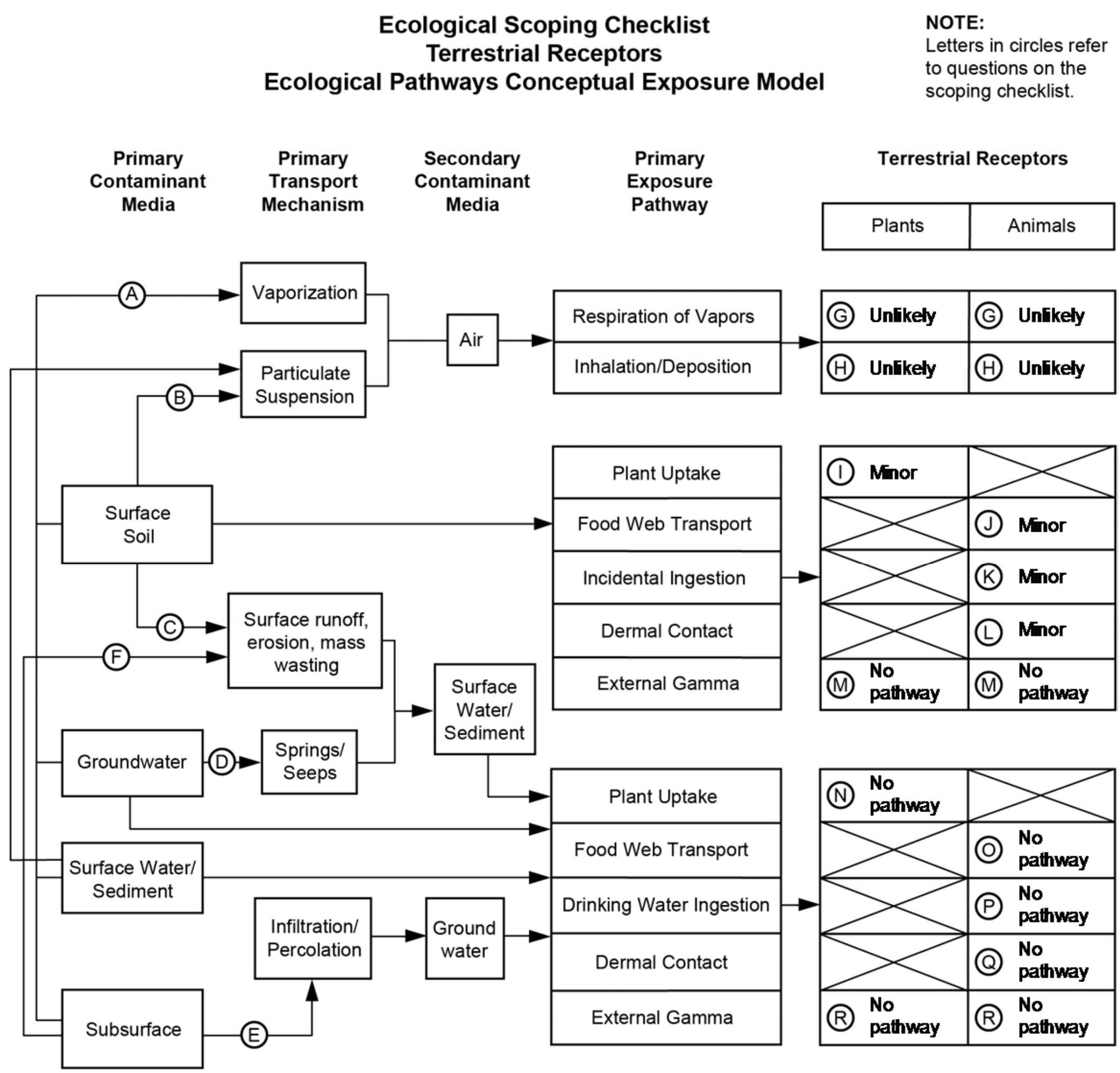
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

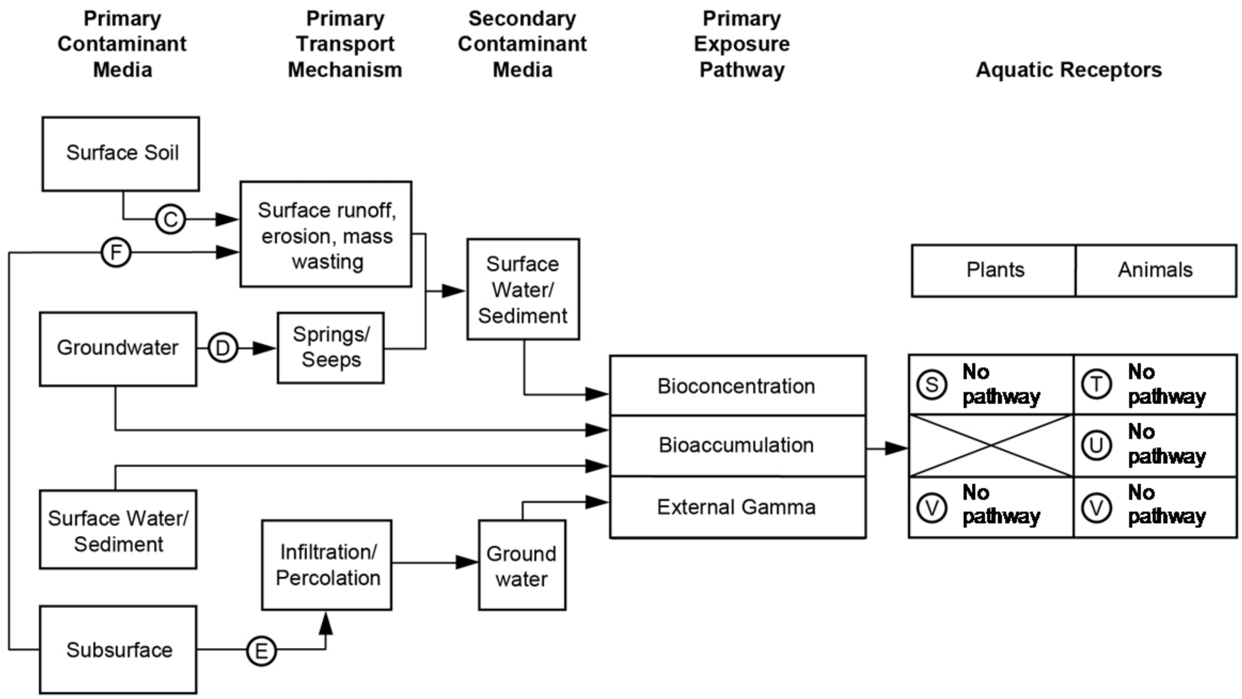
Aquatic Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.


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
Vaporization
Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G Unlikely
G Unlikely
H Unlikely
H Unlikely
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I Minor
J Minor
K Minor
L Minor
M No pathway
M No pathway
C
Surface runoff, erosion, mass wasting
F
Surface Water/ Sediment
Groundwater
D
Springs/ Seeps
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
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the scoping checklist.



SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature):

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature):

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-3.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMU 03-029 AND AOC C-61-002

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMU 03-029 and AOC C-61-002
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	SWMU 03-029 is a former landfill located approximately 300 ft south of building 03-271 near the rim of Sandia Canyon. The landfill reportedly received excess asphalt from the batch plant and was subsequently covered with sand. The fill raised and leveled the surface areas at the mesa rim. The site was investigated by trenching and buried asphalt was not encountered in any of the trenches. AOC C-61-002 is an area of subsurface contamination located in TA-61, approximately 15 ft north of building 61-16, a former storage building. The subsurface contamination was found during a drill rig test. During the drilling test, a petroleum odor was noted, and diesel contamination was detected at 7 to 8 ft bgs.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – X **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – NA **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – NA **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only threatened or endangered (T&E) species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	SWMU 03-029 is located approximately 200 ft east of SWMU 03-009(a). SWMU 03-029 is approximately 100 ft south of SWMU 03-059 and receives drainage from the former salvage yard. AOC C-61-002 is not related to any other SWMUs or AOCs.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMU 03-029 and AOC C-61-002
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = none
Field notes on the GIS vegetation class	The area of around SWMU 03-029 is devoid of any vegetation and is covered with gravel. The area around AOC C-61-002 is also devoid of vegetation, except for some scattered grass and weeds. It is also near Jemez Road, the security perimeter road, and parking lots.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The habitat quality of the sites is poor to nonexistent. Some small mammals, insects, birds, and plants might be present. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is developed and the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because the sites are primarily subsurface. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft bgs.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The area around the sites are disturbed and developed. Large portions of the surrounding areas are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Completed investigations have defined the nature and extent of contamination for SWMU 03-029. The lateral extent at AOC C-61-002 warrants further sampling to complete the characterization of the site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. The data for SWMU 03-029 addresses potential transport pathways. Once AOC C-61-002 is characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No volatile organic compounds were detected at SWMU 03-029. Only one volatile organic compound was detected at AOC C-61-022 at concentrations below the estimated quantitation limits and orders of magnitude below the screening levels.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The areas are developed and covered with gravel or asphalt. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the sites but runoff might eventually flow into Sandia Canyon.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of groundwater is greater than 1000 ft bgs.

<u>**Question E:**</u>

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

<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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near these sites. Erosion potential is low and there is no evidence of mass wasting events in these areas.

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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: Volatile organic compounds are infrequently or not detected and at extremely low concentrations. Little evidence of burrowing observed at the sites

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is covered with gravel or asphalt.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Low concentrations of COPCs were detected in surface soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: A few COPCs were detected at low concentrations in surface soil.

Question K:

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: A few COPCs were detected in surface soil.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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 Minor Pathway

Provide explanation: Lipophilic chemicals were detected at low concentrations.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: The sites did not have radionuclides identified as COPCs.

Question N:

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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question P:

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question Q:</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question R:</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question S:</u>

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question 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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

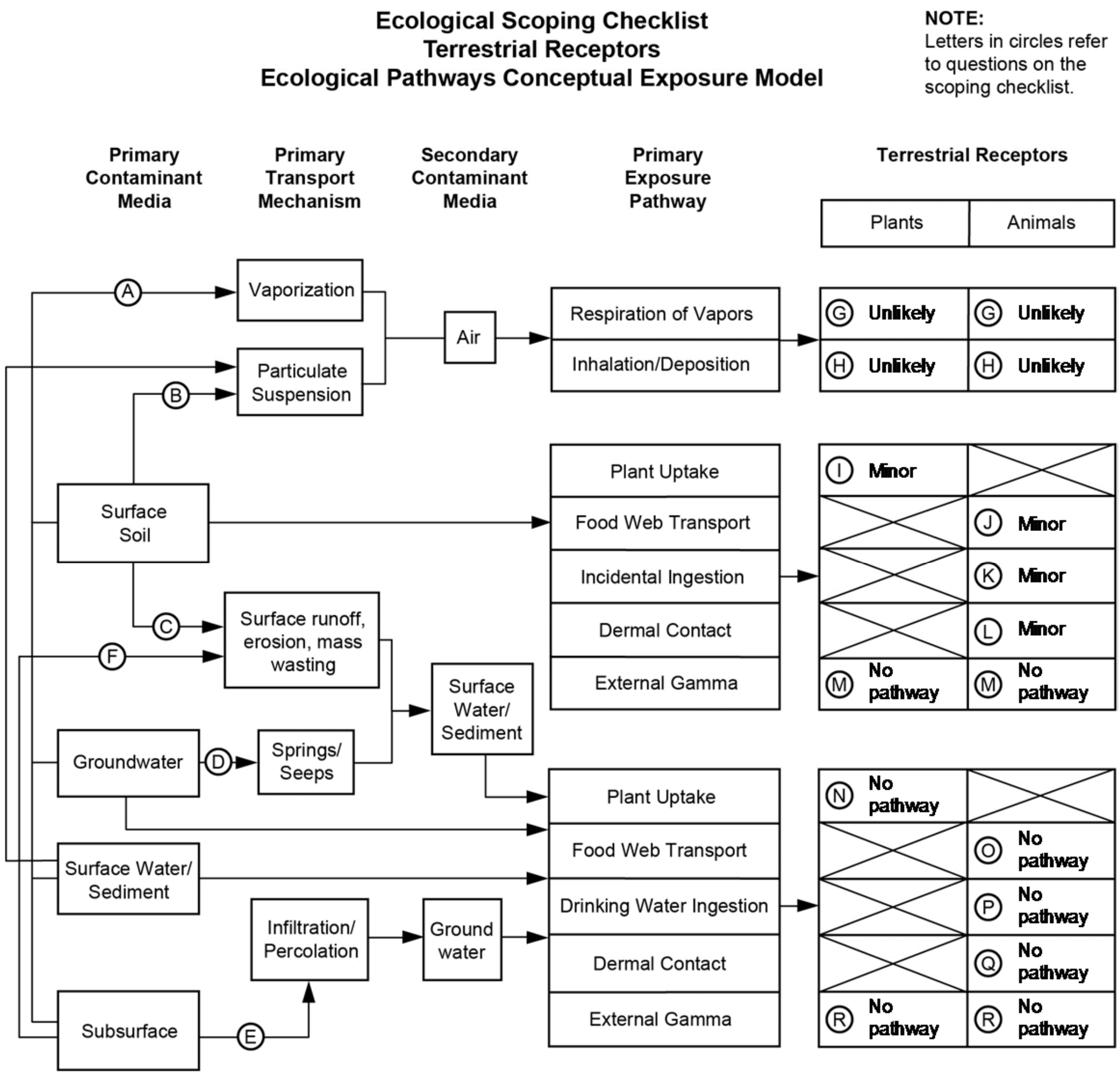
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

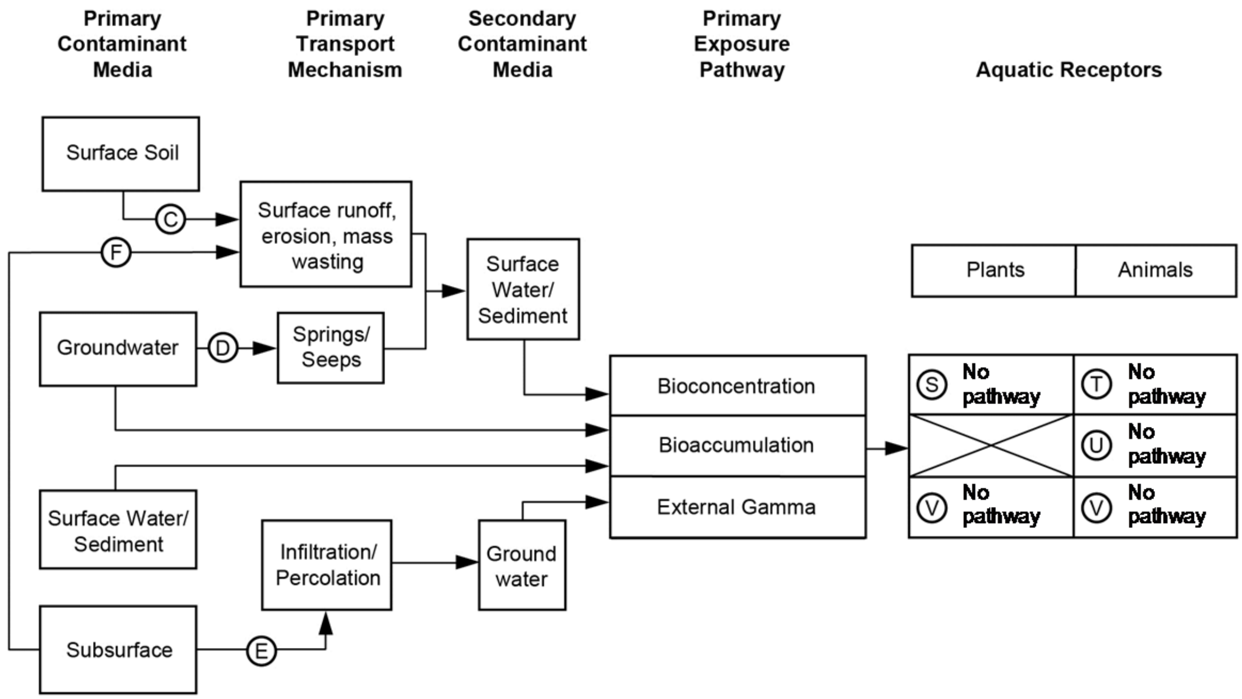
Aquatic Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.


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
Vaporization
Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G Unlikely
G Unlikely
H Unlikely
H Unlikely
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I Minor
J Minor
K Minor
L Minor
M No pathway
M No pathway
C
Surface runoff, erosion, mass wasting
F
Surface Water/ Sediment
Groundwater
D
Springs/ Seeps
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
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the scoping checklist.



SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature): Richard Mirenda

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature): Tracy McFarland

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-4.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMUs 03-014(k,l,m,n), 03-014(o), AND 03-014(u)

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMUs 03-014(k,l,m,n), 03-014(o), and 03-014(u)
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	Sites are structures associated with the TA-03 WWTP. Releases might have occurred as a result of spills, leaks, overflows, and seepage. The areas affected were beneath the structures and the surrounding areas. SWMUs 03-014(k,l,m,n), structures 03-196, 03-197, 03-198, and 03-199, are four unlined sludge-drying beds. SWMU 03-014(o) consists of three polypropylene-lined sludge-drying beds (structure 03-1871) excavated into tuff. SWMU 03-014(u) is the former location of a 1500-gal. holding tank (structure 03-1901) that collected effluent from the former TA-03 WWTP sludge beds.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – X **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – X **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – Paved areas and buildings surround the structures. **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only T&E species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	The area is developed and the sites are contiguous and upgradient. Runoff occurs among the sites and drainages run together in several areas.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMUs 03-014(k,l,m,n), 03-014(o), and 03-014(u)
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none to low **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The entire area is developed with large amounts of asphalted areas, parking lots, structures, and streets.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The area might contain some terrestrial biota, such as small mammals, insects, birds, and plants. The habitat quality of the sites is poor to nonexistent for most sites. Some areas retain grasses and weeds but provide minimal habitat. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is developed and the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow or in drainage channels into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because sites are paved or covered with structures. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft bgs.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The areas within and around the sites are disturbed and developed. Large portions of the areas are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Completed investigations have defined the nature and extent of contamination for most sites. The vertical extent warrants further sampling to complete the characterization of one site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Once the sites are characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Few volatile organic compounds were detected and when detected were generally near or below the estimated quantitation limits, in only 1 to 4 samples, and orders of magnitude below the screening levels.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The areas are developed and many parts are covered with asphalt and structures. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the sites but runoff might eventually flow into Sandia Canyon.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs, or perched groundwater present on or near the sites. The depth of groundwater is greater than 1000 ft bgs.

<u>**Question E:**</u>

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

<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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near these sites. Erosion potential is low and there is no evidence of mass wasting events in these areas.

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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: Volatile organic compounds are infrequently detected and at extremely low concentrations. Little evidence of burrowing observed at the sites

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is covered with asphalt and structures.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Low concentrations of COPCs were detected in surface soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected at low concentrations in surface soil.

Question K:

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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 Minor Pathway

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: No gamma-emitting radionuclides were detected.

Question N:

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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question P:

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question Q:**</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question R:**</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>**Question S:**</u>

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question T:</u>

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question V:</u>

Could contaminants interact with aquatic plants or animals through external irradiation?

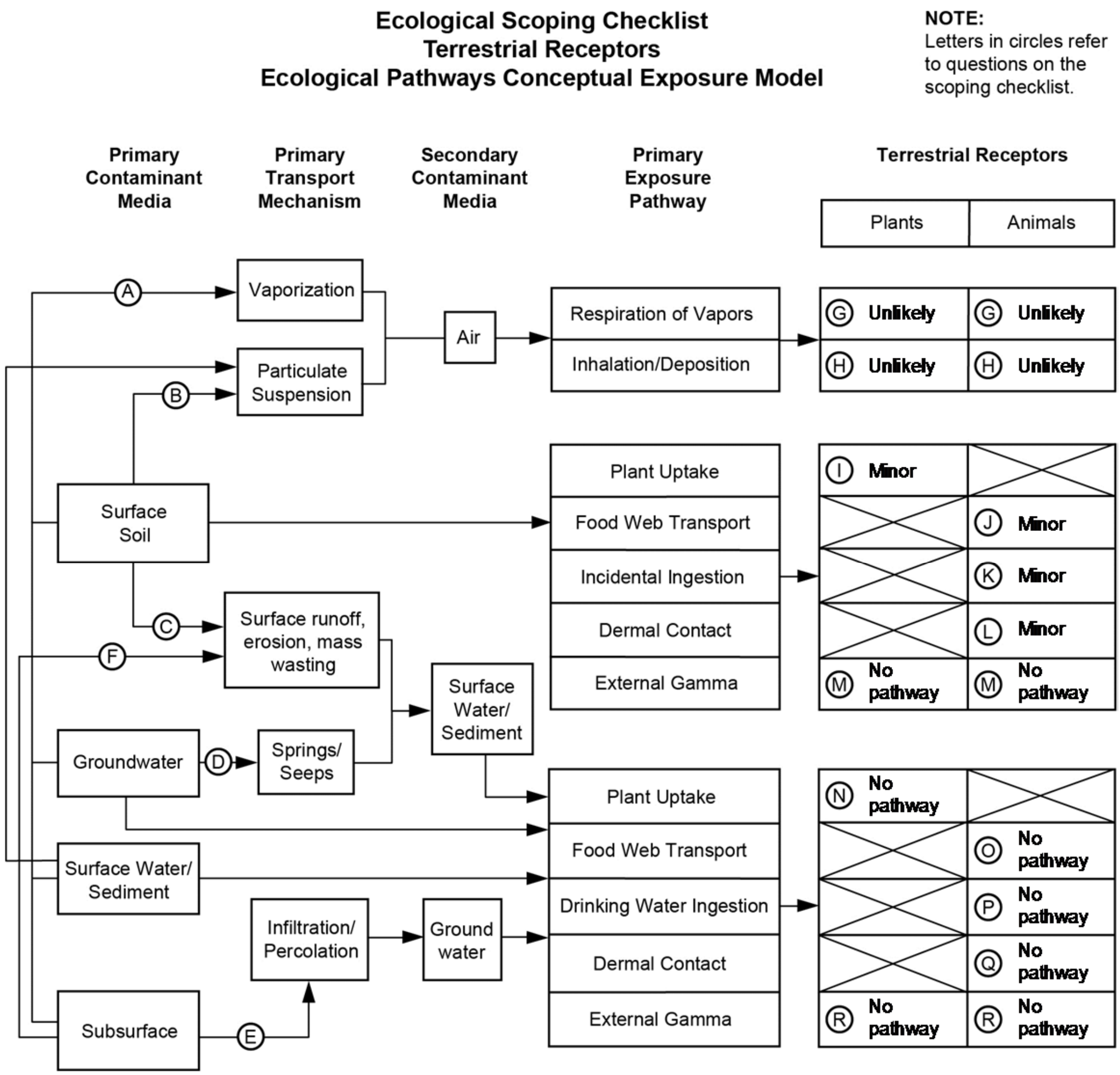
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

Aquatic Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.



Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model
NOTE:
Letters in circles refer to questions on the scoping checklist.
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Primary Transport Mechanism
Secondary Contaminant Media
Primary Exposure Pathway
Terrestrial Receptors
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Animals
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Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G Unlikely
G Unlikely
H Unlikely
H Unlikely
Surface Soil
Plant Uptake
Food Web Transport
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Surface runoff, erosion, mass wasting
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Surface Water/ Sediment
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D
Springs/ Seeps
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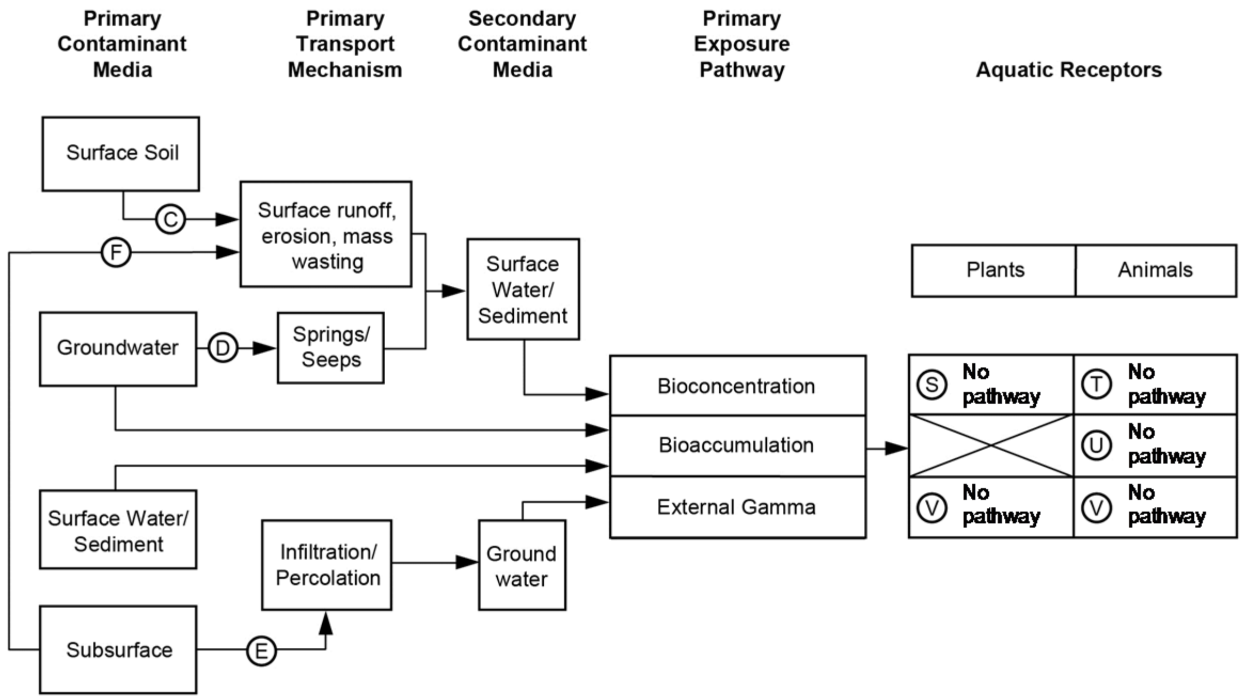
Food Web Transport
Drinking Water Ingestion
Dermal Contact
External Gamma
N No pathway
O No pathway
P No pathway
Q No pathway
R No pathway
R No pathway
Infiltration/ Percolation
Ground water
Subsurface
E

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the scoping checklist.



SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature):

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature):

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-5.0 ECOLOGICAL SCOPING CHECKLIST FOR AOC C-03-022

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	AOC C-03-022
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference map if appropriate.**	AOC C-03-022 is the former location of a tanker trailer used to store and distribute kerosene for former asphalt batch plant operations. Releases might have occurred through leaks and spills to the surrounding area.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – NA **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – NA **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – NA **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only T&E species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	This former trailer location supplied kerosene to the former asphalt batch plant, Consolidated Unit 03-009(a)-00, through a pipe that passed the oil distributor tank, AOC C-03-016.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	AOC C-03-022
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none to low **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The area is developed with asphalt parking lots and streets.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The area might contain some terrestrial biota such as small mammals, insects, birds, and plants. The habitat quality is poor to nonexistent. The area provides minimal habitat. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is developed and the asphalt cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because site is paved or covered with structures. There is no potential for groundwater contamination as the depth to groundwater at TA-03 is ~1100 ft bgs.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The area around the site is disturbed and developed. Large portions of the surrounding area are covered with asphalt.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. The lateral or vertical extent warrants further sampling to complete the characterization of the site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Once the site is characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds were not identified as COPCs.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The area is developed and many parts are covered with asphalt. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the sites but runoff might eventually flow into Sandia Canyon.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of groundwater is greater than 1000 ft bgs.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near these sites. Erosion potential is low and there is no evidence of mass wasting events in these areas.

<u>Question G:</u>

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: 0 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: Volatile organic compounds were not identified as COPCs. Little evidence of burrowing observed at the site.

<u>Question H:</u>

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is covered with asphalt.

<u>Question I:</u>

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Concentrations of COPCs were detected in surface soil.

<u>Question J:</u>

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

<u>Question K:</u>

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

<u>Question L:</u>

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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: 0 No Pathway

Provide explanation: Lipophilic chemicals were not detected.

<u>Question M:</u>

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: Radionuclides were not identified as COPCs.

Question N:

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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question P:

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question R:

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question 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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

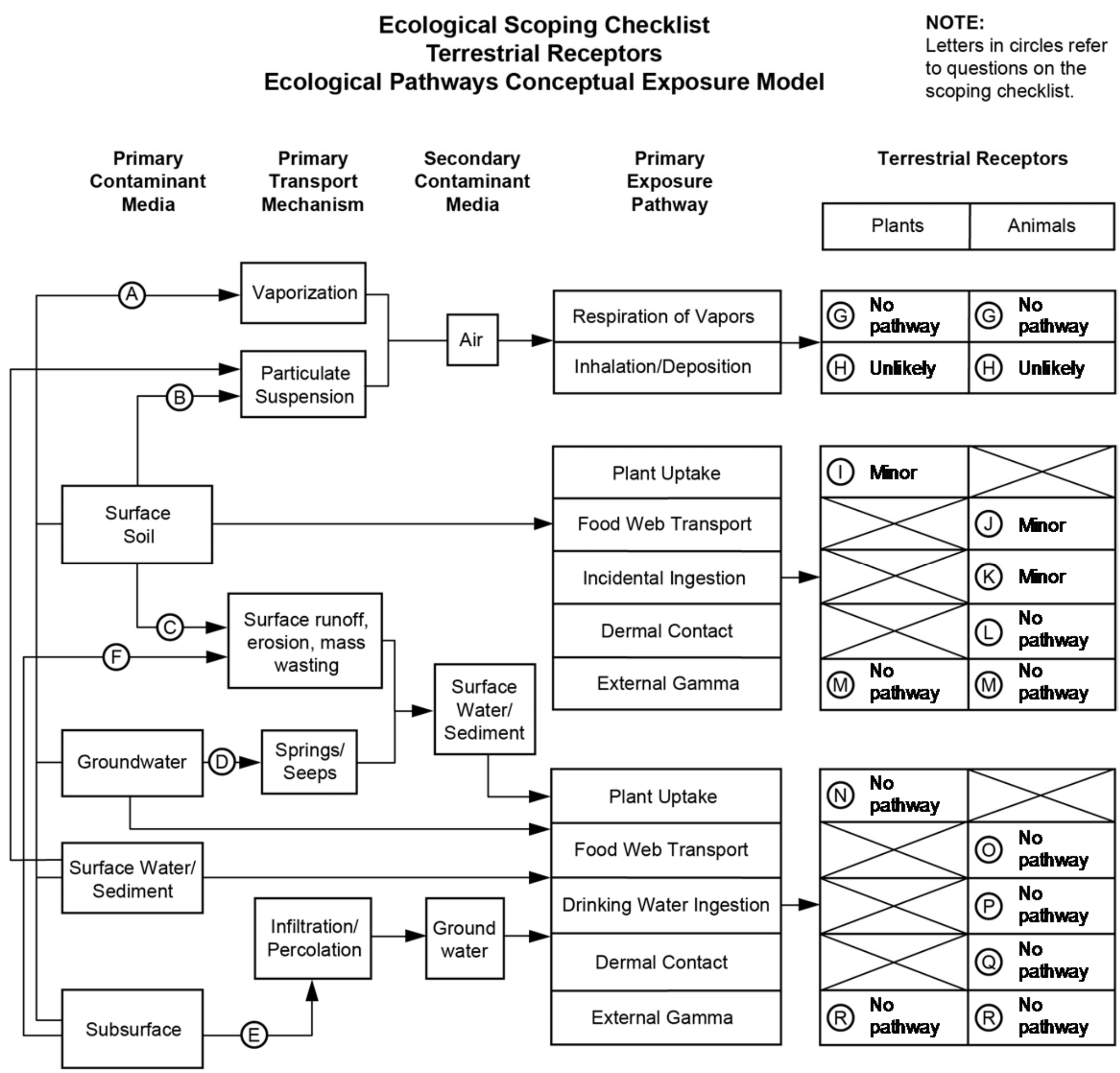
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

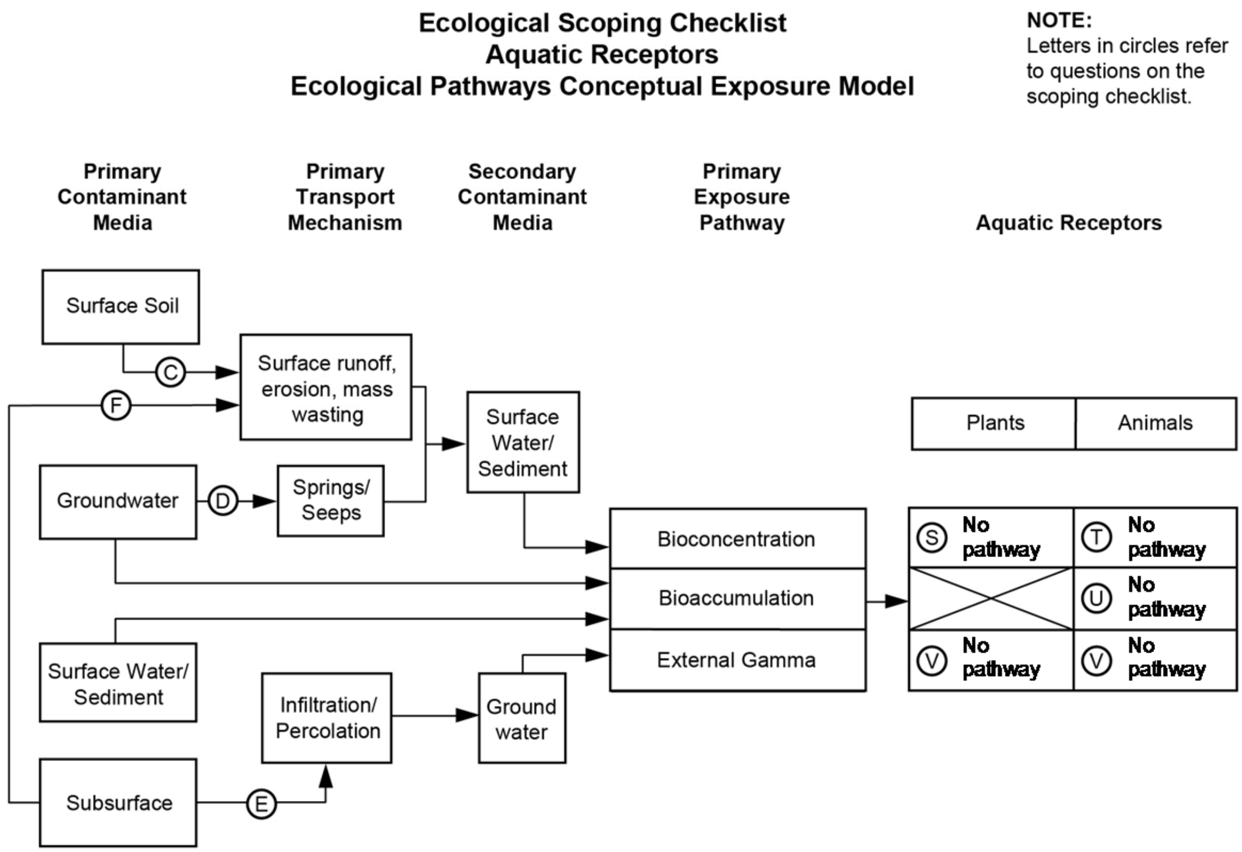
Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

Aquatic Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.


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
Vaporization
Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G No pathway
G No pathway
H Unlikely
H Unlikely
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I Minor
J Minor
K Minor
L No pathway
M No pathway
M No pathway
C
Surface runoff, erosion, mass wasting
F
Groundwater
D
Springs/ Seeps
Surface Water/ Sediment
Surface Water/ Sediment
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
Infiltration/ Percolation
Ground water
Subsurface
E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Aquatic Receptors
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NOTE:
Letters in circles refer to questions on the scoping checklist.
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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

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature): [signature]

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature): [signature]

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-6.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMU 03-012(b)

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMU 03-012(b)
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	SWMU 03-012(b) is soil contamination associated with operational releases from the TA-03 power plant, building 03-22, and associated cooling towers, including cooling tower drift and cooling water discharges.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – X **Surface water/sediment** – NA **Subsurface** – NA **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – NA **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – X **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only T&E species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	Effluent from the former TA-03 WWTP, Consolidated Unit 03-014(a)-99, was used as cooling tower water for the TA-03 power plant (building 03-22). The effluent was stored in a holding tank, SWMU 03-014(q), before it was used in the cooling towers and eventually discharged to an outfall, [SWMU 03-045(b)] located within the same drainage that receives surface water runoff from SWMU 03-012(b). SWMU 03-045(c) is a National Pollutant Discharge Elimination System–permitted outfall located about 55 ft east of SWMU 03-012(b). The holding tank and both outfalls, along with SWMU 03-012(b), make up Consolidated Unit 03-012(b)-00. Surface water runoff from SWMU 03-012(b) along with discharges from the SWMU 03-045(b) and SWMU 03-045(c) outfalls end up in the tributary to Upper Sandia Canyon that runs along the southern edge of the TA-03 power plant facility.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMU 03-012(b)
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none to low **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The entire area is developed with large amounts of asphalt, structures, parking lots, and streets.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The areas might contain some terrestrial biota such as small mammals, insects, birds, and plants. The habitat quality is poor to nonexistent and provide minimal habitat. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is developed and the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow or in drainage channels into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport. It is unlikely that contaminants will be transported as fugitive dust because sites are paved or covered with structures. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft bgs.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The area is disturbed and developed. Large portions of the area are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. The lateral or vertical extent warrants further sampling to complete the characterization of the site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Once the site is characterized the data will address potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. Not applicable.

Part C—Ecological Pathways Conceptual Exposure Model

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Models (use to complete figures at end of Part C).

Answer all questions with drop-down menu choices. When finished, select the entire document using control A, and press F9. This will update all the fields in the models to reflect the questions. You can also click in individual fields in the models and press F9 to update.

Question A:

Could soil contaminants reach receptors through vapors?

- **Determine the volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >1E-05 atm-m^3/mol and molecular weight <200 g/mol).**
- **In the case of burrowing animals, the contamination would have to occur in the depth interval where burrows are present (near surface to 5 ft below ground surface).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Only one volatile organic compound was detected at concentrations below the estimated quantitation limits in only 3 samples, and orders of magnitude below the screening levels.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual soil surface 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 the burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The area is highly developed and many parts are covered with asphalt and structures. There was also little evidence of burrowing at the sites.

Question C:

Can contaminated soil be transported to aquatic communities?

If erosion is an off-site transport pathway, determine the terminal point to see if aquatic receptors could be impacted by contamination from the site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on the site but runoff might eventually flow into Sandia Canyon.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs, or perched groundwater present on or near the site. The depth of groundwater is greater than 1000 ft bgs.

<u>**Question E:**</u>

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate to 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 come in contact with groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

<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 applicable only to release sites located on or near the mesa edge.**
- **Consider the potential erosion of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on or near the site. Erosion potential is low and there is no evidence of mass wasting events in the area.

<u>Question G:</u>

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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: Volatile organic compounds are infrequently detected and at extremely low concentrations. Little evidence of burrowing observed at the sites.

<u>Question H:</u>

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **For this exposure pathway to be complete, contaminants must be present as particulates in the air or as dust.**
- **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: 1 Unlikely Pathway

Terrestrial Animals: 1 Unlikely Pathway

Provide explanation: There was little evidence of burrowing and the ground is covered with asphalt and structures.

<u>Question I:</u>

Could contaminants interact with plants through root uptake or rain splash from surficial soil?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants may occur through particulates deposited on leaf and stem surfaces by rain striking contaminated soil (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2 Minor Pathway

Provide explanation: Low concentrations of COPCs were detected in surface soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soil?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected at low concentrations in surface soil.

Question K:

Could contaminants interact with receptors through the incidental ingestion of surficial soil?

- **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.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2 Minor Pathway

Provide explanation: COPCs were detected in surface soil.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soil?

- **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 Minor Pathway

Provide explanation: Lipophilic chemicals were detected at low concentrations at the site.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: Radionuclides were not identified as COPCs.

Question N:

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 sediment (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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food.**
- **Animals may ingest contaminated food.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question P:

Could contaminants interact with receptors through the ingestion of water and suspended sediment?

- **If sediment is present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediment.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a source of drinking water.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question Q:</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediment is 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question R:</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation is 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 No Pathway

Terrestrial Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.

<u>Question S:</u>

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 No Pathway

Provide explanation: There are no aquatic environments on-site.

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 sediment 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question 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 may result in 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 No Pathway

Provide explanation: There are no aquatic environments on-site.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

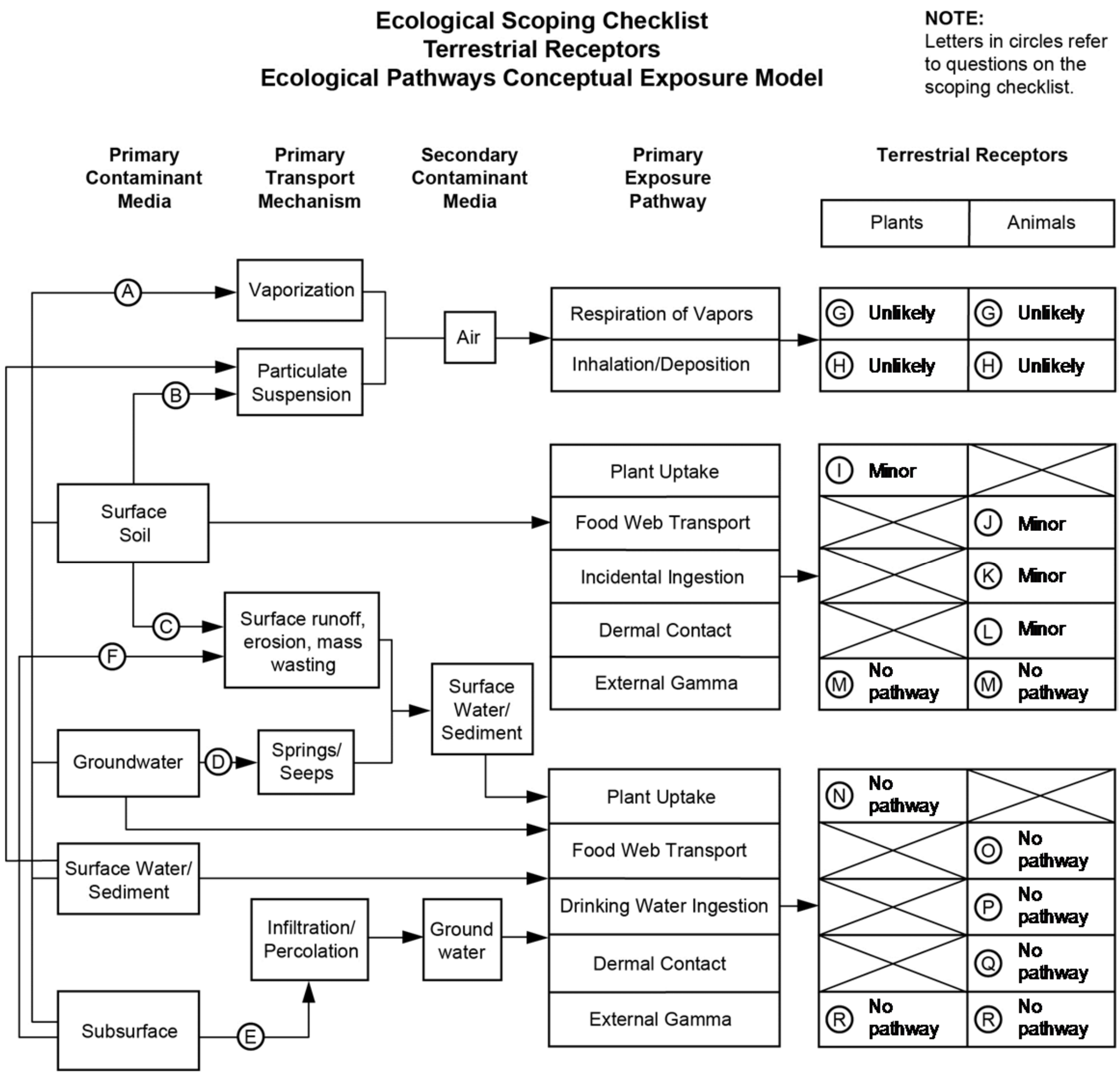
- **External irradiation is most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0 No Pathway

Aquatic Animals: 0 No Pathway

Provide explanation: There are no aquatic environments on-site.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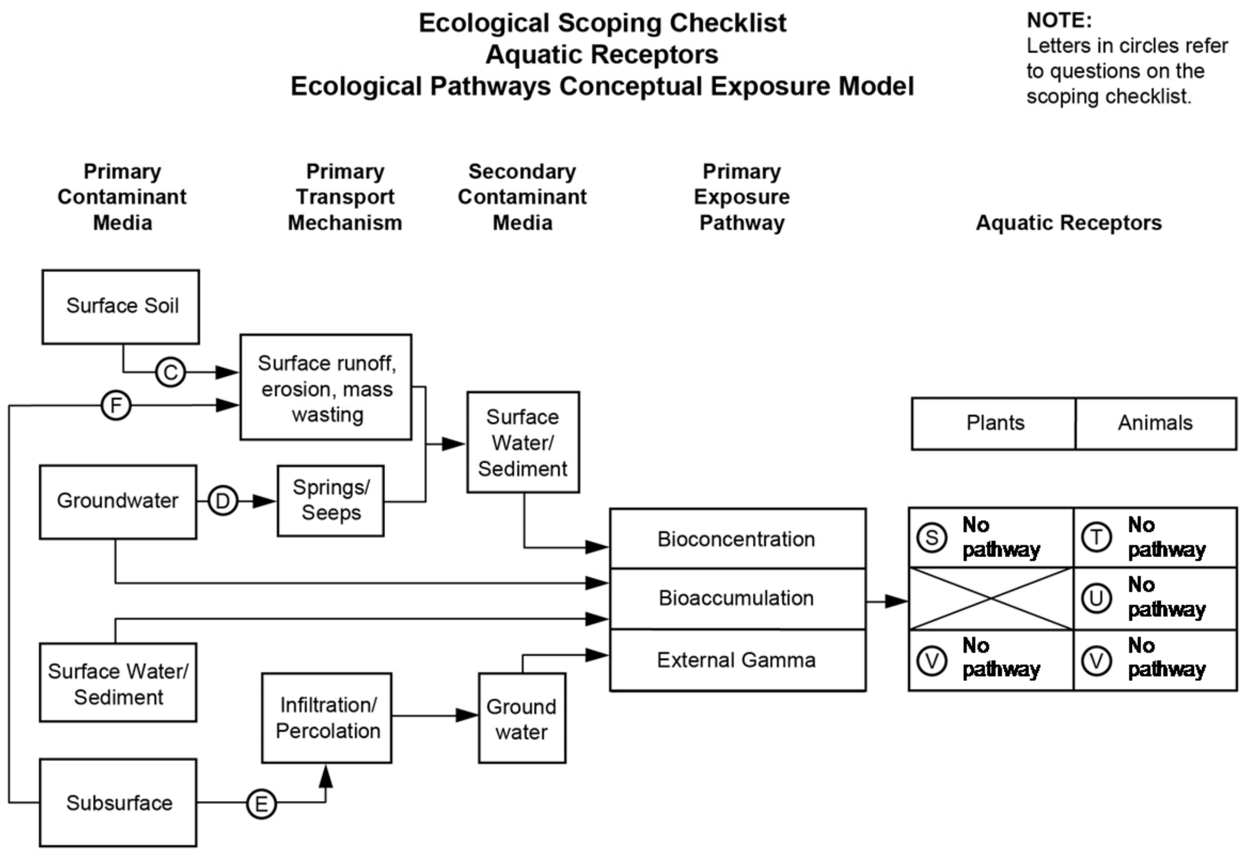
B
C
D
E
F


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
Groundwater
D
Springs/ Seeps
Bioconcentration
Bioaccumulation
External Gamma
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E
Plants
Animals
S
No pathway
T
No pathway
U
No pathway
V
No pathway
V
No pathway

SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Richard Mirenda

Name (signature): [signature]

Organization: ET-ER

Date completed: 4/22/13

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature): [signature]

Organization: MOF-CM-STR

Date reviewed: 8/22/13

I3-7.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMU 60-006(a)

Part A—Scoping Meeting Documentation

Site Identification (Include Aggregate Area)	SWMU 60-006(a)
Form of Site Releases (Solid, Liquid, Vapor) **Describe known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference map if appropriate.**	SWMU 60-006(a) is the former location of a decommissioned septic system located at TA-60 on Sigma Mesa near the northeast corner of the fence surrounding buildings 60-17 and 60-19. The septic system consisted of a 1000-gal. septic tank and associated 4-ft-wide × 50-ft-deep seepage pit. No outfall is associated with this system.
Directly Impacted Media **Indicate all that apply.**	**Surface soil** – NA **Surface water/sediment** – NA **Subsurface** – X **Groundwater** – NA **Other, explain** – NA
Vegetation Class Based on Geographic Information System (GIS) Vegetation Coverage **Indicate all that apply.**	**Water** – NA **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine** – NA **Piñon juniper/juniper savannah** – NA **Grassland/shrubland** – NA **Developed** – X **Burned** – NA
Threatened and Endangered Species Habitat **If applicable, list threatened and endangered species known or suspected of using the site for breeding or foraging.**	The only T&E species that could frequent the LANL area is the Mexican spotted owl. The owl's primary habitat is densely forested canyons and it may use Sandia Canyon and surrounding area as foraging habitat [personal communication, WES-EDA-GIS Team, Areas of Environmental Interest Metadata].
Neighboring/Contiguous/Upgradient Sites **Include a summary of chemicals of potential concern and the type of releases if impacting site.** **(Use this information to evaluate the need to aggregate sites for scoping and screening.)**	SWMU 60-006(a) is located approximately 50 ft north of building 60-198 and 300 ft west of the former location of the SWMU 60-002 central storage area. SWMU 60-006(a) is not associated with any other SWMUs or AOCs.
Surface Water Erosion Potential **Indicate if erosion is present and type; terminal point of surface water transport; slope; and surface water run-on sources. Indicate if best management practices (BMPs) are in place or are needed.**	The terminal point of surface water transport is Sandia Canyon. The mesa ground surface of the Upper Sandia Canyon Aggregate Area is typically flat (<10% slope) with some areas gradually sloping (10%–30%) toward the canyon. Erosion is not apparent.

Part B—Site Visit Documentation

Site ID	SWMU 60-006(a)
Date of Site Visit	4/18/13
Site Visit Conducted by	Kent Rich, Tracy McFarland, Richard Mirenda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = low to medium **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class	The area is developed with large amounts of asphalt, parking lots, structures, and streets. The area of the seepage pit is outside of the fenced area and covered with grasses and some trees.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and note the quality of habitat present at the site.**	Yes. The area contains some terrestrial biota such as small mammals, insects, birds, and plants. The habitat quality outside of the fence is good and provides habitat to support plant and animal populations. No aquatic community exists in the Upper Sandia Canyon Aggregate Area.

Contaminant Transport Information:

Surface Water Transport **Field notes on the erosion potential and BMPs, including a discussion of the terminal point of surface water transport (if applicable).**	The Upper Sandia Canyon Aggregate Area has a low potential for surface water transport. The ground surface is typically flat (<10% slope) and the area is developed and the asphalt or structural cover contributes to stabilization of the surface media, resulting in a low potential for erosion and surface water infiltration. Runoff moves as sheet flow or in drainage channels into the canyon. The terminal point of surface water transport is Sandia Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is potential for surface water transport but any releases from the site are subsurface. It is unlikely that contaminants will be transported as fugitive dust because the site is subsurface. There is no potential for groundwater contamination as the depth to groundwater is ~1100 ft bgs.

Ecological Effects Information:

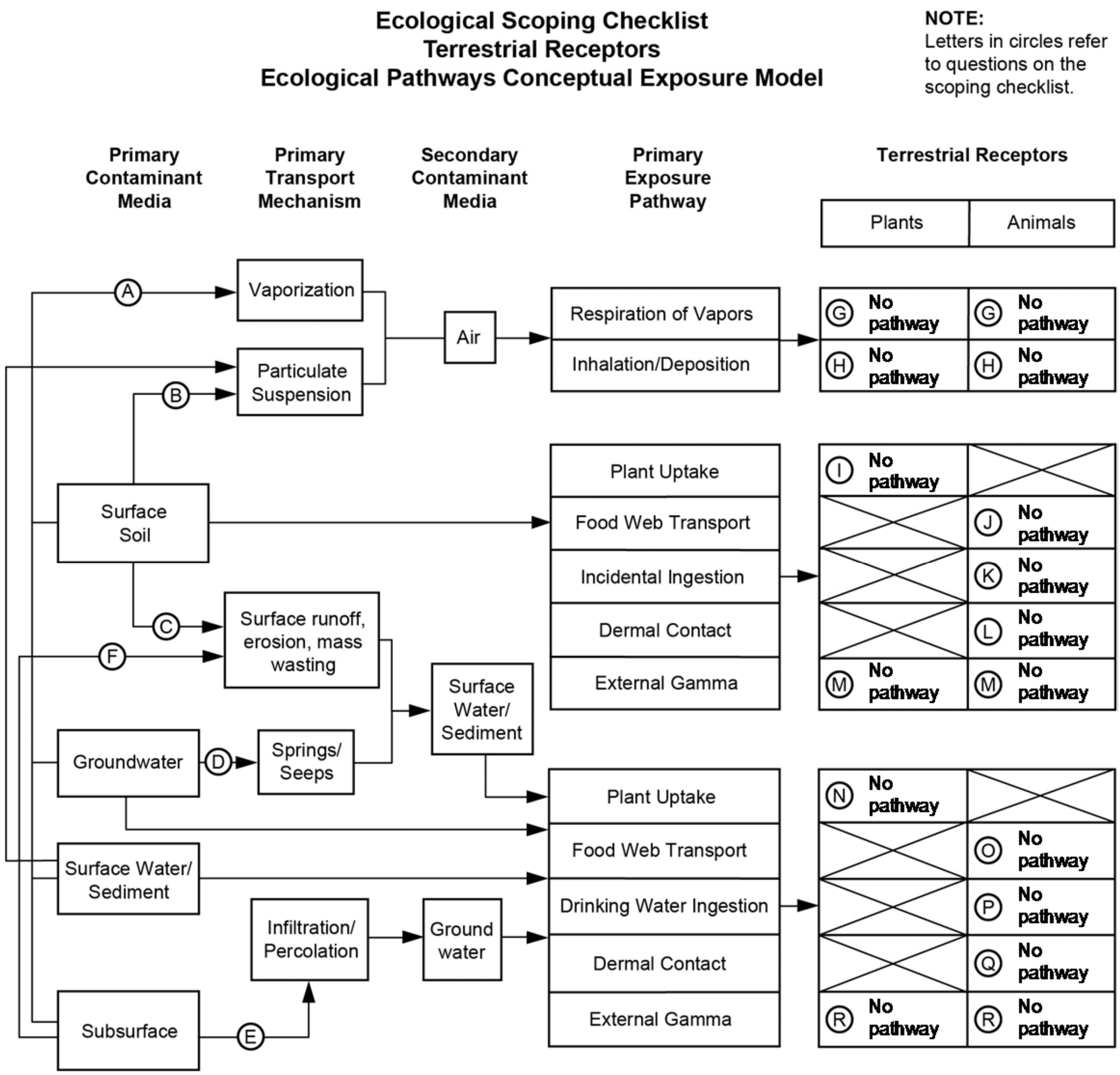
Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The area around the site is disturbed and developed. Large portions of the surrounding area are covered with asphalt or structures.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Effects are the result of the physical disturbances and industrial development of the area.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. Completed investigation has defined the nature and extent of contamination.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation**	Yes. The data addresses the potential transport pathways.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, do not complete Part C. Provide explanation/justification for proposing an ecological "No Further Action" recommendation. There are no complete exposure pathways to ecological receptors because releases occurred below 10 ft bgs and there are no transport pathways to off-site receptors.



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Terrestrial Receptors
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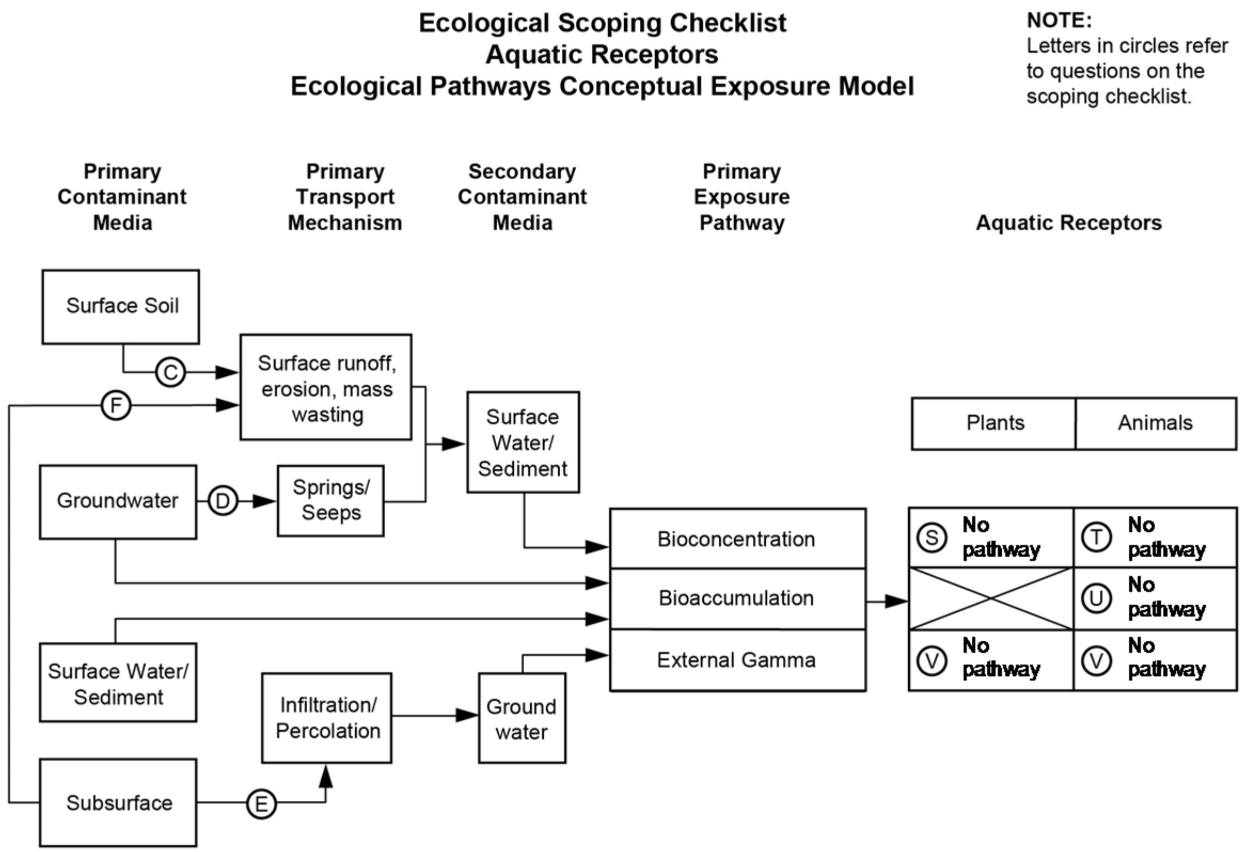
Terrestrial Receptors
Plants
Animals
A
Vaporization
Particulate Suspension
B
Air
Respiration of Vapors
Inhalation/Deposition
G No pathway
G No pathway
H No pathway
H No pathway
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I No pathway
J No pathway
K No pathway
L No pathway
M No pathway
M No pathway
C
Surface runoff, erosion, mass wasting
F
Surface Water/ Sediment
Groundwater
D
Springs/ Seeps
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
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface
E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Name (signature):

Organization: ET-ER

Date completed: 4/22/13

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Name (printed): Tracy McFarland

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Organization: MOF-CM-STR

Date reviewed: 8/22/13